



COMMUNITY ENGAGEMENT SUMMARY

DISTRIBUTED ENERGY RESOURCES (DER)

BATTERIES, SOLAR AND DEMAND RESPONSE

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ACRONYMS

ACRONYM	FULL NAME
BESS	Battery energy storage systems
BIPOC	Black, Indigenous, and People of Color
BDR	Behavioral demand response
CBO	Community-based organization
CEIP	Clean Energy Implementation Plan
DEI	Diversity, Equity, and Inclusion
DER	Distributed energy resources
DR	Demand response
GHG	Greenhouse gas
GPSG	Green Power Solar Grant
HVAC	Heating, venting, and cooling
PSE	Puget Sound Energy
REM	Remote energy management
RFP	Request for proposals
WUTC	Washington Utilities and Transportation Commission

1. EXECUTIVE SUMMARY

OVERVIEW

Puget Sound Energy (PSE) is increasing procedural equity in its product design by giving Named Communities and their service providers a seat at the design table. From September 2022 through May 2023 PSE conducted community engagement on future distributed energy resource (DER) products, including batteries, solar and demand response (DR).

PSE engaged 340 low-income residents and 61 agencies, municipalities, organizations, and tribal entities who serve those aforementioned residents in focus groups, workshops, and surveys to hear from them directly about the benefits and barriers customers may face when it comes to DER products, and how future product design can alleviate these barriers and maximize the desired benefits.

KEY FINDINGS

Through interviews, focus groups, workshops, and surveys focused on DR, solar, and battery products, participants identified the following common themes of feedback:

Cost

Upfront costs associated with asset procurement and installation, along with the ongoing cost of maintenance, were consistently highlighted as the largest barriers across all DER products, and for all customer segments. While suggestions to alleviate the barriers were unique among the three products, there was a clear ask for financial incentives that substantially offset or entirely remove the financial costs customers may encounter when participating in DER products. Participants also preferred these incentives be applied instantly so that customers do not need to manage lengthy rebate processes that exacerbate their cash flow issues.

Installation and maintenance support

The installation and maintenance associated with DER implementation can feel daunting to customers. To facilitate adoption of DERs, PSE will need to be prepared with tailored, holistic, and hands-on installation and maintenance support for the customers who request it.

Flexibility of products

While similar themes emerged across many engagements, it also became clear how diverse each customer's needs and interests could be. The final products PSE designs must be flexible enough to alleviate the nuanced challenges each customer will face based on their size, geographic location, the services they provide and whether they rent or own their property.

PSE-owned and customer-owned options

Engagement participants differed on their preference for renting versus owning assets, like solar panels. Those who preferred PSE-owned options articulated an inability to afford the associated equipment, installation, and maintenance costs. Those who preferred customer-owned options typically valued the autonomy and control of ownership. Similar to the flexibility theme, PSE should provide both options to meet diverse customer preferences.

Strong motivation to participate in DERs

While certain DERs are a better fit for some customers, across all engagements, participants indicated a strong interest in participating in future DER products. Participants highlighted the importance of energy independence, community or personal energy resilience, and reduction in energy bills as the benefits that will most motivate them to participate in DER products.

Education and outreach

While participants expressed a strong motivation to participate in DERs, there are many education and outreach gaps left to fill. The existing knowledge gap often translates into skepticism about whether DERs can deliver on the promised benefits. Participants wanted foundational questions about costs, environmental impacts, and community benefits answered to help them make informed decisions about product participation. Participants suggested PSE partner with CBOs and utilize their deep, existing community relationships to educate customers.

FINDINGS BY CUSTOMER SEGMENT

While the key findings provide an aggregate view across all DER products and all customer segments, the table below highlights nuanced findings for each category.

	Commercial customers	Residential customers	All customers
Batteries	- Value reliability during outage events as a more important benefit than reduced utility bills. They view themselves as future resiliency hubs for their communities - Voiced cybersecurity concerns	- Will struggle to commit to 10-15 year project terms - Question whether they can install a battery without needing to conduct other home upgrades - Want to be able to opt out of events	- Want significant reserves in case of an unexpected outage - Want to be educated on battery safety - Want to understand the environmental impacts of a battery's lifecycle - Are slightly more interested in hosting a PSE-owned battery than owning their own
Solar	- Want to install larger arrays and struggle with the 100 kW net metering threshold - Are currently comfortable selling environmental benefits to PSE, but want flexibility to change their minds down the road	- Will struggle to commit to 10-15 year project terms - If cost was no issue, would prefer to own the solar panels on their roof - Are very interested in community solar but would expect \$20-\$50 monthly bill credits for their participation - Would prefer to enroll in local community solar projects, even if that means they receive a lower on-bill credit	- Want to bundle solar and batteries - Are not as interested in ground mounted solar as they are in rooftop solar
DR	- Supply critical community services or need energy flowing at irregular times - Are skeptical that DR will save them money	- Have more predictable energy consumption trends - Want PSE to gamify DR and show them how they are progressing towards goals - Are most interested in smart water heaters and smart thermostats - Want to own smart devices instead of rent them	- Want to start with small adjustments and shorter event lengths - May find remote energy management (REM) intrusive - Want to be able to opt out of events
All DER products	- Don't have the staff capacity to participate in complicated and time-consuming DER products - Have strict budgets that will ultimately define their actions - Want PSE to prioritize equity in the project selection process	- Need PSE to support landlord education - Want PSE to prove the benefits to them before they enroll - Want PSE to promote DERs on social media platforms such as Facebook, Twitter, Instagram, TikTok, and nextdoor	

NEXT STEPS

This report serves as the summary of community engagement for PSE's future DER products, focused on batteries, solar and demand response. The report also meets deadlines included in PSE's Clean Energy Implementation Plan (CEIP), filed with the Washington Utilities and Transportation Commission (WUTC) in 2021. The CEIP identified a preferred portfolio of DERs, which was refined by the WUTC's conditions of approval of PSE's CEIP in June 2023. This engagement summary will further inform PSE's product portfolio and investment decisions in advance of tariff filings to the WUTC. PSE will share this summary and the progression of the tariffs with all agencies, municipalities, organizations, and tribal entities that were included in the community engagement process.

1. RESUMEN EJECUTIVO

DESCRIPCIÓN GENERAL

Puget Sound Energy (PSE) está aumentando la equidad procesal en el diseño de sus productos al dar a las comunidades designadas y sus proveedores de servicios un asiento en la mesa de diseño. Desde septiembre de 2022 hasta mayo de 2023, PSE llevó a cabo actividades de participación comunitaria sobre futuros productos de recursos energéticos distribuidos (DER), incluyendo baterías, energía solar y respuesta a la demanda (DR).

PSE involucró a 340 residentes de bajos recursos y 61 agencias, municipios, organizaciones y entidades tribales que atienden a los residentes antes mencionados en grupos focales, talleres y encuestas para escuchar de ellos directamente sobre los beneficios y las barreras que los clientes pueden enfrentar cuando se trata de productos DER, y cómo el diseño de productos futuros puede aliviar estas barreras y maximizar los beneficios deseados.

RESULTADOS CLAVE

A través de entrevistas, grupos focales, talleres y encuestas centradas en productos de DR, energía solar y baterías, los participantes identificaron los siguientes temas comunes de retroalimentación:

Costo

Los costos iniciales asociados con la adquisición de activos e instalación, junto con el costo continuo de mantenimiento, se destacaron constantemente como las mayores barreras en todos los productos DER y para todos los segmentos de clientes.

A pesar de que las sugerencias para aliviar las barreras fueron únicas entre los tres productos, hubo una clara solicitud de incentivos financieros que compensen sustancialmente o eliminen por completo los costos financieros que los clientes pueden enfrentar al participar en los productos DER.

Los participantes también prefirieron que estos incentivos se aplicaran de manera instantánea para que los clientes no tengan que gestionar largos procesos de reembolso que exacerben sus problemas de flujo de fondos.

Soporte de instalación y mantenimiento

La instalación y el mantenimiento asociados con la implementación de DER pueden resultar abrumadores para los clientes. Para facilitar la adopción de DER, PSE deberá estar preparado con soporte de instalación y mantenimiento personalizado, holístico y práctico para los clientes que lo soliciten.

Flexibilidad de productos

A pesar de que temas similares surgieron en las muchas actividades, también quedó claro cuán diversas podrían ser las necesidades e intereses de cada parte interesada. Los diseños de productos finales de PSE deben ser lo suficientemente flexibles para aliviar los desafíos matizados que enfrentará cada cliente en función de su tamaño, ubicación geográfica, los servicios que brindan y si alquilan o son dueños de su propiedad.

Opciones de productos propiedad de PSE y propiedad del cliente

Los participantes diferían en su preferencia por alquilar versus poseer activos, como paneles solares. Aquellos que preferían las opciones de que PSE sea propietario expresaron su incapacidad para pagar los costos asociados de equipo, instalación y mantenimiento.

Quienes preferían las opciones que el cliente sea propietario normalmente valoraban la autonomía y el control de ser dueño. De manera similar al tema de la flexibilidad, PSE debe brindar ambas opciones para satisfacer las diversas preferencias de los clientes.

Gran motivación para participar en DERs

A pesar de que algunos DERs se adaptarían mejor a algunos clientes, en todos los compromisos, los participantes indicaron un gran interés en participar en futuros productos DER. Los participantes destacaron la importancia de la independencia energética, la resiliencia energética comunitaria o personal y la reducción de las facturas de energía como los beneficios que más los motivarán a participar en los productos DER.

Educación y alcance comunitario

Los participantes expresaron una fuerte motivación para participar en los DERs y a la misma vez comentaron que quedan muchas brechas por llenar en educación y alcance comunitario. La brecha de conocimiento existente sobre DERs a veces se traduce en escepticismo acerca de si los DERs pueden cumplir con los beneficios prometidos.

Los participantes querían respuestas a sus preguntas fundamentales sobre costos, impactos ambientales y beneficios para la comunidad para ayudarlos a tomar decisiones informadas sobre la participación en los productos. Los participantes sugirieron que PSE se asocie con organizaciones comunitarias y utilice sus profundas relaciones comunitarias existentes para educar a los clientes.

RESULTADOS POR SEGMENTO DE CLIENTES

Mientras los resultados claves brindan una visión agregada de todos los productos DER y todos los segmentos de clientes, la siguiente tabla destaca los resultados matizados para cada categoría.

	Cientes comerciales	Cientes residenciales	Todos los clientes
Baterías	- Valoran la confiabilidad durante los cortes de energía como un beneficio más importante que la reducción en facturas. Se ven como futuros centros de resiliencia para sus comunidades - Expresaron preocupaciones de seguridad cibernética	- Les resultará difícil comprometerse con plazos de proyecto de 10 a 15 años - Se cuestionan si pueden instalar una batería sin la necesidad de realizar otras actualizaciones en el hogar - Quieren poder optar por no participar en eventos	- Quieren reservas significativas en caso de un apagón inesperado - Quieren educación sobre la seguridad de las baterías - Quieren entender los impactos ambientales del ciclo de vida de una batería - Están un poco más interesados en albergar una batería que sea propiedad de PSE que en tener la suya propia
Solar	- Quieren instalar matrices solares más grandes y tienen problemas con el límite de medición neta de 100 kW - Actualmente se sienten cómodos vendiendo beneficios ambientales a PSE, pero quieren flexibilidad para poder cambiar de opinión en el futuro	- Les resultará difícil comprometerse con plazos de proyecto de 10 a 15 años - Si el costo no fuera un problema, preferirían tener los paneles solares en su techo - Están muy interesados en la energía solar comunitaria, pero esperarían créditos en la factura mensual de \$20 a \$50 por su participación - Preferirían inscribirse en proyectos solares comunitarios locales, incluso si eso significa que reciben un crédito más bajo en la factura	- Quieren combinar energía solar y baterías - No están tan interesados en los montajes en el suelo como lo están en la energía solar en la azotea/techo
Respuesta a la demanda	- Suministran servicios comunitarios críticos o necesitan energía que fluya en momentos irregulares - Son escépticos de que DR les ahorrará dinero	- Tienen tendencias de consumo de energía más predecibles - Quieren que PSE gamifique DR y les muestre cómo están progresando hacia las metas - Están más interesados en calentadores de agua inteligentes y termostatos inteligentes - Quieren ser dueños de aplicaciones inteligentes en lugar de alquilarlos	- Quieren comenzar con pequeños ajustes y eventos de menor duración - Pueden encontrar intrusiva la administración remota de energía (REM) - Quieren poder optar por no participar en eventos
Todos los productos DER	- No tienen la capacidad del personal para participar en productos DER complicados y que consumen mucho tiempo - Tienen presupuestos estrictos que definirán sus acciones - Quieren que PSE priorice la equidad en el proceso de selección de proyectos	- Necesitan que PSE apoye la educación de propietarios - Quieren que PSE les demuestre los beneficios antes de inscribirse - Quieren que PSE promueva los DERs en plataformas de redes sociales como Facebook, Twitter, Instagram, TikTok y nextdoor	

PRÓXIMOS PASOS

Este informe sirve como un resumen del alcance comunitario para los productos futuros DER de PSE, centrados en baterías, energía solar y respuesta a la demanda. El informe también cumple con los plazos incluidos en el Plan de Implementación de Energía Limpia (CEIP) de PSE, presentado ante la Comisión de Transporte y Servicios Públicos de Washington (WUTC) en 2021. El CEIP identificó una cartera preferida de DER, que fue refinada por las condiciones de aprobación de WUTC del CEIP de PSE en junio de 2023. Este resumen informará aún más la cartera de productos y las decisiones de inversión de PSE antes de las presentaciones de tarifas al WUTC. PSE compartirá este informe y la evolución de las tarifas con todas las agencias, municipios, organizaciones y entidades tribales que se incluyeron en el proceso de participación comunitaria.

2. COMMUNITY ENGAGEMENT PROCESS

The community engagement process began in September 2022 and concluded in May 2023. The sections below outline the process, from the creation of goals and objectives to the prioritization of audiences, and the development of engagement tools.

COMMUNITY ENGAGEMENT OUTCOMES AND GOALS

In September 2022, PSE, in collaboration with their community engagement consultants Maul Foster & Alongi and Triangle Associates, developed the following community engagement outcomes, goals, and participant criteria for the distributed energy resources (DERs) public participation process. DERs are small-scale resources that can be used at the site where they are located to generate, store, or manage energy. Within the scope of this engagement, PSE focused on soliciting feedback on the following three DER products:

Solar: Distributed solar arrays generate power from the sun and can be sited on customer roofs or ground-mounted

Batteries: Distributed batteries can provide energy as a temporary backup during outages, store energy from solar panels, and reduce load on the grid during times of peak usage

Demand response (DR): Customers are incentivized to use less power during times of peak usage, for example by turning down their thermostats

OUTCOMES

- **Establish a roadmap for the equitable use of DERs** that includes the voices of the diverse communities in PSE's electric service area.
- **Position the region as a leader in the transition to a cleaner energy** future by advancing DERs in Washington state among highly impacted communities, vulnerable populations, and their service providers.
- **Remove barriers related to equity and inclusion as stated by community members**, with community co-created programs that provide DER access to all customers.
- **Solicit feedback and gain understanding from highly impacted communities, vulnerable populations, and their service providers** who are interested in using potential DER products, particularly as it relates to ownership preferences, financial incentive models, education and outreach needs, customer acquisition and enrollment, and benefits and barriers to products and services.

GOALS

Goal 1: Drive diversity, equity, and inclusion (DEI)

- DEI energizes everything we do at PSE. It's about transparency and shining light across all our activities and must be part of how we connect in the community and serve our customers. This will be accomplished through the following tactics:
 - Promote procedural equity by giving future customers of these DER products— highly impacted communities, vulnerable populations, and their service providers—a seat at the design table.
 - Compensate participants for sharing their expertise, stories, and experiences.
 - Apply community engagement outcomes towards product design, with the goal of maximizing benefits of the products and minimizing barriers to product access.
 - Ensure community feedback is representative of the geographic and demographic diversity of PSE's electric service area.
 - Identify future customers of these products, particularly from highly impacted communities, vulnerable populations, and their service providers.
 - Determine how to more effectively deliver and market these products to improve engagement and utilization.

Goal 2: Partner with customers and community

We have to partner with our customers and our communities. We don't have all the answers when it comes to creating a clean energy future. Instead, we want to get there in partnership with our customers and do so in a way that involves all voices and prioritizes historically underserved communities. We will use the following goals to continue to support communities in need and help remove barriers.

- Utilize the outcomes of this community engagement process to create and file tariffs for DER products that maximize benefits and minimize barriers.
- Serve as a conduit between PSE and community members — individuals or groups — to create and strengthen relationships.
- Manage and meet expectations of external and internal interested parties throughout this process, keeping those parties — including the WUTC — updated and informed as the feedback and engagement process moves forward.

PARTICIPANT CRITERIA

To achieve the above-stated goals, we worked with interested parties to ensure inclusion of a diverse set of voices across PSE's electric service area. This included a focus on customers who may want to participate in DERs but experience barriers to access (e.g., access to the necessary equipment, language or cultural barriers, income, etc.). The following participant criteria helped guide our invitations for engagement:

Residential customers in PSE's electric service area with a priority on:

- Black, Indigenous, and other People of Color (BIPOC) communities
- Named Communities as listed in the Clean Energy Implementation Plan (CEIP)
- Limited English proficiency community members
- Low-income households
- Rural communities

Commercial customers in PSE's electric service area who serve the aforementioned residential customers, including:

- Nonprofits
- Tribal entities
- Government agencies
- Municipalities
- Small businesses

¹ Named Communities include both Highly Impacted Communities and Vulnerable Populations:

Highly Impacted Communities are designated by the Department of Health based on the cumulative impact analysis required by RCW 19.405.140 or a community located in census tracts that are fully or partially on "Indian country," as defined in 18 U.S.C. Sec. 1151.

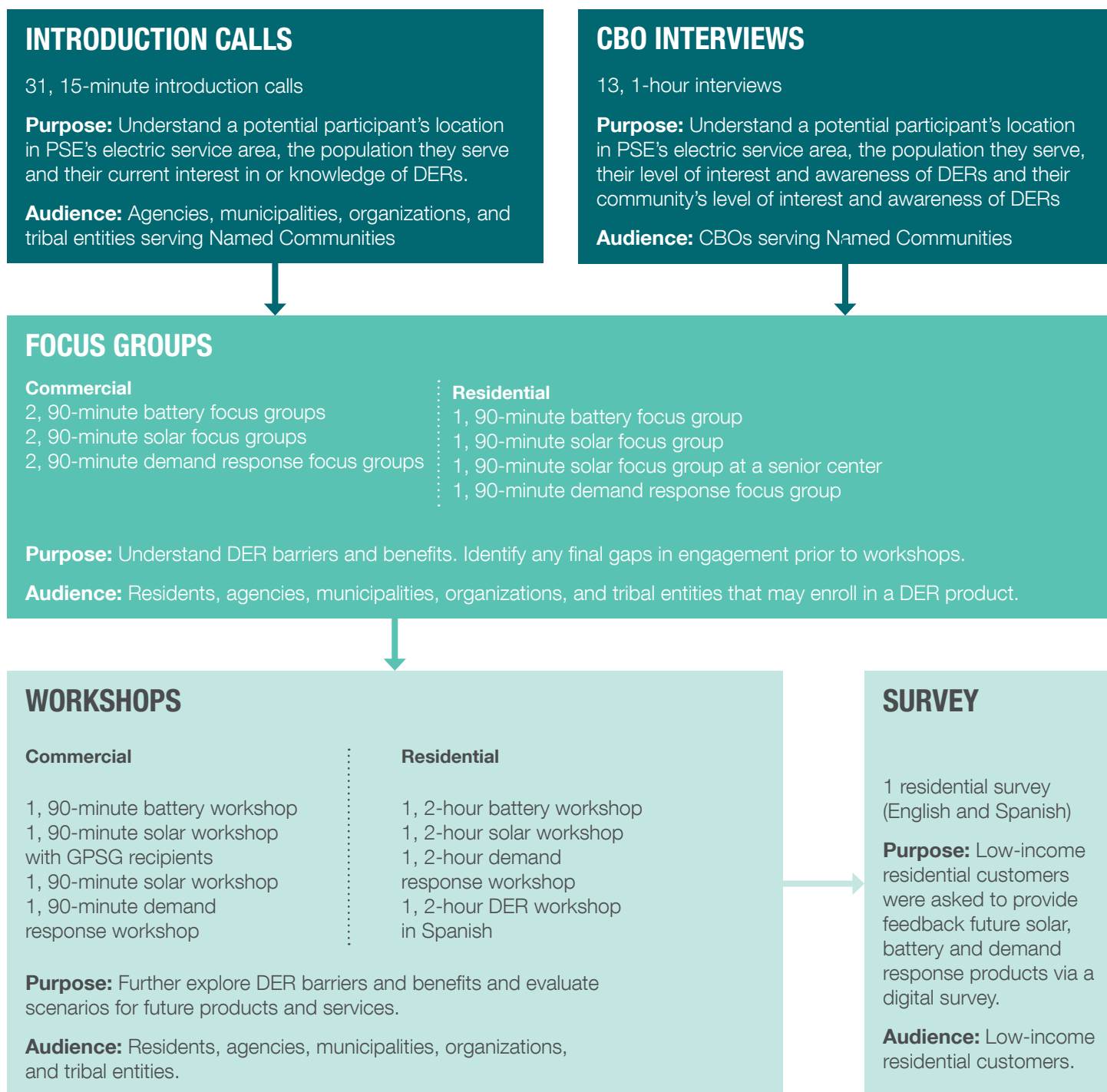
Vulnerable Populations are communities that experience a disproportionate cumulative risk from environmental burdens due to: Adverse socioeconomic factors, including unemployment, high housing and transportation costs relative to income, access to food and health care, and linguistic isolation; and sensitivity factors, such as low birth weight and higher rates of hospitalization.

COMMUNITY ENGAGEMENT PROCESS

After the development of the objectives, goals, and participant criteria listed above, the team developed a list of agencies, municipalities, organizations, and tribal entities to invite to participate in the engagement process (full list in Appendix A).

The flow chart below depicts the cascading nature of the engagement process and how PSE and its consultant team moved from introduction calls through CBO interviews, focus groups, workshops, and a survey.

As each engagement tool was used, the team synthesized feedback and incorporated it into the next stage of engagement to inform the questions asked and dive continually deeper with participants.



COMPENSATION

To reduce engagement barriers for communities who PSE most needs to hear from in the design process, compensation was offered to participants for sharing their expertise, stories, and experiences.

All interview, focus group, and workshop participants were offered \$50/hour for their time. For example, those who attended a 90-minute workshop received \$75, whereas those who attended a 30-minute interview received \$25. Participants received compensation through a donation to their organization, a donation to another organization of their choice, or Visa gift cards. All survey participants were given a \$25 Visa gift card for survey completion. Not all participants accepted compensation.

ENGAGEMENT PARTICIPANTS

A total of 61 customers participated in either an introduction call, interview, focus group or workshop.

Participant	Population served	Counties served in PSE electric service area
A Watered Garden Family Learning Center	Low-income, rural communities	Whatcom
Anacortes Housing Authority	Low-income, rural communities	Skagit
Bellevue LifeSpring	Low-income, youth	King
Board of Skagit County Commissioners	Skagit County residents*	Skagit
Boys & Girls Club of Whatcom County	Youth, limited English proficiency	Whatcom
Bremerton School District	Youth*	Kitsap
Camp Korey	Youth, people with disabilities	Skagit
CHI Franciscan Health	Low-income	Kitsap, Pierce, Whatcom
City of Lacey	City of Lacey residents*	Thurston
City of Langley (Climate Crisis Action Committee)	City of Langley residents*	Island
City of Mount Vernon	City of Mount Vernon residents*	Skagit
City of Olympia	City of Olympia residents*	Thurston
City of Tumwater	City of Tumwater residents*	Thurston
Easton School District	Youth, rural communities*	Kittitas
El Centro de la Raza**	Low-income, Latinx	King
Encompass	Low-income	King
Family Support Center of South Sound	Families and survivors of domestic violence	Thurston
Federal Way Black Collective	BIPOC communities	Pierce
Ferndale Food Bank	Low-income	Whatcom
Helping Hands Food Bank	Low-income	Skagit
Homes First	Low-income	Thurston
Imagine Housing	Low-income	King
Island County	Island County residents*	Island
Japan-America Society of the State of Washington	BIPOC communities	King
Kent United Methodist Church	Kent residents*	King
King County Department of Natural Resources and Parks	King County residents*	King
King County Housing Authority	Low-income	King
Kitsap Community Resources	Low-income, veterans	Kitsap

*Customers whose mission includes services to populations other than Named Communities were reminded to provide feedback through the lens of their customers or residents with the greatest need. **Did not participate in individual engagements but were instrumental in engaging participants for a Spanish Workshop, as noted in the Spanish workshop section.

Participant	Population served	Counties served in PSE electric service area
Lummi Nation	Lummi Nation	Whatcom
Lynden Senior Center	Fixed-income seniors	Whatcom
Mount Si Senior Center	Fixed-income seniors	King
Northwest Agriculture Business Center	Farmers	Island, King, Skagit, Whatcom, Pierce, Thurston
Pierce County	Pierce County residents*	Pierce
Pierce Transit	Pierce County residents*	Pierce
Port of Bellingham	People and goods moving throughout Whatcom County*	Whatcom
Port of Seattle	People and goods moving throughout the greater Seattle region*	King
Puyallup Food Bank	Low-income	Pierce
Renton Downtown Partnership	Renton small businesses and residents*	King
Samish Indian Nation	Samish Indian Nation	Skagit
Senior Services for South Sound	Fixed-income seniors	Thurston
Shoemaker Manufacturing	Rural employees	Kittitas
SideWalk	Houseless, low-income	Thurston
Skagit Conservation District	Farmers	Skagit
Skagit County Farmland Legacy Program	Farmers	Skagit
Skagit Friendship House	Houseless, low-income	Skagit
Skagit Gleaners	Low-income, rural communities	Skagit
Skagit Valley YMCA	Youth, families*	Skagit
Skagit Watershed Council	Skagit county municipalities, businesses, advocacy groups, and residents*	Skagit
South King County Tool Library	Low-income, small business, nonprofits, service groups	King
Sustainable Connections	Small businesses*	Whatcom
Timberland Regional Library	Thurston County residents*	Thurston
Vashon Household	Low-moderate-income residents	King
Virginia Mason Hospital	King County residents*	King County
Washington Soldiers Home	Veterans	Pierce
Washington State University Mount Vernon Northwestern Washington Research and Extension Center	Farmers	Skagit, Whatcom, King
Washington State University Skagit County Extension	Farmers	Skagit
Whatcom Center for Early Learning	Children with disabilities	Whatcom
Western Washington Agricultural Association	Farmers	Skagit, Whatcom, King
Whatcom County	Whatcom County residents*	Whatcom
Yelm Community Schools	Youth*	Thurston
Youthnet	Youth	Skagit

*Customers whose mission includes services to populations other than Named Communities were reminded to provide feedback through the lens of their customers or residents with the greatest need. **Did not participate in individual engagements but were instrumental in engaging participants for a Spanish Workshop, as noted in the Spanish workshop section.

3. FEEDBACK

INTERVIEWS WITH COMMUNITY-BASED ORGANIZATIONS (CBOS)

A selection of CBOs serving Named Communities in PSE's electric service area were invited to participate in a 60-minute interview which sought to:

- Learn about their mission within their community.
- Understand their community's interest in distributed energy resources (DER).
- Learn about benefits and barriers to participating in DER products.
- Inform the development of future DER engagements.
- Discuss the CBO's interest in participation in future engagements and identify additional community members to invite.

ENGAGEMENT PARTICIPANTS

Out of the 44 CBOs contacted, 22 participated in interviews.

Participant	Population served	Counties served in PSE electric service area
A Watered Garden Family Learning Center	Low-income, rural communities	Whatcom
Bellevue LifeSpring	Low-income, youth	King
Board of Skagit County Commissioners	Skagit County residents	Skagit
Boys & Girls Club of Whatcom County	Youth, limited English proficiency	Whatcom
Encompass	Low-income	King
Federal Way Black Collective	BIPOC communities	King
Ferndale Food Bank	Low-income	Whatcom
Helping Hands Food Bank	Low-income	Skagit
Japan-America Society of the State of Washington	BIPOC communities	All
Kitsap Community Resources	Low-income	Kitsap
Lynden Senior Center	Fixed-income seniors	Whatcom
Senior Services for South Sound	Fixed-income seniors	Thurston
Skagit Conservation District	Farmers	Skagit
Skagit County Farmland Legacy Program	Farmers	Skagit
Skagit Valley YMCA	Youth, families	Skagit
Skagit Watershed Council	Skagit county municipalities, businesses, advocacy groups, and residents	Skagit
Sustainable Connections	Small businesses	Whatcom
Vashon Household	Low-moderate-income residents	King
Washington Soldiers Home	Veterans	Pierce
Washington State University Mount Vernon Northwestern Washington Research and Extension Center	Farmers	Skagit, Whatcom, King
Washington State University Skagit County Extension	Farmers	Skagit

FEEDBACK

COMMUNITY INTEREST IN DERs

Participants shared that their communities are interested in DERs based on what they have heard thus far about solar, batteries and DR. However, there is still a lack of baseline understanding of what DERs encompass and the types of products PSE may offer in the future. Existing informational resources are scarce or difficult to digest. In addition, customers may lack the financial resources to pursue installation and implementation. To remedy this, CBOs suggested creating outreach materials that clearly outline information about products and the incentives, tax credits and other funding sources associated with them.

CBOs noted that their communities often have competing needs that may result in the de-prioritization of localized clean energy. For example, using their existing financial resources to maintain a comfortable temperature in their home may outweigh spending that money on solar panels. To increase community interest, there needs to be a low financial barrier to entry and clear communication regarding what cost savings will result from participation.

Community interest may also vary based on geographic location. Solar may be more attractive to urban customers for whom reliability concerns are not as significant, whereas rural customers may be more inclined to enroll in battery products as they would alleviate reliability concerns.

BENEFITS

When asked which potential DER benefits are most appealing, CBOs shared that lower electric bills were the most important benefits to community members considering participation in DER programs. Assuming that the financial barriers to entry are alleviated, CBOs recommended more robust education and outreach with communities that focuses on the customers' nuanced needs. There was also a strong interest in how the expansion of DER products can increase clean energy jobs and training opportunities for customers.

Resiliency and grid reliability are important customer benefits, especially given the increasing impact of climate change in recent years. Especially in rural areas, concerns about reliability are becoming more prevalent. Participants noted that products that address these concerns would be attractive to customers.

Reducing greenhouse gas emissions and actively combating climate change are important to some, but not all. While being good environmental stewards is something that many community members have interest in, cost savings and grid reliability are often prioritized higher. If environmental benefits are coupled with financial savings, a larger demographic will likely participate in DER programs.

Self-sufficiency and asset ownership are attractive product elements that would increase interest in participation. Assuming that financial barriers are removed and adequate training is in place for maintenance issues, community members' ability to reduce their reliance on a utility would promote program participation.

BARRIERS AND SOLUTIONS

CBOs were asked which barriers would prevent residential or commercial customers from participating in DER products and what solutions PSE could implement to alleviate those barriers.

Barriers and solutions for commercial customers

CBOs shared the following barriers and associated solutions for their organization.

Finances and cost: Many CBOs said that while being good environmental stewards is an organizational value, their budget defines their actions.

Solution: Offer financial incentives that are commensurate with an organization's relative revenue. If they have less revenue, they should receive larger incentives. PSE should clearly communicate all financial implications of each offering, as customers must feel confident that participation in DER products will not create a long-term financial burden. One CBO shared that when prioritizing which grants to apply for, they must pursue those that can enhance services for clients ahead of what is perceived as facility or technology upgrades. Some agricultural customers expressed interest in leasing space on their agricultural facilities for PSE-owned solar to be installed on. Some customers expressed interest in rent to own options for their commercial rooftops.

Lack of personnel and existing staffing capacity: Lack of staff and existing staff's lack of bandwidth will make participating in DER products difficult, especially if the products require long-term engagement and management.

Solution: Dedicate a PSE staff member to help an organization enroll in the program and shepherd them through ongoing product operations and asset and equipment maintenance. In addition, provide training courses, both in-person and virtual, for staff that will be maintaining equipment or assets.

Insufficient infrastructure and lack of space: Some CBOs have aging and small buildings that are not as well prepared for DER installation. Agricultural customers shared concerns about siting utility-scale renewables on agricultural and resource lands if those installations take land out of agricultural production.

Solution: Allow for a shared battery or solar installation that can serve more than one co-located customer, similar to a microgrid. If customer buildings do not meet installation needs for solar and batteries, start them off with demand response instead. To avoid taking land away from agricultural production, consider using solar and batteries to power diking pump stations or mount solar over watercourses and salmon bearing creeks to create shade and reduce rising water temperatures. Customers cautioned PSE about getting too ahead of the curve with technology like electric tractors and electrifying other equipment. Farmers may not be ready for it and it's important to hear and understand their concerns instead of forcing the technology upon them.

Distrust of DR: Some customers viewed DR programs as invasive and did not appreciate the control PSE would have over devices like smart thermostats.

Solution: No solution was discussed.

Barriers and solutions for residential customers

CBOs shared the following barriers and associated solutions for their clients and broader community.

Finances and cost: Participants cited upfront equipment and installation costs as the most significant barriers for residential customers to participate in DER products.

Solution: Provide financial incentives to residential customers to increase access to DER products. Upfront incentives or on-bill financing with low interest rates for equipment purchases could alleviate the cost barrier. One participant recommended implementing an incentive system that would allow individuals with lower incomes to receive higher incentives. CBOs stressed the importance of providing customers with clear and concise messaging around cost savings and the rate of return from DER products.

Language: Language barriers may prevent residential customers from accessing information about DER products and may impact how individuals could receive information. CBOs noted that receiving information in a customer's primary language may improve their degree of trust in PSE.

Solution: Translate materials into multiple languages, both digitally and in print. Offer phone or in-person consultations in multiple languages as community members are often more comfortable talking to someone over the phone or in person, as opposed to communicating over the internet via chat.

Unfamiliarity with DERs: For many community members, DERs are a complex and new topic, both in terms of the technology as well as the language used to describe them. There is a perception that battery, solar and demand response products are for affluent customers only.

Solution: Partner with trusted CBOs to offer education and outreach materials in different formats and languages. Come prepared to respond to questions related to cost.

Access to technology: Some community members lack access to reliable internet, computers, and devices. This barrier may prohibit them from learning about, enrolling in, or participating in DER programs.

Solution: Offer in-person consultations as some individuals are more comfortable speaking to someone in person. Help customers find community internet hubs if they do not have internet access at home.

Renting instead of owning their home: Lower rates of home ownership among Named Communities may limit active participation in DER products. In addition, some renters fear that landlord participation in DER products will lead to rent increases due to passed-through equipment and maintenance costs

Solution: Conduct outreach with landlords to educate them, create buy-in, and encourage them to allow their renters to participate in DER products. Provide financial incentives for landlords so that there are less costs to pass through to residents.

"I think our community is most concerned about cost. Anything that can reduce their monthly expenses is their primary motivation."

CONNECTING WITH COMMUNITIES

When asked what practices PSE should follow when connecting with residential customers, participants shared that PSE should:

- **Utilize existing communication channels and methods to achieve community connections.** CBOs have robust, established relationships with the customers they serve and are adept at meeting community members where they are. To utilize the trusted messenger approach, work with CBOs to add information about engagement opportunities in their newsletters or on their social media channels and offer in-person engagement opportunities in community spaces.
- **Offer incentives for engagement and lead with a product's financial benefits when sharing information.** Compensate community members for their time spent providing feedback on DER products. Since residential customers with limited incomes are most focused on lowering their utility bills, communicate the financial benefits of DERs first and foremost.
- **Keep people in the loop.** Inform community members about how their feedback is incorporated into product design. Creating a continuous feedback loop makes these engagement processes tangible and acknowledges and honors the time participants spent providing feedback.
- **Go at the community's preferred pace.** Some communities, including agricultural communities, may feel that the pace of these programs is forcing technology upon them. Take the time to pause, understand and address their concerns before expecting buy-in and participation.

In addition to these interviews, CBOs were offered opportunities to participate in the commercial solar, battery, and DR engagements. A total of 10 CBOs who participated in these interviews chose to participate in those subsequent engagements.

INTRODUCTION CALLS

Prior to the focus groups and workshops, customers not identified as community-based organizations (CBOs) participated in introduction calls. During these brief calls, the project team learned about the participants' mission within their communities, provided an introduction to distributed energy resources (DERs) and learned more about their existing experience with DERs and any initial barriers to DER access for themselves or their customers. Information collected through these calls helped frame the design of subsequent engagements. This section summarizes overarching feedback themes heard throughout the introduction calls.

ENGAGEMENT PARTICIPANTS

Out of 66 customers contacted, 33 participated in introduction calls.

Participant	Population served	Counties served in PSE electric service area
Bremerton School District	Youth	Kitsap
Camp Korey	Youth, people with disabilities	Skagit
CHI Franciscan Health	Low-income	Kitsap, Pierce, Whatcom
City of Lacey	City of Lacey residents	Thurston
City of Langley	Low-income	Island
(Climate Crisis Action Committee)	City of Langley residents	Island
City of Mount Vernon	City of Mount Vernon residents	Skagit
City of Tumwater	City of Tumwater residents	Thurston
City of Olympia	City of Olympia residents	Thurston
Easton School District	Youth, rural communities	Kittitas
Homes First	Low-income	Thurston
Imagine Housing	Low-income	King
Island County	Island County residents	Island
King County Department of Natural Resources and Parks	King County residents	King
Lummi Nation	Lummi Nation	Whatcom
Mount Si Senior Center	Fixed-income seniors	King
Northwest Agriculture Business Center	Farmers	Island, King, Skagit, Whatcom, Pierce, Thurston
Pierce County	Pierce County residents	Pierce
Pierce Transit	Pierce County residents	Pierce
Port of Bellingham	People and goods moving throughout Whatcom County	Whatcom
Port of Seattle	People and goods moving throughout the greater Seattle region	King
Puyallup Food Bank	Low-income	Pierce
Renton Downtown Partnership	Renton small businesses and residents	King
Samish Indian Nation	Samish Indian Nation	Skagit
Shoemaker Manufacturing	Rural employees	Kittitas
SideWalk	Houseless, low-income	Thurston

Participant	Population served	Counties served in PSE electric service area
Skagit Friendship House	Houseless, low-income	Skagit
Skagit Gleaners	Low-income, rural communities	Skagit
South King Tool Library	Low-income, small business, nonprofits, service groups	King
Timberland Regional Library	Thurston County residents	Thurston
Virginia Mason Hospital	King County residents	King
Whatcom County	Whatcom County residents	Whatcom
Yelm Community Schools	Youth	Thurston
Youthnet	Youth	Skagit

FEEDBACK

EXISTING DER EXPERIENCE AND PERCEPTIONS

Customers expressed interest in renewable energy, sustainability, and reducing carbon emissions. Many participants were already implementing sustainability measures or had plans to do so. Participants with existing solar installations indicated interest in adding batteries and expanding solar into more of their commercial buildings and into the homes of their community members. They shared that DR may be better suited for small to medium businesses or residents, rather than larger organizations with multiple buildings because it would be easier to manage energy use with fewer employees and buildings. Participants also suggested that DER benefits should be available to all communities, including historically disadvantaged communities that have been left out of programs like these in the past.

BENEFITS

Participants shared that the following DER benefits are important to them:

- **Financial benefits** for customers that include reduced bills and additional incentives for participation.
- **Sources of backup power, improved reliability, improved resiliency** for PSE and customers, especially those in rural areas.
- **Reduced energy consumption and energy burden** for customers.
- **Environmental benefits** for customers in the form of reduced carbon emissions.
- **Educational benefits** on conserving energy and reduced emissions.
- **The potential to bundle** DER products with other energy efficiency improvements.
- **An opportunity to be more resilient and adaptable** in the face of climate change.

BARRIERS

Participants shared barriers that might prevent themselves and their communities from participating in DER products:

- **The overall cost of participation may be unattainable.** Participants do have the available funding to purchase solar or batteries without additional assistance or grants.
- **Organizational staff capacity and familiarity with the programs.** Many organizations are already understaffed and do not want to add additional responsibilities to staff workloads.
- **A lack of communication from PSE** around the details of planned DR events could cause confusion and reduce participation among customers. Participants were especially hesitant about DR programs that would allow PSE to control their devices.
- **Limited experience with technology** may make it difficult for participants to operate new devices such as smart thermostats or batteries.
- **Rural areas with limited internet access** may not have the necessary internet connectivity to implement programs.
- **Lack of education** on how DERs, like smart thermostats, contribute to grid resiliency may reduce initial interest in programs from customers.
- **Lack of building ownership** makes it difficult to implement the necessary permanent changes to those buildings. Landlords or property owners will need to buy into the program as well.

EDUCATION, OUTREACH, AND MARKETING

Participants suggested PSE could do the following to improve education, outreach, and marketing:

- Focus marketing on customers that have already requested energy assistance as they serve to benefit the most from reducing energy use.
- Implement pilot programs to demonstrate program benefits and create opportunities for customer testimonials.
- Highlight cost saving and reliability benefits of programs in messaging to align with stated community priorities.

BATTERIES

Distributed batteries can provide energy as a temporary backup during outages, store energy from solar panels, and reduce load on the grid during times of peak usage.

COMMERCIAL ENGAGEMENTS

This section summarizes the feedback heard during all battery-specific focus groups and workshops with commercial customers.

ENGAGEMENT PARTICIPANTS

Out of the 44 customers contacted, 13 participated in battery engagements.

Participant	Population served	Counties served in PSE electric service area
A Watered Garden Family Learning Center	Low-income, rural communities	Whatcom
City of Langley (Climate Crisis Action Committee)	City of Langley residents	Island
City of Olympia	City of Olympia residents	Thurston
City of Tumwater	City of Tumwater residents	Thurston
Shoemaker Manufacturing	Rural employees	Kittitas
Homes First	Low-income	Thurston
Japan-America Society of the State of Washington	BIPOC communities	All
King County Department of Natural Resources and Parks	King County residents	King
Lummi Nation	Lummi Nation	Whatcom
Skagit Friendship House	Houseless, low-income	Skagit
South King Tool Library	Low-income, small businesses, nonprofits, and service groups	King
Washington Soldiers Home	Veterans	Pierce
Youthnet	Youth	Skagit, Snohomish, Kitsap

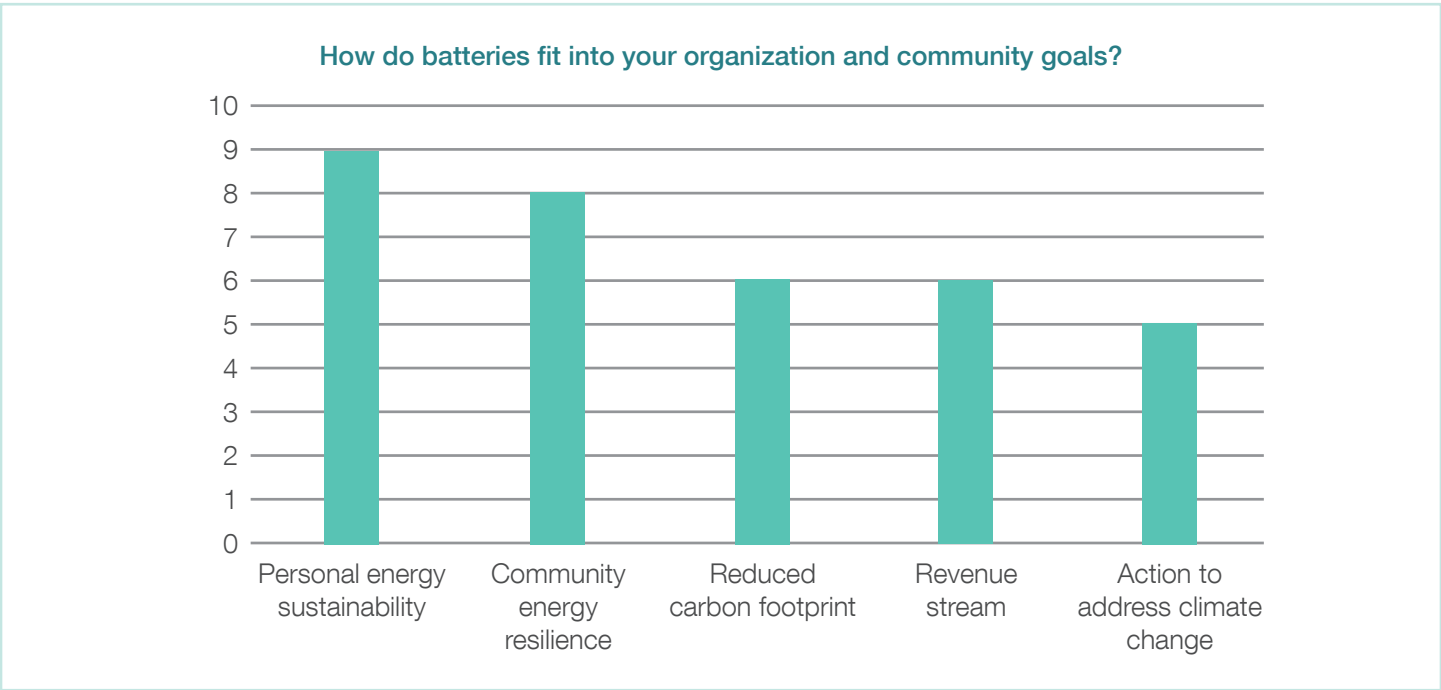
Key		
Focus group	Workshop	Focus group + workshop

COMMERCIAL FOCUS GROUPS

Following introduction calls and CBO interviews, customers were invited to participate in virtual 90-minute focus groups designed to understand the barriers and benefits associated with batteries and education and outreach best practices. In the invitation, PSE sent a poll for customers to indicate their interest and availability for all solar, battery, and DR focus groups. Out of the 44 customers invited, 11 participated in one of two battery focus groups.

BENEFITS

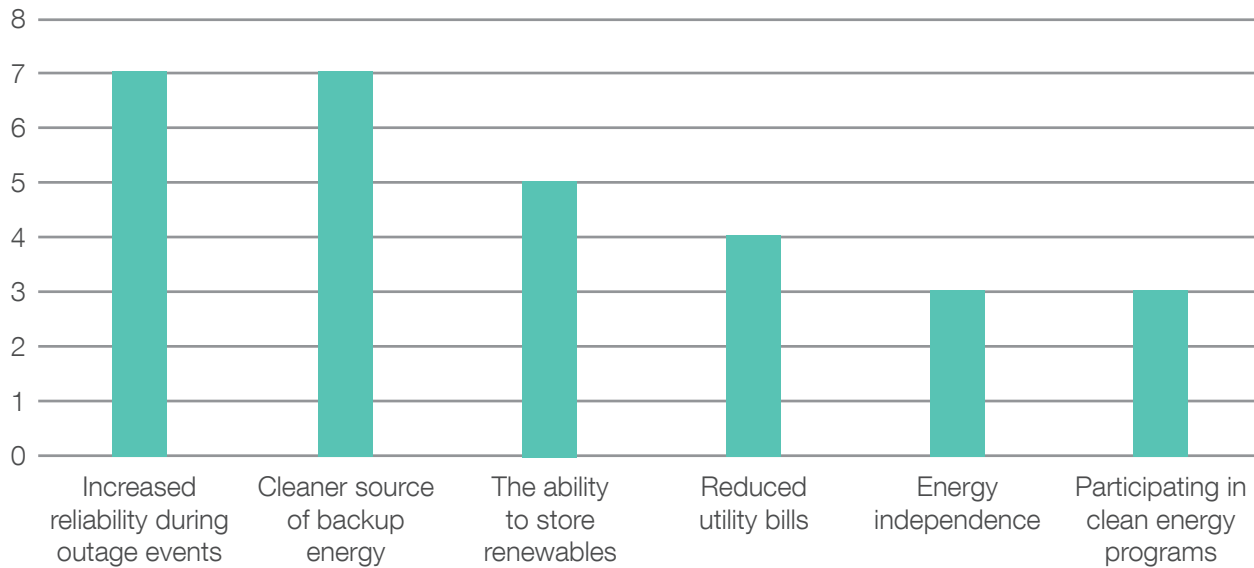
During each focus group, participants were asked to select all the ways in which batteries fit into their organizational and community goals.



Most participants indicated personal energy sustainability as their top goal and shared that batteries fit in well with their organization’s goals to adopt more clean energy strategies. Community energy resilience, reduced carbon footprint, and additional revenue were also important goals. Participants representing nonprofit organizations highlighted the importance of revenue streams and a focus on cost savings. Fewer participants selected action to address climate change as an important goal for their organization or community but did not share the reasoning behind their selection.

Participants were then asked to select all the battery benefits that are important to themselves and their communities.

What battery benefits are most important to you and your community?



Participants expressed that batteries help build community energy resilience, especially during power outages as batteries can provide backup power for essential services such as grocery stores, food banks, emergency housing providers, government services, heating and cooling homes, and well water.

Participants noted that batteries could serve as an alternative or supplemental energy source in urban and low-income communities, especially if CBOs have the capacity to serve as a resiliency hub using battery backup power for their communities. Participants also selected cleaner sources of backup energy as a top benefit and noted that batteries can reduce noise pollution and carbon emissions by replacing gas generators. In addition, they stated that batteries could help integrate renewable energy sources onto the grid, which reduces greenhouse gas (GHG) emissions and helps meet community sustainability goals.

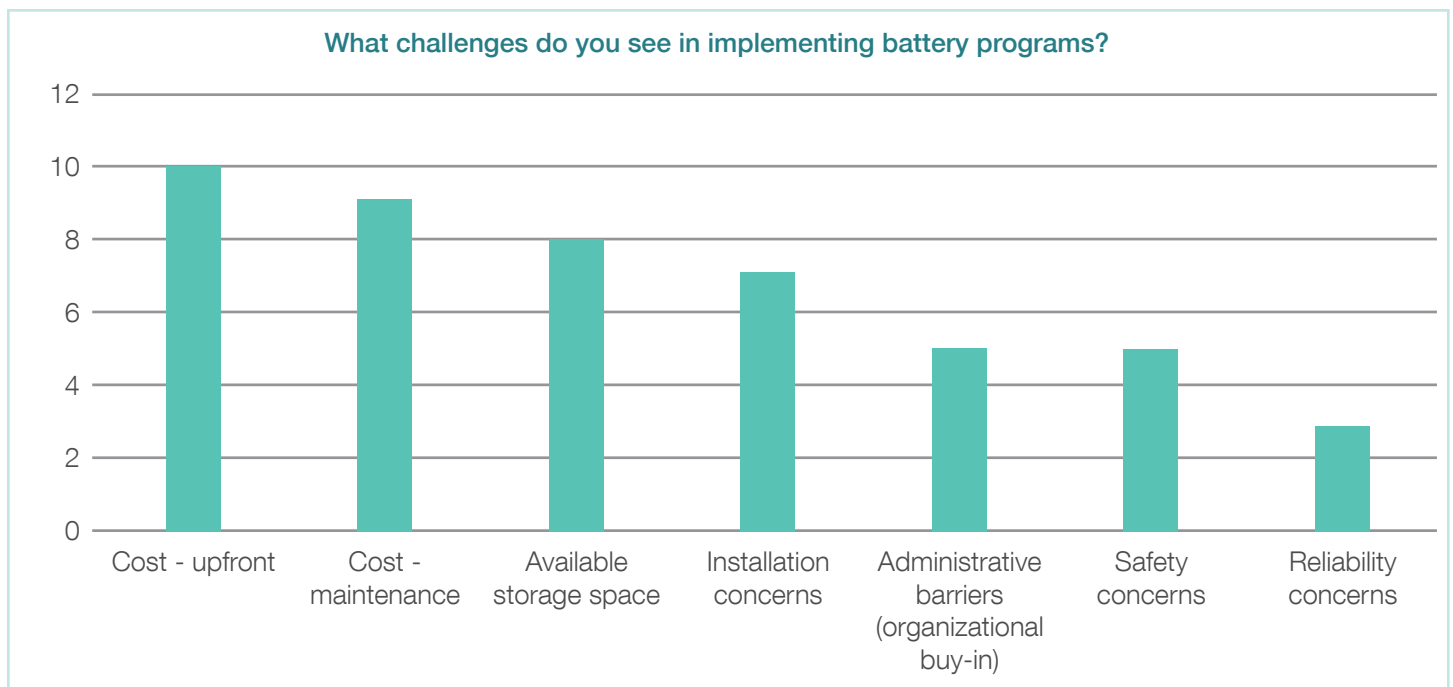
Reduced utility bills also ranked as a top priority in the poll, and participants cited that the reduction in utility bills a battery could provide is critical to nonprofit organizations and low-income communities.

There was also a belief that batteries could reduce customer rates by reducing transmission and infrastructure costs. Participants were intrigued that batteries can provide communities with flexibility for their specific energy needs, such as when batteries are configured such that customers can choose what to power during outage events.

"Batteries empower customers to understand their consumption of energy, and it's a great way to talk about climate change."

BARRIERS

Participants were asked to identify all the challenges to implementing a battery program



The focus group facilitator asked participants to consider perceived barriers and potential solutions for PSE to implement in the design of future battery products. Participants shared:

Lack of clarity on battery capacity: There is not enough information available on battery capacity and how that translates to a battery's ability to provide power during long-term outages.

Solution: Educate customers on battery capacity and provide resources to estimate how energy stored translates to the duration of backup power provided during an outage.

Building limitations: The minimum requirements to safely store a battery are unclear to participants. Many participants occupy older buildings that may require repairs and are concerned that these repairs may limit their ability to install batteries. Participants also shared concerns about whether they have the necessary space to store a battery and if the space they do have provides the appropriate protection from the elements.

Solution: Provide an easy assessment process that helps customers determine if their property is viable and safe for battery installation.

Permitting and insurance requirements: Many buildings require permitting or insurance prior to battery installations, which could pose significant administrative and legal barriers, especially if the customer is a nonprofit or has budget limitations.

Solution: Participants did not identify a specific solution, yet emphasized the need for PSE to offer holistic and innovative solutions to this barrier.

Property manager approval: Property manager approval is necessary for those who rent their space. It could be challenging to convince property managers to commit to this investment because of the upfront costs, implementation time, and ongoing maintenance.

Solution: Educate property managers on battery benefits prior to working with tenants who are interested in the program.

Equity concerns for pilot projects: Participants expressed concern that low-income or under-resourced areas could receive less attention when it comes to battery opportunities.

Solution: Ensure programs are accessible for all customers and program design includes additional holistic support in under-resourced communities. The intake and application process should also consider equity.

Administrative barriers: Participants shared concerns about ease of navigating the program, researching credible manufacturers and installers, managing a complicated installation process, and managing financing, installation, and associated costs.

Solution: Address these concerns through upfront education and holistic technical consultation services. Continue this holistic support through the installation process and provide an approved list of vendors and suppliers.

Overall cost: Gaining organizational buy-in may be difficult because the total cost of participation, including staff training and ongoing battery maintenance, is unknown. The ability to secure budgetary resources for peripheral needs such as training facilities staff and additional maintenance staff is unknown or unlikely for some customers.

Solution: Alleviate costs through incentives or discounts, both short and long term, and provide economics of full battery lifecycle for different incentive structures.

Cybersecurity: Allowing PSE's battery control software access to customer systems may pose perceived cybersecurity risks.

Solution: Educate customers on the systems and software used to control batteries and notify them of any upgrades that may be needed to ensure cybersecurity safety

Fire safety: Concerns exist that batteries may become a fire hazard if they are not properly maintained.

Solution: PSE can educate facilities staff on proper maintenance and ways to mitigate fire risk.

Concerns about PSE controlling battery discharge events: Battery discharge events could disrupt critical services, such as medical services and waste management.

Solution: Provide several notification options and set clear limitations on how much stored energy PSE can discharge.

Environmental impacts: Participants expressed concern about the potential impacts of battery manufacturing, distribution, and disposal.

Solution: Use local companies to manufacture and install batteries and use materials that are ethically sourced and created. This will also help support the local economy.

OWNERSHIP

Participants were then asked if they would prefer to own a battery or host one owned by PSE and discussed the pros and cons of different ownership models.

Participants thought hosting PSE-owned batteries bore less risk for installation and maintenance and could provide an opportunity for customers to test out the product until they have a better understanding of the maintenance and responsibilities of ownership. However, participants also acknowledged that ownership provides more autonomy.

Ultimately, participants preferred the option to host PSE-owned batteries and receive compensation as this creates a partnership for ongoing maintenance and management. Participants prompted PSE to consider additional ownership options such as rental programs that accommodate organizations that do not own their property or buildings.

FINANCIAL INCENTIVES

When asked what financial incentives they would need to participate in a battery program, participants shared that PSE could:

- Include various forms of compensation to mitigate financial risks.
- Reduce upfront and ongoing costs for lower income customers.
- Present cost share scenarios to customers to help visualize payment plans and the financial implications of installation and maintenance.
- Support applications for state and federal grant funding for nonprofit organizations.

EDUCATION AND OUTREACH

When asked what would make their community excited about battery programs and how to successfully share that information, participants suggested that PSE:

- Clearly articulate program benefits for both individual customers and the local community.
- Be transparent about battery capacity and safety.
- Provide customers with a vetted list of trusted installers, manufacturers, and other relevant vendors.
- Provide calculation assistance for total cost of ownership including but not limited to upfront costs, maintenance, and recycling.
- Go door-to-door in communities to share information about batteries.
- Connect with partners PSE has collaborated with in the past, including government entities, community leaders, CBOs, and peer organizations to build on trusted examples and improve communications and information sharing.
- Provide compensation to customers who attend educational classes on batteries.
- Promote future products through social media and communications platforms such as NextDoor, listservs, Facebook, Instagram, Twitter, and LinkedIn.
- Utilize newsletters, community events and webinars to reach customers. Provide engagement and outreach materials that organizations can incorporate into their existing communications.
- Set up demonstration sites at CBOs where community members can learn about and experience batteries.
- Translate all materials and practice cultural awareness when developing materials to alleviate communication barriers.

COMMERCIAL WORKSHOP

Following the focus groups, customers who expressed interest in participating via a poll received an invitation to a 90-minute virtual workshop. The workshop included scenarios associated with potential future components of battery products. Out of the 33 customers invited, five participated.

Participants were asked to approach the scenarios as if they were applying for a PSE product or service to install batteries at their organization.

APPLICATION AND INTAKE

Participants were asked to review the list of scenarios below and discuss their preferred scenario. Due to technical issues at the beginning of the workshop, the project team was not able to launch a Zoom poll and instead asked participants to share feedback verbally.

Scenario	Description
A	Applicants are considered on a first-come, first-served basis
B	PSE serves eight electric counties in WA state. Applications are prioritized so projects are distributed evenly across these counties
C	Applications are prioritized based on the benefit they will provide to highly disadvantaged communities
D	Applications are prioritized for customers with a higher number of outages or with increased need for backup power (e.g. medical needs, wells, heating or cooling for seniors)

Participants did not prefer **Scenario A** and noted that additional factors need to be considered, such as the customer size, installation feasibility at a facility, geographic distribution of projects, and if the project addresses specific needs of the community being served. As an example, food banks with stocked freezers may have a higher need than customers providing non-critical services. Without these considerations, first-come, first-served would primarily benefit applicants with the most resources.

While participants viewed **Scenario B** as better than **Scenario A**, PSE should still prioritize historically underserved communities. PSE could actively reach out to and directly invite organizations that provide programs to low-income customers within a diverse set of counties to apply for these products. This would ensure that larger counties such as King County do not receive all the benefits. One participant noted that having geographic diversity makes sense, but breaking enrollment out by county might not be the most effective means of measuring geographic distribution because most counties include both urban and rural areas.

Participants felt that **Scenario C** would build resiliency in parts of the grid that have been under-resourced.

Most participants preferred a combination of Scenarios C and D because they both prioritize historically underserved communities and including both could expand the program's reach and impact.

Overall, participants agreed that **Scenario D** addressed the communities they would like to see prioritized. Service providers in areas with a higher need for backup power may already have diesel power generators, which batteries could replace. To further reduce barriers, one participant emphasized the need to invite vulnerable customers to participate in a program rather than require an application. They also suggested using existing programs, such as Section 8 housing recipients, to identify which customers to invite.

ENROLLMENT ELIGIBILITY

Participants were presented with the following scenarios and asked if they would be able to meet the requirements.

Scenario	Description
A	Prove building, or land ownership or landlord approval via documentation
B	Agree that you will participate in this program for at least 10 years or that this building will be used for the same purpose for 10 years
C	Show you are a community-based organization, government agency, or tribal entity serving historically disadvantaged communities
D	You must have a reliable internet connection

The 10-year requirement in **Scenario B** is easier to meet for government agencies who own their facilities. Even so, it is important to allow changes in the contract in case of roof damage due to oxidation or other issues impacts the project term. Other participants said it would be difficult to convince leadership of smaller organizations to commit to a 10-year term because they might not have established long-term funding to support ongoing project costs compared to larger organizations or agencies.

Participants noted that **Scenario D** is generally attainable, but some locations may experience more snow or windstorms which could impact reliability. One participant mentioned PSE could help provide reliable internet to increase program participation.

A participant representing a government entity indicated they would have no issues meeting the requirements laid out in **Scenarios A and C**.

"Battery storage is a critical element for organizations that have limited access and resources and if PSE can help solve those issues, there will be double benefits."

RANKING QUESTIONS

In the following sections, participants were asked to rank the scenarios below from their most preferred option to their least preferred option. The collective ranking results are displayed in the tables. The options are presented in ascending order, with the most preferred option receiving a score of one and the least preferred option receiving either a three or four, depending on the number of scenarios presented.

Ownership and maintenance

Participants reviewed the following scenarios and then ranked the scenarios by order of preference. Prior to responding, participants were informed that all the costs below are illustrative of a total project cost of \$10,000 and not necessarily indicative of final product offerings.

	Scenario A	Scenario B	Scenario C
Who owns	You own	PSE owns	You rent to own from PSE
Who manages installation	You hire a contractor and manage the installation	PSE hires a contractor and manages the installation	PSE hires a contractor and manages the installation
Who maintains	You maintain	PSE maintains	PSE maintains
You pay	\$5,000 up front for the installation of a battery	\$0 up front for the installation of a battery	\$3,600 over 10 years, spread out as \$30 monthly rental payments to PSE
Who maintains	Battery backup power during outages and a monthly on-bill credit for the use of a portion of the battery charge during peak periods \$20 per month totaling \$2,400 over 10 years	Battery backup power during outages	Battery backup power during outages for the first 10 years After 10 years, once ownership has been transferred, an on-bill credit of \$20 per month for the use of a portion of the battery charge during peak periods
Ranking	(2)	Most preferred (1)	Least preferred (3)

Scenario B was the most preferred because the lack of upfront costs is important for city governments and under-resourced organizations.

Participants thought that PSE-owned batteries, offered in **Scenarios B and C**, would relieve customers of maintenance and operations responsibilities. As customers would need to use staff resources to coordinate with PSE, they would benefit from PSE staff managing battery needs, especially with staff turnover at their organizations.

In **Scenario A**, participants thought that in addition to PSE incentives, state and federal grants could help increase the accessibility of this scenario for smaller entities.

While PSE owning the battery was considered a positive in **Scenario C**, one participant shared that the scenario might be less desirable because of the shorter equipment life of batteries. In the end, **Scenario C** was the least preferred scenario.

In addition to the feedback above, participants shared:

- All three scenarios offer the benefit of backup power during outages, which is particularly enticing as many organizations don't currently own any generators.
- PSE should also manage and fund end of life removal and replacement of the battery.
- Applicants should complete facility improvements (e.g. concrete pads, heating, venting and cooling systems, security equipment, etc.) themselves to accommodate the battery, but PSE should provide specifications and a stipend to make the improvements.

Overall, participants agreed that it is important for PSE to offer all the listed scenarios so customers can make the choice that works best for them.

Upfront installation financing

PSE asked participants to rank which financing scenarios for upfront installation costs best meet their needs.

	Scenario A	Scenario B	Scenario C	Scenario D
Description	PSE helps you locate state, federal, or private financing and provides letters of support	You receive a discount through your installer to reduce the upfront battery cost	You sign a memorandum of understanding that certifies your intention of purchasing a battery, along with your installer's quote and provide proof of purchase within 60 days of installation. PSE provides you with an upfront incentive to cover the agreed upon portion of the install	You receive PSE's portion of the installation costs as a rebate within 60 days of installation
Ranking	(2)	(3)	Least preferred (4)	Most preferred (1)

Most participants ranked Scenario D as their top scenario because it is simple and reduces complexity for commercial customers. Scenarios A, B, and C received relatively equal preference from participants.

One participant noted that these scenarios seem better suited for residential installation as they seem to assume that the customer would own and install the battery, instead of PSE. Participants discussed that if city agencies own the batteries, there could be project delays. For example, the upfront installation component could slow down the process as some organizations will have to go through capital planning thresholds and permitting processes.

Again, participants suggested PSE make all of these options available to increase customer choice yet emphasized that they want PSE to own and maintain the batteries so that there are no upfront installation costs.

Ongoing payments

Participants were then asked how they would prefer to receive ongoing payments for their enrollment in a battery program.

	Scenario A	Scenario B	Scenario C	Scenario D
Description	You receive a credit on your bill	You receive a Visa gift card	You receive a check	The money is deposited directly into your bank
Ranking	(3)	Least preferred (4)	Most preferred (1)	(2)

All participants agreed on the same ranking, preferring **Scenario C**, followed by **Scenarios D, A, and B**.

Direct money, offered in Scenario C and D, was preferred for most compared to a Visa gift card or bill credit. This would also allow customers to dedicate funds for community resiliency projects. Customers who preferred to receive a bill credit noted that it is easier to utilize an existing accounting system, and that they would ultimately want their finance department to determine the best mechanism

LOAD MANAGEMENT

If PSE owns the battery, there is no need to have advance notice, and having the option to opt out adds uncertainty. Participants want PSE to be the expert by using the battery frequently and as needed. They did suggest reserving battery capacity for when there is an upcoming storm and thus higher likelihood for outages. Following the event, participants want to be notified of the positive community impact associated with that event (e.g., GHG reductions).

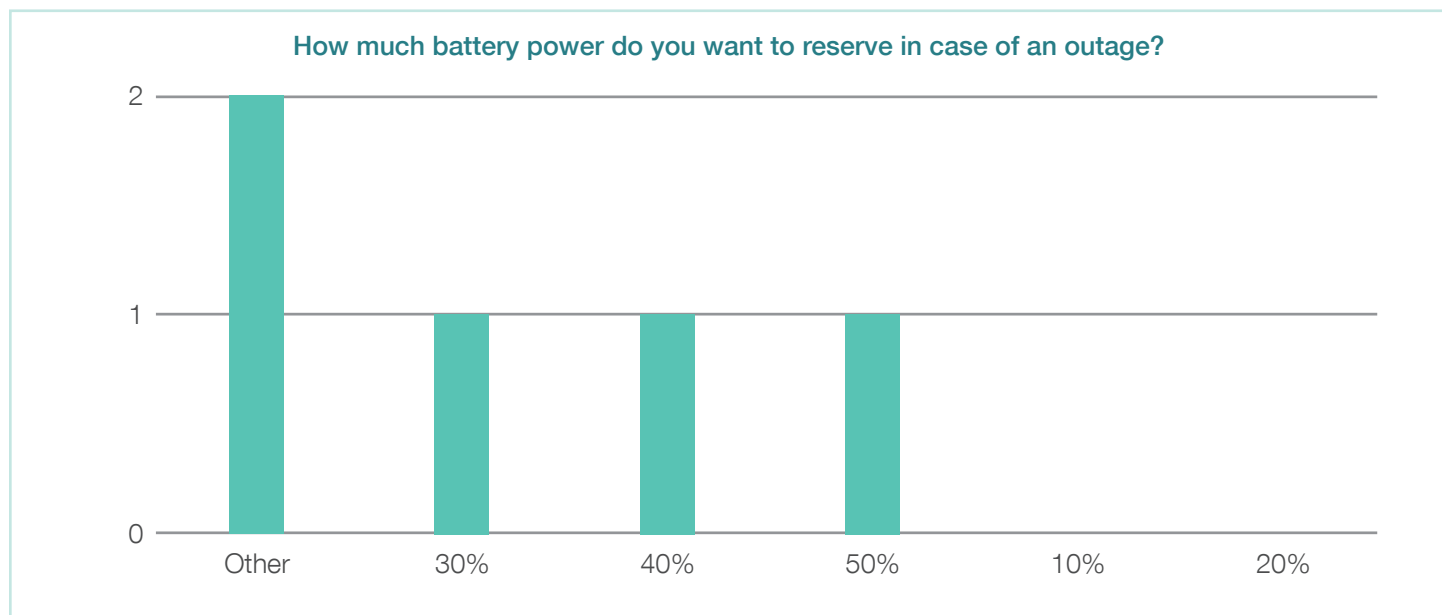
Scenario	Description
A	PSE has control over the battery, and can use it 100 times per year without notifying you
B	PSE has control over the battery and can use it 100 times per year. You are given a one-day notice and the opportunity to opt out
C	The battery is on a set schedule to have its stored power used daily

Prior to answering questions on load management, participants were given an overview. PSE described load management as when PSE compensates customers for use of their battery to manage the load on PSE's grid. Usually, customers do not notice when PSE is using the battery and PSE will not use it during a storm or heat event when there is a higher likelihood of an outage and customers may need it for backup power.

Due to limited time in the workshop, participants were asked to verbally discuss their preferred scenarios for load management but did not complete a poll.

BATTERY RESERVE

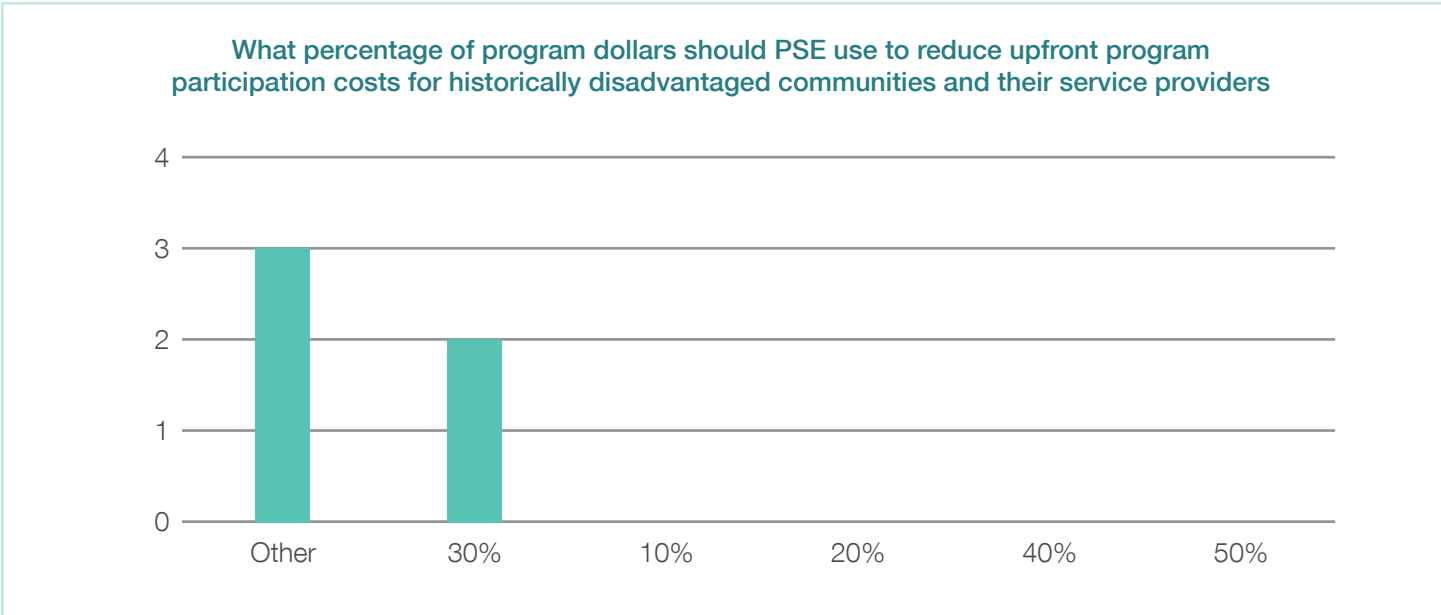
Participants selected how much battery capacity they would like reserved at all times for personal use in case of an unexpected outage.



A few participants selected “other” and noted they did not know what the best practice was for battery storage when it came to different types or sizes of facilities. They also said they would prefer to receive advice from PSE on the appropriate amount of energy to reserve depending on the building size and needs. PSE needs to set these expectations as facilities need enough reserved to keep essential services running during an outage. Similarly, some participants highlighted the importance of compensation for usage.

EQUITY TARGETS

Participants selected what percentage of program funding PSE should use to reduce upfront participation costs for historically disadvantaged communities and their service providers.



Participants primarily selected 30% of funds or ‘other’. Some participants were in favor of reserving as much funding as possible to help lower participation costs for highly disadvantaged communities. One participant suggested that PSE could assign a target value to track progress and if the target value is not being attained, it could be an indicator that the program requirements are too stringent for disadvantaged communities to access. Overall, participants cautioned PSE against assigning a set percentage.

One participant mentioned that they would like to see PSE be the experts in this area and be leaders in setting best practices.

ADVISORY SERVICES

Due to time limitations at the end of the workshop, participants discussed the advisory services listed below but did not participate in a poll.

Scenario	Description
A	PSE partners with you to create a long-term battery installation plan for your property(ies)
B	PSE prepares and provides presentations for your key stakeholders and decision makers
C	PSE provides consulting services and an online calculator to help you assess the total cost and benefits of battery products, and assistance with enrolling in other products and services

As participants discussed **Scenario A**, they noted that PSE should have materials and information easily available for partners to help them share battery benefits with their organizations and communities. This is important for large-scale projects with meaningful outcomes.

Participants discussed **Scenario B** and felt that in addition to PSE providing the presentations, PSE can offer to deliver those presentations themselves or have internal staff at the partner organizations deliver them as they are the trusted messengers within their communities. Regardless, the content should be accessible and available for all to reference.

Scenario C will help users identify cost savings and benefits, the most important factors needed to facilitate internal buy-in.

Participants thought that all three scenarios would be useful at various points of a project and necessary for overall organizational support.

EDUCATION AND OUTREACH

Due to time restraints towards the end of the workshop, participants did not discuss the education and outreach scenarios. Participants did note the importance of education and outreach for a successful battery participation. In a previous section, participants shared that they would like more information on what size of battery would meet their needs.

RESIDENTIAL ENGAGEMENTS

This section summarizes the feedback heard during all battery-specific focus groups and workshops with residential customers.

PSE collaborated with the customers who participated in CBO interviews and introduction calls to distribute an interest survey on upcoming focus groups and workshops to residents in their communities. PSE used responses to that interest survey to randomly select participants for the focus groups and workshops.

RESIDENTIAL FOCUS GROUP

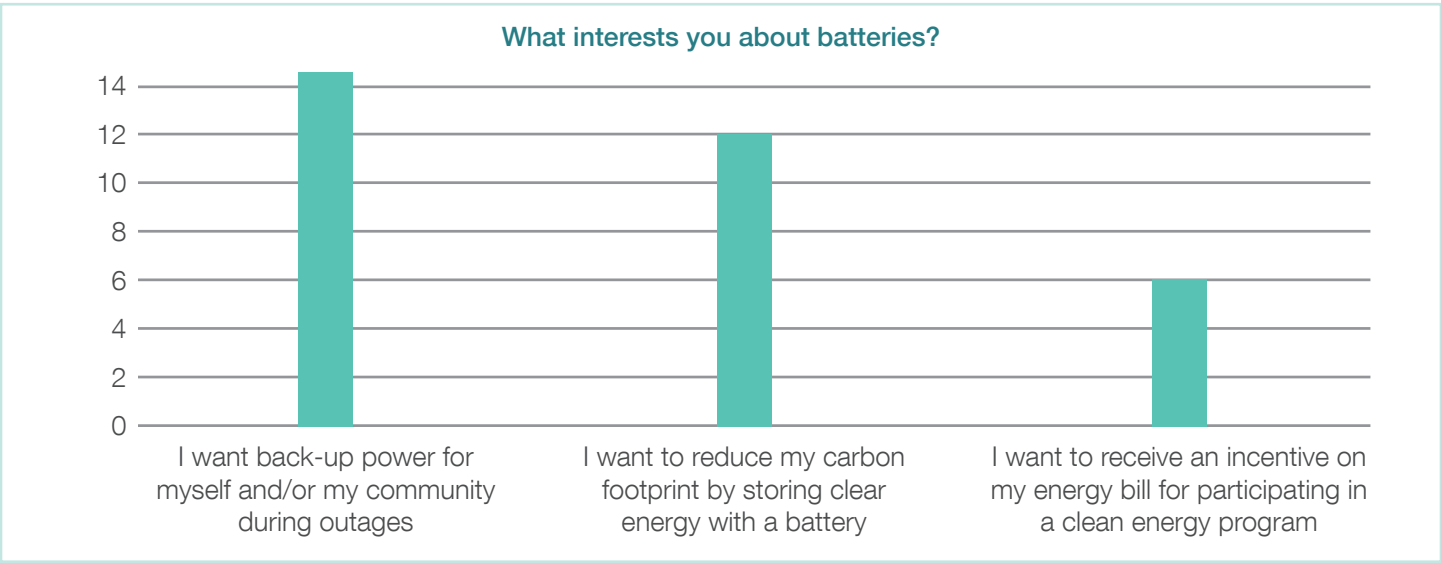
PSE held one 90-minute focus group with residential customers to understand battery benefits, barriers and education and outreach needs through the lens of customers in Named Communities. A total of 21 residential customers participated in the battery focus group.

The focus group was held after work hours to maximize participation and was offered with both Spanish and English breakout groups. Participants were able to indicate language preference when they signed up for the focus group. All participants preferred to remain in the English breakout group.

Throughout the focus group, the project team gathered feedback using Zoom polls. Not all participants responded to questions via the polls. Many participants joined using their phone and provided feedback either via the chat or verbally instead of answering polls. Those comments are captured in the additional discussion sections. Participants also asked questions about battery, solar, and DR programs throughout the focus group and a portion of the time was dedicated to answering questions and providing education on DERs.

BENEFITS – PERSONAL LENS

Participants were asked to select all the statements that reflected their personal interest in batteries.

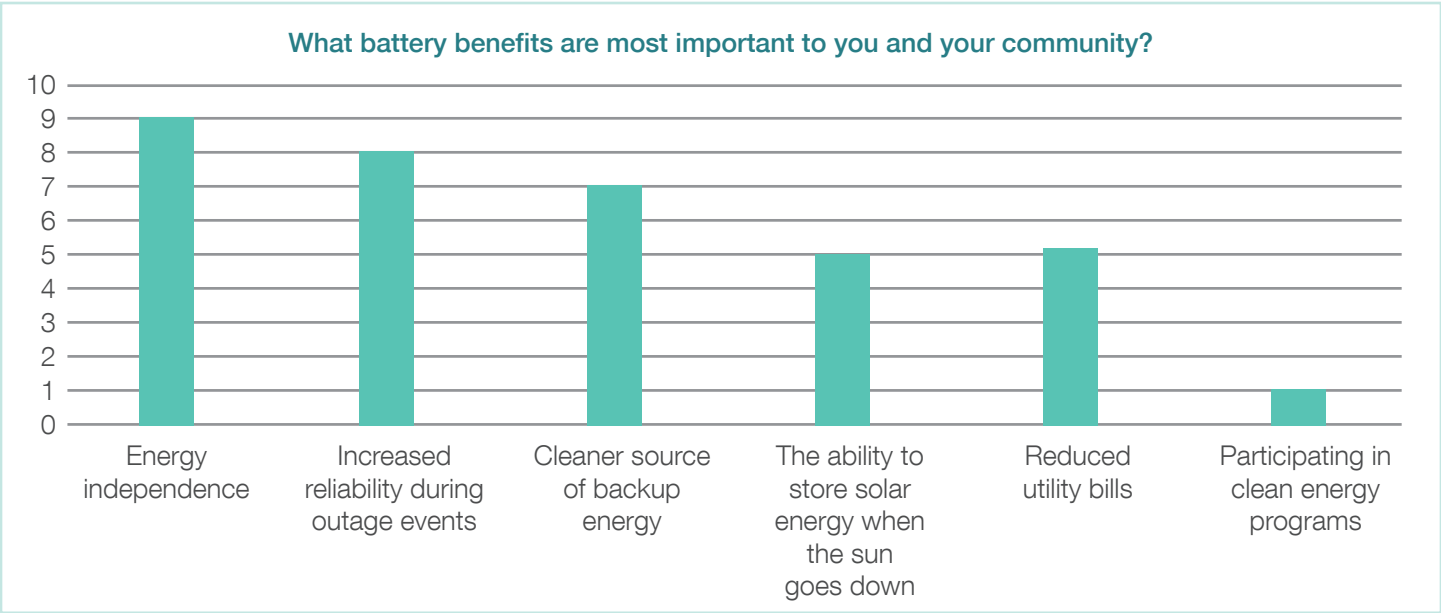


In addition to answering the poll, participants shared that:

- Energy independence provides autonomy and allows customers to decide how to allocate their resources.
- The ability to supplement batteries with solar can promote energy security and offer more options to power homes.
- Obtaining greater reliability and financial incentives is more important than reducing carbon footprint.
- Batteries provide a source of clean and renewable energy.
- Batteries can serve as a backup power during outages, which is critical for essential services such as water, heating, and medical needs.

BENEFITS – COMMUNITY LENS

To expand on the previous question, participants were asked to select all the statements that reflected their community's interest in batteries.

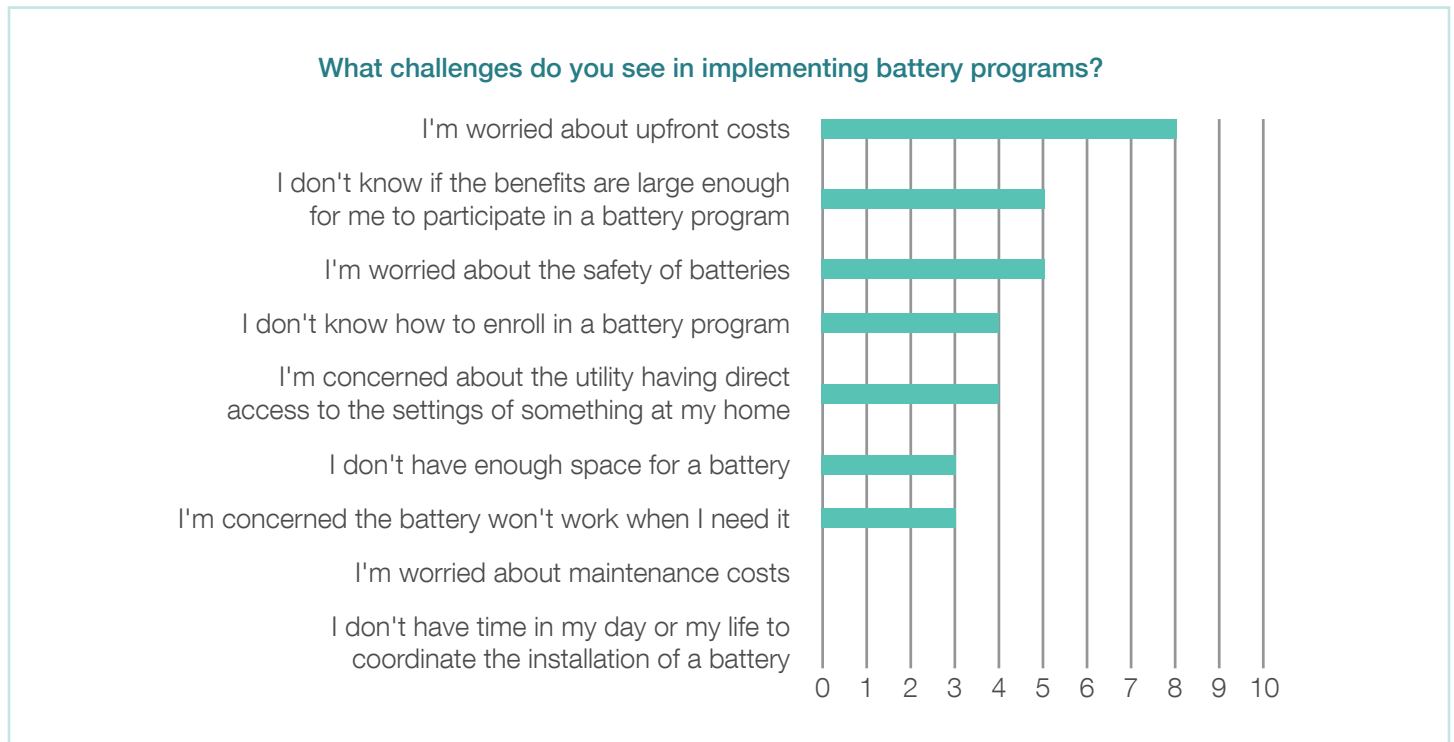


Energy independence was the most important community benefit for those who participated in the poll. Customers want to have more options when powering their homes, especially during an outage. No additional conversation ensued.

"Solar and batteries allow you to own your power."

BARRIERS

Participants were asked to identify all challenges they may face when participating in implementing a battery program.



In addition, the facilitator asked participants to consider perceived barriers and potential solutions for PSE to implement in the design of future battery products. Participants shared:

Lack of education and outreach: Customers were concerned that the lack of knowledge and information of these products and their benefits would be a major barrier to adoption.

Solution: Educate customers on long and short term returns on investment, battery storage capacity and size, the cost differential between renting and owning a battery, duration of backup power from a charged battery, time it takes to charge a battery, battery maintenance requirements and potential ways in which batteries could malfunction.

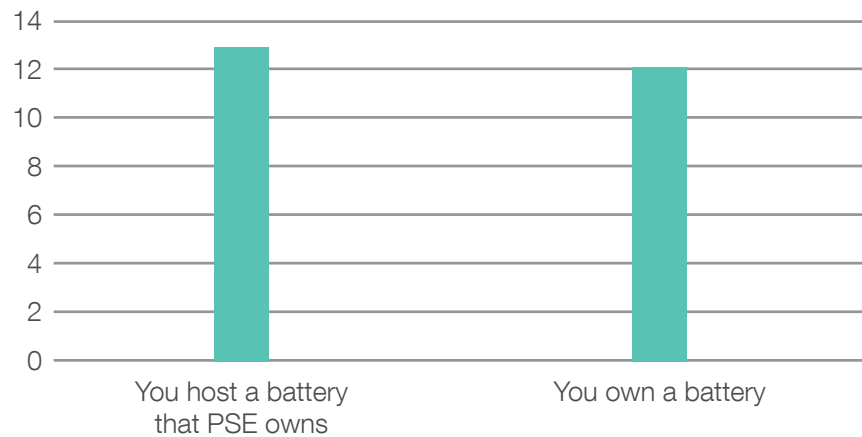
Environmental impacts of batteries: There were concerns about the environmental impacts of batteries caused by lithium mining, a key component of most commercially available batteries, and how that impacts the overall sustainability of batteries.

Solution: Educate customers on the sourcing of batteries and recycling programs for residential batteries.

OWNERSHIP

Participants were asked to choose between owning a battery versus hosting a PSE-owned battery.

What ownership models would you be interested in participating in?



In general, participants preferred hosting a PSE-owned battery. Participants that preferred hosting PSE-owned batteries indicated a potential inability to maintain a battery due to income, time, disability, etc. They also preferred the reduced installation and maintenance costs of hosting. Those that preferred owning a battery still wanted PSE's support for installation and maintenance. Participants believed that personal ownership would allow for more control over the battery and help reduce long-term energy costs on their electric bills.

FINANCIAL INCENTIVES

When asked what financial incentives they would need to participate in a battery program, participants shared that PSE could:

- Reduce upfront costs through rebates and tax benefits.
- Emphasize long-term financing incentives, such as lower monthly utility bills, on top of upfront incentives.
- Provide guaranteed loan financing and grant funding.

EDUCATION AND OUTREACH

When asked what would make their community excited about battery programs and how to successfully share that information, participants suggested that PSE:

- **Provide installation and maintenance information** and help customers determine home energy usage, costs, and return on investment.
- **Share testimonies of the program** and benefits that others have experienced.
- **Give guidance** on reliable installers and manufacturers.
- **Engage with community members that would not normally participate** in renewable energy programs, especially low-income and marginalized communities.
- **Promote future products** through community events, scholarships, focus groups, workshops, newsletters, and social media.
- **Find potential customers** by working with local agencies, housing providers, schools, and community programs to utilize their existing networks.
- **Produce a video that takes customers through the process of participating** in a battery product from start to finish.

RESIDENTIAL WORKSHOP

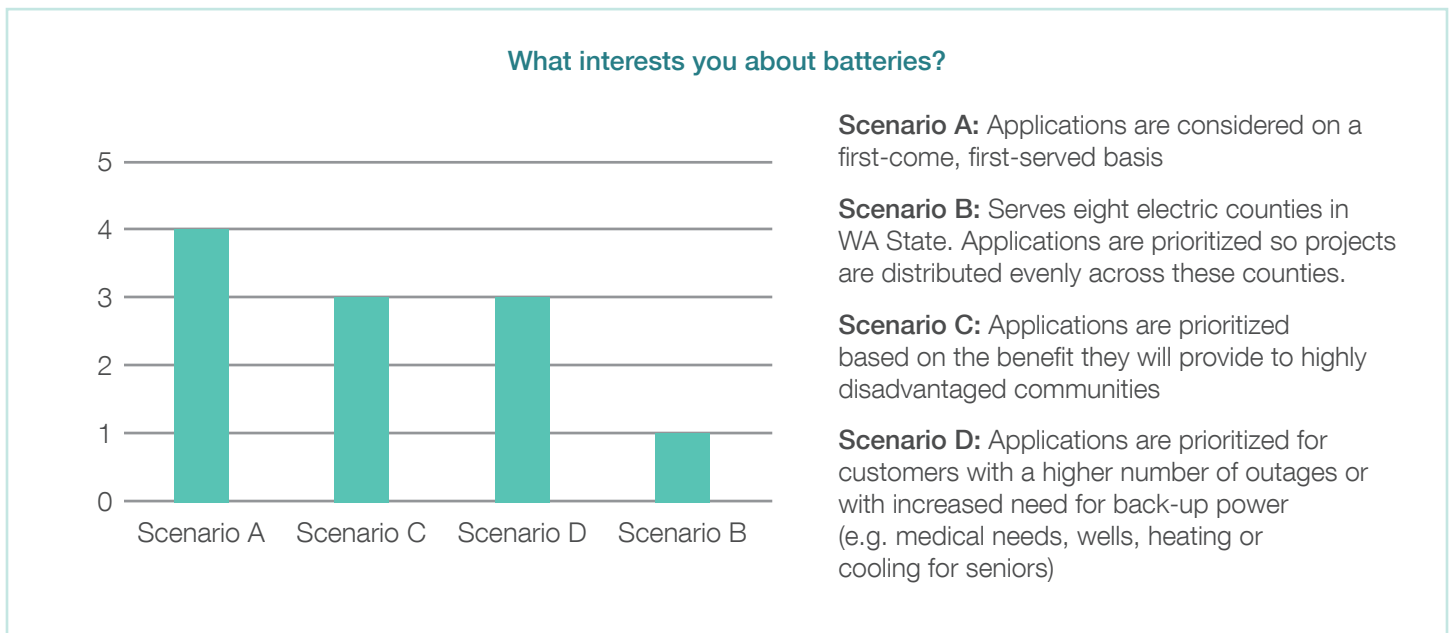
After the focus group, additional residential customers participated in a 2 hours virtual workshop designed to gather feedback on potential battery products through the lens of customers in Named Communities. The workshop was held after work hours to maximize participation. A total of 11 residential customers participated in the battery workshop.

Throughout the workshop, the project team gathered feedback using Zoom polls. Not all participants responded to questions via the polls. Many participants joined using their phone and provided feedback either via the chat or verbally instead of answering polls. Those comments are captured in the additional discussion sections. Participants also asked questions about battery, solar, and DR programs throughout the workshop and a portion of the time was dedicated to answering questions and providing education on DERs.

Residential customers were asked to approach the scenarios as if they were applying for a PSE product to install batteries in their home.

APPLICATION AND INTAKE

Participants were asked to review a list of scenarios and select their preferred scenario.



On average, participants preferred Scenario A over the other three scenarios because it prioritizes early applicants and facilitates quick participation and implementation. Most participants communicated it would be unfair to apply first but then get delayed because another customer from a different county is served ahead of them (as stated in the other scenarios). However, one participant flagged that first-come, first-served could be inequitable because customers with resources tend to receive information on time and apply early.

Scenarios C and D received equal preference. When asked to elaborate, participants shared **Scenario C** is more equitable than the other scenarios because it prioritizes low-income customers. It is important to give them ample opportunity to apply since they are less likely to have the resources, such as flexible schedules, to apply quickly to these products. **Scenario D** could benefit customers in rural areas of the state that experience more outages.

Participants preferred **Scenario B** the least and did not provide additional feedback.

ENROLLMENT ELIGIBILITY

Participants were presented with the following scenarios and asked if they would be able to meet the requirements.

Scenario	Description
A	Prove building, or land ownership or landlord approval via documentation
B	Agree that you will participate in this program for at least 10 years or that this building will be used for the same purpose for 10 years
C	You must have a reliable internet connection

Participants shared that the requirements for **Scenario A** are difficult to meet since it either assumes house or building ownership or ability to get landlord approval. As renters, participants reported they already experience challenges with successfully getting landlords to approve or fix much simpler issues.

The 10-year requirement in **Scenario B** is also difficult to achieve for both homeowners and renters, but especially as a renter. There should be more flexibility built into the program for customers who move every couple of months or years. Offering monthly participation options would be ideal. Participants perceived this requirement to have the most barriers.

Participants did not provide feedback on **Scenario C**.

RANKING QUESTIONS

In the following sections, participants were asked to rank the scenarios below from their most preferred option to their least preferred option. The collective ranking results are displayed in the tables. The options are presented in ascending order, with the most preferred option receiving a score of one and the least preferred option receiving either a three or four, depending on the number of scenarios presented.

Ownership and maintenance

Participants reviewed the following scenarios and then ranked the scenarios by order of preference in the Zoom chat. Prior to responding, participants were informed that all the costs below are illustrative of a total project cost of \$10,000 and not necessarily indicative of final product offerings.

	Scenario A	Scenario B	Scenario C
Who owns	You own	PSE owns	You rent to own from PSE
Who manages installation	You hire a contractor and manage the installation	PSE hires a contractor and manages the installation	PSE hires a contractor and manages the installation
Who maintains	You maintain	PSE maintains	PSE maintains
You pay	\$5,000 up front for the installation of a battery	\$0 up front for the installation of a battery	\$3,600 over 10 years, spread out as \$30 monthly rental payments to PSE
You receive	A reduction in your energy bill and additional on-bill credits for excess solar production each month	Battery backup power during outages	Battery backup power during outages for the first 10 years After 10 years, once ownership has been transferred, an on-bill credit of \$20 per month for the use of a portion of the battery charge during peak periods
Ranking	Lease preferred (3)	Most preferred (1)	(2)

Overall, participants preferred **Scenario B** because they appreciated that after signing up, PSE would take care of the installation and maintenance costs and processes. They felt this could be more convenient for customers who might decide to move at any time.

Participants who were concerned about the maintenance requirements that would fall to them in **Scenario A**, thought **Scenario C** might be a better fit for similar reasons shared with **Scenario B**. The monthly rental payments also allow customers more time to save up for payments.

Despite higher upfront costs, some participants still preferred **Scenario A** and thought owning the battery would pay off over time. Participants noted additional benefits to ownership, such as an immediate on-bill credit or the ability to sell the battery.

Upfront installation financing

PSE asked participants to rank which financing scenarios for upfront installation costs would best meet their needs.

	Scenario A	Scenario B	Scenario C	Scenario D
Description	PSE helps you locate state, federal, or private financing and provides letters of support	You receive a discount through your installer to reduce the upfront battery cost	You sign a memorandum of understanding that certifies your intention of purchasing a battery, along with your installer's quote and provide proof of purchase within 60 days of installation. PSE provides you with an upfront incentive to cover the agreed upon portion of the installation	You receive PSE's portion of the installation costs as a rebate within 60 days of installation
Ranking	(2)	Most preferred (1)	Least preferred (4)	(3)

Participants preferred Scenario B over the other scenarios. Customers could greatly benefit from PSE's support in the financing processes outlined in **Scenario A**. In **Scenario D**, participants noted the rebate would be beneficial but would need clarity on how it would be received (e.g., via direct deposit, by check, on-bill credit, etc.). Participants shared that the MOU process in **Scenario C** could add complications and not give customers the flexibility of backing out.

Most of us would find it difficult to find state, federal, or private financing, but if PSE would do that part for us, then they have done 50% of the job and you are only left with the other 50%.

Ongoing payments

Participants were then asked how they would prefer to receive ongoing payments for their enrollment in a battery program.

	Scenario A	Scenario B	Scenario C	Scenario D
Description	You receive a credit on your bill	You receive a Visa gift card	You receive a check	The money is deposited directly into your bank
Ranking	(2)	Most preferred (1)	Least preferred (4)	(3)

When reviewing the scenarios above, participants prioritized quick and easy options over longer processing times. On-bill credits, gift cards, and direct deposit would be easier to access and process. These options are generally faster, particularly gift cards. A check is less convenient as it would require customers to travel to the bank and the money may not be immediately deposited into their account. Flexibility to change scenarios over time would allow customers to adapt their preference to their needs.

Load management

Prior to answering questions on load management, participants were given an overview. PSE described load management as when PSE compensates customers for use of their battery to manage the load on PSE's grid. Usually, customers do not notice when PSE is using the battery and PSE will not use it during a storm or heat event when there is a higher likelihood of an outage and customers may need it for backup power.

With that information in hand, participants were asked to consider the three scenarios below and rank the scenarios in order of preference.

	Scenario A	Scenario B	Scenario C
Who owns	PSE has control over the battery and can use it 100 times per year without notifying you	PSE has control over the battery and can use it 100 times per year. You are given a one-day notice and the opportunity to opt out	The battery is on a set schedule to have its stored power used daily during peak hours (5pm-9pm) and charge off-peak
Ranking	Least preferred (3)	(2)	Most preferred (1)

Participants preferred Scenario C because reliability and consistency are important to them. In this scenario, they would be able to make plans around the set schedule and have the most transparency into PSE's usage of their battery. Some participants preferred **Scenario B** because they could opt out if needed and would have more control. Similarly, participants who did not select **Scenario A** were concerned about the increase in PSE control over their battery. As potential for PSE control increased, participants expressed a greater interest in owning the battery. Participants also indicated that customers should be notified as to how much power is being drained from the battery and compensated fairly for the energy that PSE draws.

Education and outreach

Participants were asked what education and outreach practices PSE should use to encourage product participation and awareness.

	Scenario A	Scenario B	Scenario C	Scenario D	Scenario E
Who owns	You can view one of PSE's sites with prototype batteries to see them up close and learn how they work	You receive educational materials about batteries from your housing provider or local CBO	You receive educational materials about batteries from PSE as part of a package with other services, such as solar	PSE provides referrals to trusted battery installers	PSE provides consulting services and an online calculator to help customers assess the total costs and benefits of battery products, and assistance with enrolling in other products and services
Ranking	Least preferred (5)	(4)	(2)	(3)	Most preferred (1)

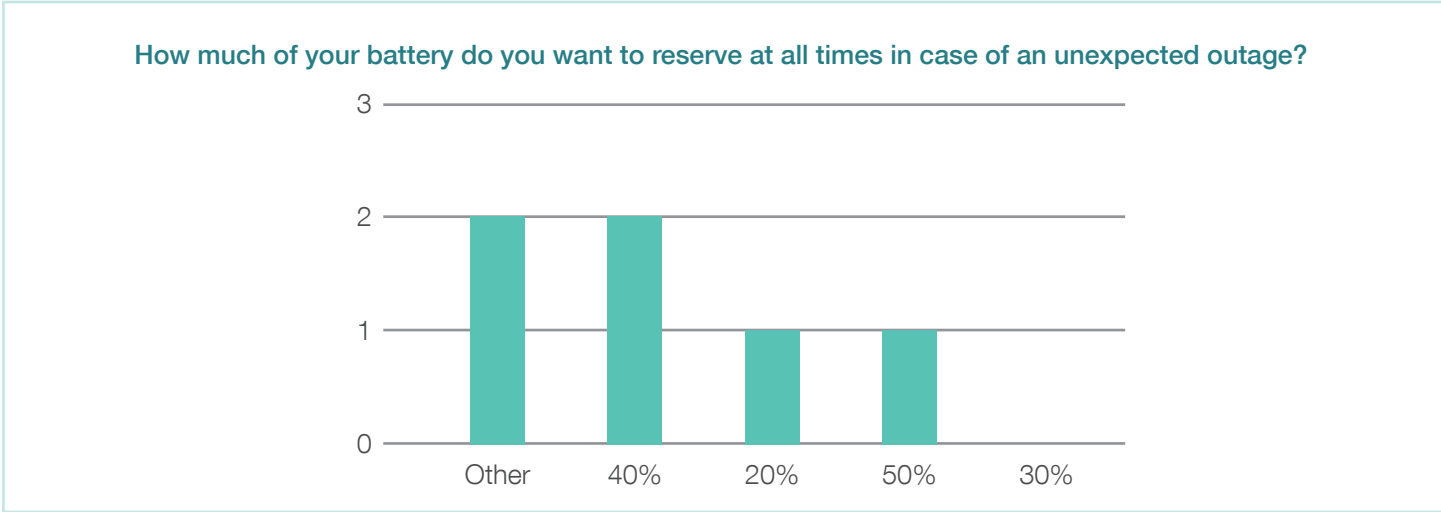
Participants preferred Scenario E because it was perceived as the most likely to provide free and real-time online support from a professional. As residents are learning about a new product, such as batteries, they want to be guided through the process in a hands-on manner. For that reason, some participants were concerned that their housing provider or local CBO may not be as knowledgeable as PSE or other subject matter experts on batteries, and were less interested in **Scenario B**. They liked **Scenario C**, when compared to **Scenario B**, since PSE can provide reliable educational materials as the expert. Participants also noted that PSE should provide materials in different languages so customers can understand the products better.

Although not the most preferred option, participants did mention benefits to **Scenarios A and D**. **Scenario D** can be useful for customers who do not know where to start when locating an installer. Participants also hoped they would be able to lean on PSE as an advocate if something goes wrong with their chosen installer. For **Scenario A**, one participant agreed that it would be useful to get a physical view of a battery because it makes signing up for the product tangible.

Overall, participants agreed that they want to receive educational materials from PSE as the subject matter experts.

BATTERY RESERVE

Participants selected how much battery capacity they would like reserved at all times for personal use in case of an unexpected outage.

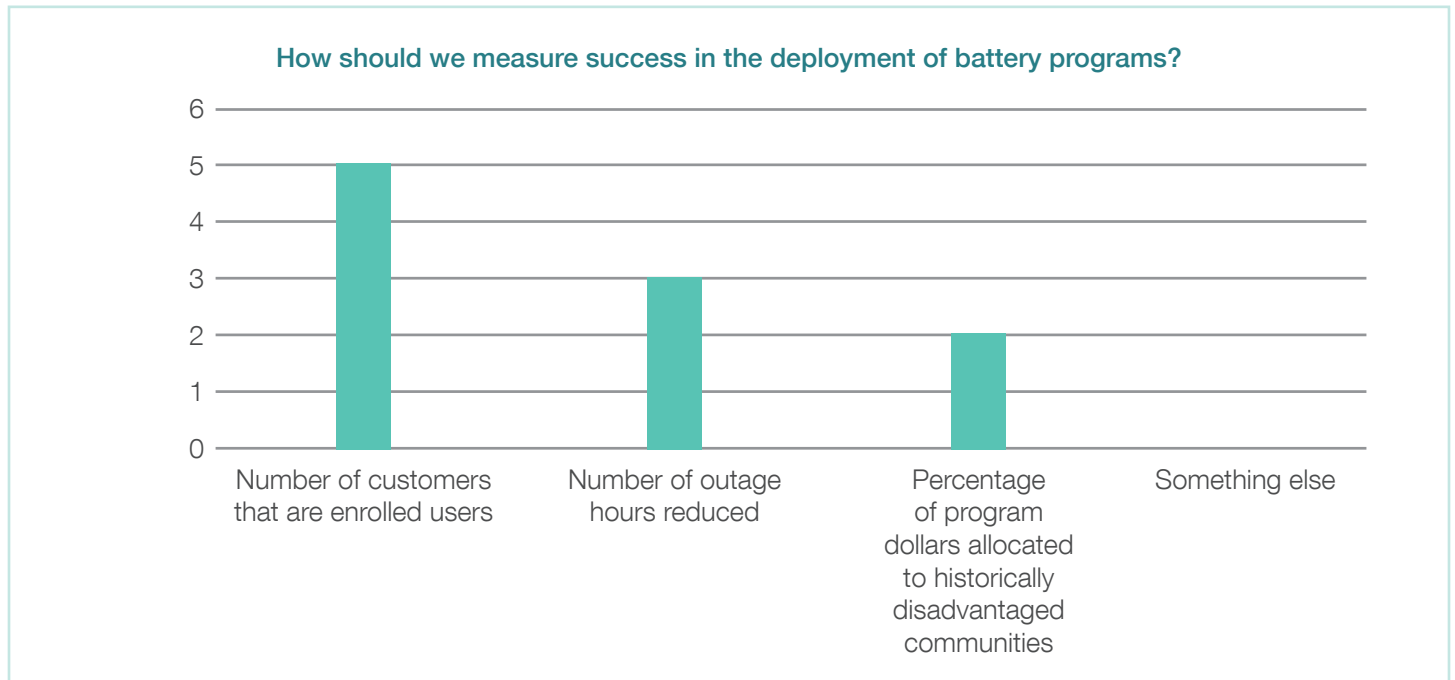


Participants preferred reserving more battery than less. Participants that selected “other” suggested percentages higher than 50%. Some participants wanted 70-80% available at any time in case of an unexpected outage. Customers wanted to feel safe knowing they have enough energy stored. The participant who selected 20% indicated that they experience fewer outages in their location.

Participants indicated they would need more information on how long a fully charged battery could power their home before answering this question in an informed manner. Some participants felt that they could sacrifice their reserve needs if they could help PSE meet the need to provide supplemental power to underserved communities when there is high demand on the grid.

MEASURED SUCCESS

Participants were asked to select all metrics that could indicate success in battery program deployment.



Participants thought that the number of customers enrolled as users would be an adequate measure of success.
Participants suggested adding environmental benefits as a metric.

SOLAR

Distributed solar arrays generate power from the sun and can be sited on customer roofs or ground mounted.

COMMERCIAL ENGAGEMENTS

This section summarizes the feedback heard during all solar-specific focus groups and workshops with commercial customers.

ENGAGEMENT PARTICIPANTS

Out of the 63 customers contacted, 15 participated in solar engagements.

Participant	Population served	Counties served in PSE electric service area
A Watered Garden Family Learning Center	Low-income, rural communities	Whatcom
Anacortes Housing Authority	Low-income, rural communities	Skagit
Bremerton School District	Youth	Kitsap
City of Tumwater	City of Tumwater residents	Thurston
Easton School District	Youth, rural communities	Kittitas
Family Support Center of South Sound	Families and survivors of domestic violence	Thurston
Japan-America Society of the State of Washington	BIPOC communities	All
Kent United Methodist Church	Kent residents	King
King County Department of Natural Resources and Parks	King County residents	King
King County Housing Authority	Low-income	King
Shoemaker Manufacturing	Rural employees	Kittitas
Skagit Friendship House	Houseless, low-income	Skagit
South King Tool Library	Low-income, small businesses, nonprofits, service groups	King
Washington Soldiers Home	Veterans	Pierce
Whatcom Center for Early Learning	Children with disabilities	Whatcom

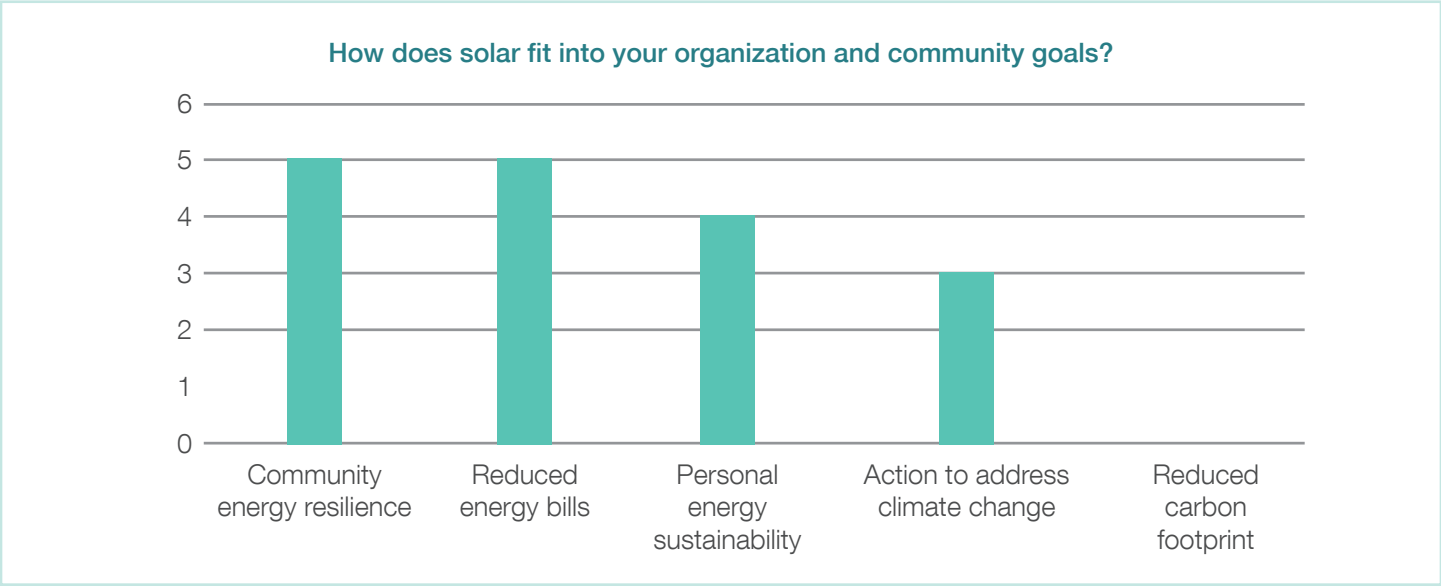
Key			
Focus group	Workshop	Focus group + workshop	Green Power Solar Grant recipients' workshop

COMMERCIAL FOCUS GROUPS

Following introduction calls and CBO interviews, customers were invited to participate in virtual 90-minute focus groups designed to understand the barriers and benefits associated with solar and education and outreach best practices. In their invitation, PSE sent a poll for customers to indicate their interest and availability for all solar, battery, and DR focus groups. Out of 44 customers invited, eight participated in one of two solar focus groups.

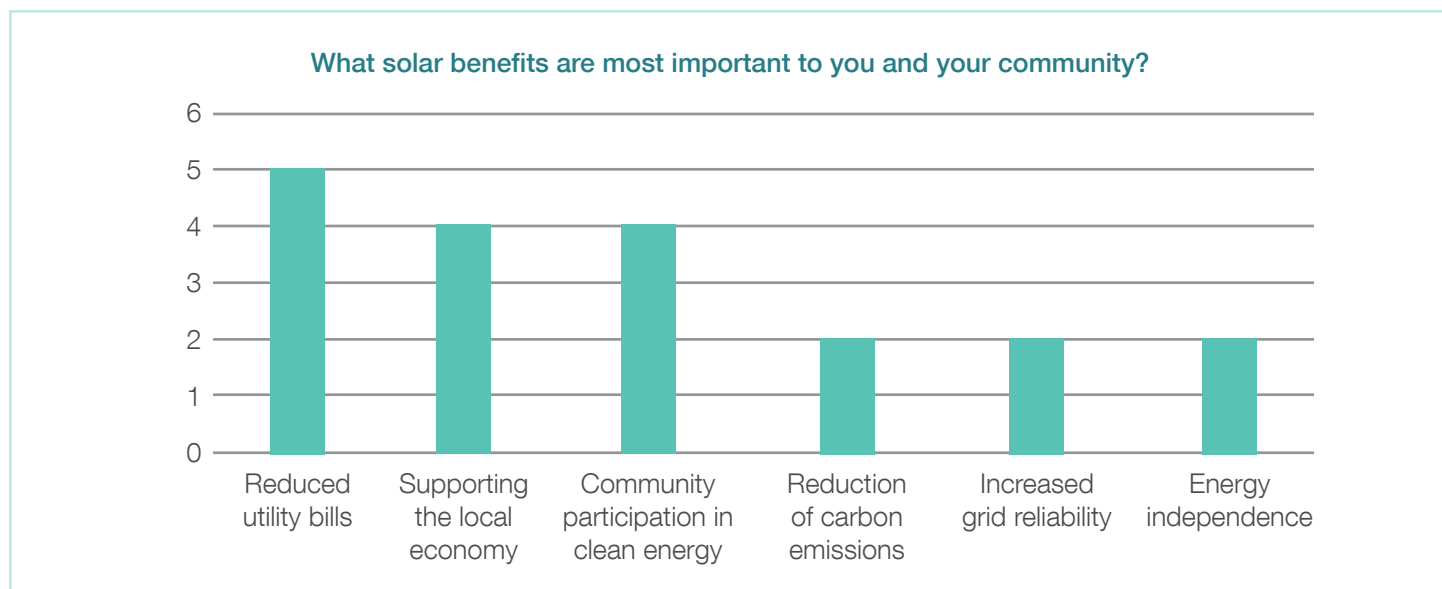
BENEFITS

During each focus group, participants were asked to select all the ways in which solar fits into their organization and community's goals.



Customers were most interested in community energy resilience and reduced energy bills as benefits of solar programs. They were particularly interested in the potential to maximize the use of their building's footprint by adding rooftop solar.

Participants were asked to select all the solar benefits that are important to themselves and their communities.



Similar to the previous poll, reduced utility bills were the most important benefit for participants and their communities. Reduced energy bills help those most in need and promote widespread solar adoption. Solar can also help reduce ongoing operating costs for organizations with limited budgets.

Solar programs can drive economic activity and job creation in local communities. Participants suggested these programs should engage youth and young professionals to promote green jobs and workforce development.

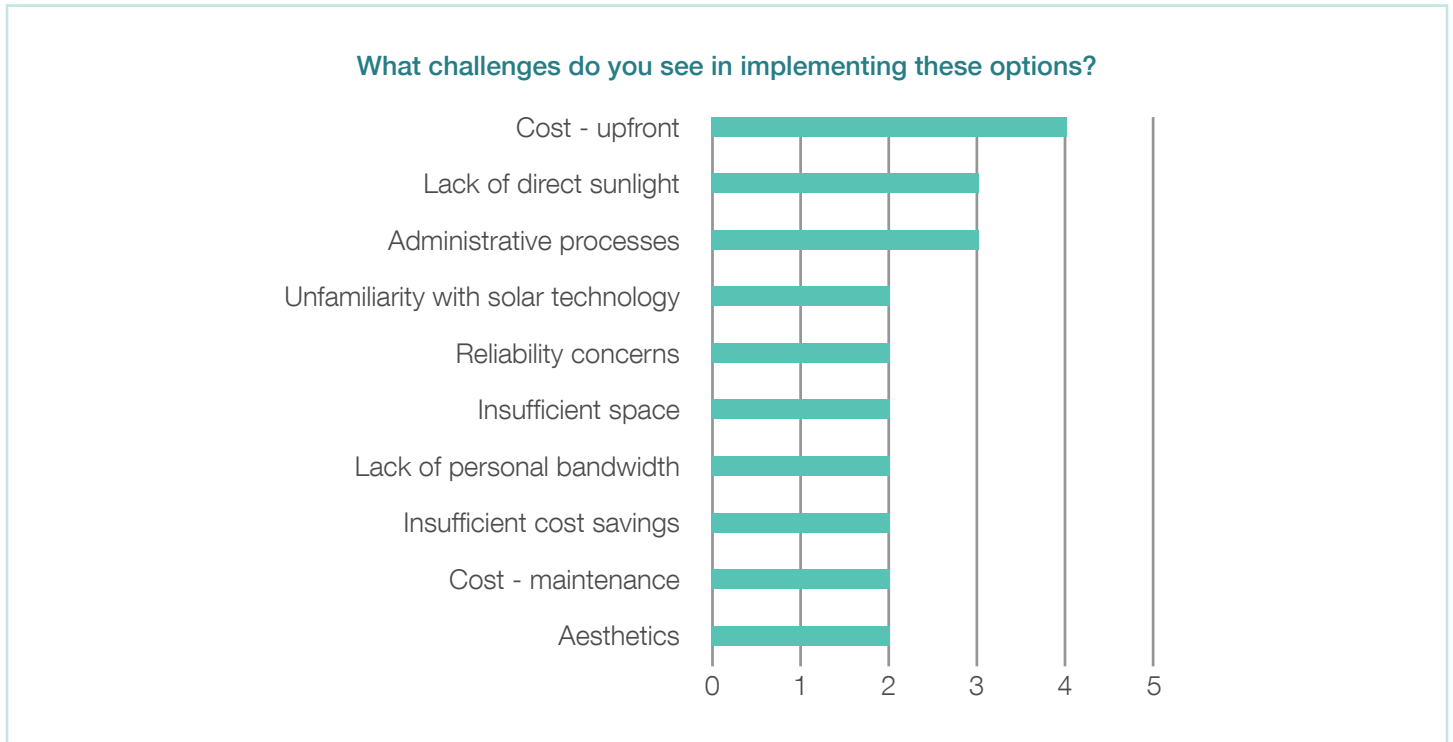
Participants were excited that solar is a step toward a just transition to a clean energy future, can help organizations achieve their sustainability goals, and encourages communities to be a part of the clean energy transition. They suggested that PSE should prioritize communities overburdened with poor air quality for these future products.

In addition, participants noted that solar puts existing, unused space to good use. There was less interest in ground-mounted solar compared to rooftop solar because it does not allow multiple uses for the same real estate.

"We are excited about having the built environment as part of our energy source. By using existing buildings, solar on roofs can be multi-purpose and part of a generating system."

BARRIERS

Participants were asked to identify all the challenges to installing solar.



In addition, the facilitator asked participants to consider perceived barriers and potential solutions for PSE to implement in the design of future solar products. Participants shared:

Upfront costs: The largest burden to organizations that rely on grants, government funding, or limited budgets is in upfront costs. Small businesses, nonprofits and renters require a quick return on investment.

Solution: Connect customers to additional funding opportunities (e.g. the Inflation Reduction Act) or offer programs where PSE owns and maintains the solar panels and leases customer roof space.

Administrative processes: Certain customers may have very specific and established procurement and capital planning processes.

Solution: To be flexible, allow customers to install solar through PSE, independently or through a third party, and provide customers with an overall financial picture and project timeline to inform their capital planning and approval processes.

Net metering threshold for larger-scale solar: The net metering limit of 100 kW has caused customers to downsize their solar installations.

Solution: Support legislative action to increase the net metering threshold to enhance viability for commercial customers.

Lack of infrastructure: The cost of upgrading existing infrastructure, including interconnection equipment and electrical systems, to ready properties for DER participation.

Solution: Provide financial and logistical support for the necessary infrastructure upgrades.

Lack of staff bandwidth: Participant’s staff are focused on critical services and did not have the capacity to take on additional responsibilities perceived to be associated with solar products.

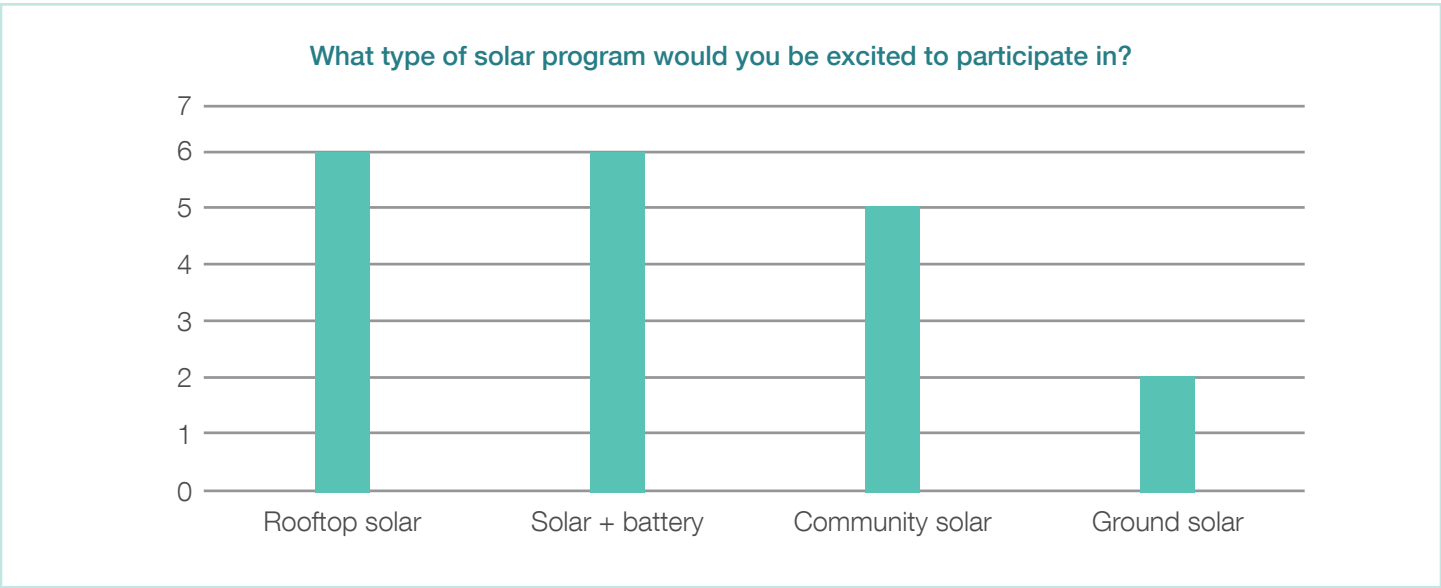
Solution: PSE provides all information required to plan for the entire lifecycle of solar, from funding to installation to maintenance to replacement and recycling. Provide customers with a “how-to” guide that outlines:

- How solar will be integrated into and impact energy bills.
- How much carbon emission reduction results from solar panels.

How to determine potential solar production and resulting energy offset, depending on the available roof or ground space.

INTEREST BY PROGRAM TYPE

Participants were presented with an overview of the types of solar programs listed below and asked to select all programs they would be interested in participating in.



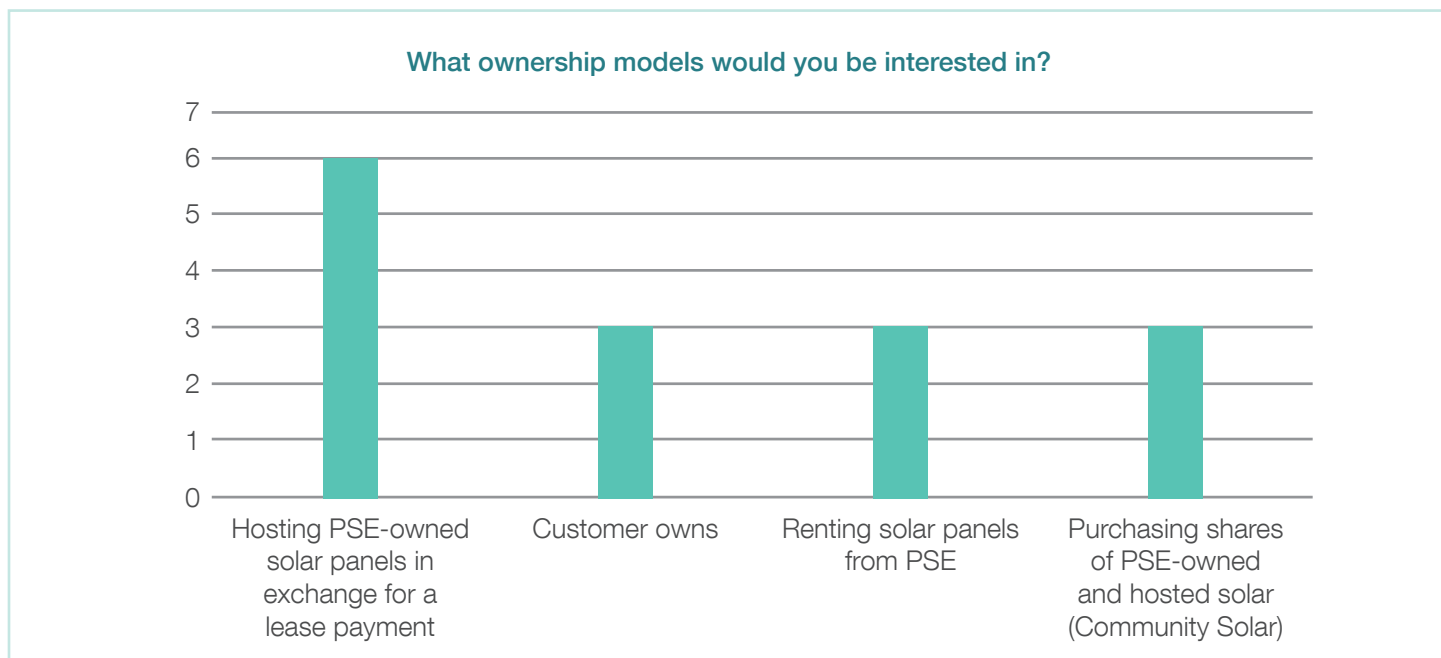
Participants were most interested in rooftop solar and a combination of solar and batteries. Land designated for residential use and future expected growth could provide multifamily solar sites. Adding batteries to solar excited participants, but it was a lower priority due to cost barriers and available space. Rural communities would benefit from a system of solar and batteries that could provide backup power during outages.

Community solar could provide a community plan to reduce emissions and become a shared investment. PSE should consider community centers and city buildings with large surface areas as potential hosts. Community solar should be easy for hosts to understand and implement, especially for residential management groups.

It would be difficult to approve and install ground solar in King County and other urban areas due to lack of available land from high commercial and residential density. However, PSE could explore installing ground-mounted solar on agricultural lands, parking lots, or landfills.

OWNERSHIP

Participants then selected all the ownership models they would be interested in participating in.



Participants were most interested in hosting PSE-owned solar panels in exchange for a lease payment from PSE for the space the solar panels take up. Upfront installation costs and customer-led maintenance would be unwelcome burdens for some organizations. These barriers influenced their interest in hosting PSE-owned panels and also meant some participants preferred renting panels from PSE. Customer ownership could be a viable option for organizations that can commit to the time and money required to install and maintain panels they own. Some participants expressed interest in hosting community solar, but wanted to be able to claim renewable energy credits if they did.

FINANCIAL INCENTIVES

When asked what financial incentives they would need to participate in a solar program, participants shared that:

- Customers would be incentivized to participate if the return on their investment over time is clear. These programs would be hard to present to property owners or leadership unless upfront costs, ongoing costs, potential savings, contract terms, and options for payment are clearly outlined.
- Customers may prefer upfront incentives as opposed to rebates to make payments more manageable.
- In general, it is easier to pay in installments rather than a large upfront payment. This allows customers with limited budgets to participate because the upfront costs are distributed over time.

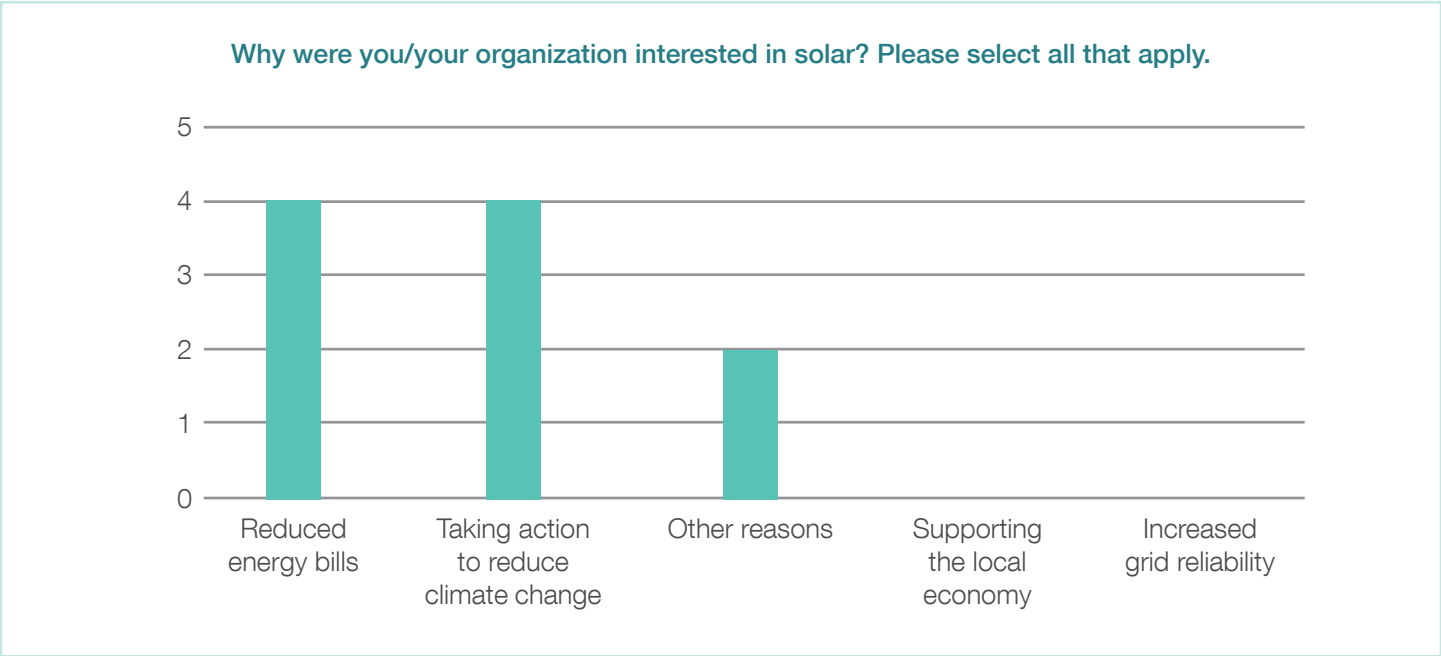
EDUCATION AND OUTREACH

When asked what would make their community excited about solar programs and how to successfully share that information, participants suggested that PSE:

- **Provide customers with a website** that is easy to navigate with relevant information like sample contractor contacts, case studies of commercial and residential projects, and customer testimonials.
- **Promote the benefits of solar** by marketing tangible information through trusted community sources (e.g., how much energy can five solar panels provide in a home?).
- **Work with government entities to develop solar demonstration projects** that educate customers and encourage them to join solar programs.
- **Introduce solar products in the classroom** to teach students about clean energy and how solar works.
- **Leverage local or well-known installers** to help promote program adoption and point customers to installers that have experience with similar entities (e.g., municipalities may want to work with installers that have previous experience with other municipalities, so that their unique administrative processes are already understood).
- **Publicize solar programs** through community events, email listservs, local businesses, community solar hosting sites, etc.

GREEN POWER SOLAR GRANT (GPSG) RECIPIENT WORKSHOP

Annually, PSE provides nonprofits, public housing authorities, and tribal entities serving low-income and/or BIPOC community members with grants to install solar at their facilities. To gather the perspectives of community service providers who are familiar with the process of installing solar, PSE invited past GPSG recipients to participate in a 90-minute workshop where they could share their experiences with solar, react to proposed future program elements, and suggest improvements. PSE invited 19 past grant recipients, and five attended.



BENEFITS

Participants were asked to select all the reasons their organizations were interested in solar.

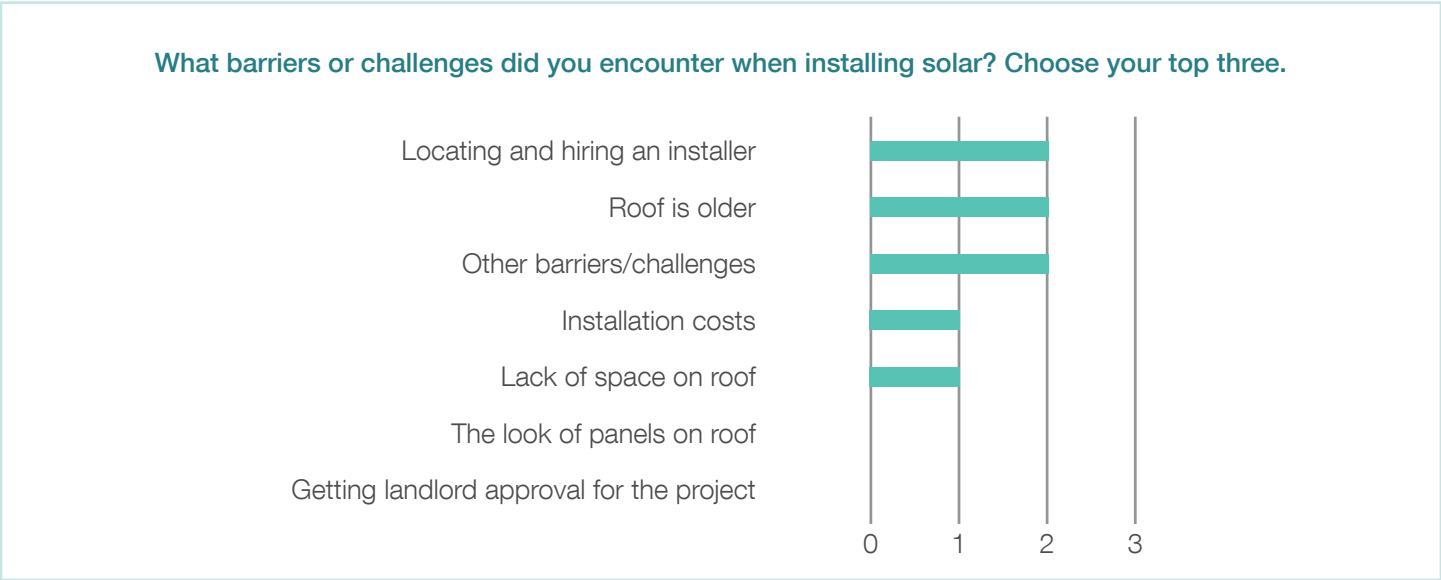
Participants were particularly interested in programs that reduce energy bills, providing an intersection in decarbonization and cost savings. Since solar panels reduce and stabilize operating costs, grant recipients can offer benefits to clients, like lower rent.

Participants found value in taking action to reduce climate change and showing their communities that climate action is not exclusively for the wealthy—anyone can participate and play a role. This sentiment aligns with participants’ mission to be a role model in the community and protect the climate for future generations. Housing authorities shared the value of solar with families and children by reporting on the energy the solar panels produced and how that offset the energy used in their buildings.

One participant is investigating adding batteries to their solar installation so their shelters can provide cooling centers via ductless heat pumps during extreme weather events and outages.

BARRIERS

Participants chose up to their top three challenges with installing solar.



When asked to expand upon their selections, participants shared that locating and hiring an installer may lead to delays given the need to schedule installation and electrical work prior to installing the solar panels. While PSE provided grant applicants with a list of potential installers, participants shared that navigating that list was daunting and some installers were not as responsive as others. Participants proposed that PSE categorize or reduce the list of vetted providers and highlight those with experience in state or federal grants, as well as those who have worked with nonprofits and understand their unique requirements and values.

One participant noted that working with an older building and roof meant space for solar panels on said roof was limited. However, they also expressed that their installer was a pleasure to work with on this issue. Another participant shared they look forward to technological advancements that will allow for capturing more solar with less space.

In addition to the listed barriers, participants suggested PSE consider making space in the electrical room for the inverter and locating the correct conduit proved difficult. Issues like these should be identified and remedied in advance of the installation. Knowledgeable local installers were able to help participants sort out these issues.

Application

Participants were asked to reflect on the accessibility of the GPSG application, and shared:

While the application took a long time to fill out, it was still accessible. Participants appreciated how responsive PSE was to questions and found the list of pre-vetted contractors helpful. Installers were supportive throughout the grant writing process and provided technical assistance where needed, increasing the accessibility of the process. Some participants shared that it was challenging to secure an installer before securing funding. To resolve this issue, one participant shared that they released a request for proposals (RFP) to have an installer on-call for any future solar projects.

"Accessible grant application processes make a substantial impact for organizations with limited capacity."

Usage and maintenance

When asked about their experience after commissioning of the solar panels, participants shared:

Some grant recipients installed technology to monitor when specific arrays stop working and have them replaced within the warranty period. Allowing grant funds to apply to this type of technology is key to optimizing the arrays and catching issues early.

Choosing where to locate the solar equipment requires special consideration. One participant selected an area near a playground and then had to gate the equipment off as children were playing with the buttons.

In one instance, an installer has helped by maintaining the system for the first year and plans to teach other employees how to take it over after the one-year mark.

Community solar

Participants were given a brief primer on community solar, then asked about their interest in hosting community solar at their facilities as opposed to owning their own system.

Participants that provide housing shared that if the community solar project beneficiaries were limited income residents, they would be much more interested in hosting. Another participant shared their organization would be interested in hosting a community solar project and providing additional power to their community if they could own the system. One participant shared that their organization has a large roof and would be open to installing both types of installations—one privately owned by their organization to generate on-bill credits for excess production, and one community solar project. Another participant flagged budget as their organization's deciding factor, which led to them choosing to own their own system and receive the on-bill credits.

Bundling batteries with solar

When asked about their interest in adding batteries to their solar installation, participants shared:

Having a cleaner alternative to existing diesel backup generators is a key benefit, even in buildings without solar. Participants expressed interest in providing backup power to their communities during adverse weather events and contributing to their community's climate resilience. One participant also expressed interest in using batteries to optimize use of solar produced on-site and participate in demand response programs.

"Batteries would provide us with security in knowing we would have power during adverse events."

Claiming environmental benefits

For customer-owned systems, customers often install solar for both the cost savings and to claim the environmental benefits associated with the solar energy production. These environmental benefits help measure progress towards their sustainability goals. Alternatively, the environmental benefits can be sold to PSE as an additional revenue stream. Participants were asked to select their preferred scenario from the list below:

	Scenario A	Scenario B
Who owns	You claim environmental benefits to count towards your sustainability goals	You sell environmental benefits to PSE to increase financial benefit
Ranking	Less preferred	More preferred

All but one participant preferred to sell the environmental benefits to PSE for financial benefit. With limited funding, additional revenue streams are primary drivers of some organizations’ choices. These financial benefits can also be used to directly benefit the families they serve.

The participant who opted to claim the environmental benefits has organizational decarbonization goals to which environmental benefits contribute. However, they might sell environmental benefits to PSE in the future if PSE’s grid power becomes substantially less carbon-intensive than it is today.

RANKING QUESTIONS

In the following question, participants were asked to rank the scenarios below from their most preferred option to their least preferred option. The collective ranking results are displayed in the tables. The options are presented in ascending order, with the most preferred option receiving a score of one and the least preferred option receiving either a three or four, depending on the number of scenarios presented.

Ownership and maintenance

Participants reviewed the following scenarios and then ranked the scenarios by order of preference. Prior to responding, participants were informed that all the costs below are illustrative of a total project cost of \$50,000 and not necessarily indicative of final product offerings.

	Scenario A	Scenario B	Scenario C
Who owns	You own	PSE owns	You are renting to own from PSE
Who installs	You hire a contractor and manage the installation	PSE hires a contractor and manages the installation	PSE hires a contractor and manages the installation
Who maintains	You maintain	PSE maintains	PSE maintains
You pay	\$25,000 up front	\$0 up front	\$18,000 over 15 years, spread out as \$100 per month rental payments to PSE
You receive	A reduction in your energy bill and additional on-bill credits for excess solar production each month \$300 per month totaling \$54,000 over 15 years	A fixed monthly payment from PSE on your energy bill for the use of your roof space or land \$50 per month totaling \$9,000 over 15 years	After 15 years, a reduction in your energy bill, ownership of the system and additional on-bill credits of \$80 per month for excess solar production each month
Ranking	Most preferred (1)	(2)	Least preferred (3)

Scenario A was ranked the highest among participants. Multiple organizations cited the importance of owning the systems they work with as it is more cost effective and requires less coordination in the long run.

Participants who were interested in **Scenario B** shared that with limited funding, the \$0 upfront cost is critical. They cannot wait 15 years for the financial benefits to pencil out. Some who selected **Scenario B** wanted to meet their organization's clean energy goals without investing budget dollars. A PSE representative clarified that **Scenario B** would not allow customers to claim the environmental benefits of the solar panels.

ADVISORY SERVICES

Due to time limitations at the end of the workshop, participants discussed the advisory services listed below, but did not participate in a poll.

Scenario	Description
A	PSE partners with you to create a long-term solar installation plan for your properties
B	PSE prepares and provide presentations for your key stakeholders and decision makers
C	PSE provides consulting services and an online calculator to help you assess the total cost and benefits of solar programs, and assistance with enrolling in other products and services

Most participants indicated Scenario A would be most impactful to their organizations. One participant's organization has multiple buildings with shared decarbonization goals across PSE's electric service area so long-term practical planning support would be most valuable. Some participants felt that they don't need the presentation assistance listed in Scenario B now that they have developed their solar knowledge base through the grant program.

One participant voiced preference for **Scenario C**, and shared that their organization would appreciate assistance with enrolling in other products, noting they are always striving for energy efficiency and appreciate the holistic approach.

COMMERCIAL WORKSHOP

Following the focus groups, customers who expressed interest in participating via a poll received an invitation to a 90-minute virtual workshop. The workshop included scenarios associated with potential future components of solar products. Out of the 33 customers invited, five participated.

Due to technological issues during the workshop, the project team was not able to administer Zoom polls. Instead, participants shared feedback verbally and through the Zoom chat. Participants were asked to approach the scenarios as if they were applying for a PSE product or service to install solar at their organization.

APPLICATION AND INTAKE

Participants were asked to review the list of scenarios below and discuss whether or not they were equitable.

Scenario	Description
A	Applications are considered on a first-come, first-served basis
B	PSE serves eight counties in Washington. Applications are prioritized so that projects are distributed evenly across those counties
C	Applications are prioritized based on the benefit they will provide to historically disadvantaged communities

Scenario C was identified as most equitable because it helps avoid a more common situation where well-resourced organizations are able to afford participation and smaller nonprofits with smaller budgets are unable to. Participants also thought PSE should prioritize customers in areas with the greatest energy needs or demands.

ENROLLMENT ELIGIBILITY

Participants were presented with the following scenarios and asked if they would be able to meet the requirements.

Scenario	Description
A	Prove building, or land ownership or landlord approval via documentation
B	Agree that you will participate in this program for at least 15 years or that this building will be used for the same purpose for 15 years
C	Show you are a community-based organization, government agency, or tribal entity serving historically disadvantaged communities

Participants remarked that customers who typically occupy buildings for long periods of time, such as government agencies, could meet **Scenario B's** 15-year requirement since their tenancy typically remains the same for many years. Organizations with shorter leases may have greater difficulty meeting the 15-year requirement. Customers who do not own their buildings may find it challenging to meet the first two requirements. One participant representing a small nonprofit operates on three-year leases. The nonprofit participant expressed interest in solar, but noted that landlord approval would be required and they may move to another building in the future, making a long-term commitment difficult. They concurred with shortening the time commitment to ten years, expanding **Scenario A** to allow for properties still under mortgage, and providing exceptions on a case-by-case basis.

RANKING QUESTIONS

In the following sections, participants were asked to rank the scenarios below from their most preferred option to their least preferred option. The collective ranking results are displayed in the tables. The options are presented in ascending order, with the most preferred option receiving a score of one and the least preferred option receiving either a three or four, depending on the number of scenarios presented.

Ownership and maintenance

Participants reviewed the following scenarios and then ranked them by order of preference. Prior to responding, participants were informed that all the costs below are illustrative of a total project cost of \$50,000 and not necessarily indicative of final product offerings.

	Scenario A	Scenario B	Scenario C
Who owns	You own	PSE owns	You are renting to own from PSE
Who installs	You hire a contractor and manage the installation	PSE hires a contractor and manages the installation	PSE hires a contractor and manages the installation
Who maintains	You maintain	PSE maintains	PSE maintains
You pay	\$25,000 up front	\$0 up front	\$18,000 over 15 years, spread out as \$100 per month rental payments to PSE
You receive	A reduction in your energy bill and additional on-bill credits for excess solar production each month \$300 per month totaling \$54,000 over 15 years	A fixed monthly payment from PSE on your energy bill for the use of your roof space or land \$50 per month totaling \$9,000 over 15 years	After 15 years, a reduction in your energy bill, ownership of the system and additional on-bill credits of \$80 per month for excess solar production each month
Ranking	Least preferred (3)	Most preferred (1)	(2)

Participants thought **Scenario B** would remove the burden of permitting, purchasing, maintaining, and removing solar panels and could benefit smaller nonprofits or lower income customers. Participants also appreciated the additional benefit of monthly payments.

Scenario C would benefit customers with permanent buildings or long-term location security. Participants suggested that PSE offer maintenance packages for solar panels once ownership is transferred from PSE to customers.

In addition to the feedback shared on the scenarios, it was suggested that PSE listen to customer goals, such as working towards a net-zero facility, and share how different options impact those long-term goals. Participants were interested in visualizations of the long-term benefits and the return on investment over time.

"The goal in our community would be to have a lower monthly bill and the incentives to be able to install as a smaller nonprofit are really helpful."

Large scale solar

The facilitator explained that some customers may wish to install larger solar installations, but installations greater than 100 kW do not qualify for net metering. The scale and economics of larger projects would change program offerings. Customers were asked which of the following scenarios they would prefer if they were to install a system larger than 100 kW.

Scenario	Description
A	You receive an upfront incentive to lower the cost of installation, but your monthly bill credit for exported energy is less
B	You don't receive an upfront incentive to apply towards installation, but your monthly bill credit for exported energy is higher

Participants indicated their preference would depend on the lifetime economics of each scenario. Larger organizations need to consider budgets, tax implications, and long-term goals and expressed the need for more detailed numbers before making a decision.

Multifamily solar

Participants who provide residential housing were asked to consider a solar installation at a multifamily property and then indicate how on-bill credits could be allocated. Three participants were housing providers, but all participants shared feedback.

	Scenario A	Scenario B
Description	On-bill credits resulting from the solar installation should be distributed equally among tenants of that building	On-bill credits should be distributed to the housing provider to then use on enhanced services for tenants
Ranking	Less preferred	Most preferred

Most customers preferred Scenario B and noted that if housing providers or property managers are responsible for the upfront and ongoing financial investment in solar, then they should receive the credits. If a building is 'green' through enrollment in solar programs, that could attract more environmentally minded tenants. Participants suggested that even though the on-bill credits should go directly to the housing provider, they could then provide rent rebates, discounts, or maintain rent prices to pass on the savings to tenants. Participants acknowledged that **Scenario A** could provide important financial benefits for tenants but felt that energy bill assistance should fall to an agency instead of the property manager.

To reduce barriers to multifamily solar programs, participants encouraged PSE to develop programs that incentivize property owners and managers. They cautioned that larger properties experience quick turnover and do not invest as much in tenants, making it difficult to rationalize larger-scale investments like solar.

Bundling batteries with solar

Next, participants were asked about their interest in adding a battery system to their solar array. Most customers were interested in batteries since they promote resiliency, provide backup power, and maximize resources, but had hesitations about the additional costs. One customer was concerned about the potential for fire.

Participants were curious how PSE will balance the future adoption of batteries and increased renewable energy generation to keep rates as low as possible for all customers.

Community solar

Participants were reminded that in community solar, customers can ‘subscribe’ to a share of a solar project located on a community building and receive the financial and environmental benefits of that share. Participants were then asked if they would prefer to host community solar or own their system to receive a reduction in energy bills and on-bill credits.

Most participants would host community solar if offered the option, especially if they already offer nonprofit services to community members. Only one participant preferred owning their own system and receiving on-bill credits.

	Scenario A	Scenario B	Scenario C	Scenario D
Description	PSE helps you locate state, federal, or private financing and PSE provides letters of support	You receive a discount through your installer to reduce the upfront installation cost	You sign a memorandum of understanding that certifies your intention of purchasing solar panels, along with your installer's quote and provide proof of purchase within 60 days of installation PSE provides you with an upfront incentive to cover the agreed upon portion of the installation	You receive our portion of the installation costs as a rebate within 60 days of installation
Ranking	(2)	Most preferred (1)	(3)	Least preferred (4)

Upfront installation financing

PSE asked participants to rank which financing scenarios for upfront installation costs would best meet their needs.

Scenario B was most preferred, and Scenario A was a close second. A nonprofit participant selected **Scenario B** because the discount means the money would not need to be accounted for in their budget. One participant noted that partnering with installers to reduce upfront costs could also help uplift local installers and vendors. They suggested that PSE provide a list of potential installers that would be willing to partner in the process. Participants also preferred this option because it gave them the autonomy to select their installer.

Many organizations already participate in similar funding processes to **Scenario A**, which could reduce processing time with applications and support letters. Participants noted that it was important for customers to be aware of available funding from the government or grant programs, and that PSE could help raise awareness about those opportunities.

Participants preferred **Scenarios C and D** less but acquiesced that it depends on their organizational needs and processes. For example, smaller nonprofits may not have a rigorous approval processes or legal review prior to signing MOUs. They may experience fewer barriers than larger organizations do in this space.

Ongoing payments

Participants were then asked how they would prefer to receive ongoing payments for their enrollment in a solar program.

	Scenario A	Scenario B	Scenario C	Scenario D
Description	You receive a credit on your bill	You receive a Visa gift card	You receive a check	The money is deposited directly into your bank
Ranking	(2)	Least preferred (4)	(3)	Most preferred (1)

Most participants preferred Scenario D since it takes less processing time. Smaller organizations preferred Scenario A because it would be one less check or deposit to track. However, other participants preferred to keep the payments separate if the money used for solar panels and money used to pay utility bills are part of different budgets.

Claiming environmental benefits

For customer-owned systems, customers often install solar for both the cost savings and to claim the environmental benefits associated with the solar energy production. These environmental benefits help measure progress towards their sustainability goals. Alternatively, the environmental benefits can be sold to PSE as an additional revenue stream. Participants were asked to select their preferred scenario from the list below:

	Scenario A	Scenario B
Who owns	You claim environmental benefits to count towards your sustainability goals	You sell environmental benefits to PSE to increase financial benefit
Ranking	Less preferred	More preferred

Most participants preferred Scenario B, because there is no current financial benefit to reporting their carbon offsets, and many smaller nonprofits do not have stated sustainability targets. Participants noted that if a future policy was enacted that required commercial customers to meet sustainability targets with financial penalties for non-compliance, they would have a higher preference for claiming the environmental benefits of their systems.

Advisory services

Due to time limitations at the end of the workshop, participants discussed the advisory services listed below, but did not participate in a poll.

	Scenario A	Scenario B	Scenario C
Who owns	PSE partners with you to create a long-term solar installation plan for your property(ies)	PSE prepares and provides presentations for your key stakeholders and decision makers	PSE provides consulting services and an online calculator to help you assess the total cost and benefits of solar products, and assistance with enrolling in other products and services
Ranking	More preferred	Less preferred	More preferred

Participants noted that **Scenario A** may be useful for larger installations and long-term strategic planning for larger organizations with multiple buildings. However, this service may be less useful for smaller organizations. According to one participant, **Scenario C** would be most beneficial for smaller organizations. In addition, participants felt **Scenario B** would help gain organizational buy-in. One person shared that all three scenarios would be helpful for larger organizations throughout different phases of the program.

Education and outreach

Participants were asked to review the following scenarios and indicate which they would be most and least likely to use. Due to time constraints, they did not participate in a poll and instead shared their feedback verbally.

	Scenario A	Scenario B	Scenario C	Scenario D
Description	You can view a PSE site with prototype solar panels to see them up close and learn how they work	You receive educational materials about solar panels from PSE as a part of a package with other services	PSE provides referrals to trusted solar installers	PSE provides information about how to incorporate workforce development opportunities for your community related to the solar installation
Ranking	Less preferred	More preferred	More preferred	Less preferred

Participants responded that **Scenarios B and C simplified the process for businesses and organizations that need stakeholder or board approval**. They hoped the trusted solar installers mentioned in Scenario C would help with permitting and provide rooftop installation tips.

Participants thought that the need for each scenario depends on where each customer is in the process. For example, organizations that are already interested in solar and are ready to select an installer may benefit from **Scenario C**, while those that are still exploring the financial benefits of solar may need assistance calculating the return on investment.

Participants did not provide specific comments on **Scenarios A or D**.

RESIDENTIAL ENGAGEMENTS

This section summarizes the feedback heard during all solar-specific focus groups and workshops with residential customers. PSE collaborated with the customers who participated in CBO interviews and introduction calls to distribute an interest survey on upcoming focus groups and workshops to residents in their communities. PSE used responses to that interest survey to randomly select participants for the focus groups and workshops.

RESIDENTIAL FOCUS GROUP

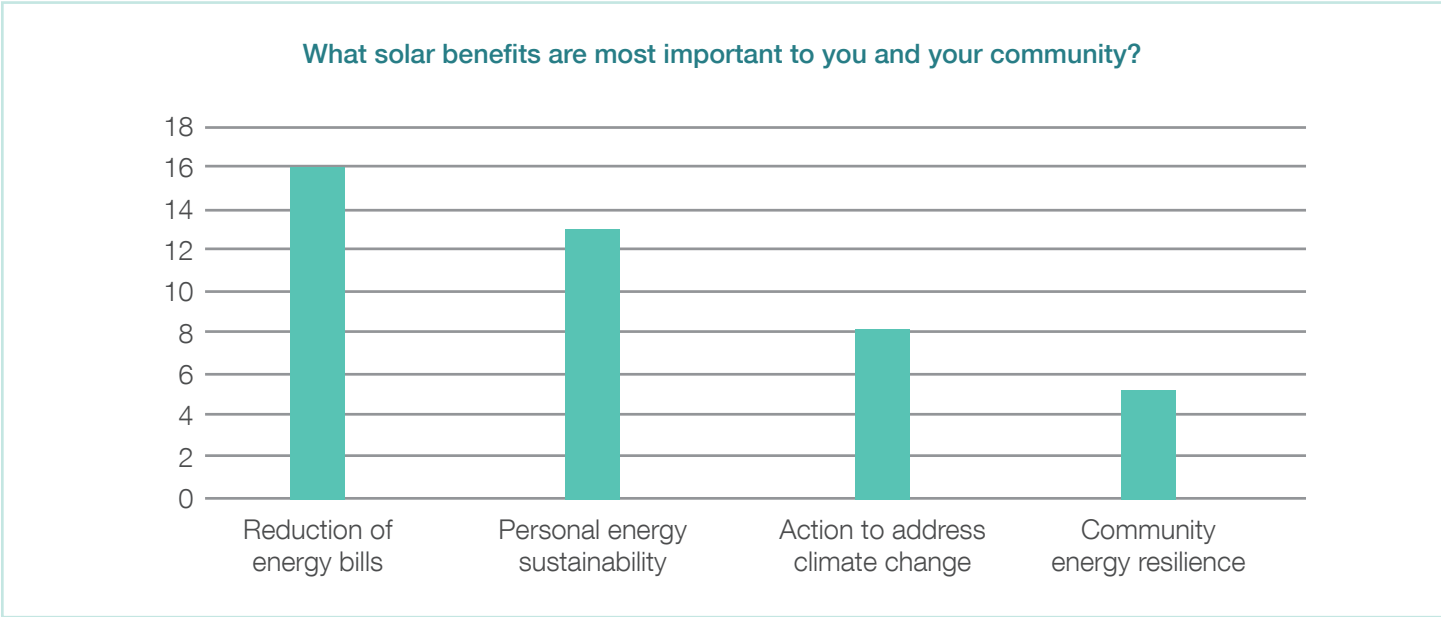
PSE held a 90-minute focus group with residential customers to understand solar benefits, barriers and education and outreach needs through the lens of customers in Named Communities. A total of 25 residential customers participated in the solar focus group.

The focus group was held after work hours to maximize participation and was offered with both Spanish and English breakout groups. Participants were able to indicate language preference when they signed up for the focus group. All participants preferred to remain in the English breakout group.

Throughout the focus group, the project team gathered feedback using Zoom polls. Not all participants responded to questions via the polls. Many participants joined using their phone and provided feedback either via the chat or verbally instead of answering polls. Those comments are captured in the additional discussion sections. Participants also asked questions about battery, solar, and DR programs throughout the focus group and a portion of the time was dedicated to answering questions and providing education on DERs.

BENEFITS – PERSONAL LENS

Participants were asked to select all statements that represented their interest in solar.

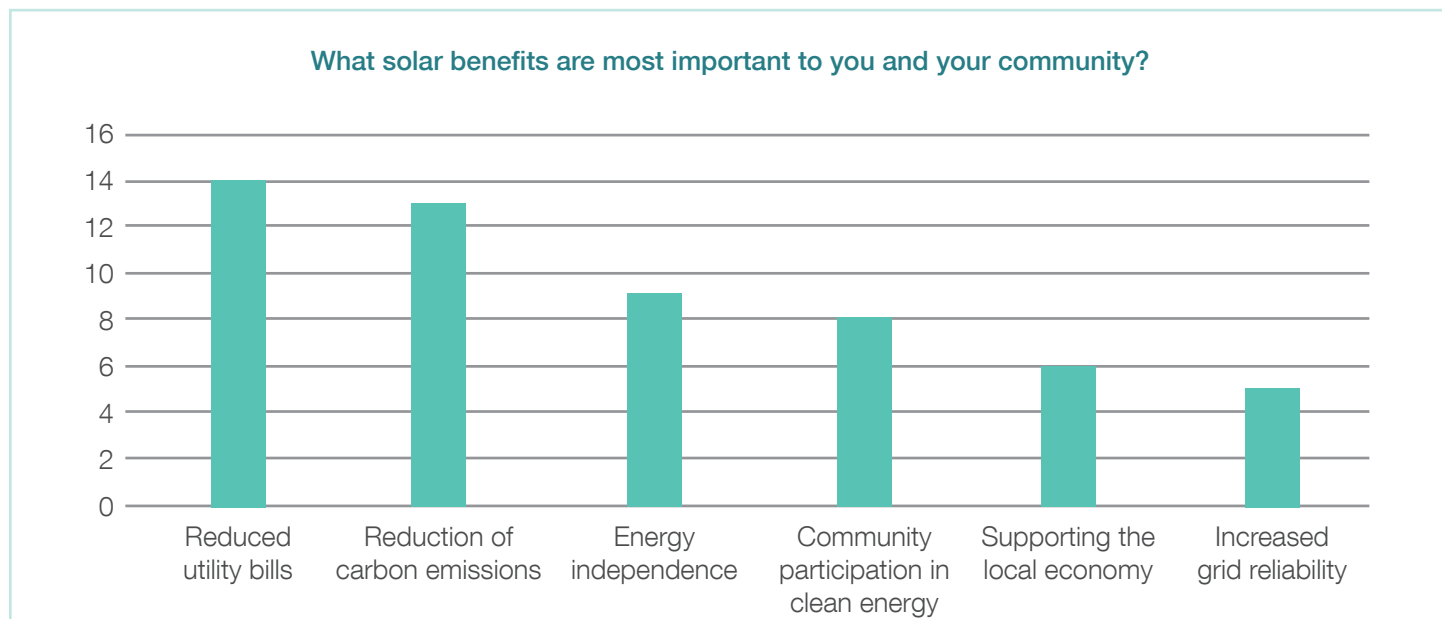


Most participants were predominantly interested in reducing their energy bills through solar. In addition to responding to the poll, participants shared the following sentiments about solar:

- Solar is a clean source of energy.
- Lowering energy costs is beneficial to all.
- Solar can reduce energy expenses.

BENEFITS – COMMUNITY LENS

To expand on the previous question, participants were asked to identify all solar benefits that are important to their community



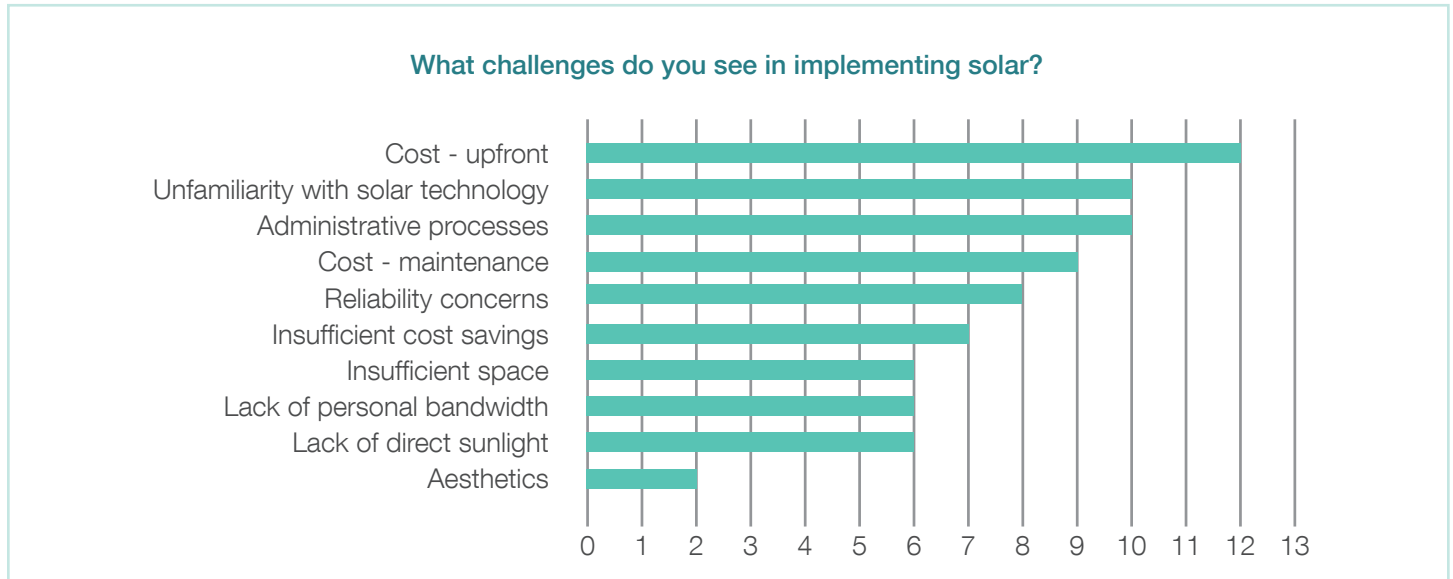
Responses were similar to the previous poll with most participants citing reduced utility bills as the most important benefit, followed by reduction of carbon emissions. Energy independence, community participation, and supporting the local economy were the next most important. The least important benefit was increased grid reliability.

Participants also shared the following feedback:

- Solar can help growing communities and support the economy by allowing more clean energy job opportunities.
- Solar programs can lower overall costs for nonprofits that serve low-income community members and then redirect those funds to other services offered.
- The initial cost of installation is high, but the ongoing maintenance costs are low, which makes it more affordable in the long term.
- It is important to educate customers on the benefits of solar and the installation process to help them realize that solar is achievable.

BARRIERS

Participants identified all challenges they perceive experiencing when participating in a solar program.



In addition, the facilitator asked participants to consider perceived barriers and potential solutions for PSE to implement in the design of future solar products. Participants shared:

Upfront costs associated with installation: This common concern could prohibit adoption of solar programs.

Solution: Payments spread out over time would be more accessible and realistic for customers than a higher upfront payment. Participants would like to have warranties for solar products.

Credit scores or loan eligibility: Low credit scores may prohibit customers from obtaining financing for solar installations.

Solution: PSE could accommodate customers with lower credit scores by creating financing programs or helping them identify loan opportunities.

Administrative processes: Customers feel overwhelmed by the variety of tasks required to successfully install and maintain solar.

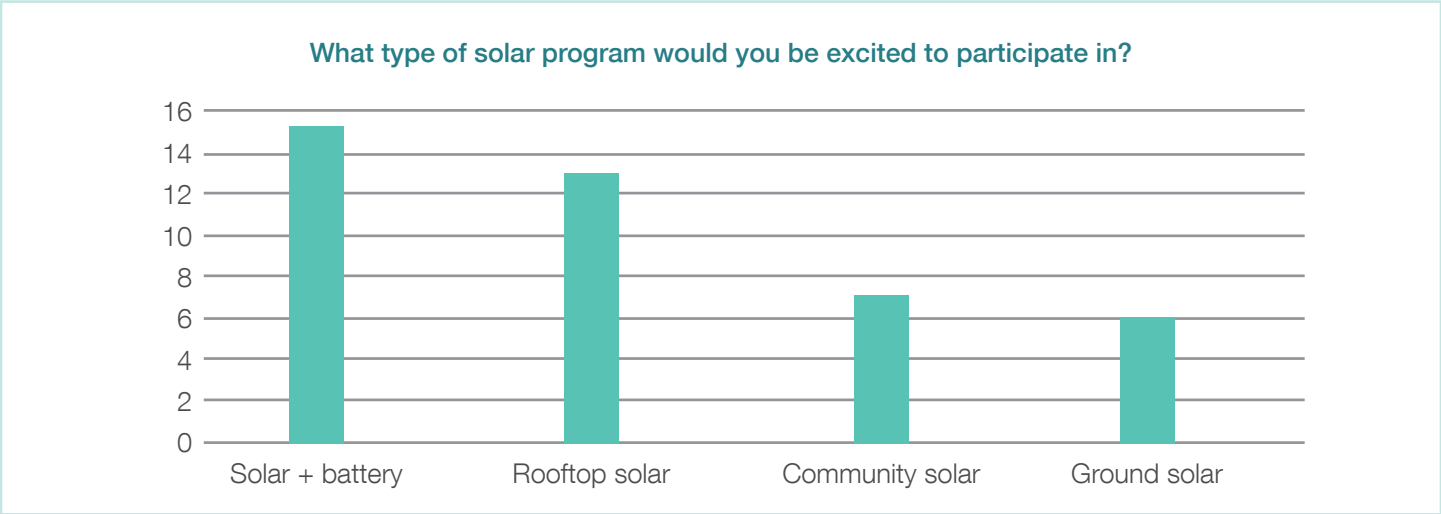
Solution: Create a manual that includes solar product details, contractor selection tips, step-by-step installation instructions, and instructions for ongoing maintenance. Include visuals, graphs, and cost comparisons. For a human touch, connect customers with solar product consultants to explain the process and foster adoption.

Renters may not have the authority to make permanent changes to their homes: Solar takes up a lot of space and requires continued resource investment. Not all landlords will agree to install solar, despite renter interest.

Solution: No solution was identified by participants.

INTEREST BY PROGRAM TYPE

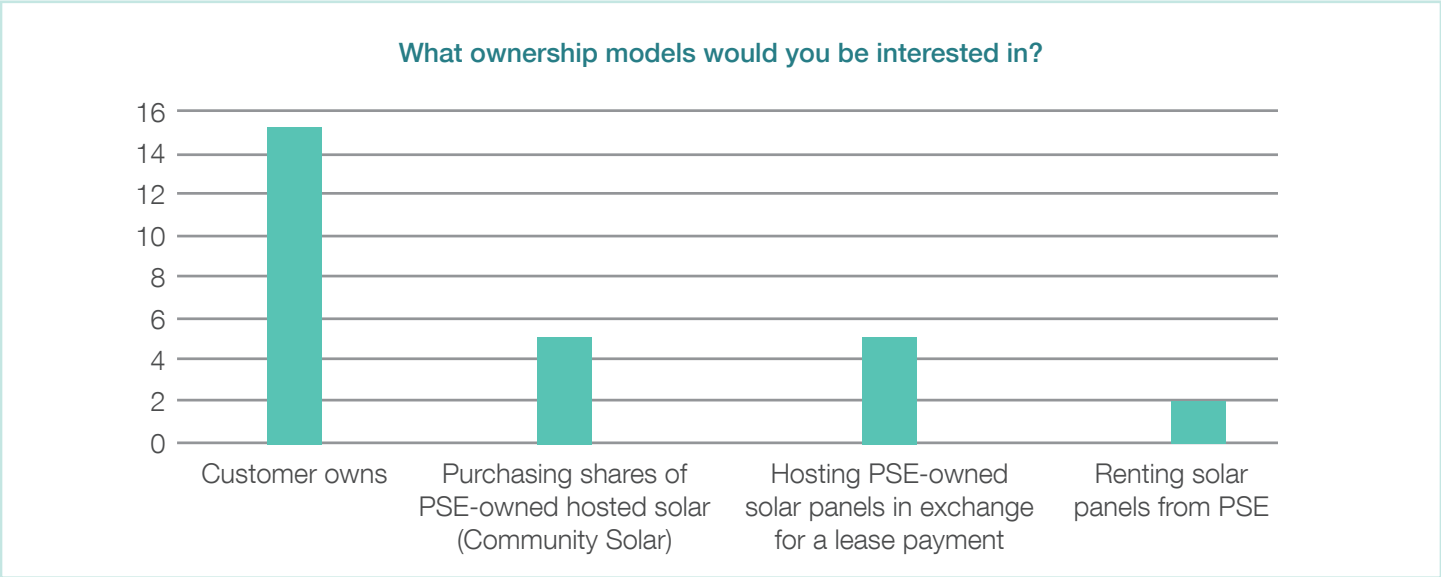
Participants were presented with an overview of the types of solar programs listed below and asked to select all the programs they would be most interested in participating in.



In addition to the poll, participants verbally expressed excitement regarding the potential benefit of solar and battery pairings to offer backup power during outages. They also shared concerns about vandalism to ground-mounted solar installations.

OWNERSHIP

Participants expanded on their interest in different program types by selecting all the ownership models they would consider participating in.



Participants expressed the most interest in owning their solar panels over any of the other options. They expressed the customer-owned option may be better for homeowners, especially if it results in energy bill savings. However, participants had concerns about the maintenance required. Participants suggested PSE address this concern by providing regular maintenance for customers who request it.

Renting to own could help customers begin their personal transition to cleaner energy through obtaining solar panels without a large initial investment. However, participants worried that homes with rented solar panels could be harder to sell and factoring rented solar panels into a home's selling price could be complicated.

FINANCIAL INCENTIVES

When asked what financial incentives they would need to participate in a solar program, participants shared that PSE could:

- Provide a list of available grants and affordable financing options for customers to reference.
- Provide price warranties and guarantees so customers with diverse financial situations can still participate.

EDUCATION AND OUTREACH

When asked what would make their community excited about solar programs and how to successfully share that information, participants suggested that PSE:

- **Provide more information on the basics of community solar** to help customers identify cost savings and environmental benefits compared to other solar programs.
- **Provide more information on how solar operates** throughout the year and how energy is stored after the sun goes down.
- **Connect with Named Communities** through other energy assistance programs.
- **Promote products on social media platforms** such as Facebook, Twitter, Instagram, Craigslist, Reddit, TikTok, and neighborhood apps such as NextDoor.
- **Conduct in-person engagement** through community events and utilize community newsletters to share information.

RESIDENTIAL WORKSHOP

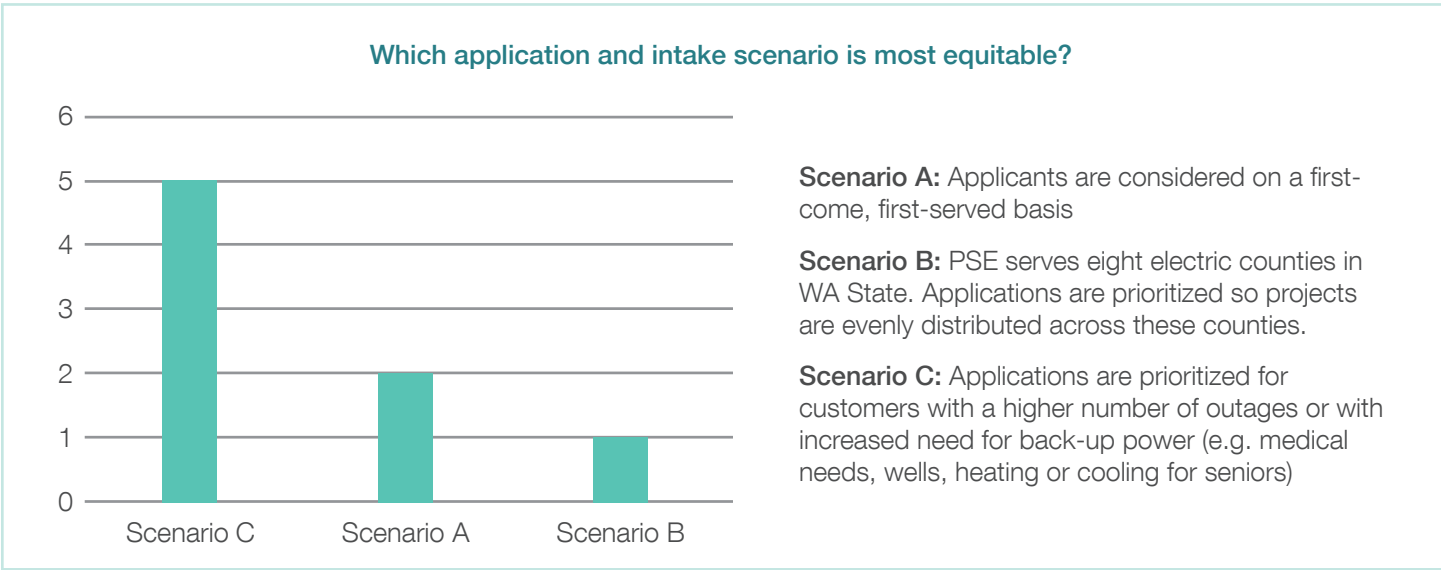
After the focus group, additional residential customers participated in a 2 hour virtual workshop designed to gather feedback on potential solar products through the lens of customers in Named Communities. The workshop was held after work hours to maximize participation. A total of seven residential customers attended the solar workshop.

Throughout the workshop, the project team gathered feedback using Zoom polls. Not all participants responded to questions via the polls. Many participants joined using their phone and provided feedback either via the chat or verbally instead of answering polls. Those comments are captured in the additional discussion sections. Participants also asked questions about battery, solar, and DR programs throughout the workshop and a portion of the time was dedicated to answering questions and providing education on DERs.

Residential customers were asked to approach the scenarios as if they were applying for a PSE product to install solar in their home.

APPLICATION AND INTAKE

PSE asked residents to share which application and intake scenarios they found to be most equitable and how PSE should prioritize applications based on the three scenarios presented.



Residents found **Scenario C** to be the most equitable and also suggested that applications should be prioritized based on income status. No additional feedback was shared for **Scenarios A and B**.

ENROLLMENT ELIGIBILITY

Residents were asked if they could meet the enrollment eligibility requirements listed below:

Three participants were able to meet both requirements, but the remaining participants expressed that both these requirements would be barriers to participation. Specifically working with a landlord for approval and documenting that approval may prove difficult.

Scenario	Description
A	Prove building, or land ownership or landlord approval via documentation
B	Agree that you will participate in the program for at least 15 years

RANKING QUESTIONS

In the following sections, participants were asked to rank the scenarios below from their most preferred option to their least preferred option. The collective ranking results are displayed in the tables. The options are presented in ascending order, with the most preferred option receiving a score of one and the least preferred option receiving either a three or four, depending on the number of scenarios presented.

Ownership and maintenance

Participants reviewed the following scenarios and then ranked the scenarios by order of preference in the Zoom chat. Prior to responding, participants were informed that all the costs below are illustrative of a total project cost of \$50,000 and not necessarily indicative of final product offerings.

	Scenario A	Scenario B	Scenario C
Who owns	You own	PSE owns	You are renting to own from PSE
Who installs	You hire a contractor and manage the installation	PSE hires a contractor and manages the installation	PSE hires a contractor and manages the installation
Who maintains	You maintain	PSE maintains	PSE maintains
You pay	\$15,000 up front for the installation of solar	\$0 up front for the installation of solar	\$13,500 over 15 years, spread out as \$75 per month rental payments to PSE
You receive	A reduction in your energy bill and additional on-bill credits for excess solar production each month \$100 per month totaling \$18,000 over 15 years	A fixed monthly payment from PSE on your energy bill for the use of your roof space or land \$20 per month totaling \$3,600 over 15 years	After 15 years, a reduction in your energy bill, ownership of the system and additional on-bill credits of \$20 per month for excess solar production each month
Ranking	Least preferred (3)	Most preferred (1)	(2)

Most participants ranked Scenario B as their first choice because the amount of work PSE is responsible for, including maintenance, would greatly reduce their stress associated with the program. The additional fixed monthly payment was also appealing. One resident felt that solar panels depreciate so quickly, they preferred to not be liable for the upfront investment. Participants did not share additional feedback for Scenarios A and C.

Upfront installation financing

PSE asked participants to rank which financing scenarios for upfront installation costs would best meet their needs.

	Scenario A	Scenario B	Scenario C	Scenario D
Description	PSE helps you locate state, federal, or private financing and provides letters of support	You receive a discount through your installer to reduce the upfront installation cost	You sign a MOU that certifies your intention of purchasing solar panels, along with your installer's quote of purchase within 60 days of installation PSE provides you with an upfront incentive to cover the agreed upon portion of the installation	You receive our portion of the installation costs as a rebate within 60 days of installation
Ranking	(2)	Most preferred (1)	Least preferred (3)	(2)

Participants ranked **Scenario B** highest because the discount offered an immediate price reduction with the least effort of all the scenarios. Note that Scenarios A and D ranked equally to participants.

Ongoing payments

Participants were then asked how they would prefer to receive ongoing payments for their enrollment in a solar program.

	Scenario A	Scenario B	Scenario C	Scenario D
Description	You receive a credit on your bill	You receive a Visa gift card	You receive a check	The money is deposited directly into your bank
Ranking	(2)	Most preferred (1)	Least preferred (3)	(2)

Scenario B was the top choice because Visa gift cards provide the most immediate financial benefit. Note that **Scenarios A and D** ranked equally to participants.

One participant suggested offering electronic payment options like PayPal or Zelle in addition to the scenarios presented to the group.

Bundling batteries with solar

Residents were asked if they would be interested in adding a battery to their solar array. Some noted this would increase costs but were intrigued by the benefit of backup power helping to balance energy demands.

COMMUNITY SOLAR

Participants were reminded that in community solar, customers can ‘subscribe’ to a share of a solar project located on a community building and receive the financial and environmental benefits of that share.

Value of a community solar share

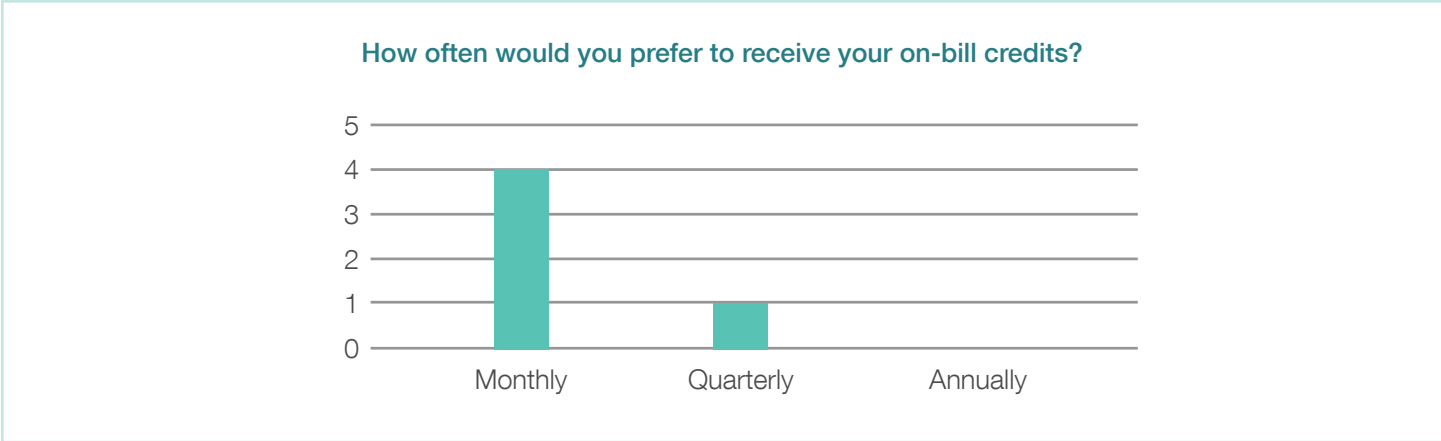
Participants were asked what monthly on-bill credit would encourage them to enroll in community solar.



The most popular on-bill credit options were 10 or 15 dollars, but participants noted that it would depend on their financial situation. Some shared that community solar could be a good alternative for those that are unable to install solar on their property.

Credit frequency

To follow up on on-bill credit amounts, participants were asked how often they would prefer to receive their on-bill credits.



Most participants preferred a monthly on-bill credit to align with their other monthly bills because it is more consistent, predictable, and affordable.

Financial versus community benefit

Residents were asked if they would rather enroll in a local community solar project in exchange for a lower on-bill credit or enroll in a community solar project installed further away for a higher on-bill credit.

Participants preferred to enroll in the local community solar projects, even with a lower on-bill credit. They felt the projects would be easier to access if they were in their community, perceived local projects as more reliable and believed they would provide the most direct community benefits.

"Community solar can be a great option for people who are unable to install solar panels on their roofs because they do not own their homes, have sufficient resources, or roof conditions to support solar."

MEASURES OF SUCCESS

Participants were asked which metrics indicate success in solar program deployment.

Scenario	Description
A	How many customers have on-site solar?
B	What portion of our energy comes from solar?
C	What percentage of program dollars went to historically disadvantaged communities?
D	Something else?

Participants selected **Metrics A and C** most often from the list above. For ‘Something else,’ residents suggested tracking awareness of renewable energy products, number of customers that purchased or are enrolled in solar products, and how well customers engage in community solar.

EDUCATION AND OUTREACH

Participants were asked what education and outreach practices PSE should use to encourage product participation and awareness.

	Scenario A	Scenario B	Scenario C	Scenario D
Description	You can view one of PSE's sites with prototype solar panels to see them up close and learn how they work	You receive educational materials about solar panels from your housing provider or local CBO	You receive educational materials about solar panels from PSE as a part of a package of other services	PSE provides consultation services and an online calculator to help you assess the total cost and benefits of solar products
Ranking	Less preferred	Less preferred	More preferred	More preferred

Residents selected Scenarios C and D as the most valuable but noted that Scenarios A and B could also be valuable for customers who are in the beginning stages of exploring solar or have not yet been connected to consultation services.

IN-PERSON FOCUS GROUP WITH A SENIOR CENTER

During a CBO interview, the senior center suggested an in-person engagement with their residents who may experience barriers to virtual engagements. To meet this need, PSE and the senior center hosted a 90-minute in-person focus group with seniors in the local community. To market the in-person focus group, the senior center distributed fliers, shared focus group details via their organization’s newsletter, and posted it on their exterior facility sign downtown. Twenty-five participants joined the workshop. All participants received a physical \$50 Visa gift card as compensation for their time.

Three members of PSE’s Community Engagement and Customer Outreach teams facilitated the conversation and documented feedback. While the goal of the focus group was to solicit feedback from participants, it also served as an educational opportunity that allowed community members to learn about solar and to ask questions of PSE staff. In contrast to the other focus groups, feedback was collected solely through notetaking of the verbal discussion; there were no surveys or polls taken during the focus group.

FIRST REACTIONS AND AWARENESS OF SOLAR IN YOUR COMMUNITY

To better understand seniors’ awareness of and interest in solar, participants were asked where they see solar panels in their community. A few participants have noticed solar panels on new buildings or buildings undergoing construction, as well as more rural areas. One participant noticed solar panels on a new construction project on Sunset Avenue in Bellingham.

Participants were then asked whether they think that solar panels could meet their energy needs. Six to eight individuals expressed interest in solar panels and would like to learn more about them.

BENEFITS

Next, PSE provided a list of benefits and participants were asked to share their thoughts on the importance of those benefits to themselves and their community. There was no consensus as to what benefits were most important to all participants.

Benefits	Feedback
Reduction of carbon emissions	Being environmentally conscious is important, but solar is not the only way to achieve that goal Seniors have typically been curtailing use of home appliances to combat rising utility bills
Supporting the local economy	Supporting the local economy is important There should be incentives to buy solar panels from local companies building and operating in Washington
Energy independence	Participants did not share feedback on this topic
Reduced utility bills	Participants did not believe that the upfront costs of solar panels would pencil out compared to utility bill reductions over time
Increased grid reliability	One participant asked whether they would still have power during an outage if they installed solar panels as that would be a primary motivator
Community participation in clean energy programs	Community participation is important, but only if solar panels are made affordable for everyone Participants advocated for programs that meet all income levels as some seniors, even with fixed incomes, don’t meet the 200% FPL limit Participants felt that solar adoption and investment should not necessarily fall to individual households and customers but should instead be taken on by larger commercial customers such as those with schools, barns and warehouses

Participants were then asked if there were any benefits missing from the list above. While participants did not share additional benefits, they did share additional concerns:

Effectiveness: Participants wondered whether solar would be an effective energy source in the winter months and whether it would be strong enough to operate a heat pump in a private home. Participants requested more information on what amount of power is needed to power each appliance in their home.

Home upgrades: Participants expressed concern about the sequencing of installing solar and a new roof at the same time and suggested there be a package deal offered for completing both tasks at the same time.

OWNERSHIP

Participants were asked to consider the ownership scenarios below and provide feedback on what they liked, disliked and which scenarios should be added.

Scenario	Description
A	You own the solar panels
B	You host the solar panels that PSE owns
C	You rent solar panels from PSE

Participants shared that Scenario A seemed financially out of reach. Participants expressed interest in learning more about **Scenario B**, assuming that it would not increase their costs. Similarly, participants who expressed preference for Scenario C would be willing to explore renting solar panels if there was no increase to their utility bill. Participants did not suggest any additional ownership models that were not listed above.

CUSTOMER CONNECTED SOLAR: CONCERNS AND BARRIERS

PSE provided a list of concerns and barriers and participants were asked if the concerns and barriers resonated with them in relation to the three scenarios provided above.

Concern	Feedback
I'm not sold on the benefits of solar	Most residents expressed this sentiment They specifically reiterated the concern that solar is less reliable in the winter months and questioned whether solar could help curtail power surges
I'm worried about upfront costs	Most residents expressed this sentiment throughout the entirety of the conversation
I wouldn't know how to find a contractor to help me install solar	The few participants who shared this concern stated that while Whatcom County contractors were easy to work with, the estimates provided were out of their price range
I'm concerned the panels won't work when I need them to	Participants who shared this concern stressed that in the instance of an outage, they would be concerned about malfunctioning solar panels if they were relying on them for backup power
I don't have enough space on my roof	Participants who shared this concern cited a current or future need for roof repairs or an entirely new roof prior to solar panel installation A condo owner expressed that they live in a multifamily property and therefore don't have authority over or ownership of the roof space Multiple participants echoed that they have downsized from single-family properties to multifamily homes
My roof lacks direct sunlight	Participants did not share feedback on this topic
I don't think the cost savings are worth the effort	Participants were skeptical that the cost savings from solar would make their initial investment worthwhile
I don't have time in my day or life to participate in this program	Senior participants did not feel lack of time was an issue for them
Panels are not aesthetically pleasing	One participant shared that they find solar panels to be 'ugly'
I'm worried about maintenance costs	A few participants shared that roof maintenance, not solar panel maintenance, was their largest concern when considering overall maintenance costs

Most participants noted that they were primarily concerned about the benefits of solar and upfront costs.

Participants were then asked to share ways in which PSE could alleviate the concerns and barriers listed above.

Concern: "I'm worried about upfront costs"

Solution: Offer more grants for solar panels for organizations, individuals, and members of the community. A few participants referenced how well PSE's Green Power Solar Grants have been received in the community, and many would like to see more available.

Solution: Provide information about the types of financial and environmental benefits of installing solar for those who are unfamiliar with the technology. It is important to offer information about how solar panels can reduce a customer's utility bill long term.

Concern: "I'm not sold on the benefits of solar"

Solution: Consider investing in large-scale solar as opposed to smaller arrays at single-family homes. Participants felt that the largest impact will come from prioritization of and investment in larger arrays over smaller residential projects.

COMMUNITY SOLAR: CONCERNS AND BARRIERS

PSE shared the concept of community solar with participants, then shared a list of concerns and barriers. Participants were asked if the concerns and barriers resonated with them.

Concern	Feedback
I wouldn't want to use my money to subscribe to the program.	The majority of seniors shared that they have concerns about whether or not community solar would result in cost savings, and as a result, did not want to participate in the program
I only want solar if it's on my own property.	Most participants shared that they would prefer solar panels to not be placed on their property Many shared that their property size was too small for solar panels to make a significant impact
I don't think PSE should put resources into this.	Some participants expressed concerns regarding the allocation of resources as determined by elected officials but did not comment on PSE's allocation of resources
I would find signing up on the website difficult.	Many participants shared that web-based signups were challenging for seniors due to a lack of familiarity with technology
I am worried the solar arrays will impact the aesthetics of my community.	Again, a participant expressed that solar panels are 'ugly' and an 'eye-sore'

Participants were asked if they had any concerns about community solar, not listed above. No additional concerns or barriers were shared.

FINANCIAL INCENTIVES

Participants were asked to consider the financial models outlined below and provide feedback on what they liked, disliked and if any scenarios could be added.

Scenario	Description
A	I would participate if PSE offset a portion of the money I spent
B	I would participate if all my costs were covered

The majority preferred **Scenario B** with many expressing that they may not see the financial investment into solar panels pay off in their lifetime. Seniors would be more interested in participating if they could see a return on investment within five years. In addition, they may have to take out a loan or take money from their pension to pay the upfront costs. A couple of participants shared that in order to consider **Scenario A**, they would want to learn more about the amount of money being offset before committing.

EDUCATION AND OUTREACH

At the end of the engagement session, participants were asked how they prefer to receive information. Participants suggested PSE implement the following:

- **Meet communities where they are** by conducting in-person events.
- **Collaborate with existing community organizations** who can distribute information to their community members.
- **Provide written materials and presentations** that include information about solar and answers to frequently asked questions.

DEMAND RESPONSE (DR)

In DR programs, customers are incentivized to use less power during times of peak usage, for example by turning down their thermostats.

COMMERCIAL ENGAGEMENTS

This section summarizes the overarching themes heard during all the demand response focus groups and workshops.

ENGAGEMENT PARTICIPANTS

Out of the 44 customers contacted, 14 participated in demand response engagements.

Participant	Population served	Counties served in PSE electric service area
City of Langley (Climate Crisis Action Committee)	City of Langley residents	Island
City of Tumwater	City of Tumwater residents	Thurston
Homes First	Low-income	Thurston
Island County	Island County residents	Island
Japan-America Society of the State of Washington	BIPOC communities	All
King County Department of Natural Resources & Parks	King County residents	King
Lummi Nation	Lummi Nation	Whatcom
Port of Seattle	People and goods moving throughout the greater Seattle region	King
Renton Downtown Partnership	Renton small businesses and residents	King
Samish Indian Nation	Samish Indian Nation	Skagit
Skagit Friendship House	Houseless, low-income	Skagit
South King Tool Library	Low-income, small business, nonprofits, service groups	King
Sustainable Connections	Small businesses	Whatcom
Yelm Community Schools	Youth	Thurston

Key		
Focus group	Workshop	Focus group + workshop

COMMERCIAL FOCUS GROUPS

Following introduction calls and community-based organization (CBO) interviews, customers were invited to participate in virtual 90-minute focus groups designed to understand the barriers and benefits associated with DR and education and outreach best practices. In their invitation, PSE sent a poll for customers to indicate their interest and availability for all solar, battery, and DR focus groups. Out of 44 customers invited, 14 participated in one of two DR focus groups.

During the focus groups, facilitators used verbal discussion and Mentimeter polls as engagement tactics. Please note when reviewing results that not all participants responded to the polls.

ENERGY CONSUMPTION TRENDS

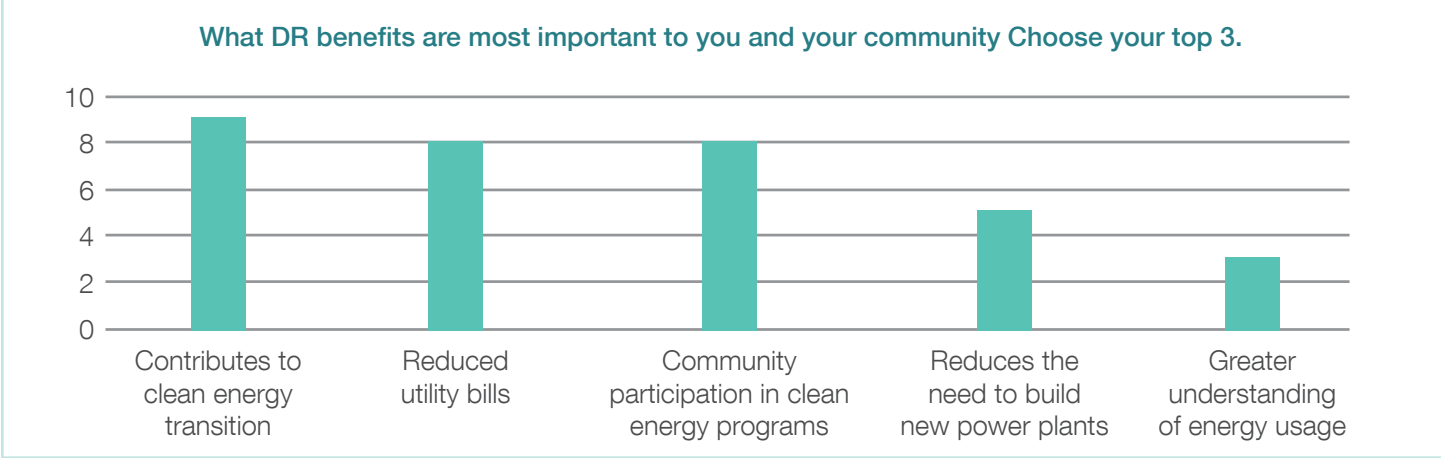
Participants were asked to verbally share what time of day they use the most energy. Most participants agreed that their energy use peaks in winter. Increases are also expected during hot summer afternoons, as more heat pumps have been installed and will be used to mitigate rising summer temperatures. Beyond this, energy use trends varied widely depending on the type of organization and service provided:

- Wastewater treatment centers tend to use the most energy following heavy rain events.
- Schools use the most energy during regular school hours and in the evenings during winter sports seasons.
- Downtown businesses peak at many different hours throughout the night, from local pubs and bars that operate late into the evening and manufacturing plants that start working at 1 a.m.
- CBOs providing free meals tend to peak at mealtimes but also have refrigerators constantly operating.
- Office buildings with traditional work schedules may be easiest to curtail electricity use at, and some have already installed solar to offset consumption.

BENEFITS

Participants in both commercial focus groups chose their top three DR benefits.

Participants felt that DR programs could augment community understanding of clean energy programs in a way that



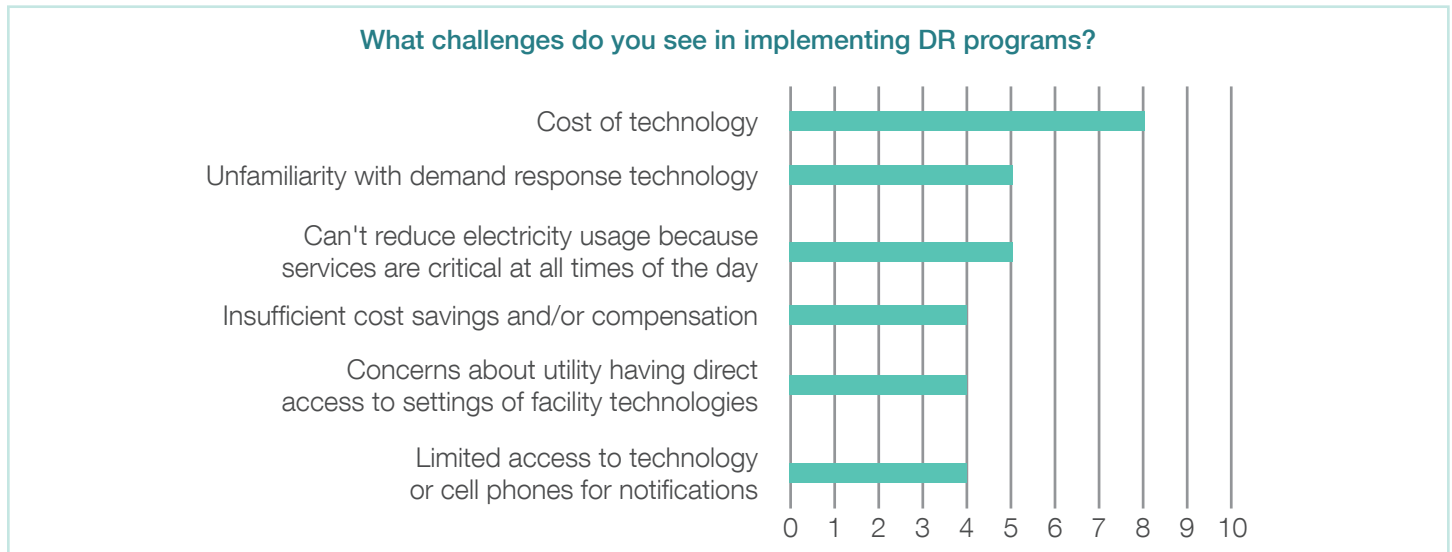
builds trust, enhances community partnerships, and creates a stronger sense of community pride. DR programs provide opportunities for organizations to utilize emerging technologies that take advantage of a highly efficient, untapped method of reducing energy costs and emissions. Cost saving opportunities are critical and help organizations increase their services and impact to the community.

In addition to those listed above, participants shared the following benefits they felt were important:

- Enhanced access for low-income customers who do not traditionally have opportunities to participate in the clean energy transition.
- Strategies for small offices and individuals to approach the United Nations' Sustainable Development Goals.

BARRIERS

Participants selected the top three anticipated challenges to implementing DR programs in their facilities.



In addition, the facilitator asked participants to consider perceived barriers and potential solutions for PSE to implement in the design of future DR products. Participants shared:

Lack of interest or distrust that it will save money: Participants shared that businesses and service providers in the community may be focused on other issues, like expanding services to community members in need. Convincing them that this effort is worth their time could be a significant hurdle. Smaller organizations may also be reluctant to invest in programs they do not see larger businesses participating in. Given that DR technology is new and emerging, some participants noted that unless they saw examples of successful implementation in their community, there may be uncertainty as to whether DR products would result in cost savings.

Solution: Use plain talk, share examples of what works, and build trust in the community. Share successful examples of DR programs implemented across different sectors, including how bills were reduced versus the cost to implement, and how barriers and challenges were addressed.

Upfront costs and limited budget allocated to fuel-switching efforts: Many facilities may use gas or oil for heating, and upgrading to electric heating that uses smart devices can be prohibitively expensive. For smaller organizations, upgrading to a smart thermostat or water heater can also be challenging as the cost to retrofit existing infrastructure may be costly.

Solution: Offer substantial financial incentives – offsetting costs up to 75% – for fuel-switching. Providing and paying to install smart devices would go a long way.

Inability to reduce critical services: Multiple participants provide critical services that operate 24/7, such as healthcare organizations or community shelters that serve unhoused populations and cannot reduce these services to respond to energy peaks.

Solution: Collaborate with organizations to identify opportunities to participate in DR without compromising critical functions or services. For instance, dimming or other slight adjustments across facilities could still provide large savings with minimal functional impacts.

Communication needs differ among customers: Small businesses may not have robust communications channels for quickly responding to DR prompts (e.g., some do not use email), and larger businesses may require more time to handle the logistics of DR (e.g., unplugging the chargers to an electric vehicle fleet of 500).

Solution: Plan for recurring peaks and communicate 24-48 hours in advance of anticipated peak events (e.g., heat domes).

Low staffing capacity to implement DR logistics: Multiple participants flagged limited staff capacity as a potential challenge for implementing DR at their organization’s facilities. Staff turnover and vacations could exacerbate the challenge.

Solution: Automate wherever possible to limit the need for staff to directly implement DR. Identify multiple employees to receive DR notifications to ensure the role is covered in the event of staff departure or vacation.

Facility managers are focused on fixing what is broken, not changing what is already working: Getting them invested in DR programs may be challenging.

Solution: Incentivize networking with facility management peers across other organizations. This may be a more effective education tactic than having upper management educate them about DR. This tactic may also create a support group for knowledge sharing, lessons learned, and troubleshooting.

Renting and owning your space has different challenges: Small businesses often rent their facilities and may have to spend time coordinating with their landlord to implement DR programs. While customers that own their facilities will spend less time gaining buy-in on program enrollment.

Solution: Develop different tools for different sizes and types of organizations. Develop tools specifically for renters and landlords so that renters can bring landlords along in the process, have more control over their impact and more efficiently implement DR programs.

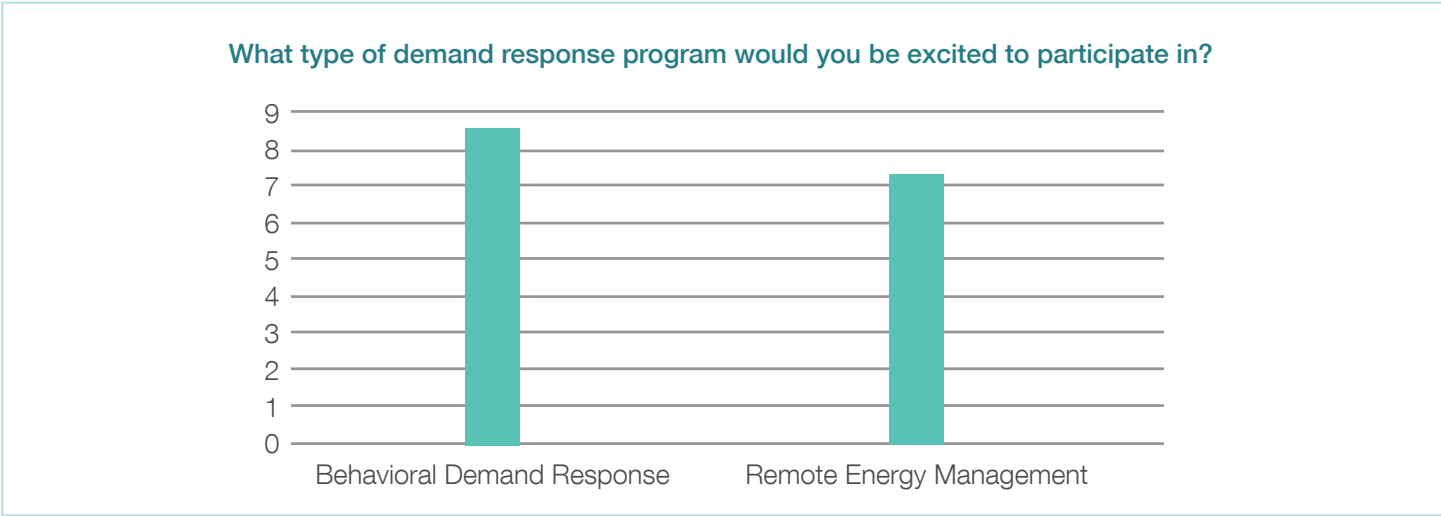
"This is by far the greatest untapped environmental resource in the region. It's a slam dunk for the community in keeping rates down and getting involved in the transition to clean energy, but it's also extremely challenging to be able to rely on the energy savings."

BEHAVIOR DEMAND RESPONSE (BDR) VERSUS REMOTE ENERGY MANAGEMENT (REM)

Participants reviewed definitions for two types of demand response programs:

- **Behavioral demand response (BDR):** Customers individually adjust their heating, ventilation and cooling (HVAC) systems, lighting, or other operations in response to a request from PSE.
- **Remote energy management (REM):** Customers grant PSE specific permissions to remotely adjust equipment to manage peak demand. PSE works with customers to develop a plan and install necessary equipment.

Then, they identified their preferred DR program.



BDR feedback

Organizations with staff capacity to adjust thermostats or appliances would be successful at implementing BDR programs. Some organizations noted that maintenance staff could assume these duties as a part of their job descriptions. Participating in BDR will help staff feel engaged and proactive in reducing their workplaces' carbon emissions. This in turn could inspire staff to implement DR in their own households.

REM feedback

Smaller businesses may be busy or overwhelmed and might not have dedicated facilities personnel who can implement BDR. In these instances, REM was a better option because it alleviates the need for staff to dedicate their time to DR. One participant flagged that REM might be challenging for seasonal venues that rely on and can expect increased energy usages at certain times of year.

During this discussion, Participants shared additional ideas that would make themselves or their communities more excited about DR programs:

- **Make setup as easy as possible.** Have a person come out to set the device up and be the organization's ongoing point of contact at PSE if there are any issues.
- **Ensure there is an easy way to opt out.** Organizations should be able to easily opt out of a DR program via phone, website, or text.
- **Keep it simple and paint a clear picture,** especially when it comes to financial benefits and incentives. Demonstrate that DR will not cost customers money or time to participate in. Prove that it will not break systems or processes that are working. Provide reference points as organizations may not be aware of how much energy use they can shift and how much it will impact their utility bills.
- **Do it right the first time.** Customers are likely to opt out immediately if things go wrong or if participation is a drain on their time.
- **Quell the belief that REM is intrusive.** Be conscious of how REM is described and make the range of adjustments clear up front so customers feel confident that it will not negatively impact their organization.
- **Vet technology and provide resources for installation.** Take the guesswork out of finding reliable equipment to implement DR programs. Provide resources and assistance, like step-by-step installation instructions as well as video tutorials.

FINANCIAL INCENTIVES

When asked what financial incentives they would need to participate in a DR programs, participants shared that PSE could:

- **Pay for the equipment.** Removing this upfront financial barrier would go a long way in encouraging customers to participate.
- **Provide stronger incentives for fuel-switching,** to reduce barriers for organizations in facilities with limited existing electrical infrastructure.
- **Consider offering larger upfront incentives** to get people in the door to build trust and community interest in the programs, even if those incentives are not sustainable for the life of the programs and need to be eventually scaled back.
- **Provide on-bill financing, through the meter.** Participants discussed successful examples of this and highlighted the approach's effectiveness in removing financial barriers for renters and low-income customers. Without the need for a credit check and a small 1% interest rate to cover the program's administrative expenses, this financing approach has increased access to clean energy upgrades for customers who traditionally would be excluded from participating.

EDUCATION AND OUTREACH

When asked what would make their community excited about DR programs and how to successfully share that information, participants suggested that:

- **Ambassador systems like PSE's Powerful Partners attract people to join in and help build trust in the community.** Ambassadors lead by example and can work with PSE to troubleshoot unanticipated issues as they come up, such as cutting heat to a warehouse and having all the water pipes burst.
- **Schools are adept at sharing information with families.** Schools may have less flexibility in participating in DR programs but are motivated and capable of getting the word out.
- **Share graphics and verbiage that can be replicated and customized for use in different spaces.** This is more helpful than sharing a PDF flier because organizations can adapt materials to fit their own communication needs, like adding educational text to their newsletters.

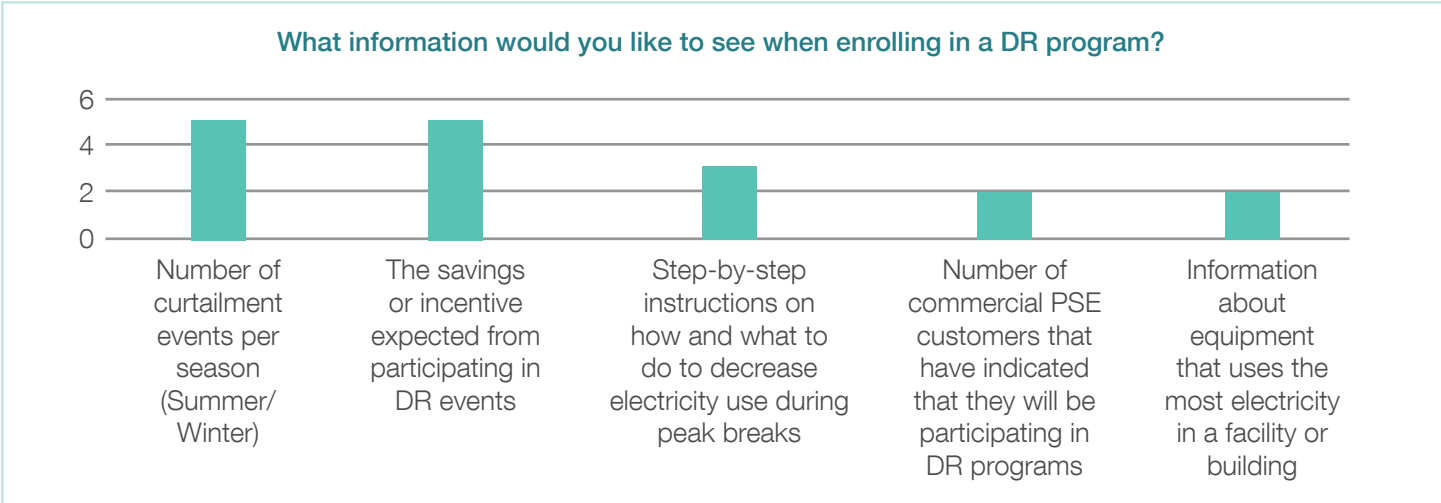
COMMERCIAL WORKSHOP

Following the focus groups, customers who expressed interest in participating via a poll received an invitation to a 90-minute virtual workshop. The workshop included scenarios associated with potential future components of DR products. Out of the 33 customers invited, five participated.

Participants were asked to approach the scenarios as if they were enrolling their organization’s facilities in a DR product. Due to technological issues during the workshop, participants shared their feedback verbally.

INFORMATION NEEDS

Participants selected all the types of information they would need to enroll in a DR program.



Providing personalized, step-by-step instructions for decreasing electricity use during peak periods, along with clear expectations for the number of events per season, expected energy and cost savings, and incentives for participating will be most useful.

Smaller businesses may need more education on the benefits and logistics of curtailing energy use during a DR event. Sharing testimonials from similar customers who have successfully participated in DR programs could create buy-in through more relatable conversations.

Profiling which equipment uses the most electricity might not be as valuable for large commercial customers as they may not have the ability to alter critical equipment usage, like hospital equipment.

EVENT LENGTH

Next, the facilitator asked participants to imagine their energy use during peak periods and then indicate how long of an electricity reduction event their organizations could reasonably participate in.

Scenario	Description
A	1 hour
B	2 hours
C	3 hours
D	4 hours
E	Other

The majority of participants preferred the one and two hours options while still caveating that the event length they could manage was contingent on how much advance notice they are provided. For example, with a day's notice, organizations could manage a longer event. Most participants reflected that having somewhere between 12-24 hours of preparation time is workable, but one hour would be more challenging. Shorter timeframes for DR events using BDR would require ample personnel to execute the reduction, while notification the day prior to an event gives customers the chance to sleep on it and consider what is realistic for their organization. If only an hour's notice is provided for DR event using REM, customers will need to be able to override the reduction if they really need to use the equipment.

Participants suggested that PSE provide a menu of options for adjustments that can be made, along with information on the impact on energy and cost savings. For instance, HVAC systems may be limited to a one hour maximum of event length before it significantly impacts building temperature. Alternatively, EV fast charging could easily be reduced to half its normal demand. Participants added that preparation time also depended on the type of equipment impacted. For example, a 10% reduction in LED light intensity is so negligible it could be completely automatic, but other types of use reduction would require more warning. If PSE can help customers innovate to allow for longer event lengths with less perceptible impacts, they would be more inclined to participate in longer DR events.

A few participants shared that if the incentives are the same across the board, customers are likely to elect for shorter event length timeframes.

PARTICIPATION FREQUENCY

Following their discussion of timing, participants were asked how frequently they would be willing to participate in DR events, assuming no negative impact on their organization's operations.

Scenario	Description
A	Never
B	1-2 times per month
C	3-4 times per month (once a week)
D	More than once a week
E	Whenever offered
F	Other

There was not clear consensus around a preferred participation frequency. Some participants felt that reframing the option of "whenever offered" to "whenever needed" would be more applicable to public agencies, since this is seen as a public good. Others reflected that while DR events are likely to happen during inclement weather due to peak energy use, facilities like wastewater treatment plants that must maintain their high energy usage during heavy rain events would be unable to participate. Multiple participants expressed there is too large of a gap between never and one to two times per month. Instead, they expressed interest in one to two events per season, or quarter.

For DR events using REM, participants felt that more frequent participation would be easy as it would be automated. If it requires more interaction, as BDR does, participation would be less frequent depending on staff bandwidth. Depending on the equipment, participants felt their organizations could participate as often as every day (e.g., reducing LED brightness). But for other types of equipment, like water heaters at housing shelters, participation would be less frequent.

"With no negative impacts, we are all in."

PAYMENT METHODS

Next, the facilitator asked how organizations would prefer to receive compensation for their energy reductions.

Scenario	Description
A	You receive a credit on your bill
B	You receive a Visa gift card
C	You receive a check
D	The money is deposited directly into your bank

Many participants shared that on-bill credits would be easiest to keep track of. Checks tend to get lost in divisions or departments while on-bill credits are built into an existing tracking system.

Participants who preferred checks felt that receiving a check makes it easier to fence off funding for climate action work. Cities have multiple departments that receive PSE energy bills, so discerning total savings from on-bill credits across multiple department bills could be challenging. In this case, participants suggested paying by check, but also providing a master bill for organizations or an annual report on total DR savings.

INCENTIVE AMOUNT

Participants were asked what level of incentive would make participating in a DR program worthwhile to their organization.

Scenario	Description
A	\$.03/kW curtailed per event
B	\$.05/kW curtailed per event
C	\$.07/kW curtailed per event
D	\$.10/kW curtailed per event

Overall, participants were in support of a larger incentive, opting for \$0.07 - \$0.10/kW curtailed. One participant shared their organization currently pays slightly more than \$0.10/kWh for their electricity, so the higher incentive would be motivating. Another participant shared that higher financial incentives encourages businesses to use less energy during a peak period, because in effect, this makes energy from the grid more expensive during peak times. Most participants felt that incentives lower than \$0.07/kWh curtailed are unlikely to make the hassle of participating worth it to customers. If offering a lower incentive, it would be better to emphasize other benefits of the program, such as promoting the public good or maintaining the grid. For example, cities are interested in reducing brownouts and blackouts. Another option would be to provide a monthly discount for participation. One participant noted this was done for similar programs on the east coast.

EDUCATION AND OUTREACH

When asked what would make their organization excited about DR programs and how to successfully share that information, participants suggested that PSE

- **Fact sheet:** A simple one-pager outlining the “why” for would be useful for organizations to communicate internally and encourage employees to change their normal practices. PSE should create the fact sheet to remove the burden from customers.
- **Site visit with PSE staff:** Site visits are useful, especially for larger facilities that need a customized approach to collect data on what can be adjusted or shut down. This also builds long-term relationships between PSE and the customer.
- **Virtual information session:** Virtual education and outreach events have become more popular, but they can also be more difficult to customize to an organization’s needs. To remedy this, a participant suggested grouping attendees by size and type of commercial customer. This creates a cohort for customers to tap into. Virtual sessions are also good options for DR programs, like REM, that require less customer involvement or minimal customization.
- **Use existing engagement channels within cities and counties:** There are existing collaboration channels between cities and counties which PSE could plug into, like regional councils and municipal listservs. While customizing PSE programs to fit the needs of smaller cities and businesses has been trickier, cities are used to doing this kind of engagement to find solutions and connection points.
- **Annual report:** Customers would like to receive an annual report from PSE that shares how their participation in DR programs impacts both decarbonization and cost savings. PSE should consider highlighting customers with the biggest impacts. There could also be an award program.
- **Videos:** Creating videos that walk through different types of equipment and processes would reach a broader audience. Consider using TikTok.

RESIDENTIAL ENGAGEMENTS

This section summarizes the feedback heard during all demand response (DR) focus groups and workshops with residential customers.

PSE collaborated with the customers who participated in CBO interviews and introduction calls to distribute an interest survey on upcoming focus groups and workshops to residents in their communities. PSE used responses to that interest survey to randomly select participants for the focus groups and workshops.

RESIDENTIAL FOCUS GROUP

PSE held a virtual 90-minute focus group with residents to understand DR benefits, barriers and education and outreach needs through the lens of customers in Named Communities. A total of 19 residential customers participated in the DR focus group.

The focus group was held after work hours to maximize participation and was offered in Spanish and English. Participants were able to indicate language preference when they signed up for the focus group. All participants preferred to remain in the English breakout group.

Throughout the focus group, the project team gathered feedback using Zoom polls. Not all participants responded to questions via the polls. Many participants joined using their phone and provided feedback either via the chat or verbally instead of answering polls. Those comments are captured in the additional discussion sections. Participants also asked questions about battery, solar, and DR programs throughout the focus group and a portion of the time was dedicated to answering questions and providing education on DERs.

ENERGY CONSUMPTION TRENDS

As an icebreaker, participants were asked what time of day they use energy the most. Most participants agreed that their home energy use peaks in the mornings and evenings, although many agreed that it can be more variable in the summer months when energy use might rise in the afternoons to keep their homes cool.

BENEFITS

Participants were asked to select their top three DR benefits.

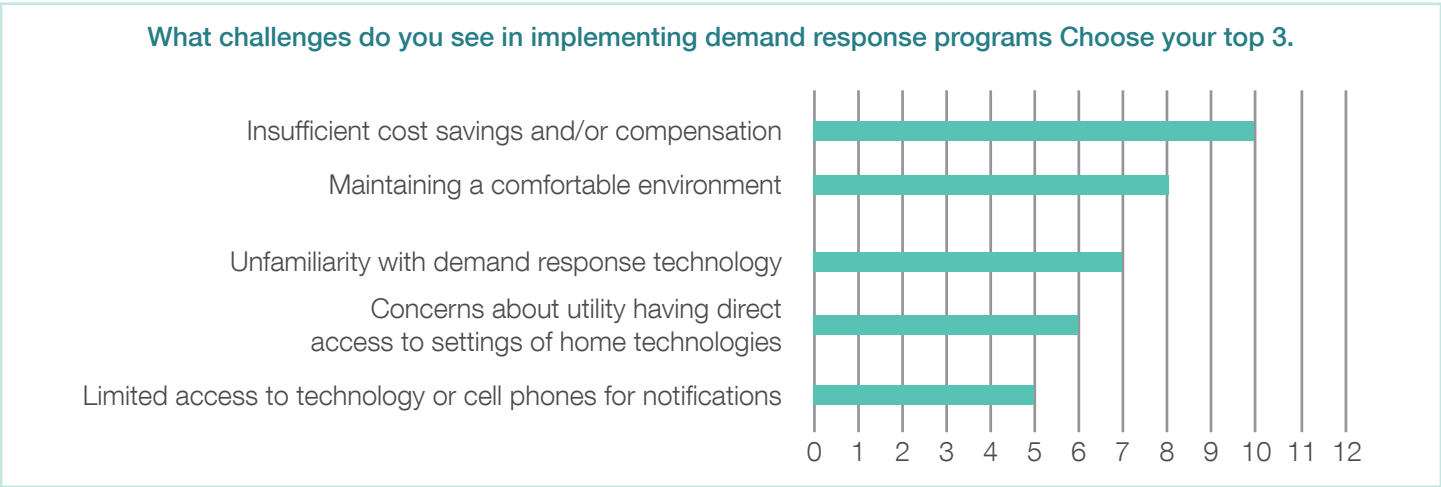


Participants shared the following additional or expanded benefits:

- Economic benefits of the transition to clean energy
- Reduced harmful emissions from carbon-intensive peaking power plants
- Increased grid stability

BARRIERS

Participants were asked to choose the top three challenges they would face when enrolling in DR programs.



In addition, the facilitator asked participants to consider perceived barriers and potential solutions for PSE to implement in the design of future DR products. Participants shared:

Limited financial means to cover device and installation costs: Participants voiced concerns over the cost of installing smart devices.

Solution: Provide incentives to remove any upfront costs from participation.

Maintaining a comfortable environment is very important for older adults and they may not have the technology skills to successfully enroll in DR programs.

Solution: Organize orientation sessions and set up a special care response team to assist older adults when issues arise. Older adults appreciate in-person contact and will be more likely to engage with programs if they receive patient support from a human throughout the process.

Lack of data and misinformation about DR: Participants felt there is a great deal of uncertainty around the value they will receive from participation in DR programs and how to go about enrolling in those programs.

Solution: Create simple and clear materials to communicate associated costs and savings, setup and ongoing use of smart devices, and any risks to program participation. Communicate this information through accessible channels like social media, billboards, fliers, radio and television advertisements.

Fear of not having access to appliances when needed: This barrier may be especially prevalent for customers with health needs that require reliable access to heating and appliances.

Solution: Provide advance notification of REM events, with clear instructions on how to adjust appliances and opt out. Participants suggested setting guidelines for how many degrees thermostats could be lowered without explicit consent would help them feel more secure. Participants would also value education about what other appliances they could adjust as part of a DR event, in case they could not change their thermostats.

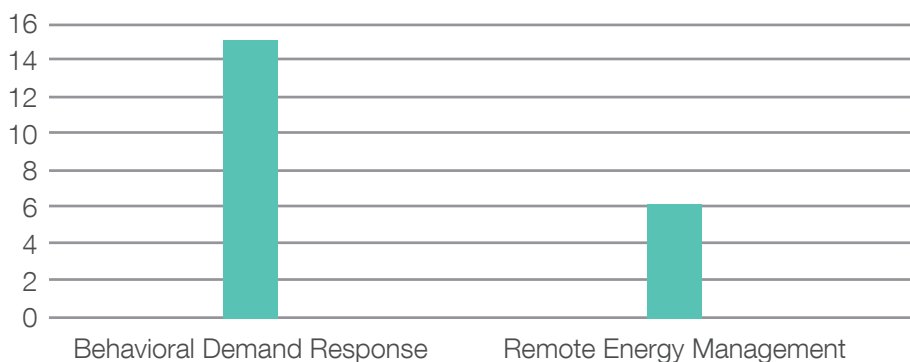
BDR VERSUS REM

Participants reviewed definitions for two types of demand response programs:

- **Behavior demand response (BDR)**
Customers individually adjust their HVAC systems, lighting, or other operations in response to a request from PSE.
- **Remote energy management (REM)**
Customers grant PSE specific permissions to remotely adjust equipment to manage peak demand. PSE works with customers to develop a plan and install necessary equipment.

Then, they identified their preferred DR program.

What type of demand response program would you be excited to participate in?



There was a strong preference for BDR because it was perceived to be simpler and affords more autonomy. In case of emergencies, it is better to be able to choose when you participate.

Participants felt that REM may require higher upfront costs, as individuals may have to invest in purchasing smart devices in the absence of financial incentives.

FINANCIAL INCENTIVES

When asked what financial incentives they would need to participate in a DR program, participants shared that PSE could:

- **Reduce or cover the cost of smart devices** needed for enrollment and implementation.
- **Offer time-varying rates** to further incentivize participating in a DR event.

EDUCATION AND OUTREACH

When asked what would make their community excited about DR programs and how to successfully share that information, participants suggested that PSE:

- **Network with customers through community programs and gatherings**, particularly for older adults with less access to cell phones and other communication technology.
- **Partner with CBOs and public housing authorities that have established trust in their communities.** They are adept at sharing information in ways that best meet their community's needs.
- **Use social media and catchy ads** to direct people to a website with clear information and resources.
- **Provide clear descriptions of program logistics, financial incentives, and the cost savings customers can expect** so customers can evaluate whether participating makes enough of a difference to their utility bills to be worth the trouble.
- **Set a target for energy saved** and provide feedback to customers on how they are progressing toward that goal.

RESIDENTIAL WORKSHOP

After the focus group, additional residential customers participated in a 2-hour virtual workshop designed to gather feedback on potential demand response (DR) products through the lens of customers in Named Communities. The workshop was held after work hours to maximize participation. A total of 10 residential customers participated in the DR workshop.

Throughout the workshop, the project team gathered feedback using Zoom polls. Not all participants responded to questions via the polls. Many participants joined using their phone and provided feedback either via the chat or verbally instead of answering polls. Those comments are captured in the additional discussion sections. Participants also asked questions about DR programs throughout the workshop and a portion of the time was dedicated to answering questions and providing education on DERs.

Residents were asked to approach the scenarios as if they were enrolling their home in a DR product.

INFORMATION NEEDS

Participants were asked to identify the type of information they would need to enroll in a DR program. They selected all that applied.

Scenario	Description	Participants who indicated preference*
D	Information about devices, appliances and lighting that uses the most electricity in your household	66%
C	Step-by-step instructions on how and what to do to decrease electricity use during peak periods	46%
A	Number of residential PSE customers that have indicated that they will be participating in demand response programs	12%
B	The savings/incentive expected from participating in the demand response events	12%

*Total exceeds 100% as participants were able to vote for more than one option.

Many participants expressed that landlords and property owners would be most interested in the effectiveness of DR programs, as they would likely be the ones who would make the investments in DR technology. The costs and expenses involved in participating, and the timing of DR events were considered important factors. Participants also expressed concern about the amount of maintenance required for each smart device.

Information on financial incentives, which appliances and devices used the most electricity, and step-by-step instructions for how to curtail energy use during a DR event will be critical components when developing education materials for customers.

ENROLLMENT METHODS

Participants reviewed definitions for two types of demand response programs:

Behavioral demand response (BDR)

Customers individually adjust their HVAC systems, lighting, or other operations in response to a request from PSE.

Remote energy management (REM)

Customers grant PSE specific permissions to remotely adjust equipment to manage peak demand. PSE works with customers to develop a plan and install necessary equipment.

Then, they indicated how they would prefer to enroll in BDR and REM programs.

BDR

Scenario	Description	Participants who indicated preference
C	Self-enrollment via website	66%
B	Self-enrollment via phone	33%
A	PSE enrolls me	0%

Participants preferred self-enrollment via website because they assumed you could also quickly access step-by-step instructions for how to curtail energy use during a peak period on that same website. Website interactions are also easier to revisit than a missed call and are accessible because you can log in using different devices.

Participants that preferred to enroll via phone felt they are more reliable in emergencies and easier to use. Familiarity with a phone would help customers feel more in control.

REM

Scenario	Description	Participants who indicated preference
D	Phone	33%
C	Email	33%
B	Online	22%
A	Phone app	11%

Participants noted that phone calls could make it easier for customers to express their needs or concerns while enrolling. However, other participants noted that email correspondence would result in efficient communication as they check that platform on a daily basis.

EVENT LENGTH

Next, the facilitator asked participants to imagine their energy use during peak periods and then indicate how long of an electricity reduction event they could reasonably participate in

Scenario	Description	Participants who indicated preference
D	2-hour	44%
C	3-hour	22%
B	4-hour	22%
A	1-hour	11%
E	Other	0%

Those who selected 2 hours reported it would be a manageable amount of time to limit their energy usage without it being disruptive. Participants would be willing to extend that event length if it has not become disruptive, but they would prefer to start out with shorter events to become acclimated to the program. Those who selected longer event lengths did so to achieve higher incentives and cost savings.

PARTICIPATION FREQUENCY

Following their discussion of timing, participants were asked how frequently they would be willing to participate in DR events, assuming no negative impact.

Scenario	Description	Participants who indicated preference
F	Whenever offered	55%
E	1-2 times a month	33%
D	More than once a week	11%
C	3-4 times a month	0%
B	Never	0%
A	Other	0%

Cost savings were the motivation for participating whenever the option is offered. Similar to the feedback provided on event length, starting slowly and getting comfortable with the program could lead to more frequent participation over time.

SMART DEVICE PREFERENCES

Participants selected all the smart devices they would use to participate in DR events.

Scenario	Description	Participants who indicated preference*
D	Smart water heaters	55%
C	Smart thermostats	44%
B	Electric vehicle charging stations	22%
A	None of the above	0%

*Total exceeds 100% as participants were able to vote for more than one option.

Participants felt that smart water heaters would not take much time to program and are effective at reducing energy consumption. They are a frequently used appliance and would be helpful to have in the house. Smart thermostats were perceived as an easy and effective way to reduce energy costs.

SMART DEVICE OWNERSHIP

Participants indicated whether they would prefer to own or rent their smart devices.

Scenario	Description	Participants who indicated preference
B	Own	66%
A	Rent	33%

Those who preferred to own the equipment cited more control and less chance of a conflict with whoever they are renting the equipment from. Other participants noted that renting would be a less expensive option and felt that meant customers could opt to only use the technology when needed, given that they did not own the equipment.

FINANCIAL INCENTIVES

Multiple forms of financial incentives were presented to customers across both BDR and REM products.

BDR – Bill reduction

Participants were then asked what level of bill reduction would incent them to enroll in a BDR program.

Scenario	Description	Participants who indicated preference
D	5% bill reduction	44%
A	3% bill reduction	33%
B	2% bill reduction	11%
A	Other	11%

Participants verbally expressed support for 3% and 5% bill reductions. Savings as small as 3% were still motivating to multiple participants, although some said any lower than 7% would not be enough.

REM – Cost share percentage

Participants were then asked how much they would be willing to invest in a remote energy water heater if PSE covered the remainder.

Scenario	Description	Participants who indicated preference
F	25%	44%
D	75%	33%
A	50%	22%
B	100%	0%
A	Other	0%

While 25% was the most preferred option, participants who verbally expressed their preferences were split between the 50% and 75% cost sharing scenarios, ultimately deciding that 75% felt most realistic.

REM – Participation incentive

Participants were then asked what annual participation incentive would encourage them to enroll in REM.

Scenario	Description	Participants who indicated preference
D	\$50/year	55%
C	\$25/year	22%
B	\$100/year	11%
A	\$75/year	11%

Although \$50/year received the most votes in the Zoom poll, the only participant to verbally express their preference selected \$100/year.

PAYMENT METHODS

Multiple forms of compensation methods were presented for participant feedback across both BDR and REM products.

REM – Incentive models

Participants were asked to vote on the incentive model they would most prefer.

Scenario	Description	Participants who indicated preference
C	Dynamic rebates based on participation	44%
B	Flat on-bill credits	33%
A	Flat monthly or seasonal rebates	12%
D	Other	11%

Participants felt there was a higher upside to Scenario C as it allows customers to be compensated if they enroll in multiple DR events. A few participants indicated interest in on-bill credits because they are easy to keep track of and are built into an existing household financial stream.

REM – Payment mechanism

Participants were asked how they would prefer to receive payment for participation.

Scenario	Description	Participants who indicated preference
D	You receive a Visa gift card	100%
C	You receive a credit on your bill	0%
B	You receive a check	0%
A	The money is deposited directly into your bank	0%

All of the participants selected the Visa gift card option, sharing that they are easy to use and receive via email. They are also less time-consuming to redeem compared to checks.

OPTING OUT

Participants were asked to select how they would like to opt out of a REM program.

Scenario	Description	Participants who indicated preference
C	By email	44%
B	By text	33%
A	Through a website	22%

Most participants preferred to opt out via email because it is convenient and private. Though least preferred, participants shared that if they were to opt in via a website, opting out via the same website would be simple. Another participant recommended that apps also be considered as an opt out method.

AFTER THE EVENT

Participants were asked what information they would like to receive after participating in a DR event.

Scenario	Description	Participants who indicated preference*
D	Electricity saved	55%
C	Dollars saved	55%
B	Greenhouse gas or carbon saved	55%
A	Comparison to similar participating customers	22%

*Total exceeds 100% as participants were able to vote for more than one option.

Electricity and dollars saved will help customers monitor their progress towards their own financial and energy goals. Understanding how their actions have reduced carbon emissions will help communicate their impact on community health. Some participants indicated that all the information above should be shared to incentivize continued participation in DR events.

SOLAR, BATTERY, AND DEMAND RESPONSE (DR) WORKSHOP WITH RESIDENTIAL CUSTOMERS, IN SPANISH

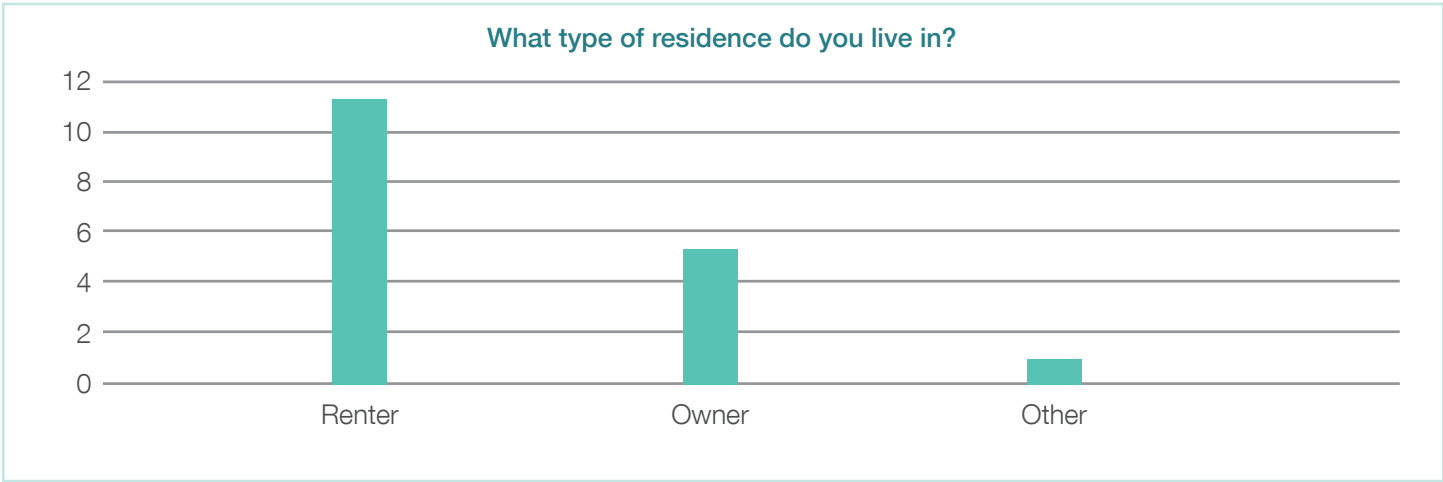
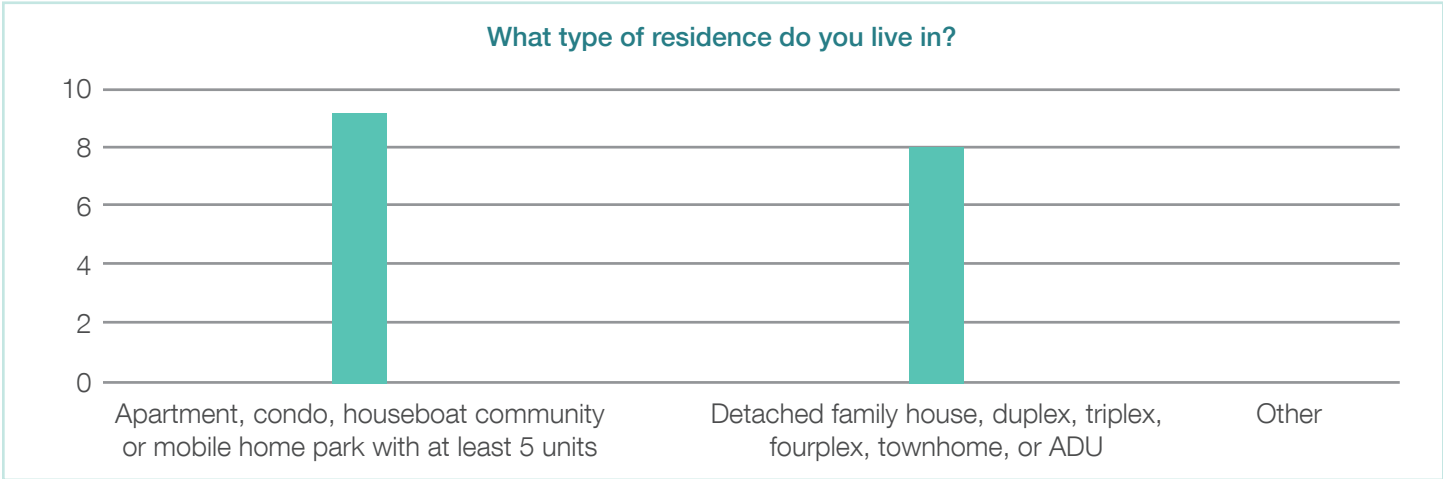
In addition to the three residential workshops for solar, batteries, and DR, PSE held a two-hour workshop designed to test draft product concepts for solar, batteries and DR products through the lens of the Spanish-speaking community.

While PSE offered Spanish-language breakout groups for the previous workshops, no participants self-selected into those groups. To address this gap, the project team combined solar, batteries and DR into one workshop and marketed it specifically to Spanish-speaking customers. PSE collaborated with three CBOs — El Centro de la Raza, Skagit Gleaners, and Youthnet — to market the workshop to their communities. A total of 20 residential customers joined the Spanish workshop.

During the discussion, residents mainly provided feedback verbally and through the Zoom chat function as opposed to Zoom polls. This was done to promote dialogue between participants and reduce the back and forth between functions throughout the entire workshop.

HOUSING TYPE AND OWNERSHIP

As the type of residence a customer lives in and whether they rent or own can greatly influence their response to certain product scenarios, participants began the workshop by indicating their housing type and ownership status.



The participant who selected other did not expand on their choice.

SOLAR

Residents were asked to approach the scenarios as if they were applying for a PSE product or service to install solar where they live.

APPLICATION AND INTAKE

PSE asked residents to share which application and intake scenarios they found to be most equitable and how PSE should prioritize applications based on the three scenarios presented.

Scenario	Description
A	Applications are considered on a first-come, first-served basis
B	PSE serves eight counties in Washington. Applications are prioritized so that projects are distributed evenly across all counties
C	Applications are prioritized based on the customer's income status or location in historically disadvantaged communities

Most agreed that **Scenario B** was equitable because it would ensure that customers in all counties have access to solar products. A few mentioned that county-specific support may result in faster project completion.

Regarding **Scenario C**, participants suggested PSE should prioritize applications from low-income and rural customers and offer additional support and educational services to those communities. One participant expressed concern that this scenario may require customers to provide documentation and complete additional paperwork to prove income status, which can be challenging.

In the end, participants agreed that the most equitable option was a combination of scenarios B and C. They suggested PSE distribute projects evenly across all counties and apply the criteria in Scenario C to each county.

A few participants emphasized the importance of a simple application process. Those same participants shared that PSE should endeavor to complete projects in a timely manner so that customers do not become frustrated with the experience.

ENROLLMENT ELIGIBILITY

Residents were asked to consider two enrollment eligibility scenarios and the benefits and barriers to each.

Scenario	Description	Benefits	Barriers
A	Prove building, or land ownership or landlord approval via documentation	Most participants considered this scenario to be practical and was a reasonable criterion	Customers may experience difficulty retrieving sufficient approval documentation from landlords This scenario left a few participants concerned that they would not be able to participate in a solar program as renters
B	Agree that you will participate in this program for at least 15 years	Participants did not believe this scenario had benefits	All participants felt that holding a customer to a 15-year commitment was unreasonable because it is hard to predict if you will live in the same residence for that length of time, for both owners and renters This would be particularly inequitable for renters who may face rent increases and lease terminations that could threaten their ability to stay in one residence for 15 years

To alleviate some of the barriers expressed above, participants suggested that PSE:

- Partner with landlords and property management to install solar and offer it as a service to benefit current and incoming renters. Participants believed this would allow more renters the opportunity to participate in solar and receive its benefits.
- Create clear contract language so that when one renter moves, the new tenant can access the benefits of solar.
- Offer alternative solar products, such as community solar. One participant shared that in Mexico there are solar centers that cities and community members benefit from. These centers bring the community together.

RANKING QUESTIONS

In the following question, participants were asked to rank the scenarios below from their most preferred option to their least preferred option. The collective ranking results are displayed in the tables. The options are presented in ascending order, with the most preferred option receiving a score of one and the least preferred option receiving either a three or four, depending on the number of scenarios presented.

Ownership and maintenance

Participants reviewed the following scenarios and then ranked the scenarios by order of preference. Prior to responding, participants were informed that all the costs below are illustrative of a total project cost of \$50,000 and not necessarily indicative of final product offerings.

	Scenario A	Scenario B	Scenario C
Who owns	You own	PSE owns	You are renting to own from PSE
Who manages installation	You hire a contractor and manage the installation	PSE hires a contractor and manages the installation	PSE hires a contractor and manages the installation
Who maintains	You maintain	PSE maintains	PSE maintains
You pay	\$15,000 up front for the installation of solar	\$0 up front for the installation of solar	\$13,500 over 15 years, spread out as \$75 per month rental payments to PSE
You receive	A reduction in your energy bill and additional on-bill credits for excess solar production each month \$100 per month totaling \$18,000 over 15 years	A fixed monthly payment from PSE on your energy bill for the use of your roof space or land \$20 per month totaling \$3,600 over 15 years	After 15 years, a reduction in your energy bill, ownership of the system and additional on-bill credits of \$20 per month for excess solar production each month
Ranking	Least preferred (3)	Most preferred (1)	(2)

Participants who ranked Scenarios B and C highest felt the low to no initial cost provided the lowest barrier to entry.

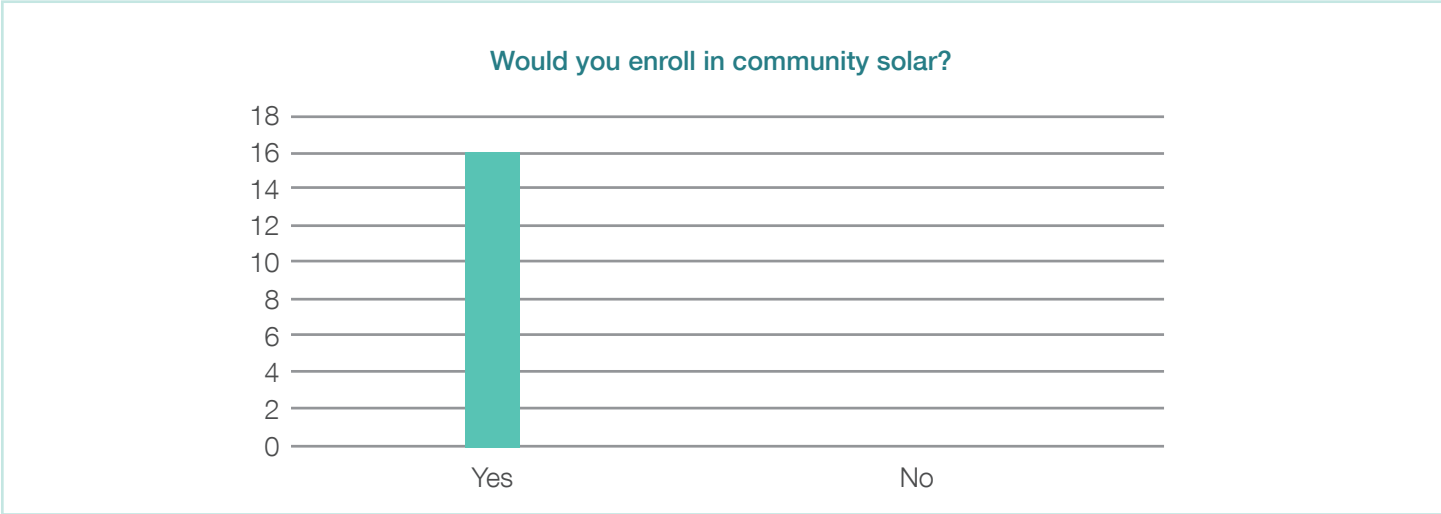
Residents felt that in **Scenario B** they could rely on PSE for their knowledge and expertise to manage installation and maintenance of the panels. Participants felt that the \$0 upfront cost, in addition to the monthly payment, would incentivize residents to support solar.

Participants liked **Scenario C** because it offered a more flexible ownership option compared to Scenario A. Similar to the feedback received on product eligibility, one participant shared that it would be difficult for a renter to commit to a 15-year term.

Participants shared that **Scenario A** would be most advantageous for homeowners and, as a group of primarily renters, ranked this scenario low. A few participants shared that the \$15,000 upfront cost would be a challenge.

COMMUNITY SOLAR

Participants were told that in community solar, customers can ‘subscribe’ to a share of a solar project located on a community building and receive the financial and environmental benefits of that share. They then indicated whether they would subscribe to a community solar product.



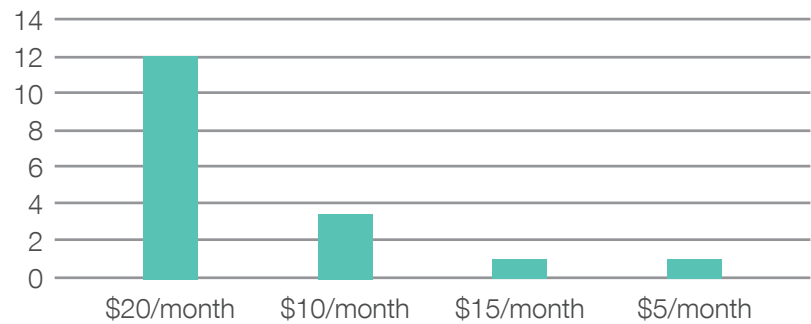
With resounding support for the way community solar increases community access to clean energy and empowers customers to participate in solar, participants also shared:

- **Community solar removes barriers to traditional residential solar.** For example, landlords rarely want to take risks with new technologies and even struggle to repair common plumbing or electrical issues in a timely manner. Installing and maintaining solar panels would be no different. Community solar removes that barrier, particularly for renters.
- **Education is critical for its success.** Many emphasized that PSE should focus education efforts on community solar instead of other types of solar because it is more likely that residents would subscribe to community solar before installing a solar panel at their home due to the myriad of barriers posed.
- **Community solar creates community ownership and financial benefits for community members.** Participants want to build community control over their energy sources and see the financial benefits of clean energy distributed to community members, not just utilities.

"I want to see community solar offered in every neighborhood, so all community members have access to safe, reliable, and affordable clean energy no matter where they live."

Value of a community solar share

What monthly bill credit would encourage you to enroll in community solar?



Participants were asked what monthly on-bill credit would encourage them to enroll in community solar. Participants did not provide additional feedback on this topic.

Credit frequency

To follow up on on-bill credit amounts, participants were asked how often they would prefer to receive their on-bill credits.

If you were to enroll in shares, how would you prefer to receive production credits?



Participants did not provide additional feedback on this topic.

BATTERIES

Residents were asked to approach the questions as if they were applying for a PSE product or service to install a battery where they live.

APPLICATION AND INTAKE

In addition to the scenarios presented during the solar discussion, participants were asked to consider an additional scenario, Scenario D, and share if and how that changed their preferences.

Scenario	Description
A	Applications are considered on a first-come, first-served basis
B	PSE serves eight counties in Washington. Applications are prioritized so that projects are distributed evenly across all counties
C	Applications are prioritized based on the customer's income status or location in historically disadvantaged communities
D	Applications are prioritized for customers who have a high number of power outages or with a greater need for backup power (e.g., medical needs, heating or cooling for the elderly)

Participants felt that **Scenario D** was reasonable and an important prioritization factor, but PSE should research what 'need' means for customers, beyond what is listed. For example, families with children may have a greater need for backup power to address the complex needs of newborns, babies, and young children that can arise during an outage. One participant shared that PSE should make sure customers are not excluded by prioritizing some customers over others.

Similar to the solar discussion on application and intake, participants agreed that **Scenario B** is the most equitable when combined with criteria from **Scenarios C and D**.

ENROLLMENT ELIGIBILITY

Similar to the solar product eligibility scenarios, participants were asked to consider the first two scenarios below and share if the adjustment in **Scenario B** or addition of **Scenario C** impacted their preferences.

Scenario	Description
A	Prove building, land ownership or landlord approval via documentation
B	Agree that you will participate in this program for at least 10 years
C	Have reliable internet connection

Participants had the same response to the 10-year commitment in **Scenario B** as they did to the 15-year commitment required for solar. They saw this commitment as a significant barrier to participation, especially for renters.

When asked to discuss **Scenario C**, a few shared that their internet connection can be unpredictable. Internet outages can be common if multiple people in a household are using the internet at the same time or if they are located in a remote area. PSE should consider ways to support customers in obtaining the reliable internet connection that is required for battery products.

RANKING QUESTIONS

In the following sections, participants were asked to rank the scenarios below from their most preferred option to their least preferred option. The collective ranking results are displayed in the tables. The options are presented in ascending order, with the most preferred option receiving a score of one and the least preferred option receiving either a three or four, depending on the number of scenarios presented.

Ownership and maintenance

Participants reviewed the following scenarios and then ranked the scenarios by order of preference. Prior to responding, participants were informed that all the costs below are illustrative of a total project cost of \$10,000 and not necessarily indicative of final product offerings.

	Scenario A	Scenario B	Scenario C
Who owns	You own	PSE owns	You rent to own from PSE
Who manages installation	PSE has control over the battery and can use it 100 times per year without notifying you	PSE has control over the battery and can use it 100 times per year. You are given a one-day notice and the opportunity to opt out	The battery is on a set schedule to have its stored power used daily during peak hours (5pm-9pm) and charge off-peak
Who maintains	You hire a contractor and manage the installation	PSE hires a contractor and manages the installation	PSE hires a contractor and manages the installation
You pay	You maintain	PSE maintains	PSE maintains
You receive	Battery backup power during outages and a monthly on-bill credit for the use of a portion of the battery charge during peak periods \$20 per month totaling \$2,400 over 10 years	Battery backup power during outages	Battery backup power during outages for the first 10 years After ten years, once ownership has been transferred, an on-bill credit of \$20 per month for the use of a portion of the battery charge during peak period
Ranking	Least preferred (3)	Most preferred (1)	(2)

Similar to feedback received for the solar ownership and maintenance scenarios, **Scenario B** was ranked as their top preference with **Scenario C** a close second.

Scenario B allows customers to access the benefits of batteries without upfront costs or installation and maintenance coordination. This creates more opportunities for customers of all income levels to experience the benefits of batteries.

Spanish-speaking customers value opportunities for ownership and appreciated **Scenario C** for that reason. Owning their own battery would allow them to become more energy independent and support their personal sustainability goals.

While many ranked **Scenario A** as their least preferred option, a few ranked it as their first choice because the \$5,000 upfront cost felt more attainable than the upfront cost shared in the solar scenarios.

Spanish-speaking customers value opportunities for ownership and appreciated **Scenario C** for that reason. Owning their own battery would allow them to become more energy independent and support their personal sustainability goals.

While many ranked **Scenario A** as their least preferred option, a few ranked it as their first choice because the \$5,000 upfront cost felt more attainable than the upfront cost shared in the solar scenarios.

Load management

Prior to answering questions on load management, participants were given an overview. PSE described load management as when PSE compensates customers for use of their battery to manage the load on PSE's grid. Usually, customers do not notice when PSE is using the battery and PSE will not use it during a storm or heat event when there is a higher likelihood of an outage and customers may need it for backup power.

With that information in hand, residents were asked to consider the three scenarios below and rank the scenarios in order of preference.

	Scenario A	Scenario B	Scenario C
Who owns	PSE has control over the battery, and can use it 100 times per year without notifying you	PSE has control over the battery and can use it 100 times per year. You are given a one-day notice and the opportunity to opt out	The battery is on a set schedule to have its stored power used daily during peak hours (5pm-9pm) and charge off-peak
Ranking	Least preferred (3)	Most preferred (1)	(2)

Overall, participants want to receive a notification before PSE uses their battery so they can be aware, provide consent, and prepare as needed. It is particularly important to notify customers with greater need for backup power or higher energy needs so they can decide to opt out if they do not want to participate. Thus, most residents selected **Scenario B** as their preferred option.

One participant agreed with **Scenario C** that batteries should be charged during off-peak hours to lower the demand during peak hours.

Upfront installation financing

PSE asked participants to rank which financing scenarios for upfront installation costs best meet their needs.

	Scenario A	Scenario B	Scenario C	Scenario D
Description	PSE helps you locate state, federal, or private financing and provides letters of support	You receive discounts through your installer to reduce the upfront battery cost	You sign a memorandum of understanding that certifies your intention of purchasing a battery, along with your installer's quote and provide proof of purchase within 60 days of installation. PSE provides you an upfront incentive to cover the agreed upon portion of the installment	You receive PSE's portion of the installation costs as a rebate within 60 days of installation
Ranking	Most preferred (1)	(2)	Least preferred (3)	(2)

Scenario A was of most interest to participants because they wanted to understand all the financial options available to them via state, federal, and private avenues. They asked how federal incentives fit within PSE's products and noted that they would appreciate it if PSE offered support navigating these options.

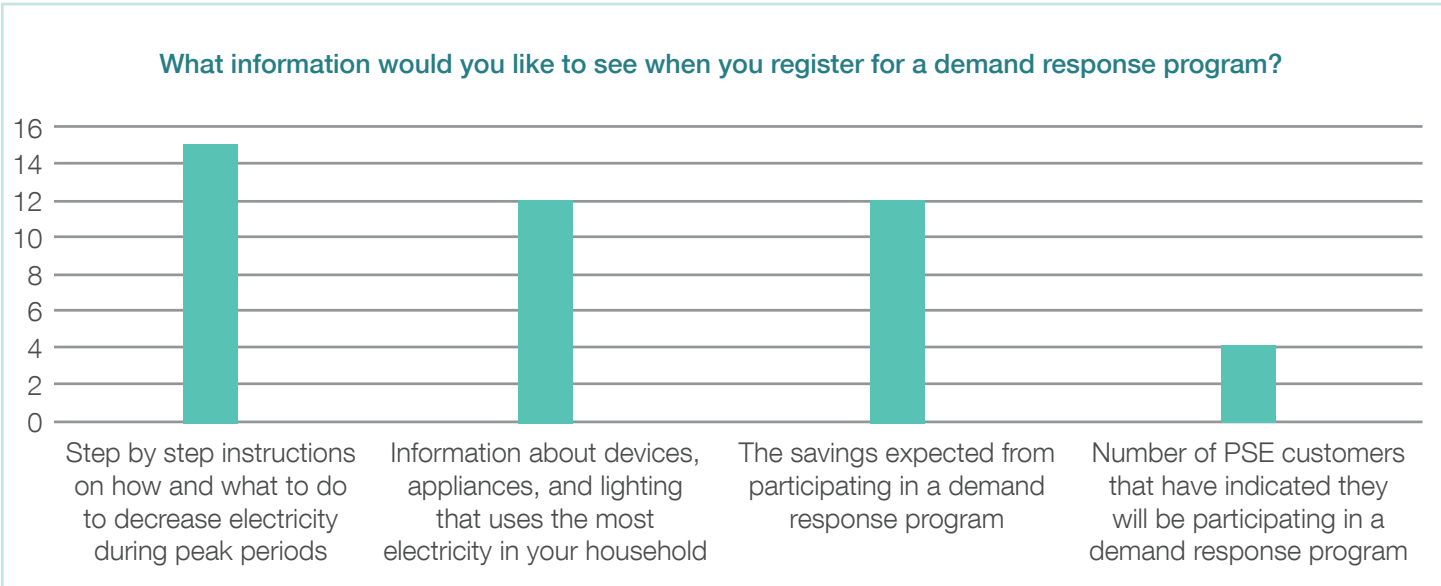
DEMAND RESPONSE (DR)

Residents were asked to approach the questions as if they were to consider enrolling their home in a demand response program.

Due to time constraints towards the end of the workshop, participants completed Zoom polls to answer questions but did not discuss their responses further, unless otherwise noted in the comments.

INFORMATION NEEDS

Participants selected all the information they would need to enroll in a DR program.

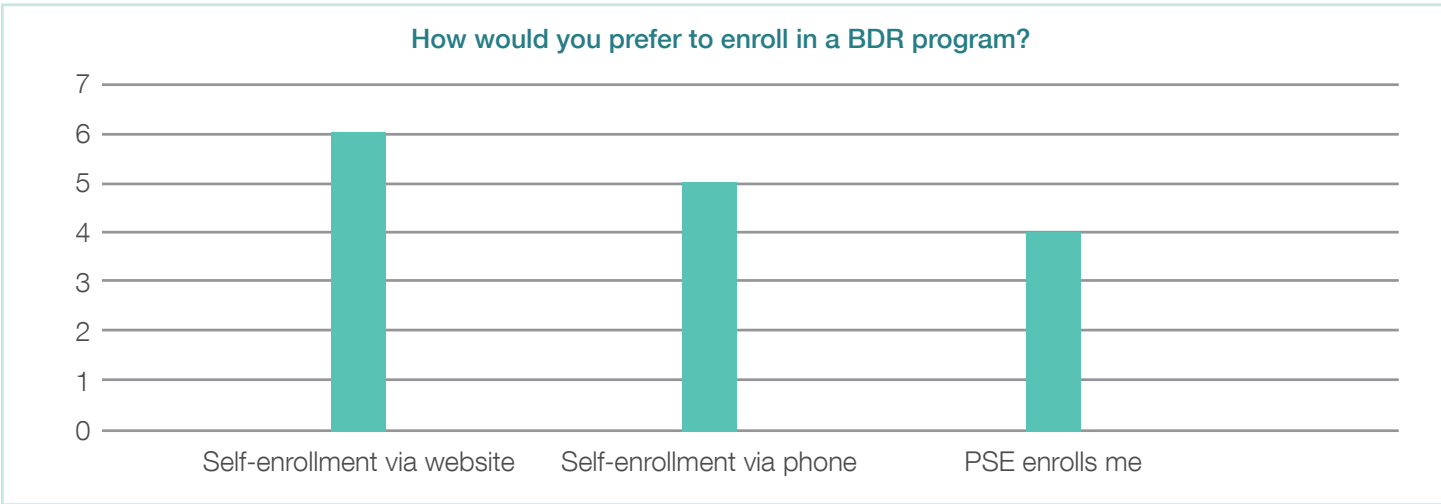


BEHAVIORAL DEMAND RESPONSE (BDR)

Participants received the following overview of BDR before answering a series of polls:

BDR: Customers individually adjust their HVAC systems, lighting, or other operations in response to a request from PSE.

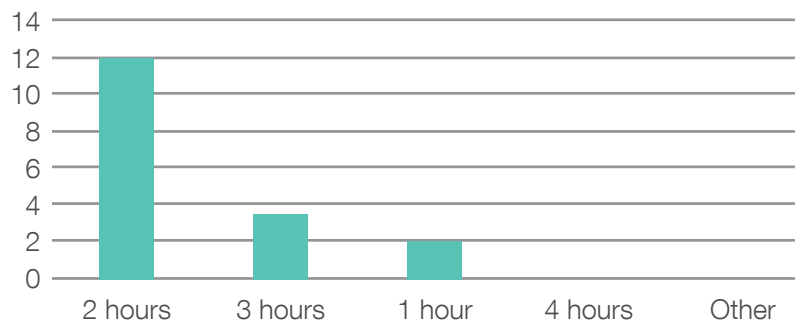
Enrollment



One participant shared that they support the option for PSE to enroll customers to reduce the burden of navigating a confusing website or long wait times on the phone.

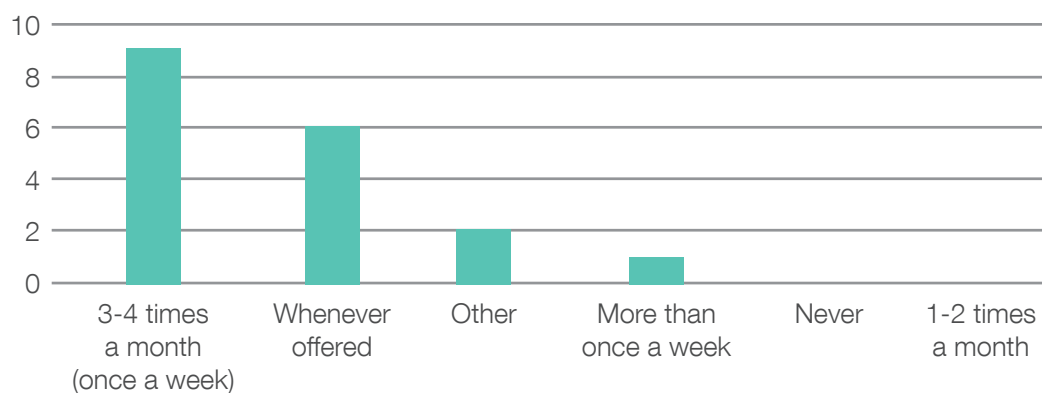
Event length

How long of an electricity reduction event could you participate in during peak periods?



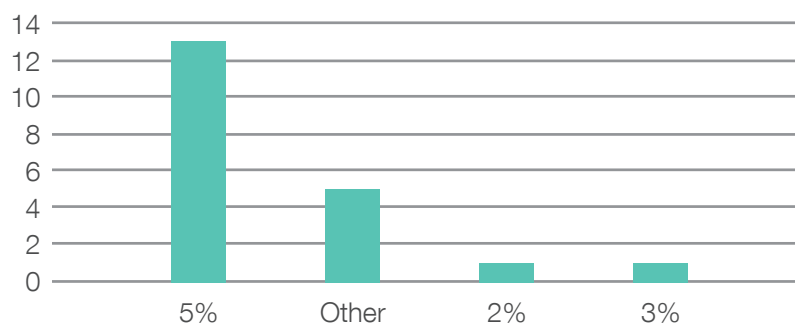
Participation frequency

How many times a year would you be willing to participate?



Bill reduction

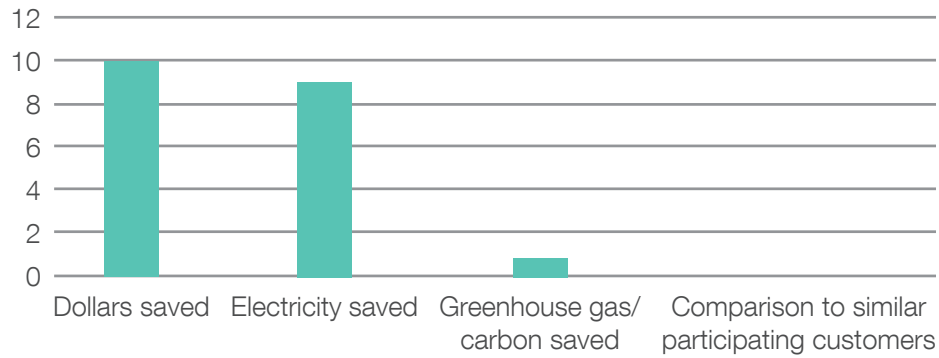
What % of savings (bill reduction) would make participation in BDR worthwhile?



When asked what other percentage of savings would make participation in BDR worthwhile, a few participants shared their preferences verbally. One participant said that a 5% reduction would be the minimum amount to make participation in BDR worthwhile, one said that 15% savings would be the minimum amount and that a 5% savings feels insignificant. Two participants said 50% savings would make it worthwhile, and finally, one said 80% savings.

After the Event

What information would you like PSE to share with you after participating in a BDR event?



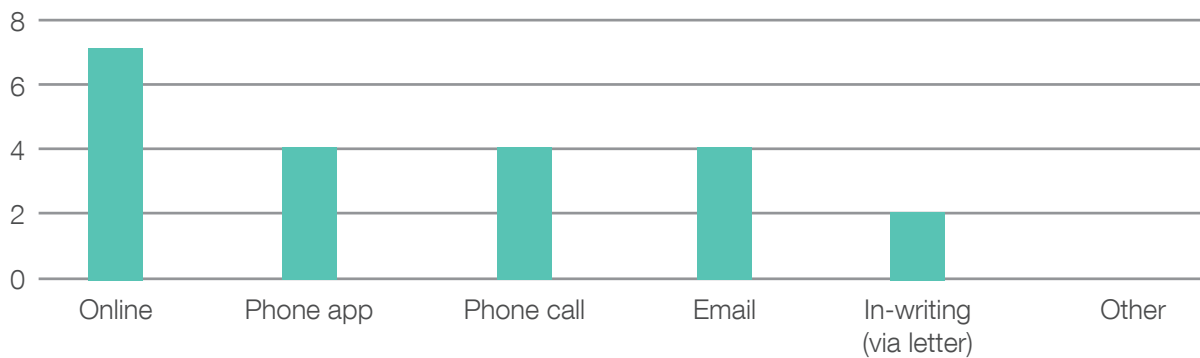
REMOTE ENERGY MANAGEMENT (REM)

Participants received the following overview of REM, before answering a series of polls.

Remote energy management (REM): Customers grant PSE specific permissions to remotely adjust equipment to manage peak demand. PSE works with customers to develop a plan and install necessary equipment.

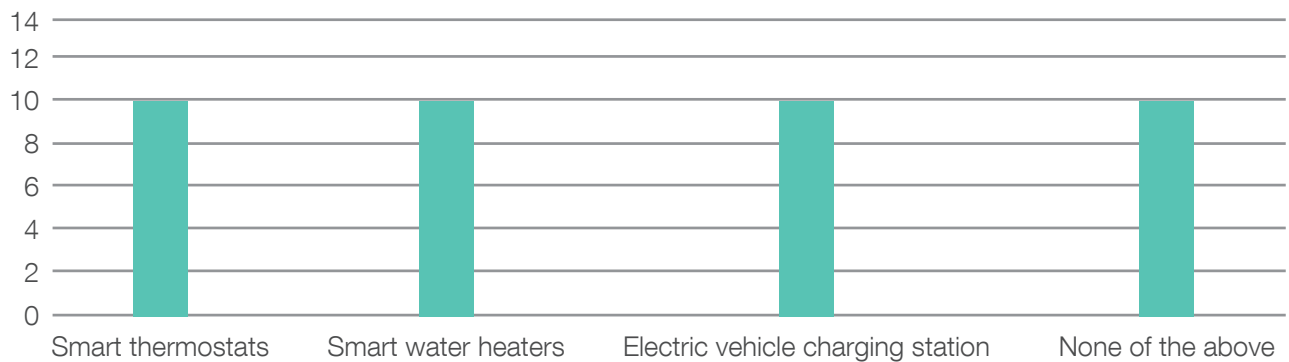
Enrollment

How would you prefer to enroll in a REM program?

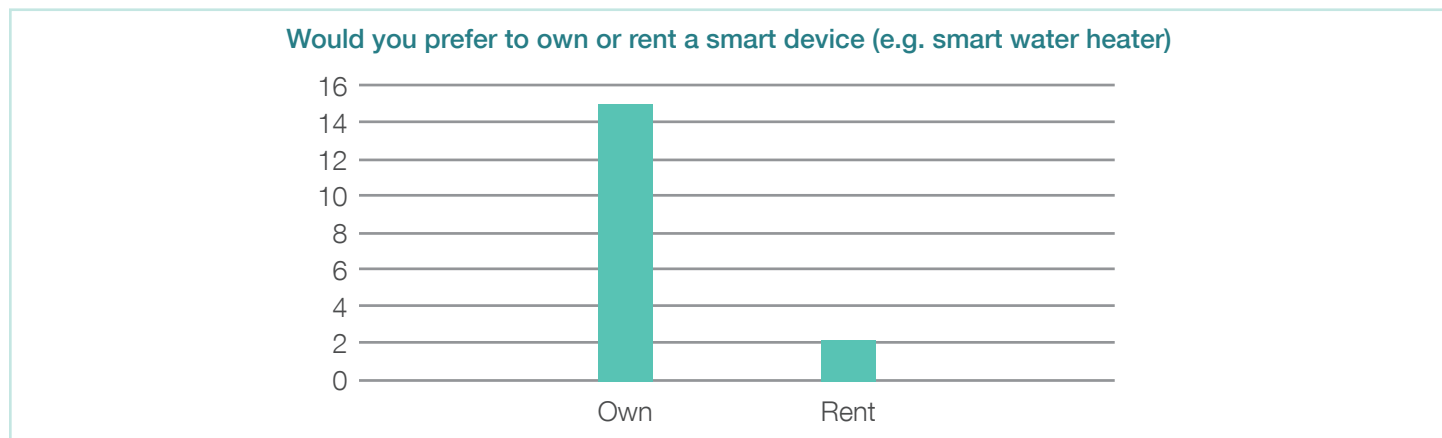


Smart device preferences

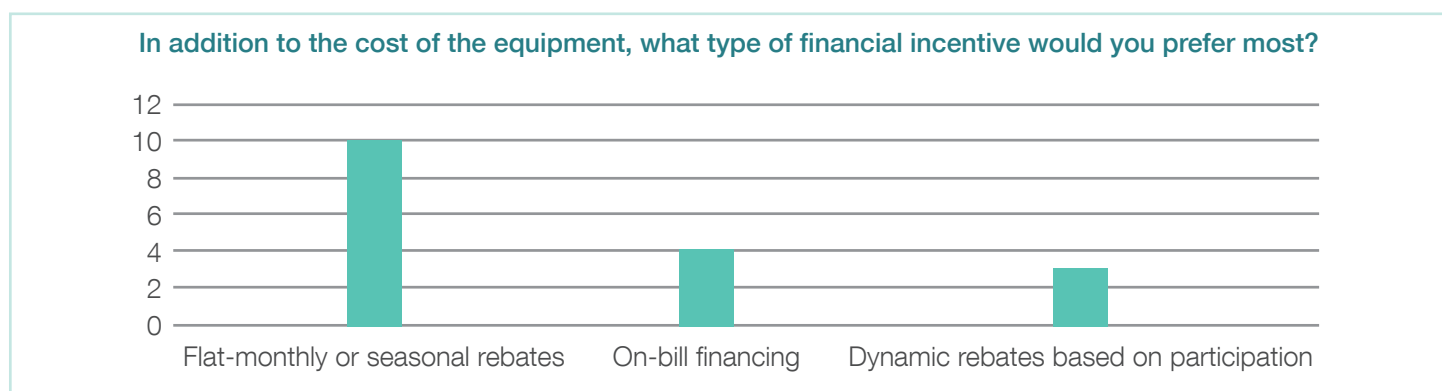
What type of smart devices would you use at your residence?



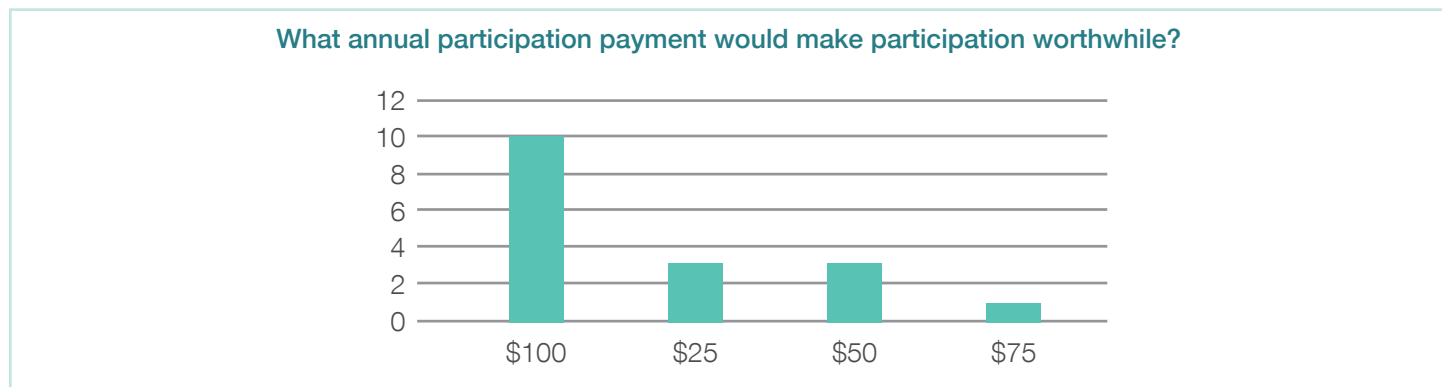
Smart device ownership preferences



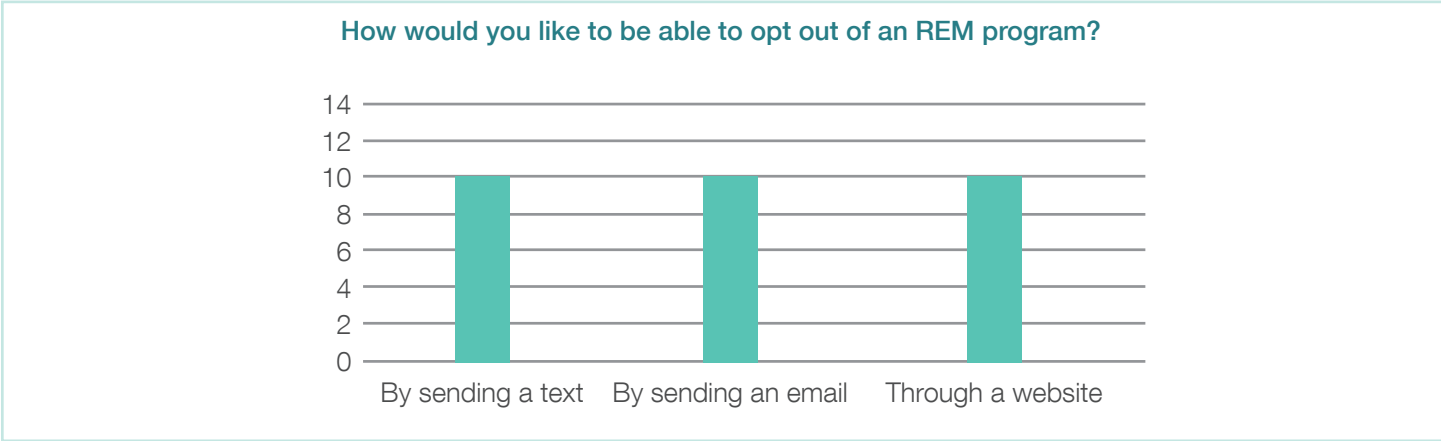
Financial incentive mechanism



Annual participation incentive



Opting out



Compensation preference across all DER products

At the end of the workshop, participants were asked to consider four scenarios and share how they would prefer to receive payments from PSE for participation in solar, battery, and DR programs. Participants shared their preferences verbally and by using Zoom chat.

Scenario	Description
A	You receive a credit on your bill
B	You receive a Visa gift card
C	You receive a check
D	The money is deposited directly into your bank

Most participants preferred Scenario D because it does not require ongoing logistical effort by customers. One participant shared that receiving a check would be preferable to the other options.

SURVEY

In addition to the interviews, focus groups and workshops, an online survey was distributed to residential customers throughout PSE's electric service area. The survey covered batteries, solar and demand response. The survey was offered in English and Spanish.

To market the survey, PSE took two approaches:

1. The survey was distributed to a list of 400 customers developed by the PSE Customer Insights Team. This batch of customers was identified using the following demographics and criteria:
 - b. Located in PSE's electric service area
 - c. An area median income of less than 80%
 - d. A mixture of rural, suburban, and urban populations
 - e. A mixture of homeowners and renters
 - f. A mixture of climate concern levels
 - g. Populations within PSE's designated Named Communities demographic
8. The survey was distributed to 425 individuals who were invited to participate in residential focus groups and workshops, but were unable to join due to a cap in registration. This distribution list was developed, and the survey distributed through coordination with two local community-based organizations (CBOs), Homes First and El Centro de la Raza.

To ensure feedback was collected from low-income customers residing in PSE's electric service area, participants were screened out of the survey immediately if they lived in a county outside PSE's electric service area, and if their household income exceeded 200% of the Federal Poverty Level or 80% Area Median Income, whichever was higher. Twenty-eight participants were screened out of the survey using these filters.

A total of 202 residential customers responded to the survey. One hundred and seventy people responded to the survey in English and 32 responded to the survey in Spanish. Forty-five of the 202 respondents abandoned the survey part way through. Please note if viewing the survey results in the appendix that the #s below are a combination of the English and Spanish surveys.

SURVEY RESPONDENT DEMOGRAPHICS

To better understand respondent demographics, PSE required participants to specify their race, age, and county of residence. Participants could select more than one race.

Race	Responses
Black or African American	44%
White	38%
Hispanic or Latino	17%
Asian or Asian American	3%
American Indian or Alaska Native	2%
Native Hawaiian or other Pacific Islander	1%
Another race	0%

Age	Responses
25-34	58%
35-44	25%
18-24	7%
45-44	7%
55-64	2%
65-74	1%
75+	0%

County of Residence	Responses
Island	25%
King	20%
Kitsap	14%
Skagit	14%
Pierce	12%
Whatcom	6%
Kittitas	5%
Thurston	4%
Other	0%

SOLAR

To begin, participants received the following context on solar:

Solar refers to small-scale solar arrays, sometimes installed by customers on their roof or on the ground, to generate power from the sun. Any unused energy is added to the grid and shows up as a credit on your bill. PSE's power grid continues to provide you energy when you are using more energy than the panels are producing.

Then, participants were asked to indicate their level of interest in installing solar where they live.

Interest level	% of respondents
Very interested	67%
Somewhat interested	22%
Neither interested nor disinterested	11%
Somewhat disinterested	0%
Not at all interested	0%

Most respondents were very interested in installing solar. Interest was even stronger among respondents who self-identified as Black or African American, or Hispanic or Latino, with 77% indicating they were very interested.

RANKING QUESTIONS

The following ranking system was used for multiple questions throughout the survey. The results table shows the percentage of respondents that chose the corresponding selection as one of their top two choices. Rows are arranged from top to bottom in order of decreasing ranking.

Participants ranked what interests them the most about installing solar where they live, in order of importance,

Benefits	% of respondents ranking 1 or 2
Personal energy resilience	72%
Community energy resilience	47%
Taking action to reduce climate change	38%
Reduction of my energy bills	37%
Supporting the local economy	4%
Local workforce development benefits	2%

Most respondents ranked personal energy resilience highest, followed by community energy resilience. Participants were also given an opportunity to suggest benefits that were missing from the list provided. Creating education opportunities, promoting social wellness and contributing towards community development were mentioned.

Participants selected all perceived barriers that might prevent them from installing solar where they live.

Barriers	% of respondents
Installation costs	62%
Locating and hiring an installer	35%
Lack of space on my roof	30%
I don't know how to maintain solar	21%
I don't know if the cost savings outweigh the cost of installation	20%
My roof is older	19%
I rent and don't believe my landlord would support this	19%
My roof does not receive direct sunlight	18%
The look of panels on my roof	11%
I don't have time to coordinate the installation of solar	10%
None of the above	1%
Other	0%

Installation costs were by far the largest identified barrier to installing solar, with the anticipated difficulty of finding and installer and lacking roof space following.

To follow up, participants suggested ways in which PSE could reduce the aforementioned barriers. Most suggested that PSE offer financing and incentives to reduce installation costs, increase education on the benefits of solar for both customers and landlords, and supporting workforce development efforts that would lead to an increase in installers in the area.

OWNERSHIP

Participants ranked the three scenarios below in order of their interest in participating in a similar program. Respondents were cautioned that the dollar values were meant to be illustrative and not necessarily indicative of final product costs or offerings.

	Scenario A	Scenario B	Scenario C	None
Who owns	You own	PSE owns	You are renting to own from PSE	
Who installs	You hire a contractor and manage the installation	PSE hires a contractor and manages the installation	PSE hires a contractor and manages the installation	
You pay	You maintain	PSE maintains	PSE maintains	
Description	\$15,000 up front for the installation of solar	\$0 up front for the installation of solar	\$13,500 over 15 years, spread out as \$75 per month rental payments to PSE	
Description	A reduction in your energy bill and additional on-bill credits for excess solar production each month \$100 per month totaling \$18,000 over 15 years	A fixed monthly payment from PSE on your energy bill for the use of your roof space or land. \$20 per month totaling \$3,600 over 15 years.	After 15 years, a reduction in your energy bill, ownership of the system and additional on-bill credits of \$20 per month for excess solar production each month	
% of respondents ranking 1 or 2	70%	67%	57%	6%

Considering responses to the English and Spanish survey together, there was strong preference for Scenarios A or B. Looking only at the Spanish survey results, there was a stronger preference for Scenario A, at 84%. Respondents could also suggest an alternative structure for participation, but none were provided.

When asked what additional information they would need from PSE before installing solar, respondents asked for more details on the cost, durability, performance, reliability, and maintenance of solar panels. There was a request for transparency around the advantages and disadvantages of solar.

COMMUNITY SOLAR

Next, participants received the following definition of community solar:

Community solar is a program where subscribers can purchase a share of a solar project located on a community building by paying a monthly subscription. Subscribers receive bill credits each month for the energy the project produces.

Then, participants were asked to indicate their level of interest in enrolling in community solar.

Interest level	% of respondents
Very interested	60%
Somewhat interested	28%
Neither interested nor disinterested	9%
Not at all interested	2%
Somewhat disinterested	0%

Most respondents were very interested or somewhat interested in participating.

Participants ranked what interests them the most about enrolling in community solar, in order of importance

Benefits	% of respondents ranking 1 or 2
Community energy resilience	75%
Taking action to reduce climate change	58%
Reduction of my energy bills	46%
Subscribing to a project that is close to where I live	15%
I am a renter, and this helps me participate in solar without having to install at my home	6%

Most respondents ranked community energy resilience highest, followed by taking action to reduce climate change and reduction of their energy bills. Participants had the opportunity to suggest any benefits missing from the list above. Ease of access and avoiding the installation cost of installing solar on their home were mentioned.

Participants selected all perceived barriers that might prevent them from enrolling in community solar.

Barriers	% of respondents
I wouldn't want to spend money on the monthly subscription cost	55%
I only want solar if it's on my own property	45%
I would find signing up on the website difficult	34%
I am worried the solar arrays will impact the aesthetics of my community	23%
Other	3%

Roughly half of respondents were concerned about the monthly subscription cost and only wanted solar if it was on their property.

Asked to comment on how PSE could reduce these barriers, respondents suggested that PSE reduce any cost of participation, provide a simple registration process and provide more education opportunities for communities.

Next, participants were asked to assume their monthly subscription fee has been waived, then share what monthly on-bill credit would encourage them to enroll in community solar. While some respondents entered values in the hundreds or thousands, \$50 was the most common and median answer.

Participants were asked how often they would prefer to receive on-bill credits after enrolling in community solar.

Preferred frequency	% of respondents
Monthly	58%
Quarterly	32%
Annually	10%

Most respondents preferred to receive monthly on-bill credit while a smaller, but not insignificant population, preferred quarterly.

When asked what additional information they would need from PSE before installing solar, respondents asked for more details on costs, how many members of their community will get to participate, if they would need to be involved in maintenance and the positive and negative impacts of community solar.

BATTERIES

Next, participants received reviewed the following context on batteries:

Battery energy storage systems (BESS) provide temporary backup power to increase reliability during power outages and store energy from solar to use when the sun goes down, and they can be used by PSE to help meet demand during peak periods (like cold winter mornings). Batteries can be installed at your home or apartment to provide you backup power during outages, and to provide capacity to the electric grid during periods of high demand for electricity.

Then, participants were asked to indicate their level of interest in installing a battery in their home.

Interest level	% of respondents
Very interested	58%
Somewhat interested	29%
Neither interested nor disinterested	10%
Somewhat disinterested	2%
Not at all interested	1%

Most respondents were either very or somewhat interested.

Participants ranked what interests them the most about installing a battery where they live, in order of importance

Benefits	% of respondents ranking 1 or 2
Decrease frequency and duration of outages	72%
Reductions of my energy bills	78%
Cleaner source of backup energy than diesel generator	30%
Storing renewables	11%
Supporting the local economy	2%
Local workforce development benefits	15%
Participating in clean energy programs	6%

Decreasing the frequency and duration of outages and reducing my energy bills were ranked highest, followed by having a cleaner source of backup energy than a diesel generator. Participants had the opportunity to suggest any benefits missing from the list above. They mentioned the perceived portability of batteries and reducing their carbon footprint and the extra power for their wheelchair and hospital bed.

Participants selected all perceived barriers that might prevent them from installing a battery where they live.

Benefits	% of respondents ranking 1 or 2
Installation costs	57%
Locating and hiring an installer	38%
I don't know how to maintain a battery	32%
I don't have space for a battery in my garage or outside my home	28%
I am concerned about the safety of batteries	22%
I don't know if the cost savings outweigh the cost of installation	20%
I rent and don't believe my landlord would support this	13%
I don't have a reliable internet connection	9%
I'm only interested in pairing a solar and battery installation together	8%
I don't want PSE to have access to use the battery	6%
Other	1%
None of the above	1%

The most commonly identified barrier was installation costs. The next tier of concerns revolved around the expertise needed to install or maintain the battery. One customer who selected other noted their disability.

Asked to comment on how PSE could reduce these barriers, respondents suggested that PSE provide incentives to reduce any associated costs, educate customers and landlords on how to safely install, maintain and handle batteries and consider sending an installer to assist them.

Participants ranked the three scenarios below in order of their interest in participating in a similar program. Respondents were cautioned that the dollar values were meant to be illustrative and not necessarily indicative of final product costs or offerings.

	Scenario A	Scenario B	Scenario C	None
Who owns	You own	PSE owns	You rent to own from PSE	
Who installs	You hire a contractor and manage the installation	PSE hires a contractor and manages the installation	PSE hires a contractor and manages the installation	
You pay	You maintain	PSE maintains	PSE maintains	
Description	\$5,000 up front for the installation of a battery	\$0 up front for the installation of a battery	\$3,600 over ten years, spread out as \$30 monthly rental payments to PSE	
Description	Battery backup power during outages and a monthly on-bill credit for the use of a portion of the battery charge during peak periods. \$20 per month totaling \$2,400 over ten years	Battery backup power during outages.	Battery backup power during outages for the first ten years. After ten years, once ownership has been transferred an on-bill credit of \$20 per month for the use of a portion of the battery charge during peak periods.	
% of respondents ranking 1 or 2	75%	63%	58%	3%

Scenario A was the most popular, with Scenario B close behind. Respondents could also suggest an alternative structure for participation, but none were provided.

Participants reviewed the following context on how PSE may utilize batteries installed at their home:

PSE will compensate you for the use of your battery to manage the load on PSE's grid. Usually, you won't even notice when PSE is using your battery, and PSE will not use it during a storm or heat event when there is a higher likelihood of an outage so that you can use it for back-up power.

Then, customers were asked to rank which of the following scenarios they would be most likely to least likely to participate in.

Level of PSE control	% of respondents ranking 1 or 2
PSE has control over the battery and can use it 100 times per year. You are given a one-day notice and the opportunity to opt out	74%
PSE has control over the battery and can use it 100 times per year without notifying you	69%
The battery is on a set schedule to have its stored power used daily during peak hours (5 p.m.–9 p.m.) and charge off-peak	58%

There was a preference among respondents for PSE to have variable use of the battery up to a set limit over the year. However, they would prefer to be notified in advance of that usage and given the opportunity to opt-out.

Participants were asked to indicate how much of their battery power they reserved at all times in case of an unexpected outage.

Reserve %	% of respondents
50%	37%
40%	32%
30%	23%
20%	7%
Other	2%

Reserving 50% at all times was the leading choice, followed closely by reserving 40% at all times. The two respondents who selected other indicated they wanted to reserve between 50 to 100%.

When asked what additional information they would need from PSE before installing a battery where they live, respondents wanted to know how much space a battery would take up, the advantages and disadvantages of battery installation, battery safety precautions, and how long before a battery is depleted.

DEMAND RESPONSE (DR)

Next, respondents received the following context on DR.

DR rewards customers for using less power when it's in high demand but never charges the customer extra for using power when they need it. Using less power helps create system-wide resiliency, lowers carbon emissions, and keeps electricity rates low. There are two main types of DR:

Behavioral demand response (BDR): You adjust your thermostat or appliances in response to a request from PSE.

Remote energy management (REM): You grant PSE permission to remotely adjust your thermostat or appliances.

All demand response programs are voluntary, and customers can always opt out of participating.

Next, participants indicated which DR program they would prefer to participate in.

DR program	% of respondents
Remote energy management	49%
Behavioral demand response	27%
Both	21%
None of the above	3%

Nearly half of respondents indicated they would prefer to participate in a REM program, more than a quarter to participate in a BDR program, and about a fifth to participate in both. When filtering for respondents over the age of 45, a larger percentage were only interested in behavioral demand response (60%), while 30% were interested in both.

Behavioral demand response (BDR)

Participants selected all the benefits that would make them interested in participating in BDR.

DR program	% of respondents
Reducing my energy bills	68%
Receiving money up front to participate	50%
Better understanding how my energy usage impacts my bill	49%
Better understanding how my energy usage impacts the grid	32%
Decrease frequency and duration of outages	26%
Taking action to address climate change	25%
None of the above	0%
Other	0%

Most respondents were most interested in reducing their energy bills.

Participants selected all perceived barriers that might prevent them from participating in BDR.

Barriers	% of respondents
Cost of smart thermostat/appliances	65%
I am hesitant to learn new technologies	35%
I don't believe the cost savings would be worth the effort	30%
I am not able to change when I use energy in my home	24%
I am not interested in changing the temperature of my home	16%
I don't want PSE to monitor how I use energy for appliances in my home	13%
I have limited access to the technology needed (e.g., cell phones) to receive notification	13%
I rent and don't believe my landlord would support this	9%
None of the above	2%
Other	0%

Most respondents identified the cost of smart devices as their primary concern.

When asked how PSE can reduce these barriers, respondents suggested PSE provide smart devices at no cost and work on addressing trust and assuring customers that they will not lose the freedom to adjust their equipment.

Remote energy management (REM)

Participants selected all the benefits that would make them interested in participating in REM.

Benefits	% of respondents
Reducing my energy bills	59%
Receiving an upfront incentive to participate	57%
I don't have to adjust my thermostat or appliances myself	36%
Taking action to address climate change	29%
Better understanding how my energy usage impacts my bill	26%
Better understanding how my energy usage impacts the grid	21%
Decrease frequency and duration of outages	13%
Other	1%
None of the above	0%

Similar to BDR, respondents identified a reduction in their energy bills as their primary motivator.

Participants selected all perceived barriers that might prevent them from participating in REM.

Barriers	% of respondents
Reducing my energy bills	59%
Receiving an upfront incentive to participate	57%
I don't have to adjust my thermostat or appliances myself	36%
Taking action to address climate change	29%
Better understanding how my energy usage impacts my bill	26%
Better understanding how my energy usage impacts the grid	21%
Decrease frequency and duration of outages	13%
Other	1%
None of the above	0%

Similar to BDR, most respondents identified the cost of smart devices as a barrier with hesitancy to learn new technologies coming in second.

When asked how PSE can reduce these barriers, respondents suggested PSE provide smart devices at no cost and create more education opportunities for residential customers and their landlords.

All DR programs

Next, participants were given the following definition of a peak period:

Peak periods occur when demand across the grid for electricity is highest, which typically happens on cold winter mornings when everyone's heat turns up.

Participants were asked how they would prefer to be notified about a reduction in electricity usage during peak periods.

Notification method	% of respondents
Email	78%
Text message	16%
Phone call	5%
Other	1%

Most respondents preferred email notifications. Filtering for respondents over the age of 45, a strong preference for text message was indicated (70%) over email (30%).

Participants were then asked how long of an electricity reduction event they could participate in during peak periods.

Event length	% of respondents
2 hours	36%
1 hour	31%
3 hours	26%
4 hours	7%

Respondents generally chose to participate in shorter events.

Respondents then indicated how much notice they would need to prepare for a decrease in electricity usage during peak periods.

Notice time frame	% of respondents
3-4 days	42%
1 day	31%
Less than 24 hours	16%
1 week	9%
Greater than one week	3%

Most respondents indicated they would need between one to four days of notice to prepare for a decrease in electricity usage during peak periods.

Respondents then shared the frequency with which they would be willing to participate.

Frequency	% of respondents
1-2 times a month	36%
3-4 times a month	33%
Whenever offered	18%
More than once a week	11%
Never	2%

Most respondents indicated they would be willing to participate between one and four times per month.

Participants were asked to select all types of information they would like PSE to share with them after they participate in a DR event.

Frequency	% of respondents
Electricity saved	66%
Dollars saved	55%
Greenhouse gas/carbon saved	50%
Comparison to similar participating customers	21%
Other	0%

Most respondents wanted PSE to tell them how much electricity and money they had saved during an event.

Participants then indicated how they would like to receive the aforementioned information.

Notification method	% of respondents
Email	84%
Text message	7%
Website	6%
Letter	3%
Other	0%

A strong majority of respondents indicated a preference for receiving results via email.

Moving to savings and incentive questions, respondents were asked what % of savings (bill reduction) would make participation in a DR program worthwhile.

Bill reduction	% of respondents
3%	53%
5%	29%
2%	16%
Other	2%

More than half of respondents indicated that a 3% bill reduction would make participating worthwhile. The participant who selected other asked for more than 5% bill reduction.

Respondents then indicated what annual participation payment would make participation in a DR program worthwhile.

Bill reduction	% of respondents
\$50	43%
\$75	23%
\$25	17%
\$100	17%

Fifty dollars was the leading choice with the next portion of respondents preferring the higher value of \$75.

Asked what additional information they would need to participate in a DR program, respondents wanted to learn more about the impact they could make by participating and if their information would be kept private and confidential.

GENERAL QUESTIONS

To conclude the survey, PSE explored participants' housing situations, their general preferences for receiving payments and information, and their opinions on climate change, new technology, and equity.

Participants were first asked what type of residence they live in.

Type of residence	% of respondents
Detached single-family house, duplex, triplex, fourplex, townhome, or accessory dwelling unit	51%
Apartment, condominium, houseboat community, or mobile home park with at least 5 housing units	49%
Other	0%

Asked what type of residence they live in, about half of respondents indicated that they live in a single family home. The other indicated that they live in multifamily housing.

Next, participants were asked if they own, rent or manage their home or property.

Type of residence	% of respondents
I live in and rent my home directly from a landlord or property manager	43%
I live in and own my home	32%
Someone else owns or rents the home I live in directly from a landlord or property manager	22%
I am the property manager or landlord of a property	3%

Most respondents indicated that they rent their home.

Participants ranked how they would like to receive payments from PSE for participating DER programs.

Preferred method of payment	% of respondents
You receive a Visa gift card	85%
You receive a credit on your bill	72%
You receive a check	27%
You receive a direct deposit to your bank	16%

Most participants ranked receiving a Visa gift card the highest, followed by on-bill credits.

Participants then selected all the demographic characteristics PSE should consider when verifying a customer is part of a historically disadvantaged community.

Demographic characteristics	% of respondents
Household income	59%
Age	54%
Race/ethnicity	44%
Gender identity	32%
Disability status	30%

More than half of respondents selected household income and age as the demographic characteristics PSE should consider.

Participants then indicated all the ways they would like to learn about future PSE programs.

Notification method	% of respondents
Email	86%
Social media	22%
PSE.com	20%
Direct mail	20%
Community events	11%
Fliers at the library, grocery store, etc.	8%
Newspaper announcements	4%
Combined with other program offerings	4%
Other	0%

Most respondents preferred PSE notify them via email about future programs. There was some interest in learning about future programs through social media, direct mail, and at PSE.com.

Participants were given an opportunity to share any last thoughts about DERs with PSE. Respondents suggested PSE undertake proper analysis on DERs and increase their workforce to execute on DER programs.

Participants were then asked to describe their interest in adopting new technologies.

Demographic characteristics	% of respondents
I am an early adopter. I love being the first to know about and use new technology.	62%
I am a mid-adopter. I am interested in technology but want proof of its effectiveness.	34%
I am a late adopter. I am not very interested in new technologies.	4%

Most respondents identified as an early adopter. Filtering for respondents over the age of 45, 77% identified as an early adopter, and 23% as a mid-adopter. Looking at the total results of the Spanish survey alone, more respondents identified as a mid-adopter (50%) than as an early adopter (28%).

Finally, participants were asked to indicate their level of concern about climate change on a scale of one to ten, with ten being extremely concerned, and one being not at all concerned.

Level of concern	% of respondents
10	29%
9	11%
8	18%
7	18%
6	16%
5	5%
4	1%
3	1%
2	0%
1	0%

Ninety-two percent of respondents ranked their concern above five.

CONCLUSION

KEY FINDINGS

Through interviews, focus groups, workshops, and surveys focused on DR, solar, and battery products, participants identified the following common themes of feedback:

Cost

Upfront costs associated with asset procurement and installation, along with the ongoing cost of maintenance, were consistently highlighted as the largest barriers across all DER products, and for all customer segments. While suggestions to alleviate the barriers were unique among the three products, there was a clear ask for financial incentives that substantially offset or entirely remove the financial costs customers may encounter when participating in DER products. Participants also preferred these incentives be applied instantly so that customers do not need to manage lengthy rebate processes that exacerbate their cash flow issues.

Installation and maintenance support

The installation and maintenance associated with DER implementation can feel daunting to customers. To facilitate adoption of DERs, PSE will need to be prepared with tailored, holistic, and hands-on installation and maintenance support for the customers who request it.

Flexibility of products

While similar themes emerged across many engagements, it also became clear how diverse each customer's needs and interests could be. The final products PSE designs must be flexible enough to alleviate the nuanced challenges each customer will face based on their size, geographic location, the services they provide and whether they rent or own their property.

PSE-owned and customer-owned options

Engagement participants differed on their preference for renting versus owning assets, like solar panels. Those who preferred PSE-owned options articulated an inability to afford the associated equipment, installation, and maintenance costs. Those who preferred customer-owned options typically valued the autonomy and control of ownership. Similar to the flexibility theme, PSE should provide both options to meet diverse customer preferences.

Strong motivation to participate in DERs

While certain DERs are a better fit for some customers, across all engagements, participants indicated a strong interest in participating in future DER products. Participants highlighted the importance of energy independence, community or personal energy resilience, and reduction in energy bills as the benefits that will most motivate them to participate in DER products.

Education and outreach

While participants expressed a strong motivation to participate in DERs, there are many education and outreach gaps left to fill. The existing knowledge gap often translates into skepticism about whether DERs can deliver on the promised benefits. Participants wanted foundational questions about costs, environmental impacts, and community benefits answered to help them make informed decisions about product participation. Participants suggested PSE partner with CBOs and utilize their deep, existing community relationships to educate customers.

FINDINGS BY CUSTOMER SEGMENT

While the key findings provide an aggregate view across all DER products and all customer segments, the table below highlights nuanced findings for each category.

	Commercial customers	Residential customers	All customers
Batteries	- Value reliability during outage events as a more important benefit than reduced utility bills. They view themselves as future resiliency hubs for their communities - Voiced cybersecurity concerns	- Will struggle to commit to 10-15 year project terms - Question whether they can install a battery without needing to conduct other home upgrades - Want to be able to opt out of events	- Want significant reserves in case of an unexpected outage - Want to be educated on battery safety - Want to understand the environmental impacts of a battery's lifecycle - Are slightly more interested in hosting a PSE-owned battery than owning their own.
Solar	- Want to install larger arrays and struggle with the 100 kW net metering threshold - Are currently comfortable selling environmental benefits to PSE, but want flexibility to change their minds down the road	- Will struggle to commit to 10-15 year project terms - If cost was no issue, would prefer to own the solar panels on their roof - Are very interested in community solar but would expect \$20-\$50 monthly bill credits for their participation - Would prefer to enroll in local community solar projects, even if that means they receive a lower on-bill credit	- Want to bundle solar and batteries - Are not as interested in ground mounted solar as they are in rooftop solar
DR	- Supply critical community services or need energy flowing at irregular times - Are skeptical that DR will save them money	- Have more predictable energy consumption trends - Want PSE to gamify DR and show them how they are progressing towards goals - Are most interested in smart water heaters and smart thermostats and - Want to own smart devices instead of rent them	- Want to start with small adjustments and shorter event lengths - May find remote energy management (REM) intrusive - Want to be able to opt out of events
All DER Products	- Don't have the staff capacity to participate in complicated and time-consuming DER products - Have strict budgets that will ultimately define their actions - Want PSE to prioritize equity in the project selection process	- Need PSE to support landlord education - Want PSE to prove the benefits to them before they enroll - Want PSE to promote DERs on social media platforms such as Facebook, Twitter, Instagram, TikTok, and nextdoor	

LIMITATIONS OF THIS WORK AND LESSONS LEARNED

While PSE was able to connect with a variety of agencies, municipalities, organizations, and tribal entities across its electric service area and within each of the prioritized participant criteria, it is important to note that the scale of engagement was too small and the data collection methods too diverse for key findings to be considered statistically significant. Participant feedback may also be based on hyper-local experiences.

In addition, the following limitations and lessons learned were either addressed during this round of engagement or will be addressed in future rounds of engagement on PSE programs.

Limitation or issue	Lessons learned
DERs are complex topics Customers believed DERs were a more financially viable option for them than other PSE products, like EV charging. However, the topic also felt more complex for participants, and they had a more difficult time envisioning how the products would fit into their daily lives. Residential participants wanted more space to learn during engagements, which made it difficult to gather feedback on complex questions. Commercial participants found the workshop scenarios too hypothetical to rank without additional context, but confidently answered more straightforward questions in the focus groups about benefits and barriers.	• Allow adequate time for education: There is always limited time during engagements, but it is important to allow adequate time for participants to learn about the topic and ask questions before providing feedback. • Be strategic in how questions are asked: Given that engagement was done during the early stages of product development, details on implementation were limited. When context is limited, consider breaking the content down into simpler, high-level concepts. • Continue to simplify the language used to describe concepts: While transportation electrification and solar are becoming increasingly mainstream, not all members of the public are as aware of DR and batteries. Use Plain Talk Principles when describing concepts and focus on how future products will integrate into a customer's daily life. • Use creative tools to help customers digest the topic: Multimedia tools, like new graphics and videos, can supplement text-heavy fact sheets to help these complex topics become more relatable to participants.
Engagement opportunities were marketed publicly While a more public marketing campaign increased the number of individuals engaged, PSE did not have the time or space to develop meaningful relationships with that audience. This made it difficult to encourage meaningful participation and engagements sometimes felt unfocused and one-sided.	• Partnering with CBOs is vital: Partway through the engagements, PSE shifted back to inviting residential customers through CBOs. Because these customers had been invited by a trusted organization in their community, they were more vocal and there was a larger sense of excitement around the topics. • Establish clear expectations around participation: When giving stipends to both commercial and residential participants, set clear expectations to ensure everyone's time is well spent and meaningful feedback can be gathered.
In-person engagements are different than virtual engagements As in-person gatherings become more accepted, PSE offered in-person engagements to a series of CBOs and their clients.	• Allow more time to prep for in-person engagements: While many have virtual engagements and norms down pat, we are readjusting to in-person engagements. Extra time was needed to prepare print materials, travel to the location, coordinate technology and room setup and deliver stipends.
Survey development and accessibility As it covered solar, batteries and demand response, the survey was lengthy, and the depth of questions was not able to support more rigorous statistical analysis and was instead merely a directional indicator of customer sentiment.	• Increase survey accessibility: Despite the length of the survey, 90% of survey respondents who advanced past the screening questions completed the full survey. However, a much smaller portion of respondents answered every open-ended question on the survey, which may have indicated survey fatigue. In the future, reduce survey length to keep customers engaged. • Conduct additional surveys: To confidently understand how customers value different components or features of their products or services, conduct separate conjoint analysis surveys for each DER product.

NEXT STEPS

As PSE moves forward with filing tariffs for DER products, the project team anticipates the following next steps:

- **Q2 2023 – Q3 2023:** PSE shares this report with community engagement participants and other interested parties. PSE incorporates the feedback captured in this report into tariff filings for DER products.
- **Q3 2023:** PSE files DER tariffs with the WUTC. PSE shares the filing link with community engagement participants with instructions for providing public comment.
- **2024:** If approved, the application process for products begins.

APPENDICES

APPENDIX A: ENGAGEMENT PARTICIPANTS

The table below details all who were contacted during this engagement process.

Key	
	Participated in introduction call, interview, focus group and/or workshop
	Did not respond or chose not to participate
Customer	
	A Watered Garden Family Learning Center
	Anacortes Housing Authority
	Bellevue LifeSpring
	Board of Skagit County Commissioners
	Boys & Girls Club of Whatcom County
	Bremerton School District
	Camp Korey
	CHI Franciscan Health
	City of Lacey
	City of Langley (Climate Crisis Action Committee)
	City of Mount Vernon
	City of Olympia
	City of Tumwater
	Easton School District
	El Centro de la Raza*
	Encompass
	Family Support Center of South Sound
	Federal Way Black Collective
	Ferndale Food Bank
	Helping Hands Food Bank
	Homes First
	Imagine Housing
	Island County
	Japan-America Society of the State of Washington
	Kent United Methodist Church
	King County Department of Natural Resources and Parks
	King County Housing Authority
	Kitsap Community Resources
	Lummi Nation
	Lynden Senior Center
	Mount Si Senior Center

Customer

Northwest Agriculture Business Center
 Pierce County
 Pierce Transit
 Port of Bellingham
 Port of Seattle
 Puyallup Food Bank
 Renton Downtown Partnership
 Samish Indian Nation
 Senior Services for South Sound
 Shoemaker Manufacturing
 SideWalk
 Skagit Conservation District
 Skagit County Farmland Legacy Program
 Skagit Friendship House
 Skagit Gleaners
 Skagit Valley YMCA
 Skagit Watershed Council
 South King County Tool Library
 Sustainable Connections
 Timberland Regional Library
 Vashon Household
 Virginia Mason Hospital
 Washington Soldiers Home
 Washington State University Mount Vernon Northwestern Washington Research and Extension Center
 Washington State University Skagit County Extension
 Western Washington Agricultural Association
 Whatcom Center for Early Learning
 Whatcom County
 Yelm Community Schools
 Youthnet
 Anacortes School District
 ASHHO Community Cultural Center
 AtWork!
 Bellevue Schools Foundation
 Bellingham School District
 Bellingham Technical College
 Bethel School District
 Boys & Girls Clubs of Skagit County
 Boys & Girls Clubs of South Puget Sound
 Central Kitsap Food Bank
 Child Care Action Council
 CIELO

Customer

Clover Park School District
 Community Youth Services
 Congregation for the Homeless
 Emergency Food Network
 FISH Food Bank
 Goosefoot
 Green River College
 Habitat for Humanity Island County
 Hedgebrook
 Helping Link
 HopeLink
 Housing Resources Bainbridge
 Interfaith Works
 Issaquah Food and Clothing Bank
 Kulshan Community Land Trust
 Lydia Place
 Medicine Creek Enterprise Corporation
 Muckleshoot Casino
 Muckleshoot Indian Tribe
 Muckleshoot Housing Authority
 Nisqually Indian Tribe
 Nooksack Indian Tribe
 Nourish Pierce County
 Oak Harbor Senior Center (The Center in Oak Harbor)
 Port Gamble S'Klallam Tribe
 Quixote Communities
 Readiness to Learn
 ReSources
 ShareNet
 Skagit Casino
 Skagit County Planning and Development (Sustainability)
 South Kitsap Helpline
 Skagit Valley Agricultural Leaders
 Skagit Valley Hospitality House Association
 South Whidbey Good Cheer Food Bank
 Squaxin Island Tribe
 Sumner Community Food Bank
 Suquamish Tribe
 Swinomish Indian Tribal Community
 Thurston County Food Bank
 Whatcom Community College
 YWCA Olympia

*Did not participate in individual engagements but were instrumental in engaging participants for a Spanish Workshop, as noted in the Spanish workshop section.

APPENDIX B: BATTERY ENGAGEMENT MURAL BOARDS

See next page.

Puget Sound Energy Battery Commercial Focus Group

January 25, 2023

How do batteries fit into your organization and community goals?

1

Flexibility of batteries, we serve clients with different needs and flexibility of our community which is low income and struggling. A resource like this would be helpful.

I think batteries are a great built on to pair with solar and to pull out during high demand times especially understanding demand flow and charges at our business.

I live in a rural area and we have a number of multiday outages and people out here have wells to run the electricity of the water. So, we need that community resilience, and I'm sick of hearing my neighbors generators.

Q - Especially urban communities relying on the energy grid in providing essential services and having that backup. conversation around how the grid can work more effectively for people and how they can participate. It empowers them to understand their consumption of energy and it's a great way to talk about climate change. What does revenue stream referring to? For my organization or community?

A - There is a few different potential mechanisms. One is if the business or resident owns the battery and allows PSE to dispatch it during high peak hours, PSE could compensate them for that. Or a business or home allows PSE to use some of their real estate for a battery and PSE would compensate them for using thier space.

We are interested in out low-income community having an alternative or supplemental energy sources if we could have a central lot to store and share out the power when it goes out. around our center we have a lot of low income apartments.

PARTICIPANTS + Icebreaker

How much would it cost to get a battery big enough to run my heat pump when the power goes out?

A lot of the ones that were already asked. but the repairability and maintenance which goes in parallel with their life space and hazards. especially their impact on communities.

Will we be talking about storage for perhaps neighborhood use? Or apartment unit use? Rather than just individual homes too?

Longevity, how long would it last before you need it to recharge?

Extremely interested in battery, how long do they last, what are the size? How do they run? How will you take advantage of it in an energy efficient way?

What battery benefits are most important to you and your community?

2

Same thing as mentioned before about grid reliability. Also, as a nonprofit and our clients having reduced utility bills. The rest are all important as well.

When we have power outages we don't have water and its super important. Generators are really loud and expensive and polluting, and i hate them so i would love to have batteries.

Not sure if we are getting to connection with electric vehicles. but we have a lot of people with portable batteries but when will we get to the point that we can connect your cars to your house.

Q - Interested to understand cost associated with batteries. Does it pay for itself compared to a generator. Does it recycle at the end of its life? i know it'll be quieter but will they be cheaper and more environmentally friendly overall. A - Good question to come back to, especially the thought of adding cost comparison to the generator to overall financial analysis.

Initial question of life cycle of recyclability and maintenance, we don't always have enough. Even with solar the installation and upfront costs. When it comes to carbon its the enumerated cost of life and true cost of things. thats also working with the EPA which is hard to nail down. but the comparison with research of embodied carbon and elements going into manufacturing. Another case is the conversation more on a consumer level about the way they are using power and electricity. Not easily calculated or quantifiable but that piece of the larger implications would be. moving from gas to renewables, cant wrap my head around it.

DISCUSSION QUESTIONS

3

Are there additional benefits to participating in battery programs?



What barriers might keep you from participating in a battery program?

The actual size and location of batteries, proximity to meters. Any permitting and insurance regulations, especially from a business perspective unsure of where to store these, and then indoor outdoor, seasonal things.

administrative, cost, education, outreach, insurance, equity

upfront cost

Safety, there's a level in ensuring its safe in having a worse type of battery in low-income places, making it equitable to store it, to think of solutions, PSE having an equitable path for folks to access it where it's not a lab rat situation but more of a test and learn and low vetted process. trying think of situations.

Other issue with batteries is that if I buy a battery today, next year will be a better one. So I'd rather have PSE own them, and then when they are really great maybe I'll buy them.

In our low-income neighborhood having that conversation with landlords and property managers and seeing how many will come together and share that as a cooperative. being able to get educated like we are now.

What are ways in which these barriers could be addressed?

When we talk about costs, any nonprofit discounts associated.

Batteries that could be purchased and made locally. Clarity about the sourcing, and if they were made and materials came ethically.

Age of homes and facility. Huge piece of energy factors to take into consideration. That is the breadth. Would need to know that is something I could tell their homes is viable or safe, especially for kids, pets, community, and environmental concerns. Lots of studies.

DISCUSSION QUESTIONS

4

What type of ownership models are you interested in?

Ownership

Makes sense to offer both. Seems like PSE owns feels like less of a risk, but owning it becomes your problem. Trying PSE owned first could test and improve the concept.

It depends, I'd want to see it on paper to see what the cost of each would be.

Reason for ownership is it's always more long-term impact and financial burden for folks that are living with limited resources and expansion for monthly bills. if there is a way PSE can help them buy those, and for renters or apartments the cost can go up. I would hope PSE wouldn't offer ownership unless there is a viable service plan and integrates into their systems. Can't imagine it would be immediately available. There are a lot of potential solutions and issues. Ownership has to be further along before people can take on these unknown factors and liabilities.

Hosting PSE-owned batteries

On a high level I'm interested in them, but getting down to the nitty gritty then we'll see, as they say the devil is in the details.

Same what is the differential and details.

What are your energy needs? What are critical areas that need power during outages? Do they rely on generators?

5

Speaking for our city, wastewater treatment plan, and police station have generators. Many residents have generators including people outside city not on city water.

We don't rely on a generator, we make sure our servers do a proper turnover during power outages. Depending on batteries it would be great to run a gas fired furnace or water tank.

Urbanely a lot of important have generators like nursing homes and large multifamily places that allow them to not rely on consistent power. There is a great potential collaboration there with smaller entities. We don't have a generator at our sites. Depending on the viability that is huge resource for a large group of people when there are power outages. there are several trailer park or manufactured homes when you have people needing oxygen or can't tolerate temperature changes, they need power.

Biggest issue is when our power is out, the server is not available, and we have a lot of critical information on our server.

We do not have a generator for our office, but got a grant a few weeks ago to do generators on our homes for adults with development disabilities. So, when their power goes out, they have medical needs that require them to have power at all times. We also have multiple panels now with the help of PSE and grants. That's why we were interested in the batteries, so when we do lose power they don't need a generator as well.

CHALLENGES

Difficult for us to nail down how they can be resolved without knowing what PSE plans to do. This is a great list, but all of the facets to these I would add environmental impact. We talked about empowerment, manufacturing, end of life. When I think about batteries there would have to be a lot of transparency for this process and in participation. I've worked with folks who are working in improving their homes, and that lens ties into showing people how to change their wiring. If I could rank these barriers it would be cost first, then safety and all of the other pieces falling into line.

One of the non-barriers, people are buying electric vehicles, so batteries are out there. Any way you can use that to help, personally I plan to buy an EV and once I buy them, I don't also want to own a battery, I want my car to be my battery.

Concern that if I have a battery for when power goes out, but I allow PSE to drain it when there is a peak on the grid. How will I know that PSE did that. Hard to know when I can use it when the power goes out and when it's been used as a backup for the grid.

Safety concerns are important because we have children under our custody, and we have a huge responsibility to keep them safe

Administrative barriers always exist. We work with the state a lot and they don't give us money to do all the things they ask us. I have to do it as the CEO because I can't ask my staff to do one more thing. I don't know what these barriers will be but when you think about an organization to host batteries and do these 5-6 things, how are you going to support them to do what they need to do?

Capacity is the definite word. Thinking about the factors I mentioned, property management companies, king county housing authority, any place that would benefit, will have a lack of capacity because it's a new thing to bring on. On the institutional side, the schools and sound transit working down here. Their ability to demolish and build, I know King is working on deconstruction methods and looking at life cycle of those elements. As we look at implementing batteries in the system, what is the long-term detrimental impacts as well. We don't have to have a greater impact on those communities that are more marginalized.

Q - How close is PSE from saying this battery is available, this is how it'll get hooked up, this is how much it costs, etc. How close is PSE to this information?

A - We are expecting to launch our first iteration of battery programs this time next year, and we will have that information available towards the end of this year. Then we will have subsequent rounds of expansion and modeling.

6

INFORMATION AND OUTREACH

How could PSE communicate with your organization and broader community?

If PSE for community engagement had the ability to demo a solar panel or battery and how it worked, especially if you can say this battery has the ability to power this or this long. I have no idea about those, and it would be great to understand. If they knew how long it lasts.

We share info with the City through webinars and in person events. Don't get a lot of people in person, but sending a PSE person and we could feature you in a presentation and have chili dinner to show off the battery.

Ditto on languages, even having them translated doesn't work for populations that are illiterate. Having someone that can speak indigenous languages as well. These low-income families won't be able to afford this product unless there was a huge incentive. Spanish, triqui, etc,

There's so many places that you would have to plug into and meet with people. Don't think there is a single answer for our community, there is a line i would have leverage. There's that direct service you can't really undervalue, even incentivizing people in that education. The last focus group we were talking about solar panels, we need things translated and engage communities on a cultural level.

How do you share information? What best practices do you recommend?

We own the homes and go out to get the grants and make it available for our low-income folks to participate, but this would be outside the budget.

We predominantly have Spanish and Vietnamese speakers. but you can also work with us to make that happen. We will support community partnerships.

Getting in person PSE rep. Feels like we don't get paid attention to unless we threatened to secede.

Thank PSE for having translated those flyers which is what we distributed with our community. With our partners it was easy to navigate.

Those without literacy we have resources to have people's questions answered. If you are a renter you need to get the information to talk to the landlord interested. Most of us are probably involved with communities in the same way and strengths and challenges.

Hunter Hassig comes out luckily and we are grateful to have him. Thank you for the big picture and having people who want to support like that.

We've been participating in PSE powerful partnership program, the info sent to us made it far easier to share the words. if you don't tell us what to share the likelihood, we won't be able to share.

Efforts from community having them help with implementation. i just learned about community solar so having accessible key stakeholders for those groups, they can figure out ways to have community action and create an investment. This would be a great way like in community garden buildings, scouts, benches, is a great way to bring community together. in Federal Way we have these painted boxes and that was a great connection to bring environmental awareness and art. Those create access points for low-income communities.

What additional information do you need?

Reducing the upfront costs will make it more intriguing. I looked at the payback when I installed solar. If PSE could draw some cost share perspective with batteries, I'd be interested.

Q - Curious about max amount you would spend. Did we get an idea on what a battery would cost? Even for setting up a battery program for a 4 unit apartment building

A - Average for residential battery is about 10,000\$, for a larger unit it would scale up. More complicated with residential.

Q - We are looking to get some grant to help in the community. If PSE owned them, then what would we as the hosts what would be our obligation financially?

A - Still in the conceptual phase but the two different models we've been considering, if PSE owns it then PSE would pay the business for use of real estate. another model in Vermont is that the customer pays the utility for that backup power.

What kind of financial incentives do you need?

it would be nice to pay for a personal residential fee for guaranteed power backup.

Have no idea how much we'd be able to spend. Would probably have to get a grant.

if upfront cost is too high then only rich people can participate, but if you only reduce the upfront cost and not ongoing it takes a long time to pay back.

QUESTIONS AND COMMENTS

C - Want to know what PSE will continue to do on this. Would want to hear impact studies.

Q - How much power that PSE produces is actually thorough clean energy?

A - i think it's around 25% right now.

Q - is hydro power considered clean energy?

A - Under law yes. Seattle city light has a higher percentage.

Puget Sound Energy Battery Commercial Focus Group

January 30, 2023

PARTICIPANTS

Here to learn more about what batteries have to provide. One of our goals is to reduce our GHG emissions. I'm wondering what it would take to connect our buildings to batteries and what it would take to replace out diesel generators at our facilities.

Would battery backup or green hydrogen generators be a more cost effective and reliable option to replace out gas generators over time?

Biggest question is why we would invest in batteries when there is a lot of embodied energy and environmental impact making batteries when we already have a lot of generators that would be expensive to replace.

One of the biggest fans about owning different renewables. Storage capacity is a huge piece of harnessing energy. We've got structures batteries could be located at as part of the community where we are housing 25 men or women at night and feeding 150 members of the public. It is essential for us to deliver those services to the community in a healthy way. I wonder when programs might roll out these programs to fund at our service locations.

My focus is around residential customers. I haven't made the personal investment in generators although it's interesting we just bought an electric car and thinking about getting a battery instead of a generator, and the role of solar when the power goes out once or twice a year. and then the cost.

How do batteries fit into your organization and community goals?

1

It sounds like the capabilities of these batteries is pretty significant. For PSE to be able to maintain control of that battery - community resiliency. I am interested in that component of it. It is fascinating that we can become a hub for PSE's energy in a different way. Speaking to the community energy resilience.

I feel like the potential opportunity for utility to not make larger investments. It is missing from the list. Having passive batteries seems silly. The thought of an active battery on a daily basis (to offset peak times) and enabling PSE to reduce larger infrastructure and reduce rates for customers. We can be participants and get some revenue, but also, it's a benefit for PSE and all customers because of DER's.

Q - Do you envision it being tied to solar/wind? to maximize it being there?

A - To date, we see people installing batteries as well as solar. PSE does not really have a preference at this point. We see benefits from both systems together and separately.

Q - What is their potential of holding KW hours? I understand the component to prevent surging. I am mind boggled by the whole concept. As a residential property, what is the maximum output to maintain at a facility?

A - They come in 5-6KW modules. People usually have 1-2 of those.

Q - Would there be any preference to feeding that house it is attached to first? How will it be managed when it is owned by PSE?

A - If there is a battery at your facility, it would be interconnected to prioritize the loads of your facility prefers, any extra energy exported to the grid. Might be able to be more customizable.

What battery benefits are most important to you and your community?

2

It is hard to know until we know what PSE is going to roll out. In CA, there have been battery programs for a few years. Example: we have a 0-energy building that is pretty large - when we were going into permitting with PSE, the battery system was going to trigger all of these costs. for us. They were going to treat it as additional to solar. Then it went back, and they changed their approach - to make it easy and incentivize this process.

Q - Incentives to have installation done for batteries? Are they similar to solar for WA state?

A - THE IRA does include batteries as a part of tax incentives. PSE is expecting to launch some sort of incentive program in the next coming years that would be on top of the federal tax credits.

Cleaner source of backup. Our Tribal admin building is backed up by diesel generator - when the power goes out, we depend on that. As a part of achieving our strategic energy goals - having this is of interest to us.

Important to work together especially when it is early on. Will the economics be really worth it? Hard to know at this point.

DISCUSSION QUESTIONS

3

Are there additional benefits to participating in battery programs?

What barriers might keep you from participating in a battery program?

Will we need to source independently?

Cost is the biggest barrier.

Initial cost for sure. Complexity, reliability, batteries knowing which manufacturers are credible with reliable systems. Uncertainty on where to start and who can provide the support for commercial building.

Similar to the solar programs PSE offers info online and far as vetted installers. it would be nice to have some reference. then you got concerns about upcycling or recycling the batteries, What is the future of its longevity and the replacement. Has PSE incorporated a department to do those installs, for me that is PSE owning energy, so how much is PSE going to be involved in the install process and maintenance?

its hard to answer these questions without knowing what PSE might propose.

What are ways in which these barriers could be addressed?

Sometimes I don't want the utility as a residential or commercial customer to tell me how I should work with, but with batteries if PSE can vet beforehand with vendors and suppliers that are reputable. Having the batteries installed, there is a pretty active role for the utility in doing a lot of handiwork for people.

C - With old batteries, we are really struggling with what to do with old battery (hybrid) bus battery packs. Think about what to do with these.
A - Really good feedback and will want to address upfront. Something we are starting to grapple with on demonstration projects.

DISCUSSION QUESTIONS

4

What type of ownership models are you interested in?

Ownership

Removing those barriers for homeowners especially in rural areas we have quite a few power outages.

Q - private ownership at home and PSE owned at our non-profit facilities where I work. If PSE owns, would there be a financial reward? Does PSE prefer the ownership?

A - For these types of programs, PSE wants to be able to offer what customers want. In an ideal world we will have both ownership models depending on financial benefits, but don't think PSE has a preference besides offering multiple options.

Hosting PSE-owned batteries

Hosting would be a great way for the nonprofit to be able to at least make a little money or get neutral on cost for energy.

If we were compensated for hosting PSE owned batteries that would be ideal. That way we wouldn't have to maintain or have upfront costs.

As far as having the belief that these battery suppliers are trusted by PSE would help customers choose their energy usage and ultimately a partnership with PSE

For the county we'd probably want to do PSE hosted first to show us that it works. If it did work then we'd look at the numbers to decide if ownership is better, hosting is a lower risk option.

What are your energy needs? What are critical areas that need power during outages? Do they rely on generators?

5

There is no backup systems in place, we basically go home. Its difficult for the showers, laundry, or lights are out when we have people in the facilities. you risk tons of food, we have huge walk in freezers and coolers, if it were to spoil it could really hurt things. We've got multiple public meals and programs that people are reliant on. I'll have to check with the cafe lead, there might be a facility generator for the coolers. We do have a solar array which PSE helped us fund. We are generating electricity there but to have a backup capacity would be really meaningful.

We have identified buildings that do need powers during power outages such as the community building and essential government services, they currently rely on diesel generators. The casino is also a large user that relies on generators.

Police Department, server room and infrastructure, and EV chargers at City Hall. Other infrastructure sites have needs to operate lift stations, pump stations, etc. We rely on fossil fuel generators for those needs right now OR they are not backed up (EV chargers now).

We have a lot of generators some places are more critical than others. We are putting in a really large battery system on a treatment plant in Discovery Park because we've had trouble with power outages. During storms they even out power quality which is good for the treatment plants. Some facilities could use them in small or big scale that could keep the power on.

CHALLENGES

6

Whether or not our electrical panels would need to be upgraded.

Issue with PSE's control over loads. that's done in some utilities but we dont have that experience. in one of our treatment plants there is concern on PSE having control just because of the critical nature of what we do.

Q - Generators can still serve as a backup to the battery systems?
A - Yes, they can, there are procedures that need to be put in place to ensure generators are put in safely.

Fire? adequate training for facilities staff should they need to do any maintenance.

A lot are tied together. installation concerns are storage space. Once cost upfront happens the main concern is maintenance. How often do you have to replace them. The cost upfront is also around administrative barriers. With organizational buy-in it is those other things, knowing what we are signing up for.

We've seen in the headlines with cybersecurity with energy infrastructure. Not sure if that would be an issue.

There were cell phones causing fires on planes, talking about new technology tests. You read every once in a while, of big batteries going up in flames, and the next generation is said to not do that, but we don't want to be the Guinea pigs.

PARTICIPATION

What additional information do you need?

Q - Will there be preference for who may receive the battery installs through them? Any sort of prioritization?

A - My initial thought is that we have pretty large targets for distributed batteries and we would be looking for more customers without needing to prioritize them. Don't expect any limitations for customers interested in batteries.

Q - What implies no power minimum?

A - What will likely be the case, we would require the size of the battery to not exceed typical load of facility. we want it to be primarily offsetting the load.

Q - Are you looking at this as a load evening way to manage power, because if you could stick it into a battery and have the facility use it during the high load times. Is that part of your calculation?

A - Exactly that is how PSE is hoping to get value from the battery, as well as using it as backup power for the customer. that is the ideal scenario.

Imagine a cap on capacity would be a safety concern.

Good to know why PSE is doing this in a bit of detail. Depending on the program if it seems to be in PSE's best interest then its done better. i think the more that you can explain why this is good for a customer and everybody, This kind of shared benefits, so it doesn't just seem like something PSE is doing to benefit themselves. why is this important for all of us to contribute to this? how is PSE trying to compensate customers?

What kind of financial incentives do you need?

We'll have to see what you roll out, look at economics to see what makes the most sense. I imagine it should be appealing enough to not be a financial risk or barrier.

Allowing those options to the consumer is going to make it advantageous for them to say yes. Making those available would probably be your best outcome.

We have to figure out how you are going to market it. if you want a strong roll out you have to make sure the public is aware you are offering this energy option.

i guess it would come down to what kind of incentives. Too easy for many of us to not do anything.

INFORMATION AND OUTREACH

How could PSE communicate with your organization and broader community?

For our community, high touch would be something of value to roll out program. An example is PSE came out for community engagement, we went to each of those houses to provide guidance and outcomes. If that could be replicated, that would be really valuable.

I could see splintering out customer groups and trying to recruit one of those and think about expanding it. We work with a lot with different governments and other areas is service territories. working closely with someone you've implemented a project with where people get to know their peer organizations and that builds some effectiveness for communicating with someone you respect. On residential scale something similar with city by city.

Q - Are you looking at any pilot programs?

A - We have a very small pilot running with five residents. We might start small with a sector, but we have big targets by 2025. So we will be rolling at full scale really quickly starting next year.

Social media is a great way people can share. if there is an incentive for people to attend a class too. We have a location on site that presents PSE's support. We would offer that setting as a location for meetings and education outreach by PSE, and we could host those activities for us on site. Those folks around here may also have that interest and approaching it with a different perspective with learning. There is also Nextdoor that has a county profile, and I see it has a high readership. not my favorite tool but there is folks that spend a lot of time on it.

How do you share information? What best practices do you recommend?

Rushing out installs could provide attention. Across all the chambers to be marketing them for you.

When it comes down to cost and options, I'm sure you will have a huge interest, once it's all in writing. it's really those access point after that. You are talking about ownership by individuals or by PSE but is there a medium option for someone who want to own it now instead of waiting five years, what does that look meter wise for the user to know they now have 100% control.

Q - Are you assuming you will work across all customer classes?

A - Expecting first roll out to be residential and secondary phase for commercial

C - I would encourage you to be responsive to customers that is not your first priority. Maybe call it an unknown pilot so they can take some data as an example instead of waiting X amount of years.

Beta testing was always a big deal. if you have any sites for us to sign up for happy to volunteer! i've got a neighbor across the street when the power goes down his place has a gas generator. Always know if there is no power if his generator is out. I would like to have my lights on and it be totally silent.

As a nonprofit, we've got an email list of about 5000 into our community and people with Japanese affinity. The best for us is sending out monthly newsletters and events. Having something that is ready to go into a newsletter like some request, since PSE is a member of ours. Of course social media is a big thing too, easy to forward or share. Facebook, instagram, twitter, linkedIn are the big four that most of our folks are on. Having something that we can just cut and paste would be great, if you need feedback where to provide the feedback. if you have something specific you want to roll out where you'd want us to put an event. Bringing in some speakers for clean energy.

Puget Sound Energy Battery Commercial Workshop

March 16, 2023

ICEBREAKER

Coming up right now with the City is what condition does the roof need to be in order to accommodate batteries and their weight to prepare for building repairs.

Biggest takeaway from focus group is how useful these products are for PSE and for demand response to function. The biggest question aside from safety is capacity, is there a limit to how big of a battery you would provide for specific facilities, does it have to do with solar array? Are there advantages or disadvantages to size?

How do I maintain a battery? How big is it? How many years will it last? The big one is if we sign an agreement with PSE to use it for grid support, how much power will that erase from our net metering scorecard?

QUESTIONS

Q - After 10 years do you have to replace the battery?
A - Yes, it is reaching its end of life.

Q - When you say reduce emissions at the site, is using the battery at the site really reducing emissions because it is reducing the need for PSE to send back the power?

A - It's not as straightforward as solar, a couple ways to reduce emissions, if paired with solar it reduced the needs to transport energy. Another way if it's not paired with solar, but you are participating in a PSE program or use the battery using peak times and reload during off-peak - that would help reduce GHG generation during on peak times.

APPLICATION AND INTAKE

A

We are talking about commercial scale, large systems on large buildings.

What type of system could work and what needs to be done/ See whether it is feasible whether to do that in that point. Stating need and community served and PSE can fill in the rest. Resources and design work does not become a differentiating factor.

Applications prioritize based on highly impacted communities, will the storage provide overall grid resiliency to all people or storage to provide backup generation at the site

B

Not an application rather an invitation. automatically enrolled if they live in section 8 housing. Use programs that automatically exist to low income customers. In Langley they have generators but wish they had the batteries. People with the most resources will be the ones to apply so beware.

Some consideration to sights that have backup or not have backup power in place. overlap with disadvantage and vulnerable communities. applications are prioritized based on resilience benefit to disadvantaged communities, slightly broader definition. heating and cooling for seniors or anyone with. Do not like first come first served, provide geographic distribution. Not sure across counties right way to do it but might be easiest. Ensure not all benefits are in king county.

Q - So the battery can be installed as a standalone without a PSE array? resiliency purposes

C

When I think about resiliency, I think about the grid and how some parts of grid have been undercapitalized over time. Tacoma power have taken an overlay of their system and look at areas that have been like this and are prioritizing those areas for engineering work.

Applications are prioritized based on resilience benefit to disadvantaged communities, a slightly broader definition. heating and cooling for seniors or anyone with. Do not like first come first served, provide geographic distribution. Not sure across counties right way to do it but might be easiest. Ensure not all benefits are in king county.

D

Consider medical facilities and emergency resources. Schools should be a priority, secondary level of commercial in general.

Medical facilities, long term care are essential, areas where seniors may live have the potential to fall under those areas.

Some not either or but an "and", high outages but no critical services, that would be a lower priority, increase need for backup power they may have diesel power generators.

SAMPLE PROGRAM ELIGIBILITY

I have concerns with seeing overlap with orgs without access or resources.

Expect that those groups probably experience more outages too.

I recognize that is a critical element for battery storage, but if there is a way for PSE to help solve those issues, it will be double benefits. Or find another way to participate, maybe just battery backup and not grid element.

Our experience as a gov agency, all those would be easy for us to meet.

Scenario B at face value sure as a gov facility, but there needs to be an agreement of allowances for changes for how our roof looks like or oxidant circumstances, which needs to be written in contract. If our staff think it needs to be there for 10 years, that will scare them away. Need to make sure they can do those roof repairs. Need to feel that is not going to be problem. Costs associated to that, is that going to fall on the city or the org.

Everybody has internet issues now, but as gov agency we rely on robust connectivity, and same for larger orgs. But windstorms and other stuff it's going to get everybody. I think gov have longer-term missions and it is easier for them to commit to longer periods of time.

Reliable internet is a new aspect of this. If a facility does meet A/ B/C but have internet issues, is that something PSE might assist in helping them gain to function properly with the program?

I don't know how important it is to PSE, if there is gov buildings or schools, you want to have that ability to launch this partnership with them.

OWNERSHIP AND MAINTENANCE

A Second everything, from city perspective having something with no upfront cost and is not our problem is a huge advantage. also, like option A, as a city also going out for grant sot pay for batteries, maybe it's a bigger one than PSE was thinking about. hope there will be two optoins

Having the transformers on campus, not owned by use but by PSE and a battery would act the same way. The cost and potential Maintenance or failure it falls into a transformer form an asset standpoint.

B B, A, C. Don't have to think about it, we don't have generators, would be great for our facilities to have power when there is outages. We should have PSE own it from day one, would cause confusing if staff changes or owning changes. Built in operations and maintenance strategy and nobody would lose track of that asset.

I'd like to see another row of who removes that end of life. I'd expect in B, PSE would remove it but that could change based on this map. providing staff time to coordinate with PSE to see what is necessary. even if PSE owns and manages the contractor and maintains, there is still investment and time from City. Maintaing these benefits is important for us.

An industrial level battery will probably need minimal infrastructure; the other piece is there could be some risk involved with that. there could be potential liability to sight owner. there is very few orgs that will be able to deal with an end-of-life situation with a battery. would say PSE option of owning and maintiang are huge.

C Q -I feel like we are looking at the potential hazard of it, wondering mechanical parts like automatic will have a core charge as far as upcycling of those components. I was told catching fire is just from a faulty cell, who is ensuring these facilities that are structurally bieng placed, if our office caught fire due to our batteries. Core fees and charges, will you ever be referring that that exchange for batteries?
A - there are some parts that can be reused, not many batteries that have been installed for 10 years but is being discussed to make life cycle more sustainable.

Q-Who would be responsible for the additional facility improvements? PSE or the customer?
A- In scenario A, it would be responsibility of customer. For least scenario it would make sense for PSE to pay for the pad and enclosure.
Comment: If we are doing improvements on the facility to accommodate battery storage device we might prefer to do that work ourselves, but might not be able to pay for for it working together, PSE provides specs and maybe a stipend. simplest way for us to do that. Some agreement about when it would be ready by.

I'm thinking of a large piece of equipment, not a Tesla battery for garages. This probably something the half size of a car.

. The option that I'm missing here is that PSE owns and installs it. These options would be appropriate for me if I'm going to put a smaller battery set up to manage load in home. not robust enough to power a building or campus. that's what im seeing. also falls back into maintaining and tracking.

Most orgs unless they are used to doing these projects won't be able to handle this.

Even if they were owned, they are still going to be property owner improvements. Even with that based on the scope of this, probably still going to be triggering capital planning thresholds. Speaking of things for buildings, campuses and factories, still going to trigger a capital process in most organizations. Any time you start attaching to an owners actual system things get a little touchy. Something of this scale will also have to go through the permitting process.

I was imagining that these were a bunch of telsa power walls, PSE needs to be careful about setting expectations. Could this power an entire building or a few critical circuits, curious to understand the scale PSE is thinking of this battery backup in a given building.

These options look like options for a home installation. For an industrial level installation, there is no option for PSE installing and owning.

PAYMENT

A A gov agency will look to offset within the billing system because you'll be receiving that forever. Imagine as long as there is an accounting in the system that they can go back and audit, its going to come out of same pot of money. Having additional money come in from different directions, will have to go through more.

Use existing accounting systems and use an offset that is accounted for.

B BDCA.

Order based on if they had to be purchased by the city, preference for it to not be. also reduced complexity. all these take time and delay projects. For a city agency, if we are paying for these and owning them it will have to go through capital facilities process, has to go on the list then get funding, and then embed. So scenario A would push us to the beginning of that process and won't be as nimble to respond as opposed if it's coming in the other way. another reason for something like this that an org owned battery as opposed to a PSE owned battery, it will slow down launch and roll out.

C Money is always the preferred method. we can always do ECH, least attractive is visa gift card because we buy houses and that would not be helpful.

For a gov agency, there is a benefit to receive that funding separately too. Can have a dedicated fund to use the funding from this to fund other resilience projects in the community. In that sense the income from a check could make that easier to do. Either way really.

D D,B,A,C. are interchangeable.

I try to narrow it out, everyone will have a different opinion. Having these available is what's important.

D is the simplest, then B if option to purchase ourselves then we are dealing with our own installer as long as PSE is able to get a credit. MOU could work as well and supporting costs. Some orgs might start at scenario A, and maybe not even grants but private financing. It is hard to say without seeing contracts, hard to measure that but keeping it simple is my preference.

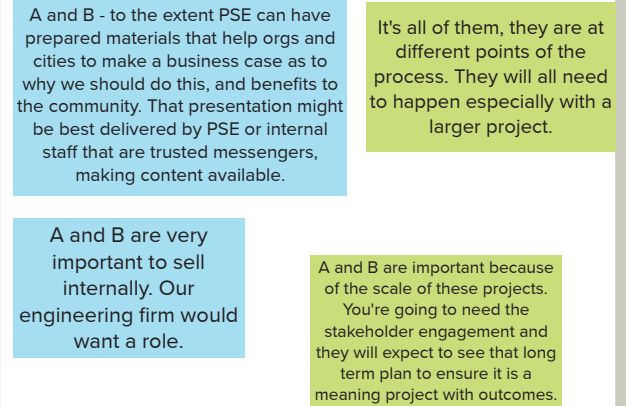
I would let the finance department decide ultimately.

There is a very large distinction between residential an industrial situation. Not even on the same scale.

LOAD MANAGEMENT



ADVISORY SERVICES



Puget Sound Energy Battery Residential Focus Group

February 15, 2023

PARTICIPANTS

21 Participants

What battery benefits are most important to you and your community?

1

Peace of mind of knowing exactly where your power is coming from.

Yes ability to store energy

It helps you store excess electricity that you can use when your solar panels aren't generating enough energy, and gives you more options for how to power your home.

The energy you're consuming will be 100% renewable, unlike power sourced from utility companies that still rely on fossil fuels.

Environmental friendly

During an outage, I think batteries are the best to use based on their reliability.

Provide your own backup power during power outages.

Energy Independence

Energy independence Ability to store energy when the sun goes down Increased reliability during outage events

Reliability is a Thing, Cause There is No Promised 24hour Power Supply, so when There is an outage, Batteries Come in

Great power back up incase of any outage

My grandson is medically complexed and having that extra reliability would be good for his medical equipment

DISCUSSION QUESTIONS

3

What barriers might keep you from participating in a battery program?

Information barrier can hinder me from participating

Capital Costs

Costs

High startup costs

Environmental concerns

Information about the long term Return on Investment

Lack of capital investment

Replenishing Duration

Limited number of full discharge Cycles

Lack of enough information and awareness

Lack of information

Financial constraints

Lack of awareness of the benefits of renewable energy, disruption of seascape.

The sustainability of the batteries, analysis are not 100% correct, so sustainability should be a main issue of the adoption

Low income households

Costs and definitely renting versus owning

Energy density, power density, charging time, life, cost, and sustainability.

Lack of maintenance, I want to be able to charge the battery the correct way

Lack of information and the cost can be a barrier

What interests you most about batteries?

2

I am not as concerned with carbon footprint if it doesn't make sense in other areas....

Energy independence allows to decide how their resources are allocated.

Even storage batteries are environmentally friendly and free of emissions. For this reason, going green with solar power systems and solar batteries is highly favoured in carbon footprint reduction.

The idea of having greater reliability and great incentives are worth it to me. If I am not getting those then the carbon footprint is not as big of an incentive to me

Solar batteries offer a way to get even more value out of your solar panels. Whether you have already installed a solar array or are planning to do so soon, solar power battery energy storage can be added onto your system to increase your energy independence and energy security by giving you up to 24 hours of solar power every day. As we like to say, solar batteries allow you to 'own your power' even more than you already can with solar panels.

What are your energy needs? What are critical areas that need power during outages? Do you currently rely on generators?

4

Air conditioning and heating

Water heating

I have a generator in case of power shortage, at least light and air conditioning must be made available.

I do not have a generator... I have been fortunate that I don't lose power a lot of times... however when it happens it is crucial to get it back up with my grandsons needs

heat is major for me... because when I get cold my medical issues have extreme flare ups

Home security system lighting, refrigerator, heating system

Vacuum cleaner, cloth ironing, dish washer

QUESTIONS AND COMMENTS

What size do people need and can the battery be recycled?

What happens to the battery life when it is overcharged?

Do solar battery system offer resilience?

Solar battery systems come with a dashboard, which ought to display current and historical information about battery levels so how do I control the system

When that extra energy is sent to neighbors is that when the customer producing the solar energy would get compensated?

Q -What's the warranty
A - Around 10 years

Q- What are the downsides and risks of solar batteries?
A- They are pretty expensive at \$15,000. There are tax credits available from the federal government and PSE is rolling out programs to bring cost down. There is not too many risk involved again only large batteries with fire risk.

Q- Is there health dangers with Lithium batteries around customers?
A - Haven't heard of any. One concern with larger batteries is there could be a fire safety concern, but with residential batteries that is not a concern.

Q- DC or AC powered?
A - lithium ion more commercially available, batteries themselves are DC powered but our homes are AC-powered, and there is a converter in the home that can make that work

The different battery manufacturers have different control systems, but they typically have several different options for controlling when to charge and discharge the battery (for example, charge when there is excess solar, discharge when the sun goes down)

At home, the batteries are typically connected to electrical appliances so that the appliances can still receive power if the power goes down. For example, utilities can charge customers different rates at different times of the day.

There are two basic types of solar batteries: lead-acid and lithium ion which is preferable?

Which ownership models are you interested in participating in?

5

I believe that PSE is also testing battery storage in a variety of local scenarios to determine the best ways they can potentially enhance the grid and meet our customers' unique energy needs.

I preferred owning one because it's actually a back up resource for me.

I would prefer owning one

If PSE is responsible for the maintenance that would reduce the barrier for those who are disabled or low income so that is great

Owning one is actually preferable for me

I'd prefer that I host a battery that PSE owns

I'd prefer to own this way. I can have full control over the battery and also help reduce on any long term costs

I'll prefer to own a battery because I'll get to learn about the battery

I preferred the hosting because of the reasons I listed above... disabled unable to maintain and low income so eligible to get some benefit in spite of financial challenges

Owning one would be a bit easier in terms of maintenance and cost

I will own it since I will meet the requirements of maintaining it

Q - If we hosted the battery then would we be responsible for the maintenance?
A - PSE would be responsible for the maintenance for PSE-owned batteries.

CHALLENGES

6

I'm very much concerned about the battery malfunctioning when I need it the most...

Am more concerned if the battery wouldn't work if I need it.

When the power goes out and you have solar batteries, it might not be quite as simple as just cruising ahead like nothing has happened, especially if the power goes out at night.

If you try to continue powering all your home systems — including heat, AC, water heater, and any other big energy guzzlers — your batteries may run out of stored energy sooner than you'd like.

PARTICIPATION

What additional information do you need?

Having a video guide of what it looks like from beginning to end... the whole process it would be a great PSA

Additional information on energy usage home and building specifications and financial information including costs and ROI. Installation and maintenance information

Testimonies of the benefits others have experienced

How do solar batteries save money?

What to look for when shopping for solar power battery energy storage

What kinds of financial incentives do you need?

I think with financial incentives you should show the upfront incentives but then definitely long term... how it is beneficial over 2-5-10yrs

Reducing the net cost of solar power systems with rebates and tax benefits is one incentive option.

Financial returns and lower monthly utility bills are major incentives.

Provide incentives to help reduce the costs of storage to consumers. Residential storage batteries, like Powerwall, reduce strain on the grid

Guaranteed loan financing and grant funding

INFORMATION AND OUTREACH

8

How would you like to learn more about future demand response programs?

I'll prefer Social media for easy access by all interested participants

Social media, Most people spent most of their time on social media sites

Hosting workshops with incentives as well

Flyers through the schools, Community events like Lacey Fun Fair... those things... for education and awareness and then for the funding... sharing the fact that it can be achievable for segment of the community who wouldn't normally believe it is attainable

Social media also community events

Social Media is the best. Both young and elderly are all on it.

Networking through local agencies, landlords, and programs

Social media, community events

Newsletters will really be a easy one to access, we're all almost on our social medias 24/7

Having programs like this to create awareness

Scholarships, hosting focus group like this

Social media would be easy to access by more participants

Puget Sound Energy Battery Residential Workshop

March 16, 2023

INTRODUCTIONS

11
participants
total

QUESTIONS AND COMMENTS

Are these
batteries
environmentally
friendly?

We have a lot of energy
providers and most of them
are giving us green energy
that is environmentally
friendly, does this do the
same thing and why should
people enroll for this
instead of the services that
are presently offered?

Number of customers that are
enrolled is good but would also
like to see the difference of why
people use this, if I choose this
battery would be more
interesting to see why they are
using it, I could change my plan
because if feel like I am helping
save the world even if it's just
one percent.

Is the battery going
to be replaced by
the company or will
we be responsible
for the new one?

APPLICATION & INTAKE

A ACDB does it for me
ABDC
A and C
ADBC
Scenario A is ok, because if you're early you will be served quickly. It would be unfair to make it first and be delayed, and someone else would be served before me.
Scenario A gives priority and no one is cheated

B No comments

D D C A
Scenario D is the most equitable, because regions with the major outages should be considered first

C Scenario C is the least equitable. You can't base it on the income status, it disadvantages the low income persons
C D B A
I think prioritizing lower income gives them the opportunity because they are not as likely to respond to a request and more likely to see it as not for them. A lot of people in WA state with lots of outages, putting them second I think maybe number 1 after that. My biggest thing is first come targets a specific population.

First come first served is likely to draw in people who are more advantaged because they would get the information early and act on it early.

SAMPLE PROGRAM ELIGIBILITY

A BA, Scenario A seems difficult
The first one is a big deal, most people have landlord difficulties.
Requirement A is a bit difficult in the sense that it assumes you own a house or building. I cannot present land ownership document and my landlord might not have an ID. Does that mean I would be left out?

B Yes I would, though participating in the program for ten years is quite a task
We should also keep in mind that some people may only stay for a few months, make it available for months would go a long way.
I kind of agree with everyone except with second option of 10 years, its quite a long time for one to choose to live in a certain apartment, thats a big task.

10 years is a lot of ask, whether you are a renter or home owner. It's a long time
The second is a bit too much. I don't plan to rent an apartment for 10 years. How do I participate if I don't know how long I will stay. There should be more flexibility if I am going to move in a couple of years. In my new home I should be able to get access to it.

OWNERSHIP AND MAINTENANCE

A I prefer A then C, lastly B...I mean I would love to own the battery however the cost is high
A is convenient
I prefer A more, for me \$5000 is a lot of money but having this more myself I could sell or rent it out and could make more money. the 6000\$ is too much money, I know it doesn't seem like a lot of a list, but way too much loss for me, prefer to pay all at once. that way save more income with battery at a time, if I were to rent it or rehire it I would be able to sell it.

B Option B looks more comfortable. BAC
Option B sounds good. BCA
Option B because all I have to do is get the battery and do not need to pay for installation and internet. BCA. For example I might decide to leave anytime, depending.

The upfront cost is a little intimidating but not too much.
Even if I bought the battery I am not comfortable with the installment plan, I want to own the battery but would want PSE to manage it because I would feel more comfortable they would do a great job.

C CAB
Option C, A, B.
The immediate feedback of 20\$ a month off is cool but not having to maintain it for all that time by myself. But it might be worth it to rent to own and transfer ownership after it is paid for.
C is much better for me personally because it would give me time to save up whatever I can so I can pay what is being transferred for me.

C is more like they are giving you time to save up and then pay. If you look at option C, it is related or more like option B where you are renting. Looks like PSE does everything for you, then you start paying more after 10 years, then the installation, making it easier for you so you can save up to pay. C is much better for me personally because it would give me time to save up whatever I can so I can pay what is being transferred for me.

Q - About the 10 years plan, lets assume I stay in a rented apartment and I got the battery and I've been there for let's say 3-4 years and choose to relocate, when I move to the new location do I start all over again or I would have to continue, will the battery move with me?

A - We haven't gotten to that level of detail. These batteries are hardwired by an electrician, probably would not move with you if you move. But your question of when the clock resets is something we will take into consideration.

LOAD MANAGEMENT

I want more battery reserve any day so I chose other, probably 80%

I went for other, I feel like there's a satisfaction you have something somewhere waiting. I feel 50% is normally balanced but it feels like its not balanced. When you have at least 70% in case of an emergency you can go for it.

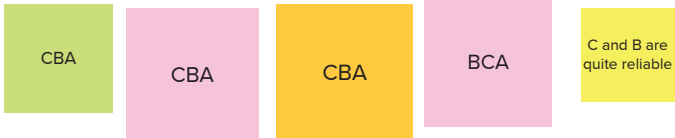
I picked 20% because power outages are not a huge thing where I am at.

I see the program as a community thing not just a me thing so part of the point of PSE is being able to serve underserved populations with access to my batteries, so I would only take what I need. It's a community effort for when the grid is being overused or other people don't have power.

I would be more interested in knowing if 50% gives you five days worth of supplement battery that would run a minimum amount of things, I would like more information.

It's a hot shot because I want to know what does 20% equal in terms of time.

I chose 50% because it was one of the highest options, in case of outage i want to feel safe and in control knowing that my battery will last me a couple of days or week if i wont know how long an outage will be out. 50% seems fair enough and its something that is very normal for me to be able to see 50% and give out 50%. i would not go for 20% that is way too low, for me i would feel what is the point of having a battery if i have to give away 20%.



Scenario 3, how much is drained from this battery and what i am being compensated it si worth it. if they use it and we dont know how much it uses, does it match the use? it would be nice to know how much is being used and if we are being compensated by this usage amounth or blindly.

I would go option B and C, A is something I would not even want to consider. If i own the battery it would be unfair to pay the 5000\$ and for you to use the battery 1000 times a year feels unfair. Option B I feel more in control and it doesn't matter if I own or rent. I feel like it is my decision and I can opt out if it doesn't sit well with me. Option C could be the best, having a plan of when it will be used the most. knowing that during a time of the day i am aware of what is going on and can change at any point in time. prefer flexibility of changing settings at preferred time.

PAYMENT

A ABCD ADCB

ABCD - Credit on my bill is accessible, gift card is also readily useable but I wouldn't go for a check

ACBD

A, D, B, C, PSE does most of the work for you here like the location, most of us would find it difficult that state or federal or private financing, but if PSE would od that they have done 50% of the job so you are left with the other 50% so it quite easier.

Easier to go from comforts of your home to get mail and get gift card. easy to assess and process. If not that then scenario A to receive credit on bill. Then scenario D and scenario C is last option.

A.D.C.B. because A, I need a way to get support it is a big help. D I like because of the rebate after 60 days, it is a welcoming an idea and something I am interested in, but would like to know what the rebate would be like.

B BCDA BADC

2431. An electronic gift card in that case is the best ,then bank, check in that order

BADC. B is fast and reliable

A gift card is easily accessible. I wouldn't go for a check... The process is stressed

C CDBA

All the scenarios are quite accessible except scenario C which needs a lot of processes since it's a check.

D

I would prefer a gift card and electronic form that is mailed to me because it is accessible and faster for me. Bank deposits are also a good idea, its something I would go for. Also having flexibility of changing my option that next time. i would not go for a check because too much time to cash the check. i would not go for any stressfulness.

I would not go for a check because too much time to cash the check. I would not go for any stressfulness.

EDUCATION AND OUTREACH

A Scenario A also good for me getting to see them up close and gives me a physcial view of what i am getting into which i love.

C Scenario C first because receiving materials entirely from PSE is a good start. Include information on how to use them, it's more like a guide. Then A,D,B

D I also like Scenario D because if something goes wrong I can point my fingers back on them. Receiving education materials is very reliable if i have nay problems or something goes wrong, ill know it wasn't my fault.

Also getting it out there in different languages so I can choose which ones I will understand better.

I don't know if housing providers are trustworthy, not sure if I would take advice form someone who doesn't own one.

E EADBC ECDBA

ECBDA

My preferred is scenario E, because I get a free phone helpline if I have any questions and have something a professional can explain.

I like the fact that they can assist with a mistake, it's coming from a reliable source.

APPENDIX C: SOLAR ENGAGEMENT MURAL BOARDS

See next page.

Puget Sound Energy Solar Commercial Focus Group

INTRODUCTION

January 17, 2023

INTRODUCTIONS + ICEBREAKER

Introduce yourself, share your organization, and icebreaker answer.

PARTICIPANTS

embarking as district a focus on education in sustainability and this ties right into that

vision of a just transition and the future that it holds.

Taking advantage of mother nature's resources she's giving us and putting it to work.

Personal interest in putting solar on my house. decrease dependence on gas and electricity. as a society we are focused on educating people on STGs. 2023 is an opportunity to pass along sustainable energy messages. This is once a quarter on our events.

WHY ARE YOU INTERESTED IN SOLAR?

1

Along same lines, on personal basis we purchased an EV cost. transfer of cost even if it is less. other ways to generate electricity or offset energy costs.

Similar to everyone. from energy resilience side, opportunity for communities to harness natural resources and potentially create more power than you are using. years ago, we had coal and lumber and now solar is something we need to take advantage of locally and find ways to generate power clean and sustainable.

Reduce any kind of ongoing costs, budget reductions we can turn back to student programs.

Our City has greenhouse gas reduction goals; we'd like to see a decrease in our total emissions and reduce costs. our growing population we'd want to serve our future populations and meet need.

WHAT SOLAR BENEFITS ARE MOST IMPORTANT TO YOU AND YOUR COMMUNITY?

2

Our City has greenhouse gas targets, I'm the sustainability coordinator so I will harness on that. before PSE reaches net zero, we want to be ahead of schedule.

I think everyone has been saying the cost and carbon emissions is climate based. there are always incentives with saving money.

Not directly tied but we have some air quality impacts and thinking about overburdened communities and having less combustion fuels and solar has less of that side effect.

Tied to energy independence. for emergency response vehicles that we are turning electric having solar on site will allow us to maintain response times in the event of a power outage.

DISCUSSION QUESTIONS

3

Are there additional benefits to participating in solar programs?

What barriers might keep you from participating in a solar program?

When we installed our solar panels, we were capped on the amount, but we would've installed more. one barrier right away, our goal is to get to as close to net neutral with our demand, but we only had 50%.

Residential standpoint, I understand there is laws preventing it. sometimes the barriers of getting approved to put something on your house. another one is trying to do solar for our residents and the issue was the liability given the fact there were big trees nearby. the amount of solar you would get would not justify the cost.

Upfront cost huge burden to us. receiving state funding would convert some of our systems to solar. a

We depend on grants so upfront cost is a barrier.

What are ways in which these barriers could be addressed?

Examples of participation. leasing roof space, we have some buildings on built yet. it's a catch 22 for us for feeling like we can afford or have solar on building and figuring out commitments before building. We have a building that we are already overbudget and can't afford to put solar. We have no way of knowing until its actually built.

Q: is the solar industry seeing more efficiency per panel. is there a forecast for when panels pay for themselves, almost a lower cost effect of install price.
A: don't have a lot of details on payback period. will take as a follow-up.

For residents being able to have some information so we can DIY it in terms of determining if solar makes sense. I've got an east facing roof is it enough to justify that by 3pm my roof is history from solar perspective. Do you need to have direct solar? Regarding your comment with cloudy days, maybe what estimates we had before don't apply because of new technology. being able to figure it out ourselves as opposed to going to an expert.

Similar to LED streetlights and PSE converts them and on the bill for maintenance, that would be a model the city would be interested in. so we can mitigate upfront cost. our maintenance staff would probably be up in arms if I put too much solar. cleaning the panels and making sure they're working. so, maintenance could be an additional on bill.

Would be interesting to see initial power generated until the payback has been had. it could be from a gov or business perspective. the first couple years the homeowner could have panels on their roof paying for others. I just think of batteries have gotten bigger.

DISCUSSION QUESTIONS

What type of solar program would you be excited to participate in?

Ground Solar

More undecided. not as interested. if there is land and have an opportunity to put just solar panels. It's just solar panels and can be a park. to me is sounds like you want to take advantage of more roofs. Never been aesthetically interested in panels on ground.

Aesthetically won't look good on school grounds and we have kids here, so we need to keep them safely out. I know it's easier to maintain but may not be feasible.

We are very forested and have some affordable housing needs so probably can't get support using our land as one purpose. Agro-voltaics may be a good approach especially Thurston County having a lot of rural land. I would like to see solar on agricultural lands were those uses overlap onto rooftop solar.

Rooftop Solar

Selected all. even ground solar from a residential standpoint. I have great garden with lots of sunshine, if I can't use it on the western side of my roof maybe the eastern side of the ground could augment what I put on my roof.

Solar + Battery

Intriguing for us. we've had power outages we can maintain a little bit but in the middle of winter we don't have a backup generator. need auxiliary lighting in our classroom or centralized heating. our outages are usually under six hours but if its cold the buildings get cold really fast. even space heaters in classrooms we'd be interested.

I'd rather do this than have a natural gas, propane generator that would be ideal.

Preferring this as opposed to fossil fuels. the city of Olympia may be getting something with the port.

Community Solar

Could take advantage of solar on somebody else roof. I know some won't have same barriers to entry.

Vehicle electrification and emergency response

We have a community-based community solar and am confused on how it interfaces with PSE or doesn't. so didn't I select this one.

Very curious to do this. whether it will save money or will be another hassle to deal with another group of folks. bad enough we deal with our residential management group already. Would just be another thing to deal with.

QUESTIONS AND COMMENTS



Q: is there any boundaries on what small scale systems are?

A: 5megawatts and anything connecting to homes and businesses

Solar trees: <https://solarnow.fpl.com/>

Q: does pse actually install the solar panels? I've used a third party

A: thats correct, going into the future we will rely on our solar installer partners to do the work.

Q: i don't fully understand how solar increases grid reliability, I'm all about that to not overload grid. could you expand on that?

A: the leaps happen when solar is paired with battery, you can have a micro-griding potential to store on site. being able to have sources of generation on distribution system can reduce the need to build infrastructure and have a diverse way of providing resources.

CHALLENGES

7

We don't have any requirements currently but in the future a challenge is getting ideally a BIPOC owned company doing the installation and getting local requirements, as highly preferred. Also, I put insufficient space and sunlight because lots of our properties have tree conflicts, and the public will want to just transition but not at the sake of trees.

Which ownership models are you interested in?

6

Q: I selected everything. Question is obviously maintenance is important, but not sure if these systems are too small for renewable energy credits and who gets to claim emission reduction would be important for us.

A: That's been a big topic of discussion. i would like to hear your ideal set up.

Q: If we could claim the recs and emissions reductions. We don't have to pay or maintain them. i know that is for an ideal world.

We don't want to take on more assets than we have to. we don't have trained solar technicians or nearby. It would be another thing to maintain in addition to root system, plumbing, etc. I selected the lease and renting, but its TBH and would have to make sure maintenance cost and ongoing repair is not at the school districts expense.

A lot of it depends on how they are set up. Don't see much of a difference for lease payment. unless you're getting some rebate on your electricity generated. renting is probably least attractive but if it's set up to be an incentive it may work. It's weird that renting something that is a permanent fixture, like what if i want to stop renting does PSE just take it away? It seems like more permanent time commitment. What's the difference between that and ownership if you finance but and eventually its yours. The renting would be great if there were significant technology improvements.

Q: Renting solar panels. Would that be renting, and PSE maintains?

A: Still working on it. Customer of PSE owns panels up front and maintains them or PSE maintains them and customer rents and will transfer ownership.

I picked ownership and hosting. I'd be ok with renting too. The number one is ownership makes the most sense if you can afford it.

INFORMATION AND OUTREACH

8

How could PSE communicate with your organization and broader community?

We do an event on various topics whether business, trade, clean energy. that's one way is putting up some particular events either in person or online. We have a database of about 5,000 in our email blast that covers several businesses from Boeing to local restaurants.

That's how we pass information. We also do things on our website. beyond my personal interest in solar it has been a topic. We did a clean energy event 6-7 years ago that didn't get much play. Seems to be different now with more interested.

I think people need to see it feel it and touch it. I think people need to see it in action. Hypothetical and things are great but unless you can walk up to it and look at it and understand it, it won't get much traction.

I completely agree, I think PSE does a great job of making people aware of programs and incentives that are available. I've always felt that they've pushed info down rather than homeowners and businesses having to search for it. If you can explain to people what every ten panels are installed what does that save? does that power a house a washer? how much energy do they really draw? Tie it to something tangible will be more meaningful for people.

I agree with everyone else, especially having the scale in Leimans terms. In Florida they did solar trees to bring awareness for solar being useful and something we can do in a lot of spaces. just to have more visibility of solar in places people go. Not sure if good for community engagement but would be generate some electricity!

PARTICIPATION

8

What additional information do you need?

We need to see the dollar figures. all of the above: upfront, ongoing, potential savings, options for payment. Can't take this to my board until some of those logistics come our way,

Anything with the battery side of solar and the ability to add to existing solar.

Any contract terms would be helpful to see. otherwise, wouldn't be able to do it.

Financials and all the factors make a big difference. im on the board of another organization that owns a building in Seattle as well that could use some help from energy cost perspective as well. Non-profits are always as anybody here are looking at ways to save or make money.

What kind of financial incentives do you need?

City would prefer to not do rebates for a cost share approach. Ideally if we could have both. Don't always have a lot of money to put upfront even with the promise of the rebate. For instance, for our sustainability program, I have \$25,000 a year, I can't wait for a rebate to come in to make progress.

If we can afford the upfront cost and ongoing, for us a lot it is the education part for the kids. our mission is not to save money but to educate the kids. if there was a way to introduce it to our kids that would be great.

Making it easy is what everyone is talking about either dealing with budget issues or upfront costs. much easier to pay as you go.

Puget Sound Energy Solar Commercial Focus Group

INTRODUCTION

January 17, 2023

INTRODUCTIONS + ICEBREAKER

Introduce yourself, share your organization, and icebreaker answer.

PARTICIPANTS

Built environment as part of our energy source. Using existing built cities and buildings to have solar on roofs to be multi-purpose and be part of generating system.

Works in waste reduction. library has a circular economy focus. also center on equity. would like to know points of access for folks in marginalized communities. energy efficiency is top tier, but we have a lot of space we can utilize better and getting it to folks that need it.

1 WHY ARE YOU INTERESTED IN SOLAR?

I would have chosen everything but I focused on top two of comm energy resilience and climate change. Infrastructure to energy grids is pretty fragile. Climate change is a huge mountain to undertake. solar as a renewable resource the amangement and distribution of it are logistical maneuvers. but what gets lost along the way is distribution. also reducing energy bills is great to focus on for folks who see that as a challenge. there was a pie analogy of taking a smaller piece of pie. ultimate goal of all the efforts. we cant change our usage too quickly wvith energy consumption but we can be more sustainable. Reducing energy consumption is parallel to that too.

Hard not to think all of the above. another thing that is important to me is economic activity in keeping and creating jobs and having the community more involved form a business perspective. keeping those jobs local. building provides jobs and a lot of solar installers are growing. in terms of energy bills its really important and drives a lot of people's actions. you are going to have some early adopters that don't think about the economics but eventually it'll be more important for people overall.

DISCUSSION QUESTIONS

What barriers might keep you from participating in a solar program?

A huge barrier we've had is net metering threshold. we've had to downsize and creatively design in the county because of the threshold. once that changes, we can have more potential in the valley with warehouses installing solar roofs. Not sure if legislation will change this in this session. I've got two or three buildings that could be net zero but I've had to downsize. the reason for that is that the economics don't work. I could have a net zero building, but I'd be paying PSE 2 or 3 cents per kilowatt hour. if someone could buy the panels or contract with PSE there will be a lot more confidence and trust PSE. Some will be more skeptical coming to their house, but whether someone wants to buy it on their own or third party, all those options would be great to be available for customers.

Barrier of interconnection of PSE with infrastructure. making that easier for customers. We've had threats of barriers from PSE of high infrastructure costs.

As a homeowner, I need a very easy "here is how you do it", integrate into bill, this is going to be the impact initial embodied carbon, and what the offset is over time. as a family we would need to plan and make sure do we need to have trees removed or do anything to our roofs. thinking of it holistically, and for my neighbor who doesn't speak English or know how these systems work or live in a multi-family home and have no idea if their apartment building could benefit from this. Ironically I used to run one of the warehouses in Napa Valley, being a third party running that, they are going to need to be told or have a lot of support and rationalizations with their bills and offsets as to why they should do it. There are small businesses that would want to see a quicker benefit and do not have that upfront capitol. having the support across the board maybe from legislature or PSE and offset those costs. For culture it needs to be seen and have local installers that are friends or known and making it cost effective for them to join into. As far as renters, maintenance and long-term support to maintain these. Those maxes you can reach and what it looks like when cells are damaged. if you are renting what is the turnaround time to repair and how it effects people. this is thinking A to Z and mitigating those problems.

What are ways in which these barriers could be addressed?

How PSE sets up its website. I was looking at another utility's website it was okay but could be better for best design for website to get into contact with contractors. having a table where they do residential or commercial projects. when you are thinking what people want, getting feedback from people who have done lar and those that are interested. people having simple access to website when venturing into what they can do. Also digging into challenges of community solar for how to get solar for people without roofs.

WHAT SOLAR BENEFITS ARE MOST IMPORTANT TO YOU AND YOUR COMMUNITY?

I was cheering. People having an understanding of these systems. also habit forming or changing habits. Ideas with a circular economy. there needs to be a better understanding of folks consuming electricity and how it impacts the system. I do think there will be a large impact of solar being widely produced on reduction of carbon emissions. in the habit forming changes we need to have relative working in renewable energy and know people in their community for them to embrace it. we have generations of coal miners and we need the next generation for solar installers. there is so much potential for youth to get engaged. there is so much a part of the cultural shift. i didn't choose increase reliability because in our region it's not as much of an issue. that's the priorities for the community at large.

We are in the midst of getting a contract for a solar installer. they are super busy right now with inflation reduction act. we have this program in the county to get youth especially from underserved communities involved in green jobs. when we get this solar installer maybe we can have some people shadowing for people looking for jobs. the ability to keep this very local and almost personal in some ways. in community participation, we assume Utilities are getting taken care of but the more we participate and are aware of them we used them more widely. during heavy rain events, the region have surface water mixed with sewage and overwhelm the treatment system. its only an issue because people are flushing their toilets. what if we had something where we can tell people to not flush their toilets for the next two hours. Some people have never thought about that. its things like that as we try to educate people we would have less environmental impact and understand these systems better. When we have coal and natural gas resources its more responsible the more collective, we get. I'm happy that within Washington the utilities are going to be forced to be better off and distributive solar can bring that change quicker.

DISCUSSION QUESTIONS

What type of solar program would you be excited to participate in?

Ground Solar

We just did a ground solar in one of our transfer stations. It's hard to think in King County of solar being the best land use. You've got open space, development, and potential farmland, but there could be some places down the Columbia River, but for me our landfills are closed landfills as having it as a site, but the economics weren't quite working out.

Won't be conducive in urban areas where we are already using as much space as possible. minimize competition for land and space.

Opportunities in Agricultural lands with farmers being able to continue farming with renewable power. Thinking about where the sun is moving to generate that energy. they are also reducing their water usage with that.

Rooftop Solar

The land we have we want to reserve for residential areas for the expected growth of the region. one example is multi-family design.

Solar + Battery

I didn't put that one there because to me the grid is the battery. I am interested in what PSE is able to roll out for batteries and how that could help the customer or community to have this battery as the offset generation. I could see getting there but not right now. it would be interesting to see opportunities for community solar.

Issues that potential arise from having big batteries in residential homes and communities. Excited about all of them but cautious optimism for each as well.

Cost will be an issue. we've been looking at opportunities, but the barrier is the meters on reservation, because we are so rural, we don't expect to have meters upgraded until later this year for 15-minute increments. It would be exciting to see those numbers.

For rural communities, that independent off grid system may be more important to those living more remotely.

Community Solar

Understand more and thinking about offsetting those higher surface area places like those Kent warehouses. where residential areas and multifamily homes making that a shared investment. even local governments and how they regulate things and be involved in the system. community centers, city institutional space that take up space but affect the cities. especially federal way being a transitional place. people going to and from Seattle and they aren't considered part of the communities in Tacoma or Seattle. how PSE is approaching these solar programs they need to be mindful of those barriers. As a homeowner of the privilege of having rooftop as natural. but for those with needing to fix their roofs, addressing those barriers.

Mix of these programs, our region would like to participate more broadly.

The nation has a strategic community plan to reduce greenhouse gases. The government is doing that and some of our residents. Solar district cup in competition for community solar which we are excited about.

QUESTIONS AND COMMENTS

Q: and I guess bandwidth is with installers.

A: from a personal perspective, lack of bandwidth.

Comment: like adding another thing to individual bandwidth.

I appreciate you listening and willingness to jump in and have these DER programs. I am hopeful the state will increase the net metering program.

Q: question to clarify, when you mean administrative approval is it regarding one entity or all entities.

A: that originally came up more from non-profits perspective of needing to hit requirements for a grant. so administrative hoops that need to be jumped through to meet those requirements. but any kind of administrative process that you see, it doesn't need to be that narrow.

Q: what would be the difference with leasing and renting?

A: a leased solar panel is PSE would own the panel and PSE would pay the customer for access to their roof. the other way around the customer is paying PSE is rent the solar panel and would ultimately own it. It's a rent to own model.

Which ownership models are you interested in?

6

I chose hosting PSE and purchasing shares. working in circular shared economy i think community investment is better than outright ownership. i think maintenance will be a big threshold for folks. there is going to be a need to grow market abilities, there could be an ongoing conversation piece for how these are perceived and enrolled in certain communities. there is going to be a threshold to make sure these will be integrated in each household. I know the temperability of batteries and the science is maybe not where it should be to have in every home. thinking about lithium-ion batteries and them being broken into and that being a market for drugs. so much on my mind going into this. PSE would have more of that responsibility.

We want all options available for people. I do wonder, community solar has changed and it's not clear if a private or public entity other than a utility can do a solar project. I think whether it requires a change from legislation, communities can come together. Also missing are third party owners that is not PSE owned. thinking about how PSE can support that without pushing those people out. Not sure who is doing this locally but I'm guessing with the IRA there will be more activity with companies trying to do lease agreements. PSE needs to make sure customers are understanding pros and cons, so they don't feel like they are getting swindled or getting pushed out.

CHALLENGES

7

These are all barriers and there are more. for me solar needs to be for someone who doesn't care about climate change and making it make sense for them. how is PSE doing marketing and educating people. in terms of lack of direct sunlight and insufficient cost savings, examples of people who've made the economics work. the best way to you as experts or entities people would respect. some other things like appealing are a personal opinion and some people boast of having panels. with reliability we've have problems with our systems going down even though they promised to work/ If you do this right you don't have to worry about it. even for maintenance we have some issues with transfer stations, more the most part the rain cleans the solar panels. i think the economics will overcome a lot of the other barriers. it's been proven that it may not be as good as solar panel in Tucson but the economics still work.

i could have chosen all of the above. the biggest issues could be just about any of these things. the reliability is my biggest concern and the lack of infrastructure that already exists to support this. that goes hand in hand with bandwidth and barriers for administrative threshold, even convincing people that climate change exists. non-profits and orgs that would need to integrate how that is handled with government and every level that comes up. I don't understand fully the science, but the direct sunlight issue doesn't seem to be much of a problem, and the space is more relative to the models you showed.

PARTICIPATION

8

I don't think it really matters. I think in our county if our panels will benefit us economically, we should always be doing it. I don't think a lot of residential people will be as convinced; you might want to land in a 7–10-year payback to make it appealing. I'm not aware with PSE incentivizing people to install solar with the IRA but could let us know. You could justify having incentives on par with energy efficiency.

INFORMATION AND OUTREACH

How could PSE communicate with your organization and broader community?

Through existing channel PSE uses for marketing. you are going to have different customers but I think the more you have case studies and people from the communities being spokespeople of why this works for them, it could speak volumes. You see a number of people with solar panels but having them from all over your service territories showcasing them pursuing them.

How do you share information? What best practices do you recommend?

One place to get projects is government facilities. we've always been constrained with tax credits. but with IRA you can take 10% tax credit. Another reason is government buildings aren't going anywhere. I could envision specific outreach to gov to see the benefit. having those paybacks, we should be doing it economically. it's kind of weird having a niche program for governments. if you have to get those collaborations we can work as a connector. if that is an appeal to PSE at some point we would be more than happy to work with PSE to work that out.

Puget Sound Energy Distributed Energy Resources, GPSG Focus Group



Mar. 21, 2023



Batteries

Would you be interested in adding a battery energy storage system (BESS) to your solar array?

We have a diesel backup generator and would like a cleaner alternative. Interested as backup power even for buildings where we don't have solar.

The ability to be a source of backup energy for our community during adverse events.

Yes we are interested in contributing to our community's climate resilience.

Knowing we would have power in the event of adverse weather would be great for us.

Keeping units cooled in the event of outages. Optimizing the amount of solar produced. Aligns with climate resiliency goals.

Audience and Users

Why were you/your organization interested in solar?

Are there any additional benefits that you can think of or that you have experienced as a result of installing solar?

Showing people that acting on climate is not exclusive to the wealthy. Anyone can participate and play a role.

There isn't a lot of solar in our community, and we wanted to be a role model in our community.

Approach to solar looks at where org can make the greatest difference in decarbonizing and reducing bills, which makes cost of operating properties lower and more stable, allowing for lower rent. Also thinking about backup power during an outage. Also adding cooling centers with ductless heat pumps and need a way to continue powering those systems to keep residents cool, so solar is an important part of keeping those operating during extreme events.

For us it was about increasing our sustainability and while we are thinking more about grid reliability it wasn't so much of a consideration during the decision making for our project. We are thinking about the climate future our kiddos will experience.

We were excited to provide solar at our shelter and provide educational reports on how much is charged and captured. It does raise awareness and interest for the families (kids especially).

Application Accessibility

Was the Green Power Solar Grant (GPSG) application process accessible?

It was very accessible, although it did take a while to fill out. PSE was very responsive when we had questions, and we appreciated the list of pre-vetted contractors. The one we chose also contributed to the grant process.

We had a challenge in that we needed to find an installer but didn't have money secured yet. Our workaround was to put out an RFQ and have a specific installer ready for any solar project at any time. But otherwise very accessible and easy to fill out, compared to other grant applications.

We had a technical partner which really helped with the grant application, agree overall it was very accessible.

I don't have direct experience with it as my predecessor completed the application, but he talked about the process as easy and accessible.

Barriers & Implementation Challenges

What barriers/challenges did you encounter when installing solar?

We would have installed more solar if we could have afforded it. We have a building on which we could continue to add more solar down the road.

We had trouble finding the conduit installed for our building--it was claimed by another building by accident. Good to work on those things in advance if possible.

It was really smooth for us. I think it depends a lot on the installer and ours was awesome, experienced with PSE and the GPSG.

We had some trouble making space in our electrical room for the converter and other equipment necessary.

The process was relatively smooth and quick from my perspective. We had a little slowdown with a scheduling window for the install and then with the electrician to connect to the panel.

We had an older building so we were a little limited on space on the roof. The installer really made a difference for us.

Maybe fewer choices on the contractor list would make the process less daunting. Some were less responsive than others.

Our installer was really great as well, handling all the coordination. They did all the coordinating with PSE.

Looking forward to technology advancements that allows us to put up solar with a lower space requirement.

Any maintenance issues?

We had technology built in to track intervals by array and we were able to catch when arrays stopped working and replace them under warranty. That's really important technology because that's how we optimize and catch issues early. Good to incentivize that technology up front.

We've had to be careful where we put our equipment. Some was located by a playground and we found we had to gate things off so kids wouldn't go and turn off the equipment.

No maintenance issues for us. Ours was installed in June 2022. Installer will maintain for first year and teach others in our congregation to do it after that.

Environmental benefits

Which scenario would you prefer and why?
Are there any other options we should consider?

Scenario 1

Depends on how "clean" the grid power is. We don't have a zero-carbon goal, but would need to be able to assure that the solar power is used by us, therefore can count towards our decarbonization goals. I think right now Scenario 1 is preferable, but it could be possible in the future for Scenario 2 to be a better option, assuming the grid power is substantially lower carbon than today.

Scenario 2

While I would love to claim the environmental benefits, reality forces me to choose 2, which would be more attractive for my church. Our financial situation is always precarious and varies from year to year. Any help is beneficial.

1x additional vote for Scenario 2

Scenario 2 would be of interest to our organization. we have no set sustainability goals but the financial benefits directly benefit the families we serve

We are a nonprofit and our mission is to the families we serve so our resources are oriented toward that focus and financial benefit helps us toward that focus.

Advisory Services

- Which scenario would you be most interested, and why?
- What scenario would you be least likely to use, and why?

x2 agree
scenario 1

Scenario 1 given we have so may residents and buildings in PSE territory and overall shared decarbonization goals.

We don't need support on presentations (2) and we feel like we got some of 3 already with our grant. Long term practicalities support choosing scenario 1.

1 has a bigger positive impact than 2 or 3 although I can see a direct benefit of 3 on a more surface level for decision-making.

I think scenario 3 would be most beneficial for our church, particularly assistance with enrolling in other products and services. We are always striving for energy efficiency. Not all installers in other issues are up to date on direct benefits and promotions, and this would be key for our church.

Community Solar

- Would you be interested in hosting community solar at your organization? Why or why not?
- What would make hosting community solar more appealing?

If we could make the community members residents, so the beneficiaries are LIC residents, that would be a gamechanger.

We would want to own our system so hosting a project is of interest if we owned the resource. We are interested in providing additional power to the community.

I think we would be interested in exploring hosting community solar. We are active participants in our community. We'd need to understand the impacts of both options before deciding between the two options but I believe we would lean toward the second.

I hate it that the budget is the bottom line, but that's the way it is-we would choose owning our own system.

We have a large roof--could we do both?

Alot of residents are on a program where they pay a specific portion of their income, so how this shows up on their bill could be really impactful.

Workforce Development

Did you include any workforce development opportunities for the community in your solar installation? If so, how did it go? If not, why not?

Part of our broader resiliency program to draw in residents to get more involved in the solar industry--particularly younger residents.

We have not had the training yet. Our installer thinks that after the spring pollen would be the ideal time to do it. We have been told that we won't need a lot of maintenance.

What could PSE do to improve this program?

Vetted providers experienced with multiple levels of state/national grants. Could be a categorization rather than cutting down the list.

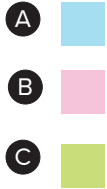
Our installer was great. I would suggest highlighting providers who have worked with nonprofits and understand our requirements and values.

Perhaps PSE could also offer a "warranty" period.

Puget Sound Energy Solar Commercial Workshop

March 16, 2023

APPLICATION & INTAKE



FEEDBACK

I think PSE's priority would be PSE's need. When you look at the region and see if Mt Vernon sees an insane demand expectation. Where do you see the unpacking happening. Maybe not so much as equitable but form the poition of a nonprofit, accessibility that might not be able to afford the same type of system. Like the library commons can afford it, and once that is there maybe friendship house doesn't need additional panels half a block away. But if the commons are being drained at their stations, maybe the demand might be higher. It depends on intensity maps, or having systems that cooperate with PSE or funding systems that would not have the support.

Q - Premise to this seems to be that there is not the capacity to handle the applications. In my experience it has been fast and easy, why does it seem there is this limited capacity that needs to be triaged.
A - The idea is that we will be offering incentives beyond what we have available today in the future. We might have a limited budget and would require us to prioritize the order to review the applications.
C - i don't know what this would look like. I know there are other programs that will prioritize disadvantaged communities, in the big picture I hope there would be an equity component. Or equity for customers who are at economic levels that they haven't participated in the past. Not sure if we are distinguishing with community or homeowner solar. I think some people would get uncomfortable for a race for the incentives. We can help support as possible.

INTRODUCTIONS + ICEBREAKER

There were five participants.

I think PSE is interested in seeing what they can do to support more solar. the biggest question with solar, when will the state expand the net metering to be on 100kw because it needs to happen now.

Of our six facilities we own five, we have solar on one and PSE has helpful to get our cafe energized. We enjoy working with PSE. I was in the focus group with DER, and batteries. Big fan of wind and got tons of ideas.

SAMPLE PROGRAM ELIGIBILITY

A With 15 years, when you have a government entity 90 percent of the time the building is not going anywhere. but if someone is leasing a building it might be a challenge. May be challenged by entities that don't own the property.

B Coming from a smaller nonprofit and commercial for profit. generally, we are signing three-year leases for properties. we wanted solar when we built our building. but our lease on the property is for three years at a time. it is a very awkward thing even if you get landlord approval. Don't know enough about the costs of moving the structure if the 15 years can move with the organization if needed. Since the people doing the boots on the streets work and are not the ones that own property.

Q - why does the amount of time matter, who is being considered for this?
A - thinking about commercial customers not actual homes.
Q - if I am doing a commercial project for work, it sounds like your saying you may offer additional incentives if we can commit to reliable power over time.
A - yes committing to using the building to serve disadvantaged communities.
Q - still struggling in what you are thinking about offering. if we put 100kw in our building, may not be for disadvantaged communities, but it's not clear what you're saying what would be different than current situation. Is this new portfolio offering?
A - it is on top of our existing offerings.



FEEDBACK

C - Hearing this is a grant opportunity that could be significant for applicants for solar. Even looking at accessing that energy as a demand response to the community. Like I was describing for the library. Then PSE can control the outflow of the energy. it is a demand backup as a part of the overall rollout of the demand systems.
A - More applicable for battery and demand response scenarios. We are taking what we can get from solar.
C - The solar use in its own form is alleviating some of the demand. When i look at these three, land ownership I'm thinking fully paid. That property can still be under mortgage. 15 years is a stretch, it might make your commercial facility management a little easier to settle at ten years. All three of these are easily accommodated from my point of view.

For our facility, we are a state agency. When I look at these things and DER, I think it is good fit for state facilities. We do lease some things, but we have a lot of permanent campuses. In my agency we have four homes that are permanent along with a cemetery. We were founded in 1891, and we have conducted the mission of taking care of veterans since then. We will continue to support veterans at our 160 acres. When I talk about being the property for us, we are looking for long term sustained involvement in clean energy. I am looking to produce our own energy system here and battery systems to use energy in the evening. To be scaled to provide energy to the grid when it is needed in the community. We have systems on campus that we are improving that would be a good tie in for the demand system. We are excited to be a part of something like that/. We have the land and scale to provide it.

QUESTIONS + COMMENTS

C - There is a bill in the legislator, PSE has been supportive of it not allowing any new hook ups. Sometimes we might have a system of a combined natural and electric system. There is a lot of chatter about gas.

Q - is there a term to it or can people negotiate the system down the future? They might want to sell them back to PSE but then recognize oh we need those.

C - you are also a natural gas provider, as legislation is weening people away from gas energy. why are we putting greater demand on electric grid which is a fine alternative but gas will be continued to use. i dont understand the compounding factors, I have solar, gas, and electric at our home. we love having power obviously, and if it needs to have different measures. why is that so frowned upon. does PSE need to ween out of their natural gas line

A - the electric system which has some natural gas generations, do plan on being renewable. but the natural gas system there is no current legislation to remove it. although it is a cleaner source than coal, there are still emissions associated with it. moving towards reduced amount of natural gas.

OWNERSHIP AND MAINTENANCE

A

I believe this is what they do in Hawaii right, you don't own the system or do anything with it.

B

Coming from perspective of small nonprint, there is only one option really, which would be PSE owning it. It removes the burden of permitting, purchasing, maintaining it and end of life. It would be a super easy to support solar, we get a little bit of money. That would make sense and the only option we would consider.

C

Q - Scenario B, is it assuming to begin immediately upon installation, in Scenario C you are not expecting the credit to hit until it is over. So, if we put solar on tomorrow, we would see a bill reduction?

A - Scenario C it would be the rental payment and you would see the bill reduction from the solar panels, but anything that you exported during the rental period, you are using the exported energy to help pay off the panels.

Q - If I am a client in Scenario C, and my rental payment is \$250 a month, am I going to see that \$250 wash out? So, scenario B is immediate with extra bonus, it would still be a benefit financially.

A - yes

FEEDBACK

Very advantageous to a lot of community orgs and state programs that are sticking around. If you are able to commit to a 15-year term to a use for the property. We would qualify for that type of established scenario, obviously when ownership is fulfilled would the property owner still have to maintain it or would PSE in the future be offering maintenance packages? I feel like that would roll in well with residential too.

We could potentially envision using both, depending on which agency would be doing a project, and if both scenarios would be priced (incentives) to be equal over time. If they would be equal over the life of the system, we'd probably be slightly more inclined to choose the lower upfront cost option. If one had better lifetime economics, we'd probably choose that one.

Hard to rank until i know which one is better. i would be looking at the economics of it and our facilities. in some case we might want to offset our use or do 100% clean in one of our facilities. it si hard for me to know what the eocnimics are going to look like in the three scenarios. that could be an important part of your marketing. what you are trying to achieve with doing this and what people can choose based on that. I could see us choosing all three of these dpeneidng on our facility.

Q - Considering the 15 years, we are in a building that is owned by a church, and they allow us to use that as a community service, and it is around a lot of low-income apartments. the 15 years would be hard. The church goes through transitions in a small community.

it was an English-speaking church, and it is now Spanish speaking. The PSE owned we would probably approach it with that in applying. We have a lot of cohorts, but our funding is not very large. I was wondering when you are talking about the community solar projects. would we be able to house the panels and they would be sending power to the apartment buildings around us? That is what i was seeing with the battery. Does it get to tap into those power lines to supplement the electricity?

A - The actual production of electricity is harder to control and manage, but there are ways it can be done on the back end or from a billing perspective, it would be a great idea to explore.

PAYMENT

A

We've done a lot through Scenario A, we've looked at grants and allows us to do a lot of other things. There may be a connection between A and B, we may go through a contractor directly based on the expense or size of the project. If there is any money within the state or other grants, it is important for the consumer to know that those are available.

B

This is most interesting for a small nonprofit because it's money we don't have to put into our budget, we don't have to sign MLUs or get approval and sign things on multiple levels.

The credit on the bill is easiest. it is for energy and cuts the cost of energy. For us it is a reduction of the utility especially if we are leasing it. One less check to track or deposit.

C



D



FEEDBACK

i am looking at this from 15-year perspective. If we are engaging in some level of ownership, we would like to be involved in the selection of the people who perform installation. if we could partner with installers and get them to help facilitate upfront reduction, don't know how you leverage that. but it would uplift those community vendors locally to get that exposure. I guess we would still be selecting so I was reading that wrong. it would be so amazing if PSE will help find funding.

Depending on the org and how they are allocating funding, if there it was a small nonprint and you are paying them 50\$ credit, it would be a different budget that the utility bill. Having it allocated more directly would help.

BATTERIES

When we looked at solar for a house, we considered battery, but we didn't do that because of the finances. We are trying to figure out the cheapest way to transition, does it make sense to have the batteries or does it make sense more with just solar. The overall system is something to consider, and I don't know enough about human behavior, if they would be as considerate about energy usage.

I am one of the biggest fans of finding every way to multiple and manage our resources. The more I am digging to learn the more I am hearing concern. Especially on the county level in Skagit, about fire hazard and how to predict that and what it causes it. I'm thinking is it that there is so much stored in that cell that is gets hot. What is the safety in that, heartbreaking to see damages produced from something that is intended to be beneficial.

It is energy resilience if you lost power, you have battery power and have the ability to use power in the evening, if it is sized appropriately, you can use it 24/7.

LARGE SCALE SOLAR

Q - Scenario A, today we pay a meter. What is this \$25,000 upfront and the monthly fee, are you looking to start charging people to pay for their own services?

A - It is paid to the installer.

The goal in our community would be to have a lower monthly bill, the incentive to be able to install when you are a smaller nonprofit, we need help with that. Our purpose for that is to have a lower energy cost, how would that work when you don't have the money to put in the unit. The first choice, it would be nice to have something in between from our perspective.

Even for an org, it is going to depend on their budgets, tax credits, when you are a big org you can make decisions at this level long term, vs smaller businesses that don't have the ability to make these decisions.

When we look at this you really need to sit down with some hard numbers, it is hard to consider how much of an incentive or bill reduction, or the project cost and offset for the exported power. Also, the tax advantages are depreciating your asset if you are paying for it. There is a whole lot of things that go unspoken here. How would i look at this, sometimes when you are looking at a customer there are very specific things that could be done based on their usage and their long-term effects. But it could be worked out on paper. you might have elements in the contract to vary based on the price of cost. if you are a fixed return that could be nothing. When you look at specific offerings it could help customers to understand. When people have the options and math worked out for them it is easier to see. You do a lot of the work upfront for them.

MULTIFAMILY SOLAR

This becomes an accounting issue with multiple tenants, it is easier to go back to housing provider and using the funds they see fit to provide the service to everybody.

I do love the fairness for money going back to tenants, but what incentive would you have for the property owners for installing them. Generally, the large property managers turn over quickly and don't care about tenants. Don't see it getting on properties with large scale if there is no incentive to accommodate.

Housing provider without question. It is their property and taking care of maintenance. You are talking about residents not having to think about these things. Definitely property owner reward should be considered.

A landlord can provide a rent rebate or discounted rental price or just not increase rent prices at renewal period to spread the benefit

Enhanced services for tenants include garbage removal, could the property owner put some savings and put it to other utility debt. I don't want to create more work for property owner, I want it to be an advantage.

The question of how it applies to utilities, is interesting, I am 95% sure it should be the housing providers, and you have to maintain it. The tenant has not invested in anything or committed to anything so not sure they should receive a benefit.

Because I hear the tenants talking about their electric bill going up, it is getting harder for them to pay. We would be the organization that would make the space for solar and connect to apartments, so that the tenants themselves can better afford utility bills. For me the on-bill credits that will be distributed equally. The tenants have the same number and using the same amount of electricity.

We are service agency so we don't own any buildings, so we are seeing how we can offer that to the community and let the landowners know we would like to help your tenants out if it is possible. In my mind i see it as being an agency offering something tangible.

ENVIRONMENTAL BENEFITS

A With the state we can report we've had so much carbon offset but there is no financial benefit to doing that. It is more a reporting thing. but as we get to certain point, businesses could get charged for extending or not meeting environmental goals. It would be great for PSE to sell them to the org, or they might to sell to others to offset their impact. Initially it might be going for the money but when there are requirements for certain thresholds they might go towards those.

B 

ADVISORY SERVICES

A Seeing that for larger kits. Could see it being necessary for long term to strategize. Don't know that is it necessary.

B Seems like an amazing way to launch internally, if there seems to be stumbling block and the staff is all on board, maybe scenario B. I'd use all three, I am in the process of getting an energy manager with the long-term goal of A, but once we have all these numbers then B can get us to a commitment to signing, all three are important it is just a matter of phasing.

C 

FEEDBACK

Financial benefit for our neighbors at this time

Everything is it depends. Our nonprint is environmental so we don't need additional credits and we are looking at ways to sell those, so an additional financial benefit would be more useful.

FEEDBACK

Is PSE actively looking now to learn ways for upcycling? Recycling as would be in great demand at the end-of-life expectancy around 15-20 years out? This may become a huge concern rapidly if programs like rent to own and PSE owned programs roll out. Maybe ideas to support this need long term. This will be a meaningful action piece of planning.

EDUCATION AND OUTREACH

A 

D 

B 

C B and C will be powerful in simplifying the process for businesses and organizations working uphill for approvals.

Division of those that want solar panels, those that think it is garbage, and those that only see the financial benefits. Having for that group the referrals to trusted installers, helpful tips for permitting, rooftops. the ones that dont want them leave them alone, but people in middle to help calculate the ROI to see if it is feasible.

MEASURES OF SUCCESS



FEEDBACK



Puget Sound Energy Solar Residential Focus Group

INTRODUCTION

January 24, 2023

QUESTIONS AND COMMENTS

Can you put solar panels on a two-story apartment house?

Which produces more power the solar independence or the solar and batteries?

What happens to the solar panels when exposed to a higher heat concentration

What financing options are available?

What kinds of solar panels to look out for?
A: There's a good variety to look out for, newest types embed directly into the roof. Most look and work the same

Would there be a higher charge or surcharge for the back up power coming from PSE?

Q: how much electricity comes from solar energy?
A: about 5% in the state

Can dust particles hinder its efficiency?

Q: how long does it last after long yearly usage and is the maintenance service expensive?
A: They last about 25 years and maintenance is minimal. Sometimes if something falls on them they need to get cleaned

How is the solar maintenance like?

Does it matter the orientation of my roof?
A: Yes but you can still use solar no matter the direction. Some will be more efficient at generating power based on sun exposure

What is the durability of each solar panel

Q: these batteries what if they are destroyed by lightning?
A: in weather protected covers.

Will the panels be on-grid or off-grid?

Can solar panel attract being hit by thunder? or is there a slight chance?

How to finance my panels?
A: There are lots of different installers who offer different financing plans, we want to hear about what's beneficial and how PSE can help facilitate ownership

Is PSE trying to make their product economy friendly?
A: Yes, PSE is developing solar in a way that makes the economics pay off for customers

What about roof tiles mentioned?
A: They work about the same as typical solar panels

How do we know the exact amount of solar power that can be used in a particular building without interruptions?

Q: If someone is doing instalments is this something that part of the energy assistance programs benefit could apply to as well?
A: Not a perfect science, and loads aren't super predictable, but we are pretty good at estimating how much a building might use and matching that, but that's why it's important to still be connected to the utility so we can match any gaps in power produced by solar.

1 WHY ARE YOU INTERESTED IN SOLAR?

Q: my heating in home is not the greatest, will solar panel energy be more efficient and better way to heat?
A: solar energy wont directly impact your heat, it provides the fuel. although it is more efficient from an overall energy usage it won't directly impact the heat

Q: since the home is not energy efficient place, my bills tend to be really high. what is the ratio of the energy costs now how much would it make the difference using solar. if you are still putting the same amount of kilowatts what is the cost of solar vs PSE's electric
A: varies but for customers PSE has a net metering program. the solar produced gets used on site or gets exported to gris and get credited for that. in general, will reduce your bill and compensated for everything.

I am more concerned about how less expensive it will be compared to regular energy bills

Is solar energy still efficient during the rainy season?

Solar energy is a clean source of energy and most importantly, it is renewable

Its better way to pay less bills and till encourages good climate conditions.

Solar energy is non pollutant and cost efficient

I believe that anything that can lower my energy costs will be beneficial to me, and I have a strong interest in renewable energy.

Q: my home is owned by a non-profit I know with energy assistance can do weatherization. will nonprofits be given help with organizing and applying?
A: Yes as part of this effort we are working those orgs and develop programs that work for them.

2 WHAT SOLAR BENEFITS ARE MOST IMPORTANT TO YOU AND YOUR COMMUNITY?

Solar energy is renewable and it will also help my community to grow and support the economy

Reduction of carbon emissions

Places like homesfirst is PSE itself having customers go through installers or will PSE take it over to facilitate this process for nonprofits and lowincome customers.

Only initial cost for installation might be high but running cost and maintenance is low for solar energy therefore it is affordable to community.

How long can solar panel last?

It goes to help lower overall cost for nonprofits and housing to help redirect those funds to more affordable housing.

Q: curious as to whether or not nonprofit like Homesfirst will get a price break if they are going to do a number of the different rentals?
A: cant speak to how installers have price breaks. but nonprofits can take advantage of IRA tax credits for solar.

Q: Can solar work in an underground building?
A: Solar does need direct access to sunlight and be open to outdoor area but can be wired to underground building.

I had someone come out to see about solar panels on my house and they said i'd have to pay 100\$ a month for panels. but my credit wasn't high enough to qualify for financing. is that something PSE can help with?
A: will definitely be looking into that to reduce barriers.

I think addressing the educational part as well to make it more achievable to those who wouldn't normally think this is an option

DISCUSSION QUESTIONS

3

Are there additional benefits to participating in solar programs?

What barriers might keep you from participating in a solar program?

How much power will be needed for the panels

Weather dependent is a barrier

Financing

Solar energy is hard to access for renters who cant make permanent changes to their homes. is there a solution?

There should be a flexible way to get it, if we have a low credit score

inability to get a genuine panel

Another barrier is unskilled installation process

It uses a lot of space and i think the storage is expensive

Reliability is one major problem with solar power. a solar panel can produce electricity for maximum 12 hours a day and a panel can only reach peak output for a short period around noon.

Education about them streamlining the process and simplifying to help those lower income who normally may not consider this

The upfront expense of building and installing solar and wind farms

Installation cost sometimes is high

Financing problem. can be solved through personal loan with regular payments

How can we sort out the weather barrier issue?

What happens if there is snow on the solar panel

Solar panels only convert a small percentage of the available solar power into usable energy. solar's reliability is also an issue, especially in certain geographic regions.

Affordability

What are ways in which these barriers could be addressed?

Sorting out weather issues in solar is simply done by acquiring a panel that comes along with battery, which can store up energy for use even when the weather is not favorable.

I think it would be awesome to have a solar consultant product expert available to explain and consult with PSE customers to encourage and help facilitate utilizing this option

DISCUSSION QUESTIONS

What type of solar program would you be excited to participate in?

Rooftop Solar

cConcern of ground solar is vandalism. how tough are these things. will they withstand some paint or rocks? especially when you dont have a lot of money to play with.

Solar + Battery

Does all solar panels have attachments of battery?

Q: is the expense different from the solar and solar with batteries?
A: batteries are more expensive and is an additional upfront cost. We are developing battery specific programs with different financial incentives.

Its appealing because of the weather condition. dont want to have uninterrupted power. I prefer the battery as a standby option

like generator

I think that having a backup would help when the power goes out

4

CHALLENGES

Is there an instalmental payment option? I would participate if there was one.

how are people on a fixed/disabled income get help

Leasing solar panels is best if you dont have the available cash upfront or dont want to do maintenance yourself.

The costs are always the first thing. but i think when peopl ehear solar panels, they can enver see it for themselves. its just out there and not attainable for them. so unfamiliarity was a big one for me. wit hcost and maintenance for say disabled people, how will they get that done at an affordable rate with a fixed income. will it be something like when a snowstorm happens will there be volunteers to clean up.

Upfront will definitely be high, saving up for it will be hard.

Unfamiliar with solar energy

7

PARTICIPATION

What additional information do you need?

Community solar basics

I would participate if there is warranty on the product

Visuals such as graphs, and cost comparisons, step by step. then for financial applications for possible grants to access, and definitely affordable financing instalments

Manual about the solar products with information about installation maintenance and how it works generally

Incentives on residential solar energy

I would participate if theres an assurance of sufficient space

What kind of financial incentives do you need?

I would participate if theres reduction in cost of purchase and installation

Flexible options of financing your solar system.

Accessible in remote areas

I agree if there was a way to get it done with no out of pocket expenses

I would participate if there is reduction in cost

Solar incentives, installation pricing warranties and quarantine guarantee

8

Which ownership models are you interested in?

I choose to participate to learn more about pse solar programs.

i think the only solution there is finance

The question would be the cost involved with the lease or rental. ownership would be great for homeowners though.

I think ownership or lease to own would be great.

Q: when i was ncouraging others to look into this, at that time washington state had tax credits, where do we stand on that, my understanding is that in november is stopped.
A: yes a past credit expired but there are new credit through the IRA.
Comment: that helps to explain to other people.

Q: how do you answer this question if you are a renter. these options don't really fit.
A: an option is community solar where any customer can sign up to recieve a share of solar in a community panels. one of our goals is to make more programs available to renters.

Q: what is the average initial cost to get this going with ownership?
A: dont have it right now but something we can get back to you on.

Ownership is better for me, without worries

Owning or leasing solar panels both allow homeowners to enjoy utility bill savings while helping the environment. leasing is better if you want to get started with solar without large initial investment while owning is the best way to save money long-term.

ownership is better

Homes are harder to sell with leased solar panels.

If i went with those sharing deals, how much extra will i be spending and will it offset my savings to make it wortwhile?
Anne - really good feedback as we develop the costs.

You cannot factor rented solar panels into the selling prices of a home.

You will recieve lower quality maintenance with leased panels. if you do not own the solar panels, you do not have access to solar panel warranties. If your syste needs maintenance, it is up to the company you are leasing from to pay for the repairs, which can lead to lower quality care that you have no control over.

Rented or leasing solar is expensive than owning

6

INFORMATION AND OUTREACH

How would you like to learn more about future solar programs?

newsletter

facebook

craigslist

social media

pinterest

reaching out through community programs (homes first, habitat) yes Facebook, Instagram, and TikTok

reddit or twitter

twitter, instagram

sometimes with social media with social media it could just be some sales pitch etc

Community events

the neighborhood app

9

Puget Sound Energy Solar Residential Workshop

March 16, 2023

ICEBREAKER+INTRODUCTIONS

There were 7 participants

QUESTIONS + COMMENTS

Would like more emphasis on Community Solar

APPLICATION & INTAKE

A

Ok with this option. 1 vote

B

1 vote

C

Most popular, 3 votes

SAMPLE PROGRAM ELIGIBILITY

A

Preferred

B

OWNERSHIP AND MAINTENANCE

A

Prefers A, but ok with all scenarios

A, C, B

B

B, A, C

B, C, A

Overall, people prefer B

Prefers B because maintenance will not be handled by me

Less stress, more options

Q - At the end of 15 years, would PSE take this back of the property?
A - Yes, at end of term PSE would take the equipment down

C

CAB

FEEDBACK

Application in regards to income status

Regular webinars and trainings on the use of Solar

FEEDBACK

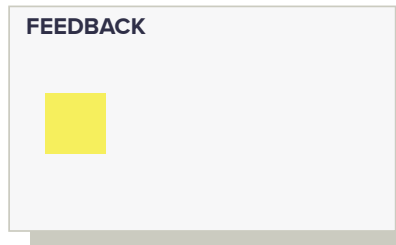
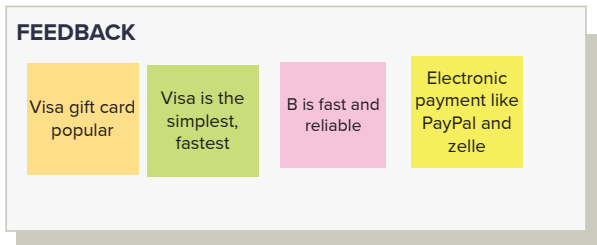
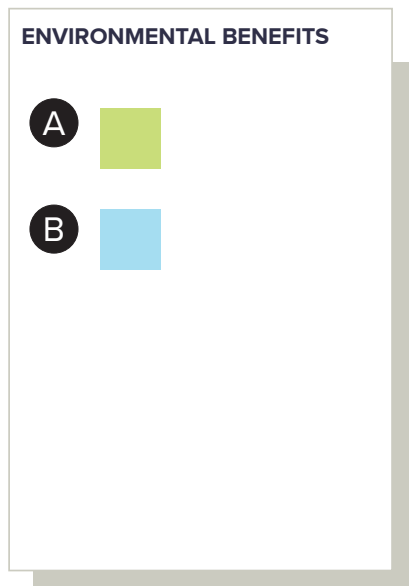
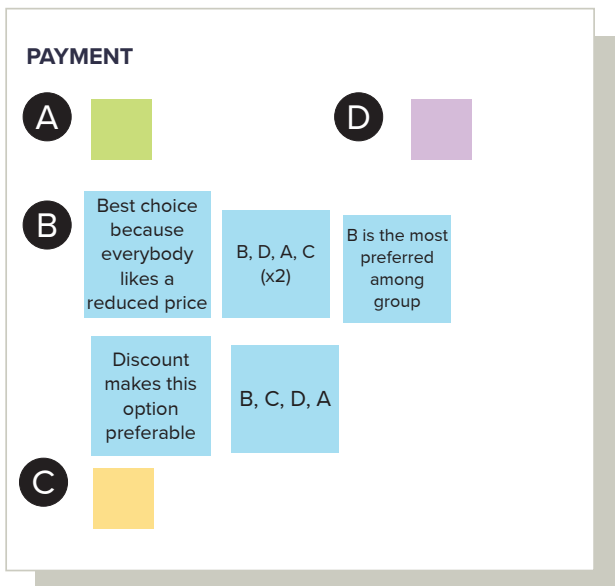
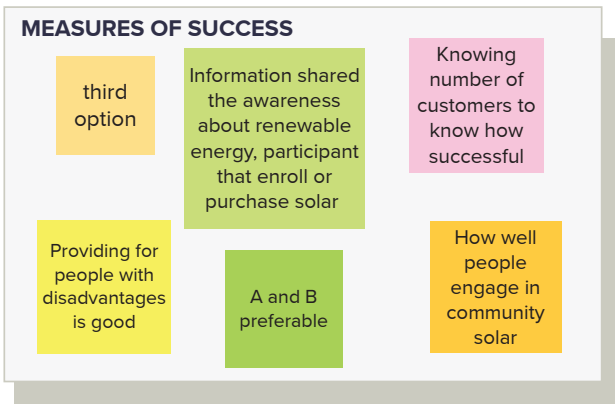
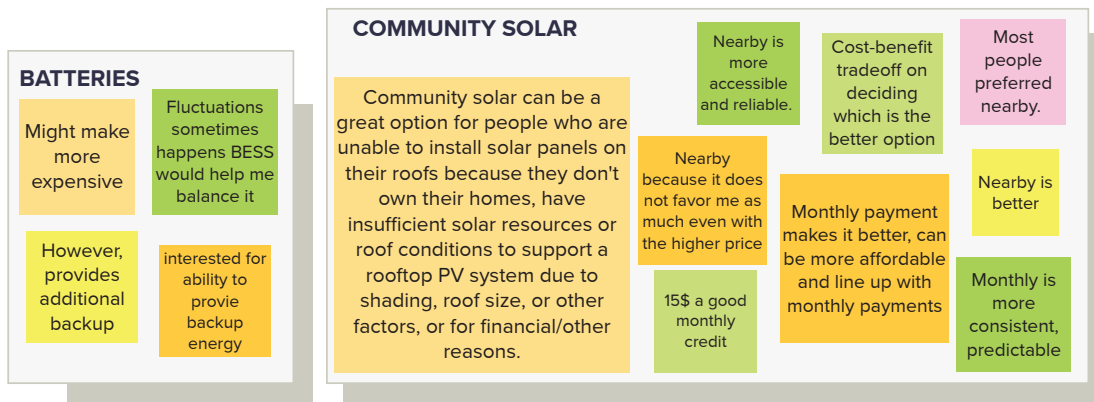
Proof of mental ability to participate

Additional requirement: someone standing as a guarantor

Barrier - having a guarantor

FEEDBACK

Prefers B because at the end of the 15 years, the value of equipment doesn't seem like that much. Not as high of a value as before.



EDUCATION AND OUTREACH

A

Preferred the least by most.

C

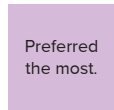


B



D

Preferred the most.



FEEDBACK

D because it has a lot of advantages - consultation is helpful

D seems like easier access

Otherwise, outside consultation can be expensive

APPENDIX D: DEMAND RESPONSE ENGAGEMENT MURAL BOARDS

See next page.

Puget Sound Energy Demand Response Commercial Focus Group

January 12, 2023

What are your organization's energy/ consumption trends? When your facilities use energy the most?

1

Residential and commercial energy needs are highest in the winter and driven by HDD today. But weather is getting hotter and more heat pumps are being installed so we will start to see some peaks in the hotter weather.

Our dozens of facilities (hundreds really) have a wide variety of energy use profiles. Wastewater use peaks just after rain events -- so spring, fall, winter heavy.

Our water infrastructure electricity peaks in summer.

What demand response benefits are most important to your organization?

2

We have an initiative this year to educate folks on the SDGs. For Japanese companies, most are very focused on the SDGs, so being able to talk about how, for example, within our small office and with our members how to approach those, would be helpful.

To me, this is by far the greatest untapped environmental resource in the region. Because of hydro we haven't really tapped into this type of strategy. It's a slam dunk for the community (keeping rates down, getting involved) but also extremely challenging to be able to rely on the energy savings.

A lot of choices our organization makes are driven by me, and I feel passionately about reducing our carbon footprint, getting our community involved in green energy, and allowing LIC people who traditionally don't have access to participating to get involved as well. Saving money is always a goal, but since we are a nonprofit, we have additional access to grants and resources that private companies might not, so we want to make use of them.

Agree that this is a really efficient approach that allows us to save energy/impact without building new infrastructure. Less cost per KW hour is also a huge benefit to folks in our community.

I would have shifted #1 (greater understanding of energy usage) to #3 (reduced utility bills).

I'm not sure if its unavailable to us or if I just don't have access but I am not able to use PSE's tool to track hourly usage, so I am not sure on a hourly basis. Our electric usage is highest in the Winter months.

Our electrical usage has been flat for past 15 years, but new electrification is in work and in planning. We are a summer peaking facility, hitting peak on hot summer afternoons.

I don't really know our trends... but since we have been solar paneling (including our office!), our consumption is now offset.

Our personal office uses the most in the middle of the day. During lunch the kitchen is used heavily.

Making recommendations to landlord might help us get better response. E.g., getting reflective coating on our windows might help during summer.

DISCUSSION QUESTIONS

4

What type of demand response program would you be excited to participate in? Why would you choose to participate in the DR program you chose?

Remote Energy Management

Many businesses we work with are busy and overwhelmed (maybe don't have a facilities/energy manager) and would probably be more likely to participate in automated remote energy management.

I don't see a need for a one-size-fits all approach. There are some facilities where we could say if we don't have some essential service that requires 24/7 energy, we'd be fine to sign up for this, but things would need to be tailored based on critical services.

Nice to have automated options to not be able to bother people for every action.

Behavioral Demand Response

Our organization is pretty engaged and could be fine doing BDR.

Some BDR is good to help people feel engaged.

DISCUSSION QUESTIONS

3

Are there additional benefits to participating in DR programs?

What's not included here would be reliability.

What barriers might keep you from participating in a DR program?

Cost vs benefit to us, our tenants, our community, our world.

language

Comfort, reliability and performance impacts can't be compromised when shedding loads.

I would say that I have quite a few commercial spaces where it will be interesting to see if their critical uses can be lowered.

Communication and having the plan laid out ahead of time.

commercial / residential don't have the financial means to electrify, might be too complex if not automatic.

at least for our infrastructure, services are critical at all times of the day. However, we could do demand response in our buildings unrelated to infrastructure.

Education (commercial and residential) on cost to participate and cost savings.

Critical services

I'll echo the point about fuel-switching financial hurdles.

Logistics, i.e., flicking on thermostat vs. unplugging 500 EVs.

What are ways in which these barriers could be addressed?

Scaling DR to meet the needs of businesses/services

Automation

Awareness that this is available drives customers to be looking at what little actions could add up.

Things like dimming, could you make it so folks don't notice a DR action?

A couple degrees in AC might not be noticeable but could be very impactful across the grid. Doesn't need to be turn off/turn on.

CHALLENGES & STRATEGIES

QUESTIONS AND COMMENTS

Q: What about small businesses who can't change the timing of their energy use?

A: Understand the program isn't for everyone, but we're planning on partnering with a commercial DR implementer with decades of experience and depending on the situation, it's really about talking to the business and tailoring a plan.

Excited to see this happening. This is so important for the region.

Great, we'd like to see if there is anything coming down the pipes on this since we're looking to get a grant around this kind of work.

Turnover in facility staff, people on vacation, difficulty of switching over cell phone notifications, having redundancy in POC, etc.

Seeing examples of what works. Everyone thinks they're being efficient and using only what they need, but seeing examples starts to shine a lightbulb for folks for what kinds of things are possible to reduce energy consumption.

Communicating examples that work -- this might work differently based on the audience (different sectors of commercial vs. residential), but it's a lot of repeat messages, plain speak, etc. Goal is for people to be able to see something and think, "hey, that could be me."

More opportunity for variability, i.e., dimming lights down to 75%, but for rate payers being able to understand what has variability, and what kinds of technology are available (i.e., variable rate drive) to facilitate those graded changes, education would be a factor. Maybe a factsheet describing to folks what is variable and how to tap into that.

Tools for large businesses may be very different than for small businesses. Perhaps simpler tools for smaller businesses, but because they may be renting space, they may not have the control larger organizations might have. Maybe develop tools for renters/landlords so renters can have more control over their impact.

Events we can see coming -- i.e., the heat dome we knew was coming. Communications 24-48 hours in advance so organizations know what is coming and what to do.

PARTICIPATION

What could PSE change to make these programs more appealing?

Pay for the equipment.

Fuel switching off propane!!!!

Can envision folks finding it intrusive to have a utility controlling their energy use. Focusing on the customer benefits (reduced cost, lowering impact) would be key.

Financial incentives is how you would be able to appeal to more businesses in the commercial space.

Make the range of the remote energy management clear up-front (i.e. min or max temp change, % lighting dimming) so people can feel confident in it.

PSE has conservation grant funds for equipment, but if you're doing a performance-based incentive or TVR, trying to package that up with the other things. PSE needs better incentives for fuel switching.

I mentioned this in the meeting but this is exactly what Whidbey Island needs to meet the future decarbonization, reliability, affordability. RMI started a Virtual Power Plant Partnership. PSE should get involved! Here on Whidbey we have a good amount of DERs (Solar, DHP and EVs are coming on).

What additional information would you need to participate?

How would these funds coincide with potential utilization of IRA incentive rollout?

30% tax credit for solar is something tribal governments can use; this is a new incentive.

Article the other day that PSE is going to have some incentives for fuel switching.

The best thing PSE could do is implement a financing mechanism through the meter. Having some sort of on-bill financing like they have in the San Juans would lower barriers for residential and commercial across the board. I.e., not having a credit check (married to the meter) helps folks on lower-income brackets. Small 1% interest rate just as the administrative fee.

Ditto On-bill financing! But also financial incentives for equipment would be most impactful with the stipulation that they will be involved in the DR program

PSE should consider larger incentives to get this off the ground than they might consider keeping going throughout the life of the programs. Need to get people in the door and recognize this will vary over the years and for different customers.

And again ditto the Fuel switching incentives including propane.

What kind of financial incentives would you need to participate?

Puget Sound Energy Demand Response Commercial Focus Group

February 2, 2023

What are your organization's energy/consumption trends? When your facilities use energy the most?

Mostly M-F, starting around 9, less so in the evening. We have a higher load in the winter, and the 24/7 wastewater treatment uses more after big rain events.

Harder for schools to get off peak hours. Don't use as much at night, but during winter seasons use a lot to keep lights on in sporting facilities. A lot is based around athletics.

Core campus is 5 facilities that were once residential, except for an industrial kitchen in our cafe. Refrigerators running always and cooking times at typical cooking times. Shelters are generally gas-heated and gas-laundry, which we're considering getting away from, but is that smart if we're trying to get away from a heavier load? Currently only really lights using electricity. We also have a gas boiler for hot water which works really well for us. We need some education on what resources are most appropriate for us to be using. Our office is probably one of the biggest spaces we might be able to curb. Until recently we were on a dual zone thermostat which wasn't working well. Replaced it with a single zone and manual dial. We need some reminders or to go back to a smart thermostat, but we didn't have the best experience with those in the past.

Quite a few manufacturing plants starting at 1am. Quite a few local pubs and bars consuming during the night. So varied amongst the different businesses.

What demand response benefits are most important to your organization?

"New power plants" feels like a non-issue because we're going to take care of that through DER.

The less we spend on energy the more we can do in our mission.

Understanding the usage factor will help everyone to be more aware of and curb usage, especially during peak times.

People are looking to adapt existing technology. If businesses are leading the way, having the tools to benefit communal understanding makes it more likely you'll be able to use what you have and partner with others.

Building trust is key. Folks with kids may be more hesitant to allow remote control of thermostats because they need to keep their kids warm. Initial momentum to build trust in the community is the hardest part.

DISCUSSION QUESTIONS

3

Are there additional benefits to participating in DR programs?

Celebrating achievements in the community. Sense of community pride.

What barriers might keep you from participating in a DR program?

Unwillingness to learn about the program.

Just not understanding the impact of participation.

Feeling like it's an uphill battle they are alone in.

Distrust this will actually save money.

Upfront costs, capacity, rental relationships with landlords.

Frustration for the time it takes to work on this while larger companies or areas seem not to be participating.

I feel confident our team would strive to implement energy saving across facilities, just most of them are already frugal as they can get. In the cause to carry each penny as far as possible in our nonprofit, I'm not sure there is much else they can offer by way of monitored reduction.

Lack of time to implement the program.

Folks most inclined to participate are also going to be looking at solar panels, other types of energy conservation. Convincing people this is worth their time is an issue and not one I feel we have the authority to change their mind on.

Lack of awareness of how we can shift and when we need to shift usage.

Lack of personnel to implement shifts.

Lots of businesses who don't even use email.

What are ways in which these barriers could be addressed?

Our director of public works is so busy, and she is the one who would be implementing changes to how the plant would be using power. She needs a person or a weekly Zoom call with other folks in a similar position. Needs some moral support. Include someone from PSE but also peers. It's a race to be second. Don't want to do something too innovative they're not doing the same thing at a similar plant.

A lot of times our facilities managers are focused on triaging what is broken. Having an incentive for that personnel group to be in focus groups with peers would be more effective than me educating my colleagues in facilities management.

DISCUSSION QUESTIONS

4

What type of demand response program would you be excited to participate in? Why would you choose to participate in the DR program you chose?

Behavioral Demand Response

BDR seems like a major gain in private households to build up that trust base and understanding of what would be implemented if they went to remote energy management.

Remote Energy Management

This could be a struggle for seasonal venues.

Remote energy seems so much easier for the commercial side, because there's no additional drain on personnel.

There might be a resistance to remote energy management. I would be way more inclined to sign up for "automatic energy management." Wording is important to not scare folks off.

Q: How easy is it to opt in/opt out of a remote energy management program? Do I need to call in and wait on hold, or is it a button on my PSE account?

A: At this stage, looking at an energy leading vendor to assist us with setting these up. There may be a landing page on our website for people to request that a representative make contact.

Q: Is it possible to override? How quickly can I opt out?

A: Those are logistics we haven't worked out yet, but theoretically there would be a way. We also give notification a day ahead to warn you of DR events, and you could then say, "no thank you."

QUESTIONS AND COMMENTS

Q: At what rate is the savings?
A: Still working to outline those program components. This engagement is part of that process.

Q: When are we looking at implementation?
A: 4th quarter 2023-2024 for the planned pilots.

Q: For an organization like a school district without much flexibility in how we use electricity? Where we're really looking to be part of this is getting information out to families on how to participate. All our families are PSE customers.

A: We can always talk about how we can make that happen. One of the easiest ways is through BDR and home energy reports. Getting reminders about what causes higher energy bills is really helpful. Lots of customers don't realize they use more power when it's colder out. These behavioral programs don't cost anything to the customer and provide a lot of benefits, so it's a good way to jumpstart some areas before we could come in and install devices, where appropriate. We also have some public-facing factsheets we can share, and we have teams at PSE who work with school districts.

Q: Will the incentives be only for 1st comers to the Remote program or does PSE intend to carry the financial benefit long term for all customers?
A: Ongoing and the plan is to grow the programs over time.

Q: Would you offer a trial period for businesses to see the impact of those adjustments, or potentially make changes? Or are things difficult to reverse once we set them up?
A: I'm not sure but that's a great idea.

It makes me think of using timers to adjust variables to suit your needs while lowering electricity. It's a learnable process and can be iterative in terms of adjusting long-term.

Q: Could you give some examples of remote demand control?
A: In a winter morning peak, we would send a signal to your business, after you had signed on and identified what pieces of equipment we could adjust, to lower the heating a couple of degrees or dim or turn off non-essential lighting or adjusting motor speed on some manufacturing equipment. Not turning things off but adjusting them to use less electricity. Metering would allow us to determine the difference in rate. This is always custom for commercial applications.

PARTICIPATION

What could PSE change to make these programs more appealing?

Making it as easy as possible. Having someone who you can get in touch with to adjust as needed. Showing it won't cost you money, time, or break something that's working. Support to walk people through every step of the way. Having someone personally reach out to tell me about it is what makes the difference in me opting into something or not.

Frequently get requests to share information. Extremely helpful if you share graphics and copy to utilize in different spaces, rather than just a PDF we have to parse through.

Canva is also easy to share from in our own materials.

Having it done right the first time. If it doesn't go right or creates additional time, you lose folks pretty much immediately.

Effective and efficient use experience.

I liked that. It's always kind of an honor to be asked to be a partner for a new program as well.

Ambassador systems like PSE's Powerful Partners. Lead by example and begin to build trust and understanding of how best to implement. There will be factors you won't know until you know, i.e., cutting heat to a warehouse leading to burst pipes.

Painting the picture.

Resource vetting.

I love the idea of providing equipment, because then you're saving us time to select equipment.

Always better to state financial incentives in the simplest terms possible, as a starting point. People may not have any idea how much energy they use or can shift.

Keep it simple.

What additional information would you need to participate?

5

CHALLENGES

Missing: Lack of understanding of electrical usage and how that passively affects the drain on people's meters. Especially smaller things we may not think about adding up.

Thinking about heating for if people are there 24/7 or if businesses are operating at all hours.

6

Puget Sound Energy Demand Response Commercial Workshop

March 28, 2023

INFORMATION NEEDS

Selected all of them but there may be some education needed for the smaller businesses

Something that wasn't on here was testimonials so they can learn from people and their examples and realize that "they can do that too." That ★will lead to buy in.

Anything that someone can relate to and say "this is like me"

I selected step-by-step; number of events and savings

Want personalized step-by-step instructions for my agency cause it will be different than someone else and in those step-by-step, I want to know how much energy I'm saving.

If there are a lot of steps and we're not saving much energy, that will be very important to know and we might choose a different route

Not sure how much it matters of the equipment we use that uses the most electricity cause we may not be able to change that

#1 source of energy consumption is pumping water but a City can't stop doing that during an extreme event. Thinking more about what we can do

Getting to this so someone would even consider enrolling

Getting to why would someone want to do this

Tapping into greater good - this is a good thing for the environment and sending those messages to folks so they understand that we're all benefiting; a non-quantifiable benefit

QUESTIONS

Is water heating the only? Is cooling part of it too?

Thermostats and water heat are two places where we can send a signal directly. There are other more complex tools where we can also send a signal. Anything grid enabled, i.e. connected to the internet, can be sent a signal

Are you including batteries?

Eventually yes. We're mostly looking at water heaters, thermostats and EV chargers. Within next year, we hope to bring batteries online as well

Modeling after similar programs?

Partnering with vendors that have experience working with and understand different customers and how to customize curtailment packages

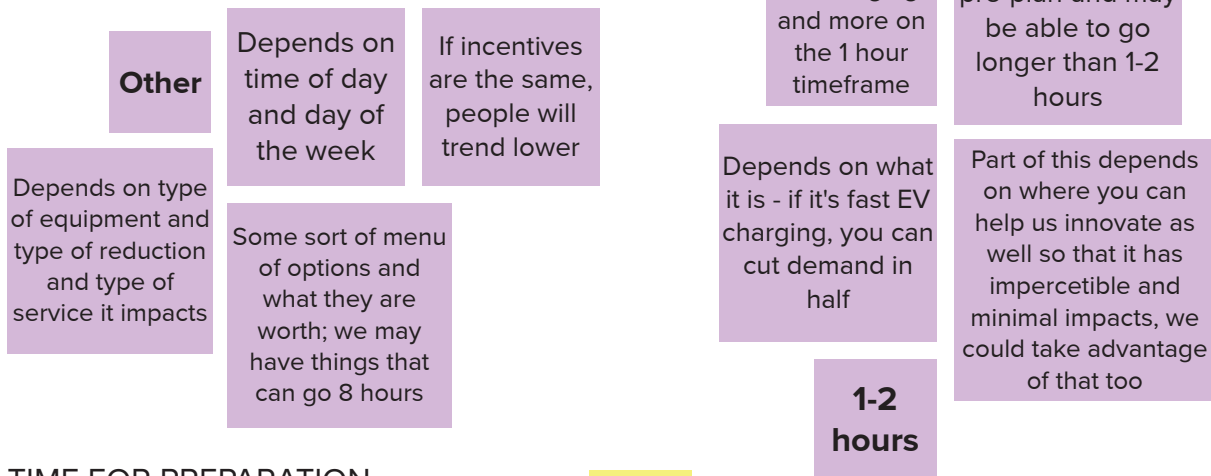
Interested in curtailment events and how we define those

Lots of different events that would be curtailment events. We're primarily looking at system capacity so we can call these events without doing undo harm to the grid

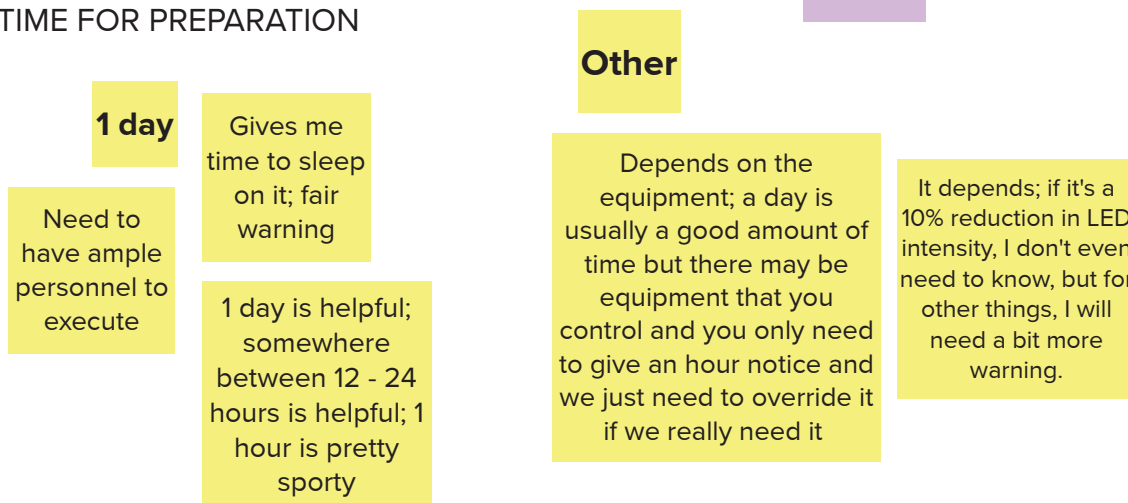
Incentive side, we're looking at cost/KW saved

EVENT LENGTH AND PREPARATION TIME

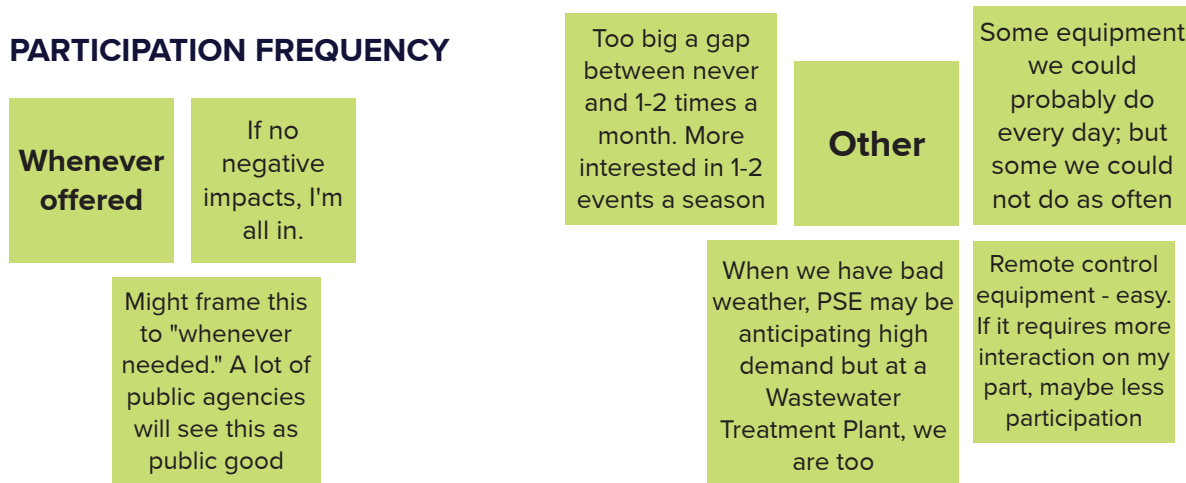
EVENT LENGTH



TIME FOR PREPARATION

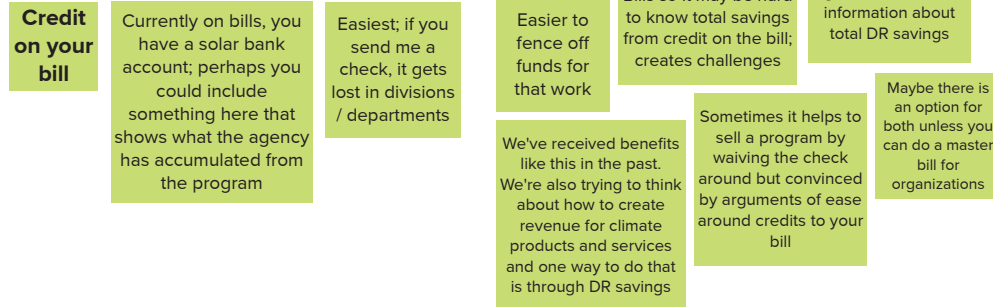


PARTICIPATION FREQUENCY



FINANCIAL INCENTIVES

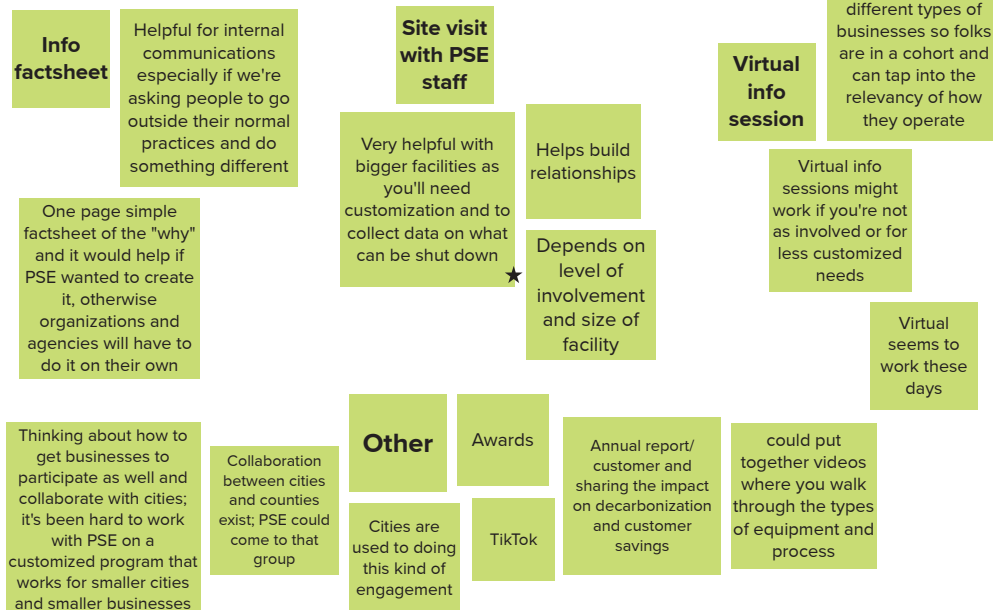
Payment methods



\$/kWh CURTAILED PER EVENT



EDUCATION AND OUTREACH



When do you use energy in your home the most?

1

Evenings
Summer months
Evenings and nights after work

From around 4pm to 11pm
Can't always turn down the heat due to health issues

late afternoon
Saving the energy is paramount! do use energy when it's cold

During the winter months, hourly electricity load is less variable but peaks in both the morning and the evening.

What demand response benefits are most important to you and your community?

2

Help integrate renewable energy onto the electric grid by providing increased stability and management, save energy

Energy efficiency

It saves energy, reduces the need for fossil fuel power plant

It helps save energy and reduce the cost spent on energy

No release of dangerous gases to the atmosphere

Greater understanding of energy and the reduced cost helps budget and cut costs

Provides an alternative to the traditional sources of energy

Participants can earn money by monetizing flexible energy use

Demand response shifts electricity consumption away from peak load times to more desirable periods when demand has settled.

Reduced utility bill will save cost

The reduction of utility bills is nice because it helps cut down on bills and you can use that for something else and also having clean energy with little to no pollution would help the atmosphere and the ozone layer

increase visibility on energy use

helps integrate renewable energy onto the electric grid

clean energy transition is environment - friendly

The economic and environmental benefits

It saves energy, reduces the need for fossil fuel power plant and other damages

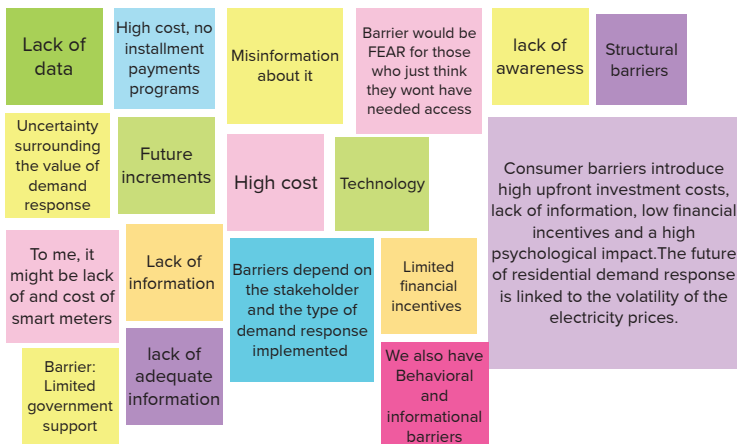
Puget Sound Energy Demand Response Residential Focus Group

February 7, 2023

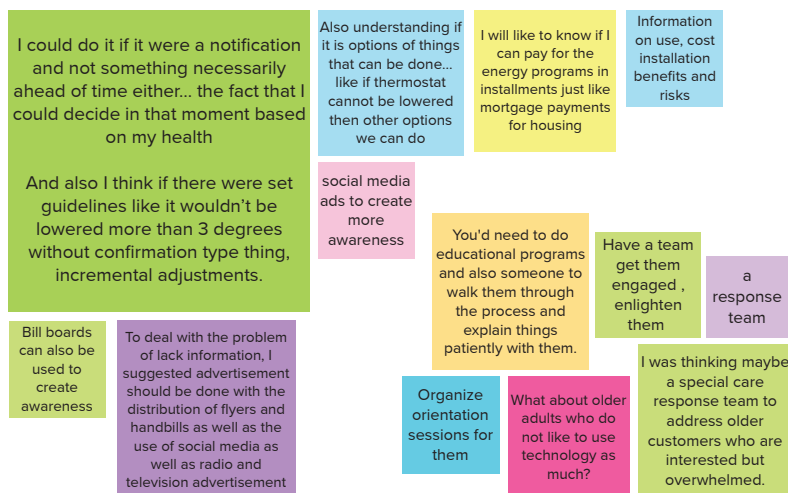
DISCUSSION QUESTIONS

3

What barriers might keep you from participating in a DR program?



What are ways in which these barriers could be addressed?



DISCUSSION QUESTIONS

4

What type of demand response program would you be excited to participate in? Why would you choose to participate in the DR program you chose?

Behavioral Demand Response

I would be more apt to do the behavioral with options.

I prefer the first because sometimes there might be emergencies and it's better if you can choose when you want to and not so as to fit your needs.

I preferred option 1 because the concept is really simple. It ultimately incentivizes customers to change their energy consumption behavior to match the need of the grid.

I prefer behavioral option because it informs and gives choices and options.

sense of autonomy

Remote Energy Management

There are high upfront costs for participation, which makes it financially unattractive to participate.

I prefer option 2.

I prefer Behavioral Response because it's allows user make his/her choices.

CHALLENGES

5

Limited access to cell phones for notification

Maintaining a comfortable environment might be challenging for older folks

I'd say it'll be the second in the chart for most people because not everyone likes to go out of their comfort zones especially older folks but when they get used to it, it'd be easier.

Also behavioral and informational barriers

inappropriate market incentive

Negligence in the part of the electricity company/distributor

Complexity of system operations

challenges for transmission and distribution network service providers and market operators to balance supply and demand efficiently and economically

Supply imbalance and variable energy supply

PARTICIPATION

6

What could PSE change to make these programs more appealing?

I feel the programs are nice, adding more incentives would also make people interested.

By maximizing energy efficiency in its buildings

the ability to delay costly upgrades to networks

fulfilling the promises of 100% clean energy

financial benefits are the primary motivation

focus on interruptible loads and load shift to reduce peak demand

Having someone help set it up and having people available to answer questions

Massive electrification of buildings and vehicles

Information about the program should be adequately explained to the public

Yes I agree with the personal touch of someone in with them. Rebates are a challenge for those who are lower income

What additional information would you need to participate?

I think there should be availability of warranty.

Some way to show the amount of incentive they could experience, will it really make a difference for people?

financial benefits are the primary motivation

set a specific target

Create a goal – get commitment – provide feedback Consider structuring the DR program so that participants get a specific difficult goal for participation, commit to the goal, and then get feedback on their goal.

information on the program

What kind of financial incentives would you need to participate?

Yeah, reducing the cost of some of these equipments would be nice

Offering time based rates, like critical peak pricing, time of use pricing

QUESTIONS AND COMMENTS

Q: How much power will the batteries be able to hold, and how long can it last after a full charge? How long does a full charge take?

A: We will follow up on questions related to batteries.

Q: Are there still focus groups like these for people who'd like to participate and also give their expertise?

A: Unfortunately our registration is at capacity but we will keep you in the loop on the survey.

Q: What is the capacity of the lead-acid battery?

The U.S. Department of Energy estimates that you can save as much as 10% a year on your energy bills by turning your thermostat back 7° to 10°F for 8 hours a day from its normal setting. From a theoretical perspective, the lead-acid battery system can provide energy of 83.472 Ah kg⁻¹ comprised of 4.46 g PbO₂, 3.86 g Pb and 3.66 g of H₂SO₄ per Ah.

Peak shaving and load shifting programs can assist in reducing the need for expensive peaking units and in flattening the load profile.

Q: So the demand response would mean we would have the thermostat lowered not that we would use our saved up energy during those times?

A: It could be both.

Q: How can electricity providers save money through reductions in peak demand and the ability to defer construction of new power plants and power delivery systems?

A: That is what DR is. Constraint on the grid typically happens at a peak period, which is when we put pressure on our infrastructure. We can use demand response to lower use during those peaks to delay infrastructure investments. Doing that now on Bainbridge Island and in Duvall.

Q: What about those who want to participate but maybe they aren't home... SO would/ could there be an incentive for those who lowered everything each time they left the home?

A: Typically, that would not necessarily be a DR program but more what we'd call customer energy management or energy efficiency. It's a great way to save energy and save money on your bill as heat typically is the biggest use of your energy.

Q: With the demand response can sensors perceive peak load problems and utilize automatic switching to divert or reduce power in strategic places, removing the chance of overload and the resulting power failure.

A: Absolutely. Using virtual power plant software allows us to dispatch DER to certain areas to mitigate constraints or overloads.

INFORMATION AND OUTREACH

7

How would you like to learn more about future demand response programs?

Networking through community programs that are already reaching customers as well

community gatherings

Community gatherings for older adults who don't have so much access to cell phones

Programs such as HomesFirst, Community action and the Housing Authority are GREAT about sharing all this kind of information.

Social media. Like Instagram, Twitter, Facebook, Pinterest and a lot more

Social media is a very effective way because most people are on social media especially Facebook and it's easier to see informations there. The ads need to be catchy and nice.

Social Media/ community programs

youths can easily get information from social media

How about a virtual power plant software?

Then also, the website of the company should also be referenced because It's where you can see their projects and their programs which would help clarify the projects and can direct people on the

C: I would love to receive notifications in advance of forecasted peak usage times.

A: This is not available yet, it will typically be a day-ahead notification (usually weather based) once programs become available.

Puget Sound Energy Demand Response Residential Workshop

March 27, 2023

INFORMATION NEEDS

Landlord/property owner would need to know

Effectiveness
of DR
programs

useful info
for both the
landlord and
the tenant

They need
to be aware
and also
ready to try

The
expenses
(x2)

Cost and
expenses
involved

Cost will be a
major concern -
mine would be
eager is program
is less costly

Cost and
specific time
of each
program
involved

Concerns you have with DR programs

How the
program will
be
maintained

How people
will engage
with it

What is missing? Anything you
would change?

No
change

The information on
each device since
not all devices use
the same amount
of energy
★

What information would be most
useful to you and why?

Incentives

I will definitely like to
know appliances that
uses more of electricity,
so that I will be mindful
and careful when using
them. because I will not
like to spend more
★

I would love step by
step instructions so
that I become well
aware of every detail
I should follow, this
would enable me not
to mess up

ENROLLMENT METHODS

BDR

WEBSITE

Website would
be helpful cause
you would have
step-by-step
instructions of
what to do ★

Websites for
notifications, it gives
you time to look into it
even later on, phone
call sometimes I may
not be near my phone
at all times

I believe the
website is
better than
phone

Websites you
can as well
log in on
different
devices

PHONE

Using a phone
number would
be better in
case of an
emergency

I chose phone
over website
because I'm
always on my
phone

I check more
often and it's
easier to use

Chose via
phone
because I feel
more in
control

REM

PHONE CALL

A phone call for
me is the best
because i will be
able to express
my self better

EMAIL

Email because
it would be
helpful to have
the website

I prefer
email

Email
would be
ok

Email is
the best

REM TECHNOLOGY PREFERENCES

Smart water heaters	It will not take much of my time. It will not consume more energy	Smart thermostats
It's something I use the most and it would be helpful to have in my house	Energy friendly	Can take your energy saving to a new level

OWN VS. LEASE

OWN	Owning is ok with me because then I will not have a conflict with the person I'm leasing from; more control
LEASE	Owning is kind of expensive, leasing is a better option since you only use it when in need ★

EVENT LENGTH AND PREPARATION TIME

BDR

EVENT LENGTH

4 hours to me would be too much	I chose 2 hours because it's more accurate and stable	4 hours because there are more cost savings associated
Less hours to get used to the program	2 hours will be good for a start, and maybe if it works out okay for me then I may add more hours	

PARTICIPATION FREQUENCY

Always willing to save costs and participate	Start slow and then maybe participate more	Available to know more
Contributing to a higher goal in addition to cost savings	I chose when ever offered because I be a able to contribute my opinion when called upon	
Whenever offered because I like to learn more and accept new changes	I chose more than twice week considering the fact that I may want to use the program in most cases,	

FINANCIAL INCENTIVES - BDR

Per event

At least 7% considering the number of hours	5% is ok	3% reduction works best for me because there I can save a little money
	3% is moderate, not too much and not too low	

FINANCIAL INCENTIVES - REM

Cost sharing

50/50 = sharing it will work for me	75% because it's more accurate to me	hmmmm I will say 75% works best for me. it is more effective and accurate to me
-------------------------------------	--------------------------------------	---

If the PSE can cover the remainder then that's kind of fair for both parties	Savings	\$100 is really ok for me
--	----------------	---------------------------

Financial incentives to participate

On-bill financing since it's incorporated into your bill and already cooperative	Provide a secure revenue stream and not result in disconnection	Dynamic rebased ★ based on participation, because the more I participate the more I am gaining
	Flat monthly or season rebates is best for me	

Follow-up information

Carbon saved and GHG saved and also how that has impacted human health	Dollars and electricity saved so that I am sure I made some progress in reducing cost	I chose dollars saved because I will make something better in it, than electricity use
How it is contributing to the broader goal of climate change, health, mortality rates	I choosed dollar saved, because no one wants to loose money, rather we want to save money, so I will like to know how much I have saved by reducing the electricity use	I chose multiple options like dollars saved, green house and electricity saved because it will help me further understand how to use them all
I chose electricity and dollars saved because it's good to know how much money you are saving		

Payment mechanisms

Visa gift card	Gift card is an easy thing to use and easily accessed if it's emailed to you	Check could be more time consuming
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Opting out

Sending an email works well because it's more private ★	Maybe consider opting out through an app	If I opted in via website I would likely opt out the same, if not then email is convenient	Website works best for me
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APPENDIX E: SPANISH RESIDENTIAL WORKSHOP MURAL BOARDS

See next page.

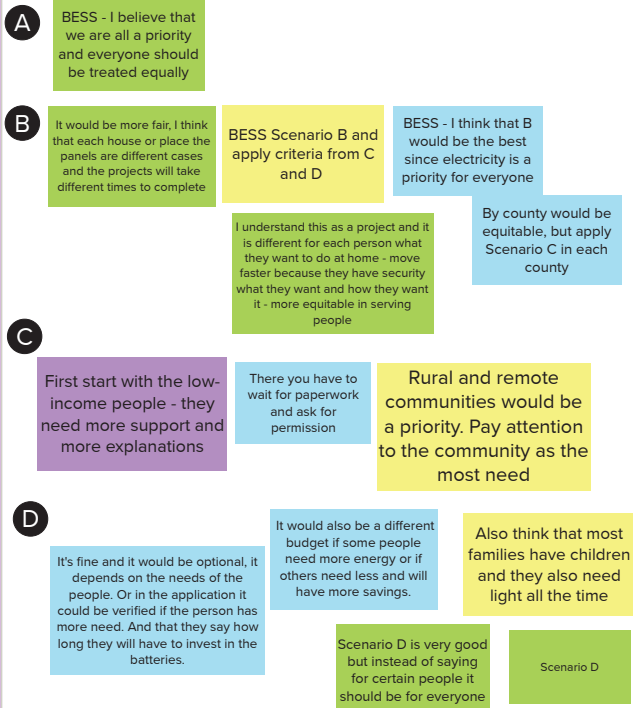
PSE Residential Workshop in Spanish Solar, Battery, DR

April 18, 2023

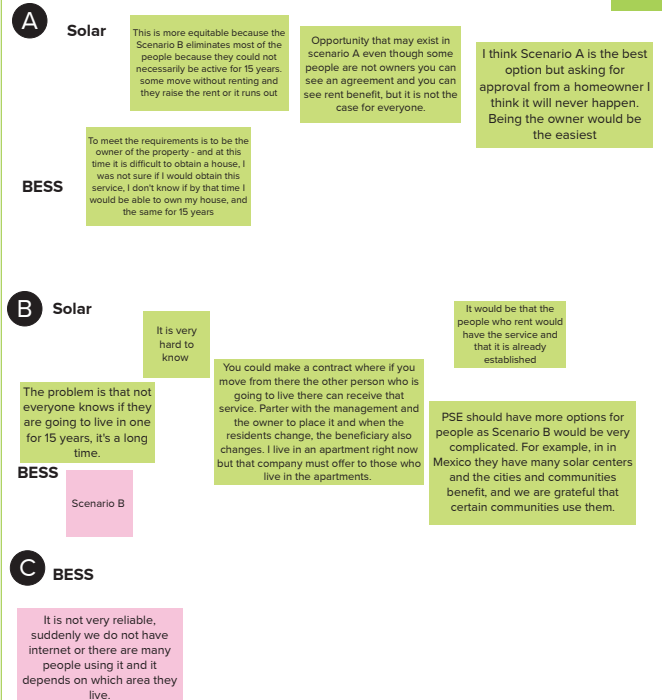
PARTICIPANTS

20
Participants

APPLICATION - SOLAR AND BATTERY



PROGRAM ELIGIBILITY



QUESTIONS AND COMMENTS

Send all the information through email to be able to review everything

If something new comes out while you are enrolled in the program, can you make updates?

Can you put panels or batteries on the ground, or how does that work?

It is important to know legal issues and considerations for cases when PSE uses my roof in exchange for incentives. There is the \$20 incentive but if I move what is the benefit?

I know there is a federal incentive that gives tax refunds if you buy solar panels, where is that incentive considered in these options? Or does it not apply?

If you are the owner, do you have to make monthly payments? Only in Scenario C you pay monthly and receive no incentive?

The downside is that batteries are very expensive, they do not go for less than \$5,000-\$6,000. Some can be easy to transport but they are expensive.

Could I do all my house chores with the energy produced by solar?

Can you obtain solar panels if you are renting a house or apartment? I saw on Facebook a promotion on solar panels but the cost was too high. The installation would be expensive but the usage allows for energy savings.

Is PSE considering how to distribute educational materials to people with these services? There could be concerns about risk having panels or batteries and the impact on one's health or the house.

If someone is taking the risk of installing, what type of computation is PSE doing to use? Quantum computing causes less damage to cell phones for example.

Batteries won't be able to be moved to other houses.

For applications it would be good to consider total family income to see how much one could contribute and how much help they would need.

OWNERSHIP AND MAINTENANCE

A Solar

AC

A would be the priority if I were the owner

BESS

ACB

B Solar

BAC

BC (4)

B, because you would not have \$15,000 as a down payment

It is that b and c are the most accessible for many people

This could be the promotion for those who are not going to pay but it will never be mine

B because PSE has experience in this and they are the experts and it would be better if they hire a contractor, and the payment is zero and it would be a fixed monthly payment of \$20, which is much cheaper than a contractor who will charge me \$3,600 for everything and for more per month, the total of 3600 is very cheap and for homeowners in option A.

B because that way PSE takes care of everything

BESS

BCA

B and C are equal

BCA

BA

BC (x2)

C Solar

For me C is the best option because I rent. But option B is the best if you are an owner.

The C would be priority as I rent. In the long term I am saving so that it is something that will belong to me

BESS

CA (x2)

Priority because the same as before of being the owner and having the batteries in support when there is a blackout. During those 10 years it could be improvement.

COMMUNITY SOLAR

Would you enroll in a community solar program? Why or why not?

I would enroll

I would subscribe to community solar

In California, the company that offers you the panels repairs your ceilings.

It is the best if panels are in the communities and they take care of damages or if there is a storm.

We would receive clean and safe energy.

Yes, I think the community needs a lot more education on this topic.

I told the owner about the plot of this investment and he ignored me. The owners don't want to damage the technology and take the risk. There are issues with landlords even to ask for a plumber or to change a light bulb. They take a long time, imagine if you ask them to install solar panels, it would take a long time.

Most people don't know how it works or make the connections. I'm working on that for when we go camping and use better lighting.

They could combine something, so that people can rent it

I would like community solar much better than the house panel.

If we can put it on a monthly basis and have something of our own that would be great. Also, to have it in every community, so if I move to another place, I know that I will also have that benefit.

Being part of the community would be ideal because it would include all the people who need it, many of us could not get this otherwise.

BESS: Financing - Upfront Installation

A

A (x5)

The first is very good because it would be looking for financing and looking for what you could pay

B

Scenario B (X2)

C

I don't like it because in 60 days one can't because of the rent or bills, it would seem to me that I didn't lose everything if I didn't pay

BESS: Load Management

A

No comment

B

It would be good because as we talked about before there are people who need priority or more energy and it would be good to have a notice of when they are going to use that energy

B so you are already warned that they are going to use your batteries and what day

B (x2)

B so they let you know that they will use your batteries and if it is a good option

Scenario B and then C

C

Most of us sleep at night and it would be better if the battery recharges at night or during the day so it can be used.

It depends on the season. During hot weather we do not use energy because there is light until late.

EDUCATION

Payments - D (x5), C

DEMAND RESPONSE

Information

B and A are popular

BDR

Application

PSE has to do the work because sometimes on the website you get stuck or confused, and by phone you have to wait your turn and it's better if they already have the application and help you.

Financial benefit

5% at the minimum

20%

50% (x2)

80%

15% because 5% is too low

REM

What type of REM technologies would you prefer to use in your home?

More technologies

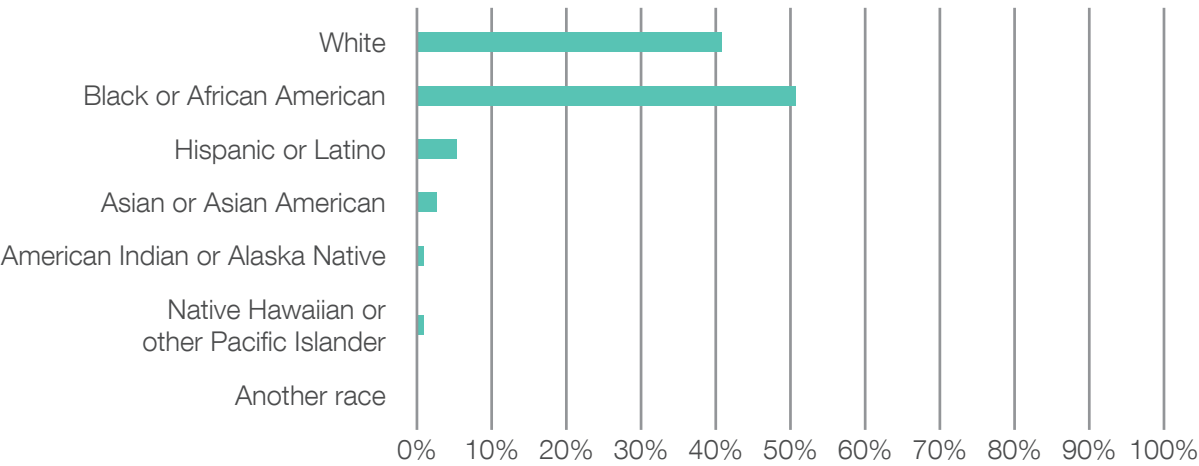
Smart light with wifi

APPENDIX F: ENGLISH DER SURVEY RESULTS

See next page.

Q1 WHAT IS YOUR RACE? SELECT ALL THAT APPLY.

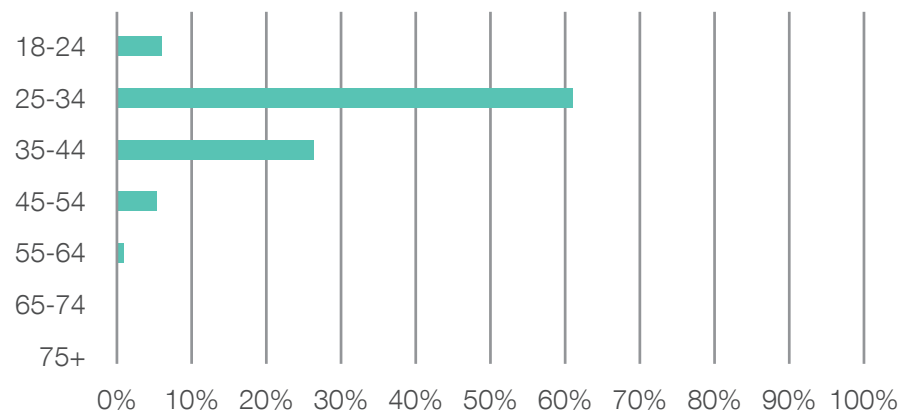
Answered: 157 Skipped: 0



Answer choices	Responses	
White	41.40%	65
Black or African American	51.59%	81
Hispanic or Latino	5.73%	9
Asian or Asian American	3.18%	5
American Indian or Alaska Native	0.64%	1
Native Hawaiian or other Pacific Islander	0.64%	1
Another race	0.00%	0
Total respondents: 157		

Q2 WHAT IS YOUR AGE?

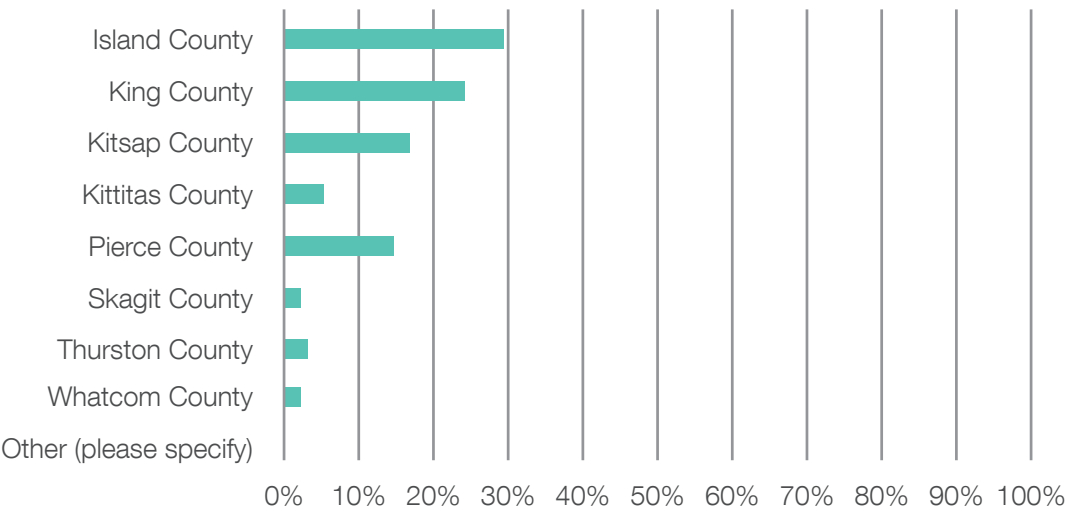
Answered: 157 Skipped: 0



Answer choices	Responses	
18-24	5.73%	9
25-34	61.78%	97
35-44	26.75%	42
45-54	5.10%	8
55-64	0.64%	1
65-74	0.00%	0
75+	0.00%	0
Total participants: 157		

Q3 WHAT COUNTY DO YOU LIVE IN?

Answered: 157 Skipped: 0



Answer choices	Responses	
Island County	29.94%	47
King County	24.84%	39
Kitsap County	17.20%	27
Kittitas County	5.10%	8
Pierce County	14.01%	22
Skagit County	2.55%	4
Thurston County	3.82%	6
Whatcom County	2.55%	4
Other (please specify)	0.00%	0
Total participants: 157		

HOW MANY PEOPLE ARE IN YOUR HOUSEHOLD?

Answer choices	Responses	
1 person (just me)	2.04%	1
2 people	12.24%	6
3 people	34.69%	17
4 people	30.61%	15
5 people	16.33%	8
6 people	2.04%	1
7 people	0.00%	0
8 people	0.00%	0
9 people	0.00%	0
10+ people	0.00%	0
Total participants: 49		

WHAT WAS YOUR TOTAL HOUSEHOLD INCOME IN 2022?

Answer choices	Responses	
Less than \$49,950	100%	1
More than \$49,950	12.24%	6
Total participants: 1		
Less than \$57,100	100%	6
More than \$57,100	0.00%	0
Total participants: 6		
Less than \$64,250	100%	17
More than \$64,250	0.00%	0
Total participants: 17		
Less than \$71,350	86.67%	13
More than \$71,350	13.33%	2
Total participants: 15		
Less than \$77,100	100%	8
More than \$77,100	0.00%	0
Total participants: 8		
Less than \$82,800	100%	1
More than \$82,800	0.00%	0
Total participants: 1		
Less than \$94,200	0.00%	0
More than \$94,200	100%	1
Total participants: 1		
Less than \$112,140	100%	1
More than \$112,140	0.00%	0
Total participants: 1		

Q15 HOW MANY PEOPLE ARE IN YOUR HOUSEHOLD?

Answer choices	Responses	
1 person (just me)	10.26%	4
2 people	15.38%	6
3 people	35.90%	14
4 people	28.21%	11
5 people	2.56%	1
6 people	5.13%	2
7 people	0.00%	0
8 people	2.56%	1
9 people	0.00%	0
10+ people	0.00%	0
Total participants: 39		

WHAT WAS YOUR TOTAL HOUSEHOLD INCOME IN 2022?

Answer choices	Responses	
Less than \$66,750	100%	4
More than \$66,750	0.00%	0
Total participants: 4		
Less than \$76,250	83.33%	5
More than \$76,250	16.67%	1
Total participants: 6		
Less than \$85,800	100%	14
More than \$85,800	0.00%	0
Total participants: 14		
Less than \$95,300	90.91%	10
More than \$95,300	9.09%	1
Total participants: 11		
Less than \$102,950	0.00%	0
More than \$102,950	100%	1
Total participants: 1		
Less than \$110,550	50%	1
More than \$110,550	50%	1
Total participants: 2		
Less than \$125,800	100%	1
More than \$125,800	0.00%	0
Total participants: 1		

HOW MANY PEOPLE ARE IN YOUR HOUSEHOLD?

Answer choices	Responses	
1 person (just me)	7.41%	2
2 people	7.41%	2
3 people	44.44%	12
4 people	25.93%	7
5 people	11.11%	3
6 people	3.70%	1
7 people	0.00%	0
8 people	0.00%	0
9 people	0.00%	0
10+ people	0.00%	0
Total participants: 27		

WHAT WAS YOUR TOTAL HOUSEHOLD INCOME IN 2022?

Answer choices	Responses	
Less than \$57,650	100%	2
More than \$57,650	0.00%	0
Total participants: 2		
Less than \$65,850	100%	2
More than \$65,850	0.00%	0
Total participants: 2		
Less than \$74,100	100%	12
More than \$74,100	0.00%	0
Total participants: 12		
Less than \$82,300	100%	7
More than \$82,300	0.00%	0
Total participants: 7		
Less than \$88,900	100%	3
More than \$88,900	0.00%	0
Total participants: 3		
Less than \$95,500	100%	1
More than \$95,000	0.00%	0
Total participants: 1		

HOW MANY PEOPLE ARE IN YOUR HOUSEHOLD?

Answer choices	Responses	
1 person (just me)	12.5%	1
2 people	25%	2
3 people	25%	2
4 people	25%	2
5 people	0.00%	0
6 people	12.5%	1
7 people	0.00%	0
8 people	0.00%	0
9 people	0.00%	0
10+ people	0.00%	0
Total participants: 8		

WHAT WAS YOUR TOTAL HOUSEHOLD INCOME IN 2022?

Answer choices	Responses	
Less than \$47,600	100%	2
More than \$47,600	0.00%	0
Total participants: 2		
Less than \$54,400	100%	2
More than \$54,400	0.00%	0
Total participants: 2		
Less than \$61,200	100%	2
More than \$61,200	0.00%	0
Total participants: 2		
Less than \$68,000	100%	2
More than \$68,000	0.00%	0
Total participants: 2		

HOW MANY PEOPLE ARE IN YOUR HOUSEHOLD?

Answer choices	Responses	
1 person (just me)	8.7%	2
2 people	8.7%	2
3 people	26.09%	6
4 people	43.48%	10
5 people	13.04%	3
6 people	0.00%	0
7 people	0.00%	0
8 people	0.00%	0
9 people	0.00%	0
10+ people	0.00%	0
Total participants: 23		

WHAT WAS YOUR TOTAL HOUSEHOLD INCOME IN 2022?

Answer choices	Responses	
Less than \$56,850	100%	2
More than \$56,850	0.00%	0
Total participants: 2		
Less than \$65,000	100%	2
More than \$65,000	0.00%	0
Total participants: 2		
Less than \$73,100	100%	6
More than \$73,100	0.00%	0
Total participants: 6		
Less than \$81,200	100%	10
More than \$81,200	0.00%	0
Total participants: 10		
Less than \$87,700	100%	3
More than \$87,700	0.00%	0
Total participants: 3		

HOW MANY PEOPLE ARE IN YOUR HOUSEHOLD?

Answer choices	Responses	
1 person (just me)	0.00%	0
2 people	0.00%	0
3 people	50.00%	2
4 people	50.00%	2
5 people	0.00%	0
6 people	0.00%	0
7 people	0.00%	0
8 people	0.00%	0
9 people	0.00%	0
10+ people	0.00%	0
Total participants: 4		

WHAT WAS YOUR TOTAL HOUSEHOLD INCOME IN 2022?

Answer choices	Responses	
Less than \$62,050	100%	2
More than \$62,050	0.00%	0
Total participants: 2		
Less than \$68,900	50%	1
More than \$68,900	50%	1
Total participants: 2		

HOW MANY PEOPLE ARE IN YOUR HOUSEHOLD?

Answer choices	Responses	
1 person (just me)	16.67%	1
2 people	16.67%	1
3 people	16.67%	1
4 people	16.67%	1
5 people	3.33%	2
6 people	0.00%	0
7 people	0.00%	0
8 people	0.00%	0
9 people	0.00%	0
10+ people	0.00%	0
Total participants: 6		

WHAT WAS YOUR TOTAL HOUSEHOLD INCOME IN 2022?

Answer choices	Responses	
Less than \$56,500	0.00%	0
More than \$56,500	100%	1
Total participants: 1		
Less than \$64,600	100%	1
More than \$64,600	0.00%	0
Total participants: 1		
Less than \$72,650	100%	1
More than \$72,650	0.00%	0
Total participants: 1		
Less than \$80,700	100%	1
More than \$80,700	0.00%	0
Total participants: 1		
Less than \$87,200	100%	2
More than \$87,200	0.00%	0
Total participants: 2		

HOW MANY PEOPLE ARE IN YOUR HOUSEHOLD?

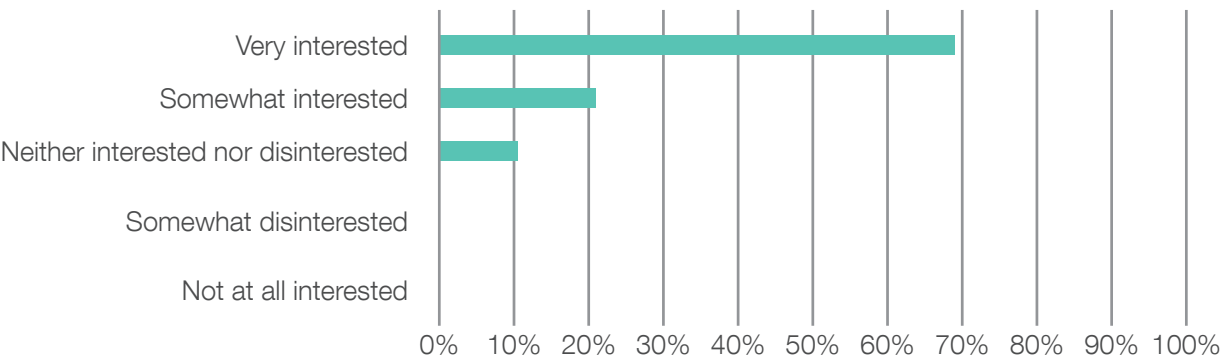
Answer choices	Responses	
1 person (just me)	0.00%	0
2 people	0.00%	0
3 people	25%	1
4 people	0.00%	0
5 people	25%	1
6 people	25%	1
7 people	25%	1
8 people	0.00%	0
9 people	0.00%	0
10+ people	0.00%	0
Total participants: 4		

WHAT WAS YOUR TOTAL HOUSEHOLD INCOME IN 2022?

Answer choices	Responses	
Less than \$65,300	100%	1
More than \$56,500	0.00%	0
Total participants: 1		
Less than \$78,400	100%	1
More than \$78,400	0.00%	0
Total participants: 1		
Less than \$84,200	100%	1
More than \$84,200	0.00%	0
Total participants: 1		
Less than \$90,000	100%	1
More than \$90,000	0.00%	0
Total participants: 1		

Q92 ARE YOU INTERESTED IN INSTALLING SOLAR WHERE YOU LIVE?

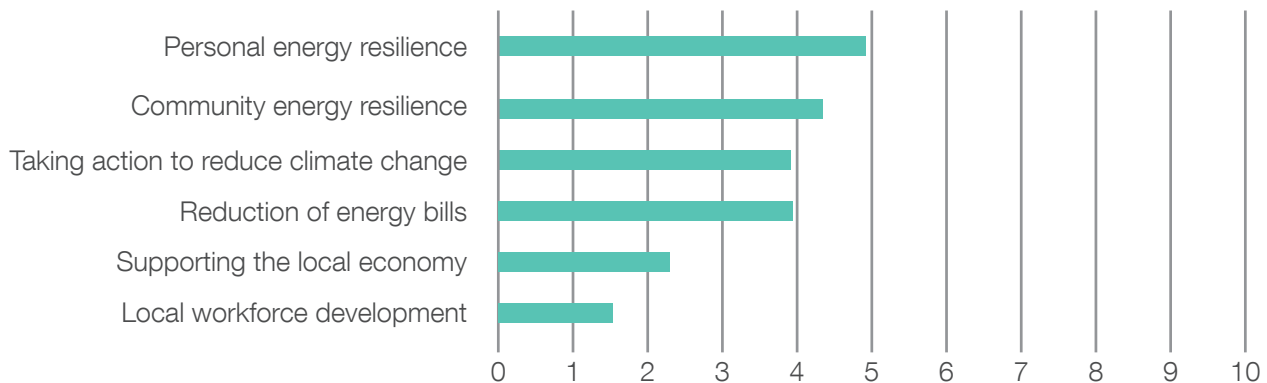
Answered: 149 Skipped: 0



Answer choices	Responses	
Very interested	69.13%	103
Somewhat interested	20.81%	31
Neither interested nor disinterested	10.07%	15
Somewhat disinterested	0.00%	0
Not at all interested	0.00%	0
Total respondents: 149		

Q93 WHAT INTERESTS YOU ABOUT INSTALLING SOLAR WHERE YOU LIVE? PLEASE RANK IN ORDER OF IMPORTANCE.

Answered: 149 Skipped: 8



Answer choices	1	2	3	4	5	6	Total	Score
Personal energy resilience	44.30% 66	27.52% 41	14.09% 21	7.38% 11	3.36% 5	3.36% 5	149	4.92
Community energy resilience	22.82% 34	24.83% 37	24.83% 37	19.46% 29	4.70% 7	3.36% 5	149	4.32
Taking action to reduce climate change	9.40% 14	28.86% 43	30.20% 45	16.11% 24	8.05% 12	7.38% 11	149	3.93
Reduction of my energy bills	23.49% 35	12.75% 19	20.81% 31	26.85% 40	10.74% 16	5.37% 8	149	3.95
Supporting the local economy	0.00% 0	4.03% 6	6.71% 10	24.83% 37	48.99% 73	15.44% 23	149	2.35
Local workforce development benefits	0.00% 0	2.01% 3	3.36% 5	5.37% 8	24.16% 36	65.10% 97	149	1.53

Q94 WHAT IS MISSING FROM THE LIST ABOVE?

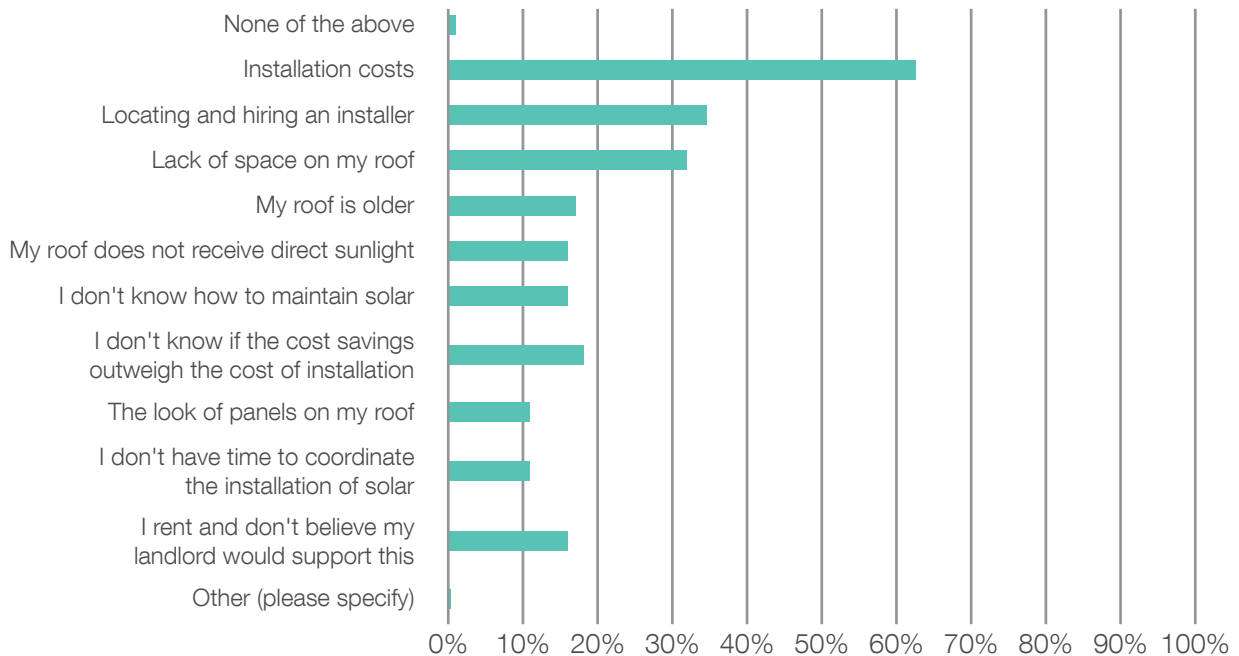
Answered: 60 Skipped: 97

#	Responses	Date
1	Having enough energy all times	4/23/2023 11:34 AM
2	Contributing towards community development	4/23/2023 11:17 AM
3	Save environment	4/23/2023 10:48 AM
4	Cheaper energy once installed	4/23/2023 10:20 AM
5	Nil	4/21/2023 8:45 AM
6	Nil.	4/21/2023 8:30 AM
7	None.	4/21/2023 8:13 AM
8	Nothing	4/21/2023 7:38 AM
9	Energy independence	4/21/2023 5:32 AM
10	None	4/21/2023 3:17 AM
11	Ease of access to the solar energy	4/20/2023 8:50 PM
12	Ease of access to the source of power	4/20/2023 8:00 PM
13	All covered	4/20/2023 7:58 PM
14	Nothing Actually	4/20/2023 7:32 PM
15	Ease of access to the power source	4/20/2023 7:12 PM
16	None	4/20/2023 3:06 PM
17	None	4/20/2023 2:27 PM
18	My project to have completed energ Supply	4/20/2023 2:14 PM
19	Nil	4/20/2023 2:11 PM
20	Nothing is missing	4/20/2023 2:07 PM
21	Nothing	4/20/2023 1:52 PM
22	None	4/20/2023 1:40 PM
23	Nothing	4/20/2023 1:37 PM
24	None	4/20/2023 1:34 PM
25	Accessibility	4/20/2023 1:21 PM
26	Nothing is	4/20/2023 1:11 PM
27	How you pay	4/20/2023 1:07 PM
28	Nothing is missing	4/20/2023 12:31 PM
29	N/A	4/20/2023 12:23 PM
30	None	4/20/2023 12:13 PM
31	None	4/20/2023 12:11 PM
32	Ease of access to the power source	4/20/2023 11:57 AM
33	None	4/20/2023 11:56 AM
34	Nothing	4/20/2023 11:54 AM
35	Nothing	4/20/2023 11:53 AM
36	Capacity efficiency	4/20/2023 11:47 AM
37	Nothing	4/20/2023 11:32 AM
38	None	4/20/2023 11:31 AM

#	Responses	Date
39	Nothing	4/20/2023 11:29 AM
40	Nothing is missing	4/20/2023 11:26 AM
41	Climate Emergency	4/20/2023 11:17 AM
42	Nothing	4/20/2023 11:16 AM
43	None	4/20/2023 11:06 AM
44	Nothing	4/20/2023 11:03 AM
45	None	4/20/2023 10:58 AM
46	It helps to save money	4/20/2023 10:51 AM
47	None	4/20/2023 10:48 AM
48	Nothing	4/20/2023 10:35 AM
49	Waivers	4/20/2023 10:32 AM
50	Nothing is missing.	4/20/2023 10:19 AM
51	Nothing	4/20/2023 10:19 AM
52	Educational services	4/20/2023 10:17 AM
53	Nothing is missing	4/20/2023 10:09 AM
54	Nothing	4/20/2023 10:09 AM
55	Nothing	4/20/2023 10:02 AM
56	Nothing	4/20/2023 9:58 AM
57	Promoting social wellness	4/20/2023 9:58 AM
58	All are available in the list	4/20/2023 9:58 AM
59	Nothing	4/20/2023 9:56 AM
60	I Don't think I missed anything	4/20/2023 9:54 AM

Q95 WHAT MIGHT PREVENT YOU FROM INSTALLING SOLAR WHERE YOU LIVE? SELECT ALL THAT APPLY

Answered: 149 Skipped: 8



Answer choices	Responses	
None of the above	1.34%	2
Installation costs	62.42%	93
Locating and hiring an installer	35.57%	53
Lack of space on my roof	31.54%	47
My roof is older	18.79%	28
My roof does not receive direct sunlight	18.12%	27
I don't know how to maintain solar	18.12%	27
I don't know if the cost savings outweigh the cost of installation	19.46%	29
The look of panels on my roof	10.74%	16
I don't have time to coordinate the installation of solar	10.74%	16
I rent and don't believe my landlord would support this	16.11%	24
Other (please specify)	0.67%	1
Total participants: 149		

#	Other (please specify)	Date
1	I am disabled	4/11/2023 7:18 PM

Q96 HOW WOULD YOU SUGGEST PSE ADDRESS THESE BARRIERS?

Answered: 79 Skipped: 78

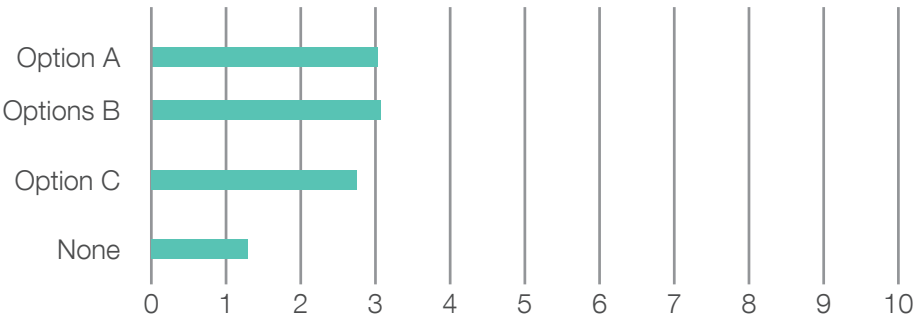
#	Responses	Date
1	Look into the cost of installation aspect	4/25/2023 11:37 AM
2	Education on solar technology and its benefits	4/23/2023 11:34 AM
3	Lower installation cost	4/23/2023 11:17 AM
4	Education on solar technology	4/23/2023 10:48 AM
5	Improve solar cells for optimal use	4/23/2023 10:20 AM
6	Providing detailed information	4/22/2023 12:42 AM
7	Not good enough	4/21/2023 10:26 AM
8	Creating and enlightenment the masses	4/21/2023 8:45 AM
9	Through seminar awareness.	4/21/2023 8:30 AM
10	Creating enlightenment.	4/21/2023 8:13 AM
11	Reducing cost	4/21/2023 7:38 AM
12	For the cost, reducing it is the way.	4/21/2023 5:32 AM
13	None	4/21/2023 3:19 AM
14	Awareness expansion.	4/21/2023 3:17 AM
15	By educating and enlightening people and finding good strategies to curb their barriers	4/21/2023 2:23 AM
16	Provide more information on the advantages of the usage of solar energy and reduce the cost of installation	4/20/2023 8:50 PM
17	Reduce the cost of installation and provide more information on the benefits of solar to the landlords so they can stop being against	4/20/2023 8:00 PM
18	Reduce cost of installation	4/20/2023 7:58 PM
19	None of these is a Barrier to me	4/20/2023 7:32 PM
20	Reducing the installation cost, advice landlords about the advice of installing and clearing rooftops to make it accessible to sunlight	4/20/2023 7:12 PM
21	Solar panels supply	4/20/2023 3:49 PM
22	Lower the cost of installation and also talk to the landlord about the installation first	4/20/2023 3:35 PM
23	Lower the cost of installation	4/20/2023 3:27 PM
24	Lower the cost of installation	4/20/2023 3:17 PM
25	Awareness recreation.	4/20/2023 3:11 PM
26	Employ more installers near the area	4/20/2023 3:06 PM
27	By ensuring that the barriers are eliminated	4/20/2023 3:06 PM
28	Making them available and accessible	4/20/2023 2:59 PM
29	Making provisions.	4/20/2023 2:46 PM
30	Electric energy	4/20/2023 2:34 PM
31	Creation of awareness	4/20/2023 2:27 PM
32	Recreation.	4/20/2023 2:23 PM
33	Reduce cost and have roofing spaces	4/20/2023 2:14 PM
34	Giving proper awareness to the masses	4/20/2023 2:11 PM
35	I think they should come in smaller sizes so they don't take off all the space on my roof	4/20/2023 2:07 PM
36	Na	4/20/2023 1:52 PM

#	Responses	Date
37	Nothing	4/20/2023 11:32 AM
38	Getting more workforce and capable hands involved	4/20/2023 1:37 PM
39	Adequate spacing to mount solar panels	4/20/2023 1:34 PM
40	To have minimal cost for installation	4/20/2023 1:21 PM
41	By bringing in qualified personnel	4/20/2023 1:11 PM
42	Bulding good relationship	4/20/2023 1:07 PM
43	Poor listening	4/20/2023 12:51 PM
44	By knowing the how much the cost saving is	4/20/2023 12:31 PM
45	Have an installment payment plan	4/20/2023 12:23 PM
46	Reducing cost	4/20/2023 12:13 PM
47	By encouraging apartment owners to develop them in a place where there is direct access to the sun and also to be flexible and allow their tenants to install the solar panels	4/20/2023 11:57 AM
48	Creating Innovations.	4/20/2023 11:56 AM
49	Nothing	4/20/2023 11:53 AM
50	Nothing	4/20/2023 11:32 AM
51	Provide solars in credit and provide installation free of charge	4/20/2023 11:31 AM
52	Proper supervision	4/20/2023 11:29 AM
53	Through awareness	4/20/2023 11:26 AM
54	More Focus Group meeting	4/20/2023 11:17 AM
55	Cost reduction	4/20/2023 11:16 AM
56	Ensuring that the cost of installing is affordable	4/20/2023 11:16 AM
57	Reduction in installation costs	4/20/2023 11:13 AM
58	Creating Awareness on solar panels and installation	4/20/2023 11:06 AM
59	Reducing cost	4/20/2023 11:03 AM
60	Provision of space	4/20/2023 10:58 AM
61	By creating other installation option	4/20/2023 10:51 AM
62	It's requires space	4/20/2023 10:48 AM
63	Getting us with professionals that could help us install them	4/20/2023 10:38 AM
64	High cost	4/20/2023 10:35 AM
65	Offer education on solar	4/20/2023 10:32 AM
66	Sometimes these those not withstand high temperature.	4/20/2023 10:19 AM
67	To implementing policy, systems, and environmental (PSE) change initiatives within Supplemental Nutrition Assistance Program-Education (SNAP-Ed) programming in U.S. rural communities; as well as strategies to overcome these barriers.	4/20/2023 10:19 AM
68	Subsidiaries	4/20/2023 10:17 AM
69	When problem like this come up I believe they should educate the poor masses out there on how to purchase it either by payment instalment on monthly like a kind of loan	4/20/2023 10:09 AM
70	By making the cost lesser, making sure people can locate them anytime they need their services, Also by teaching their customers how to maintained the installed solar	4/20/2023 10:09 AM

#	Responses	Date
71	It can be addressed if pse hires contractor to install for people who are not able to	4/20/2023 10:04 AM
72	By ensuring it's affordable	4/20/2023 10:02 AM
73	By providing an enabling environment for installation	4/20/2023 9:58 AM
74	Reduce the cost of installation	4/20/2023 9:58 AM
75	Enhance the list cost of solar panel.	4/20/2023 9:58 AM
76	If they can create awareness so that my landlord can have reasons to accept installation	4/20/2023 9:57 AM
77	Talk to landlords to support the installation	4/20/2023 9:56 AM
78	Help in terms of installmental payments	4/20/2023 9:55 AM
79	By asking people And enhancing them more about the product	4/20/2023 9:54 AM
70	By making the cost lesser, making sure people can locate them anytime they need their services, Also by teaching their customers how to maintained the installed solar	4/20/2023 10:09 AM

Q97 RANK WHICH PROGRAM MODEL YOU WOULD BE MOST INTERESTED IN PARTICIPATING IN. PLEASE NOTE THAT ALL DOLLAR VALUES ARE MEANT TO BE ILLUSTRATIVE AND ARE NOT NECESSARILY INDICATIVE OF FINAL PROGRAM COSTS OR OFFERINGS.

Answered: 149 Skipped: 8



Answer choices	1	2	3	4	Total	Score
Option A	38.26% 57	30.87% 46	27.52% 41	3.36% 5	149	3.04
Option B	44.97% 67	22.82% 34	27.52% 41	4.70% 7	149	3.08
Option C	14.77% 22	42.95% 64	30.87% 46	11.41% 17	149	2.61
None	2.01% 3	3.36% 5	14.09% 21	80.54% 120	149	1.27

Q98 IF NONE OF THESE OPTIONS ARE IDEAL FOR YOU, PLEASE DESCRIBE YOUR IDEAL OPTION.

Answered: 26 Skipped: 131

#	Responses	Date
1	Option. B	4/23/2023 11:34 AM
2	Option A is the best for me	4/23/2023 11:17 AM
3	Those options are ideal	4/23/2023 10:48 AM
4	Option B	4/23/2023 10:20 AM
5	No thanks	4/21/2023 7:38 AM
6	N/A	4/20/2023 8:50 PM
7	N/A	4/20/2023 8:00 PM
8	NA	4/20/2023 7:58 PM
9	N/A	4/20/2023 7:32 PM
10	N/A	4/20/2023 7:12 PM
11	None	4/20/2023 2:14 PM
12	Option C	4/20/2023 2:11 PM
13	They are all ideal for me	4/20/2023 2:07 PM
14	Na	4/20/2023 1:52 PM
15	I think they're all ideal and really pleasing to me	4/20/2023 1:37 PM
16	They're ideal	4/20/2023 1:11 PM
17	There are	4/20/2023 1:07 PM
18	They're all ideal for me	4/20/2023 12:31 PM
19	B, I'll be making monthly payments	4/20/2023 12:23 PM
20	N/A	4/20/2023 11:57 AM
21	They all find by me	4/20/2023 10:51 AM
22	They're fine and ideal for me.	4/20/2023 10:19 AM
23	B is the option	4/20/2023 10:09 AM
24	All are great	4/20/2023 9:58 AM
25	It's ideal	4/20/2023 9:56 AM
26	B. Is cool for me because of my budget	4/20/2023 9:54 AM

Q99 WHAT ADDITIONAL INFORMATION WOULD YOU NEED FROM PSE BEFORE INSTALLING SOLAR?

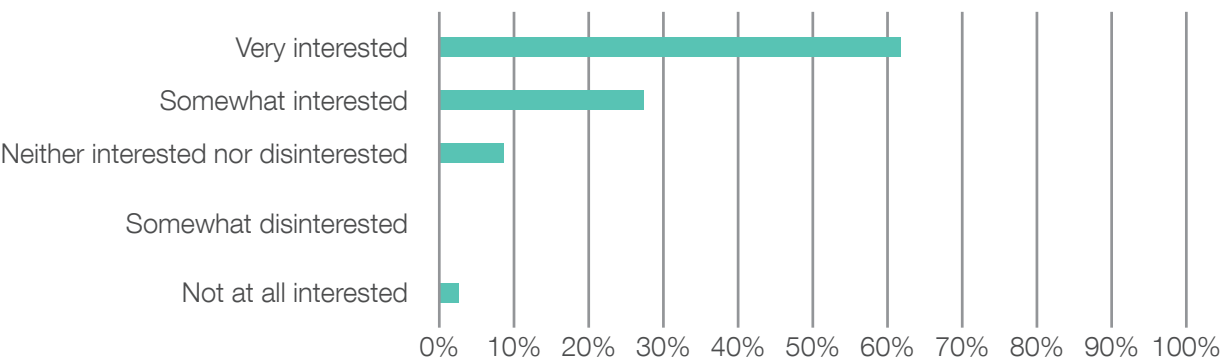
Answered: 74 Skipped: 83

#	Responses	Date
1	Maintenance	4/25/2023 11:37 AM
2	Overall cost of installation and maintenance	4/23/2023 11:34 AM
3	Solar installation services	4/23/2023 11:17 AM
4	Overall cost of solar installation	4/23/2023 10:48 AM
5	Afters installation services	4/23/2023 10:20 AM
6	Right spot	4/21/2023 10:26 AM
7	To know the capability of the solar	4/21/2023 8:45 AM
8	Lifespan benefits.	4/21/2023 8:30 AM
9	Gaining to learn more on solar panels installation.	4/21/2023 8:13 AM
10	Maintenance and cost	4/21/2023 7:38 AM
11	Panel sustainability, maintenance, installation requirements, and incentives	4/21/2023 5:32 AM
12	Benefits of installing a solar panel	4/21/2023 3:17 AM
13	How to use the solar	4/21/2023 2:23 AM
14	The advantages of using solar power	4/20/2023 8:50 PM
15	The advantages and disadvantages	4/20/2023 8:00 PM
16	Reliability of solar power	4/20/2023 7:58 PM
17	Durability and Performance	4/20/2023 7:32 PM
18	Advantages of its usage over other sources of power	4/20/2023 7:12 PM
19	Awareness Programs	4/20/2023 3:49 PM
20	None	4/20/2023 3:17 PM
21	Proper accessibility.	4/20/2023 3:11 PM
22	None	4/20/2023 3:06 PM
23	None	4/20/2023 3:06 PM
24	Benefits.	4/20/2023 2:46 PM
25	Battery capacity	4/20/2023 2:34 PM
26	Proper awareness	4/20/2023 2:27 PM
27	Advantages and Disadvantages	4/20/2023 2:23 PM
28	I already have the information	4/20/2023 2:14 PM
29	To know the advantages.	4/20/2023 2:11 PM
30	I think they should tell us more about PSE	4/20/2023 2:07 PM
31	Na	4/20/2023 1:52 PM
32	The advantages and disadvantages of PSE	4/20/2023 1:40 PM
33	Nil	4/20/2023 1:37 PM
34	Long-time life span of the solar panels	4/20/2023 1:34 PM
35	Maintainance measures	4/20/2023 1:21 PM
36	None	4/20/2023 1:11 PM
37	PSE Education	4/20/2023 1:07 PM

#	Responses	Date
38	None	4/20/2023 12:31 PM
39	Have a good customer support	4/20/2023 12:23 PM
40	I'm good	4/20/2023 12:19 PM
41	None	4/20/2023 12:13 PM
42	The cost it takes to install	4/20/2023 11:57 AM
43	Long-term Benefits.	4/20/2023 11:56 AM
44	Non	4/20/2023 11:53 AM
45	Efficiency	4/20/2023 11:52 AM
46	Maintenance	4/20/2023 11:45 AM
47	Energy consumption	4/20/2023 11:37 AM
48	Nothing	4/20/2023 11:32 AM
49	None	4/20/2023 11:31 AM
50	Maintenance	4/20/2023 11:29 AM
51	The capacity of the battery	4/20/2023 11:26 AM
52	How and when is going to be available for installation	4/20/2023 11:17 AM
53	Making it easy to access customer	4/20/2023 11:16 AM
54	The long-term benefits of the solar panels.	4/20/2023 11:06 AM
55	Nothing	4/20/2023 11:03 AM
56	It's affordable	4/20/2023 10:58 AM
57	More information about the installation process	4/20/2023 10:51 AM
58	How it works	4/20/2023 10:48 AM
59	How pse works	4/20/2023 10:38 AM
60	It is safe	4/20/2023 10:35 AM
61	I. Personally did not know about PSE so i think you all should come out on what pse is especially to older generations but i am very much a fan of pse	4/20/2023 10:29 AM
62	Get to get information on what i am signing up for	4/20/2023 10:20 AM
63	Location, the energy requirements, contracting company and the durability of the solar should all be considered which will work more effective.	4/20/2023 10:19 AM
64	The advantage of using solar	4/20/2023 10:19 AM
65	Any side effects or defects and costs	4/20/2023 10:17 AM
66	I would like to know every information on PSE	4/20/2023 10:13 AM
67	I will say it's a privileged if we are giving opportunity to purchase it	4/20/2023 10:09 AM
68	How to maintained it	4/20/2023 10:09 AM
69	What pse entails	4/20/2023 10:04 AM
70	No	4/20/2023 9:58 AM
71	Education on how to use and check for the barteries.	4/20/2023 9:58 AM
72	The warranty	4/20/2023 9:56 AM
73	Tell me the terms and conditions	4/20/2023 9:55 AM
74	I think they need to have the ones that sooth the poor people	4/20/2023 9:54 AM

Q100 HOW INTERESTED WOULD YOU BE IN COMMUNITY SOLAR?

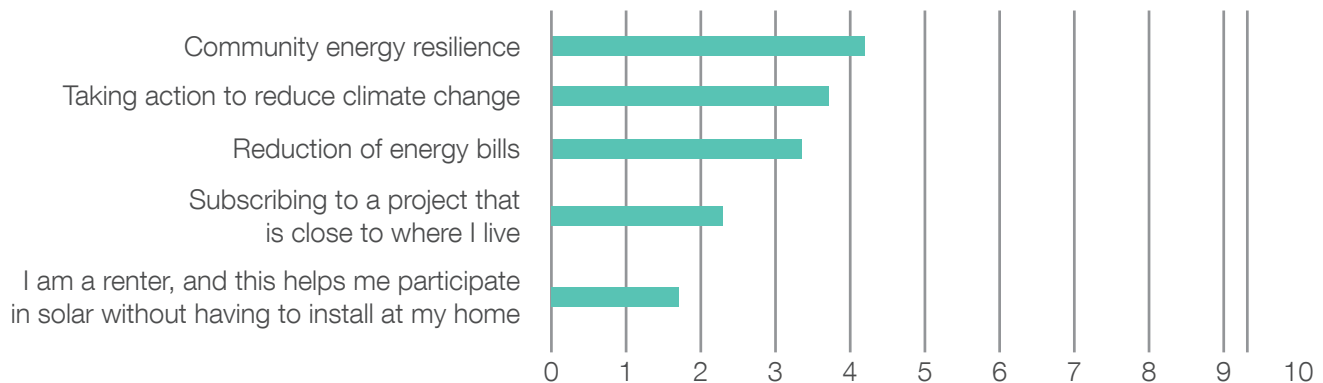
Answered: 149 Skipped: 8



Answer choices	Responses	
Very interested	61.07%	91
Somewhat interested	27.52%	41
Neither interested nor disinterested	9.40%	14
Somewhat disinterested	0.00%	0
Not at all interested	2.01%	3
Total participants: 149		

Q101 WHAT INTERESTS YOU ABOUT ENROLLING IN COMMUNITY SOLAR? PLEASE RANK IN ORDER OF IMPORTANCE.

Answered: 149 Skipped: 11



Answer choices	1	2	3	4	5	Total	Score
Community energy resilience	45.89% 67	30.14% 44	15.07% 22	4.79% 7	4.11% 6	146	4.09
Taking action to reduce climate change	28.08% 41	29.45% 43	29.45% 43	6.16% 9	6.85% 10	146	3.66
Reduction of my energy bills	19.86% 29	25.34% 37	33.56% 49	12.33% 18	8.90% 13	146	3.35
Subscribing to a project that is close to where I live	4.11% 6	10.27% 15	17.81% 26	47.26% 69	20.55% 30	146	2.30
I am a renter, and this helps me participate in solar without having to install at my home.	2.05% 3	4.79% 7	4.11% 6	29.45% 43	59.59% 87	146	1.60

Q102 WHAT IS MISSING FROM THE LIST ABOVE?

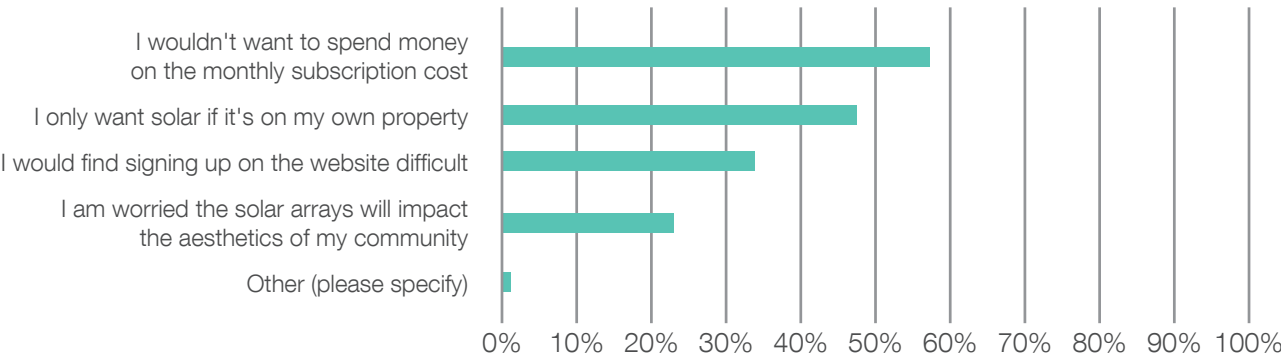
Answered: 54 Skipped: 103

#	Responses	Date
1	Being part of community development towards green energy	4/23/2023 11:36 AM
2	Being proud of saving the environment	4/23/2023 11:20 AM
3	Adequate energy available	4/23/2023 10:52 AM
4	Reduction in cost of installation due to shared cost	4/23/2023 10:25 AM
5	It's right	4/21/2023 10:27 AM
6	Nill	4/21/2023 8:47 AM
7	Nill.	4/21/2023 8:16 AM
8	All good	4/21/2023 7:42 AM
9	Reduced carbon footprint	4/21/2023 5:36 AM
10	Nothing.	4/21/2023 3:19 AM
11	The advantages of joining community solar	4/20/2023 8:55 PM
12	Ease of access to the solar energy	4/20/2023 8:11 PM
13	Its all good	4/20/2023 8:02 PM
14	Nothing to me	4/20/2023 7:33 PM
15	Ease of access and usage	4/20/2023 7:31 PM
16	Nothing	4/20/2023 3:09 PM
17	None	4/20/2023 3:08 PM
18	N/A	4/20/2023 3:06 PM
19	None	4/20/2023 2:32 PM
20	None	4/20/2023 2:16 PM
21	Nill	4/20/2023 2:13 PM
22	Nothing is missing from the list	4/20/2023 2:09 PM
23	Na	4/20/2023 1:52 PM
24	Nill	4/20/2023 1:44 PM
25	Nothing Is missing	4/20/2023 1:41 PM
26	Nill	4/20/2023 1:41 PM
27	Nothing	4/20/2023 1:23 PM
28	None	4/20/2023 1:13 PM
29	Nothing	4/20/2023 1:08 PM
30	Reduction of my energy bill	4/20/2023 12:52 PM
31	Nothing	4/20/2023 12:34 PM
32	N/A	4/20/2023 12:27 PM
33	Non	4/20/2023 12:15 PM
34	No	4/20/2023 12:13 PM
35	Nothing	4/20/2023 12:06 PM
36	None	4/20/2023 11:48 AM
37	Nothing	4/20/2023 11:36 AM
38	Notify everyone	4/20/2023 11:33 AM

#	Responses	Date
39	Nothing	4/20/2023 11:26 AM
40	Nothing	4/20/2023 11:26 AM
41	Nothing	4/20/2023 11:04 AM
42	No	4/20/2023 11:00 AM
43	Reduce cost	4/20/2023 10:55 AM
44	None	4/20/2023 10:50 AM
45	None	4/20/2023 10:36 AM
46	Nothing	4/20/2023 10:22 AM
47	Nothing	4/20/2023 10:21 AM
48	Nothing	4/20/2023 10:18 AM
49	Usage by the people	4/20/2023 10:18 AM
50	All available	4/20/2023 10:17 AM
51	Nothing	4/20/2023 10:00 AM
52	Nothing	4/20/2023 10:00 AM
53	Nine	4/20/2023 9:59 AM
54	Nothing	4/20/2023 9:55 AM

Q103 WHAT MIGHT PREVENT YOU FROM ENROLLING IN COMMUNITY SOLAR?
SELECT ALL THAT APPLY.

Answered: 149 Skipped: 8



Answer choices	Responses	
I wouldn't want to spend money on the monthly subscription cost	56.38%	84
I only want solar if it's on my own property	46.31%	69
I would find signing up on the website difficult	34.90%	52
I am worried the solar arrays will impact the aesthetics of my community	22.82%	34
Other (please specify)	1.34%	2
Total participants: 149		

#	Other (please specify)	Date
1	Nothing	4/20/2023 11:26 AM
2	I am disabled	4/11/2023 7:20 PM

Q104 HOW WOULD YOU SUGGEST PSE ADDRESS THESE BARRIERS?

Answered: 60 Skipped: 97

#	Responses	Date
1	Make signing on the website simple	4/23/2023 11:36 AM
2	Make the process of signing simple	4/23/2023 11:20 AM
3	Look for solar with the best performance	4/23/2023 10:52 AM
4	Look for the best solar types that would reduce aesthetics impacts	4/23/2023 10:25 AM
5	More information	4/21/2023 10:27 AM
6	Enlightening the community on it impact.	4/21/2023 8:32 AM
7	Improving the community standards.	4/21/2023 8:16 AM
8	Annual payments	4/21/2023 7:42 AM
9	Quarterly or yearly payments	4/21/2023 5:36 AM
10	None	4/21/2023 3:21 AM
11	Reduce the subscription and increase the ease of access to information in the website	4/20/2023 8:55 PM
12	They should increase the ease of use of the websites	4/20/2023 8:11 PM
13	Reduce the monthly rate	4/20/2023 8:02 PM
14	Make it cheaper so as to easily pay for it and	4/20/2023 7:31 PM
15	By ensuring that the monthly payment are affordable and flexible	4/20/2023 3:09 PM
16	Ensuring that payments are flexible	4/20/2023 3:06 PM
17	Provide bill payment assistance	4/20/2023 2:38 PM
18	Awareness creation	4/20/2023 2:32 PM
19	Making enlightenment on how to navigate.	4/20/2023 2:26 PM
20	Have cheaper installations and solar costs	4/20/2023 2:16 PM
21	Giving adequate information.	4/20/2023 2:13 PM
22	Making signing into the website easier and less complicated	4/20/2023 2:09 PM
23	Na	4/20/2023 1:52 PM
24	Giving room for the masses.	4/20/2023 1:44 PM
25	I suggest PSE should tell us the impact its going to make on our society	4/20/2023 1:41 PM
26	Giving support to the commonest.	4/20/2023 1:41 PM
27	To bring aesthetic solar panels	4/20/2023 1:23 PM
28	Telling us properly how pse works and the costs for everything	4/20/2023 1:13 PM
29	Buy in option	4/20/2023 1:08 PM
30	Honestly I have no idea	4/20/2023 12:34 PM
31	It is hard to coordinate signing up for a group	4/20/2023 12:27 PM
32	Communication	4/20/2023 12:16 PM
33	Reducing the cost of subscription	4/20/2023 12:15 PM
34	By getting good solar systems that would last	4/20/2023 12:06 PM
35	Enlightenment in the Community.	4/20/2023 11:59 AM
36	Sending out information to the community dwellers	4/20/2023 11:48 AM
37	Adequate information	4/20/2023 11:46 AM

#	Responses	Date
38	Proper awareness	4/20/2023 11:39 AM
39	Making weekly	4/20/2023 11:36 AM
40	Am only interested with my own solar	4/20/2023 11:33 AM
41	Would Appreciate	4/20/2023 11:20 AM
42	Making enlightenment and advancing the Community.	4/20/2023 11:20 AM
43	By sending someone to help	4/20/2023 10:55 AM
44	Lack of funds	4/20/2023 10:50 AM
45	By implementing more items which could help improve the energy needed in the solar system	4/20/2023 10:22 AM
46	to implementing policy; systems; and environmental (PSE) change initiatives.	4/20/2023 10:21 AM
47	.	4/20/2023 10:18 AM
48	Because when it comes to community based I believe alot of people might have problem rather than having it on your own and making sure it's yours and you used it whenever you want to	4/20/2023 10:18 AM
49	Lower the cost of solar panels	4/20/2023 10:17 AM
50	I am an old person with not so much exposure	4/20/2023 10:14 AM
51	Set up plans can I can own one without costing too much	4/20/2023 10:12 AM
52	Sell to more people with landed properties	4/20/2023 10:06 AM
53	Not making it efficient	4/20/2023 10:06 AM
54	Reduce costs	4/20/2023 10:00 AM
55	Ensure there is no conflict between subscribers	4/20/2023 10:00 AM
56	If the monthly subscription are high then I won't be able to subscribe	4/20/2023 10:00 AM
57	Subsidise	4/20/2023 9:59 AM
58	Get land owners instead of renters	4/20/2023 9:57 AM
59	To educate people on the one they know it works well for us	4/20/2023 9:55 AM
60	Handle installation. Set up wiring	4/11/2023 7:20 PM

Q105 ASSUME YOUR MONTHLY SUBSCRIPTION FEE HAS BEEN WAIVED. WHAT MONTHLY ON-BILL CREDIT WOULD ENCOURAGE YOU TO ENROLL IN COMMUNITY SOLAR? PLEASE SHARE YOUR ANSWER IN DOLLARS.

Answered: 84 Skipped: 73

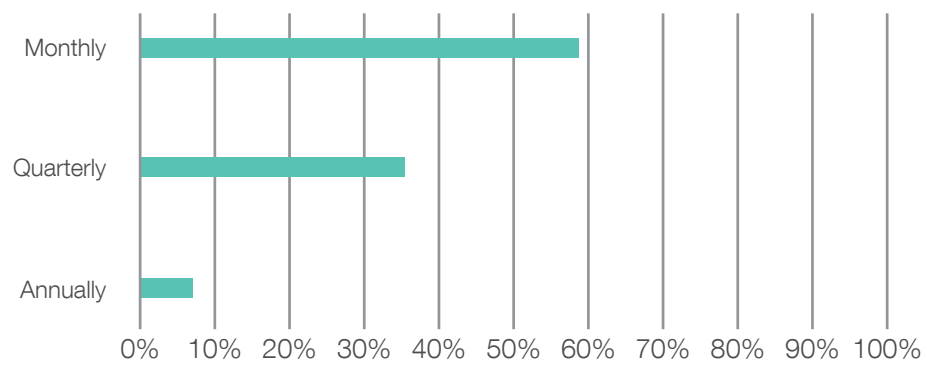
#	Responses	Date
1	\$50	4/25/2023 11:38 AM
2	\$75	4/23/2023 11:36 AM
3	\$100	4/23/2023 11:20 AM
4	\$50	4/23/2023 10:52 AM
5	\$240	4/23/2023 10:25 AM
6	100\$	4/22/2023 1:03 AM
7	Free channels for some times	4/21/2023 10:27 AM
8	\$15	4/21/2023 8:32 AM
9	\$20	4/21/2023 8:16 AM
10	Around 20 dollars	4/21/2023 7:42 AM
11	5 dollars	4/21/2023 5:36 AM
12	\$15	4/21/2023 3:21 AM
13	\$20	4/21/2023 3:19 AM
14	\$50	4/21/2023 2:25 AM
15	20	4/21/2023 1:11 AM
16	75	4/20/2023 8:55 PM
17	50	4/20/2023 8:11 PM
18	49	4/20/2023 8:02 PM
19	50	4/20/2023 7:31 PM
20	\$15	4/20/2023 3:50 PM
21	\$15	4/20/2023 3:14 PM
22	\$120	4/20/2023 3:09 PM
23	\$500	4/20/2023 3:08 PM
24	\$100 -\$200	4/20/2023 3:06 PM
25	\$40	4/20/2023 2:32 PM
26	\$15	4/20/2023 2:26 PM
27	\$15	4/20/2023 2:16 PM
28	\$20	4/20/2023 2:13 PM
29	\$70	4/20/2023 2:09 PM
30	Na	4/20/2023 1:52 PM
31	\$15 dollars	4/20/2023 1:44 PM
32	\$70	4/20/2023 1:41 PM
33	\$15	4/20/2023 1:41 PM
34	\$30	4/20/2023 1:23 PM
35	\$40	4/20/2023 1:13 PM

#	Responses	Date
36	\$3444	4/20/2023 1:08 PM
37	\$44449	4/20/2023 12:52 PM
38	\$60	4/20/2023 12:34 PM
39	\$20	4/20/2023 12:27 PM
40	\$50	4/20/2023 12:19 PM
41	50	4/20/2023 12:16 PM
42	Preservation of the environment since solar energy is environmental friendly	4/20/2023 12:15 PM
43	\$50	4/20/2023 12:13 PM
44	500 dollars	4/20/2023 12:13 PM
45	\$25	4/20/2023 12:06 PM
46	50 dollars	4/20/2023 12:06 PM
47	50	4/20/2023 12:03 PM
48	\$75	4/20/2023 12:00 PM
49	\$10	4/20/2023 11:59 AM
50	\$45	4/20/2023 11:53 AM
51	200 dollars	4/20/2023 11:48 AM
52	\$65	4/20/2023 11:46 AM
53	\$50	4/20/2023 11:36 AM
54	200	4/20/2023 11:34 AM
55	200	4/20/2023 11:33 AM
56	100\$	4/20/2023 11:33 AM
57	\$40	4/20/2023 11:30 AM
58	509	4/20/2023 11:26 AM
59	300 Dollars	4/20/2023 11:26 AM
60	75	4/20/2023 11:20 AM
61	It'll be a collective idea from individuals in the community. I think unionism.	4/20/2023 11:20 AM
62	\$50	4/20/2023 11:18 AM
63	Quartely	4/20/2023 11:04 AM
64	100 Dollars	4/20/2023 11:00 AM
65	Yes it would	4/20/2023 10:55 AM
66	Yes I will encourage community solar	4/20/2023 10:50 AM
67	\$25	4/20/2023 10:39 AM
68	\$20	4/20/2023 10:30 AM
33	\$15	4/20/2023 1:41 PM
34	\$30	4/20/2023 1:23 PM
35	\$40	4/20/2023 1:13 PM
69	\$600	4/20/2023 10:26 AM
70	\$23000	4/20/2023 10:22 AM
71	\$20	4/20/2023 10:21 AM
72	300	4/20/2023 10:18 AM
73	\$150	4/20/2023 10:18 AM

#	Responses	Date
74	\$2000	4/20/2023 10:17 AM
75	\$25	4/20/2023 10:14 AM
76	\$20	4/20/2023 10:12 AM
77	\$30	4/20/2023 10:06 AM
78	\$100	4/20/2023 10:06 AM
79	\$200	4/20/2023 10:00 AM
80	\$50	4/20/2023 10:00 AM
81	400	4/20/2023 9:59 AM
82	\$25	4/20/2023 9:57 AM
83	Yeah I will	4/20/2023 9:55 AM
84	\$50	4/11/2023 7:20 PM

Q106 HOW OFTEN WOULD YOU PREFER TO RECEIVE ON-BILL CREDITS?

Answered: 149 Skipped: 8



Answer choices	Responses	
Monthly	57.72%	86
Quarterly	34.23%	51
Annually	8.05%	12
Total participants: 149		

Q107 WHAT ADDITIONAL INFORMATION WOULD YOU NEED FROM PSE BEFORE ENROLLING IN COMMUNITY SOLAR?

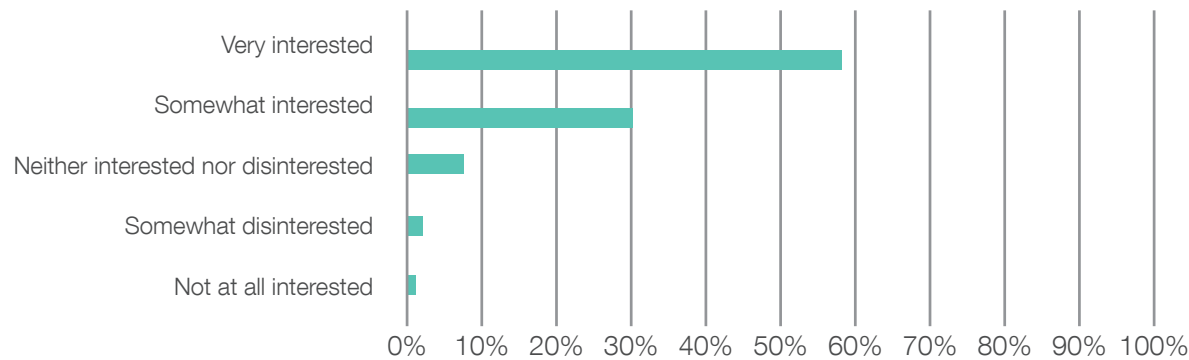
Answered: 61 Skipped: 96

#	Responses	Date
1	Maintenance and cost	4/25/2023 11:38 AM
2	Monthly subscription fee	4/23/2023 11:36 AM
3	Maintenance services	4/23/2023 11:20 AM
4	Monthly subscription cost	4/23/2023 10:52 AM
5	Types of solar they install	4/23/2023 10:25 AM
6	N/A	4/21/2023 10:27 AM
7	The usefulness of the solar	4/21/2023 8:47 AM
8	The Essential Benefits.	4/21/2023 8:32 AM
9	Knowing the benefits.	4/21/2023 8:16 AM
10	Credit to receive on electricity bills	4/21/2023 7:42 AM
11	Incentives and rebates, energy needs	4/21/2023 5:36 AM
12	None	4/21/2023 3:21 AM
13	It possible impact to the community solar.	4/21/2023 3:19 AM
14	The different usage of solar power and advantages of using it	4/20/2023 8:55 PM
15	The advantages i will get by enrolling to the pse solar community compared to now enrolling	4/20/2023 8:11 PM
16	Benefits of enrolment	4/20/2023 8:02 PM
17	How to use it	4/20/2023 7:31 PM
18	Possible Benefits	4/20/2023 3:50 PM
19	Merits and Dismerits.	4/20/2023 3:14 PM
20	Guard on how to set up	4/20/2023 3:09 PM
21	N/A	4/20/2023 3:06 PM
22	The durability of the solar	4/20/2023 2:32 PM
23	More opportunities to gain ideas	4/20/2023 2:26 PM
24	None	4/20/2023 2:16 PM
25	Proper Analysis	4/20/2023 2:13 PM
26	The costs of installation	4/20/2023 2:09 PM
27	Na	4/20/2023 1:52 PM
28	The benefits community solar	4/20/2023 1:44 PM
29	Nil	4/20/2023 1:41 PM
30	The Benefits of having Community solar panels	4/20/2023 1:41 PM
31	A written agreement	4/20/2023 1:23 PM
32	None	4/20/2023 1:13 PM
33	How to manage	4/20/2023 1:08 PM
34	NA	4/20/2023 12:52 PM
35	None	4/20/2023 12:34 PM
36	Nothing	4/20/2023 12:19 PM
37	The advantages and disadvantages of using solar power	4/20/2023 12:15 PM

#	Responses	Date
38	Nothing	4/20/2023 12:06 PM
39	Nothing	4/20/2023 12:06 PM
40	Cost effectiveness	4/20/2023 12:00 PM
41	Precautions on using Community solar.	4/20/2023 11:59 AM
42	Dangers	4/20/2023 11:46 AM
43	Nothing	4/20/2023 11:39 AM
44	Nothing	4/20/2023 11:33 AM
45	Nothing	4/20/2023 11:30 AM
46	Is it going to reach everyone in my community?	4/20/2023 11:20 AM
47	The Advantages and Disadvantages of enrolling in Community solar	4/20/2023 11:20 AM
48	None	4/20/2023 11:04 AM
49	It's safer than portable	4/20/2023 10:50 AM
50	How would everyone benefit, I hope no one gets left out	4/20/2023 10:39 AM
51	How it can be maintained	4/20/2023 10:30 AM
52	N/A	4/20/2023 10:22 AM
53	Who to call when we have issues with the installation	4/20/2023 10:21 AM
54	Nothing	4/20/2023 10:21 AM
55	Maintainance costs	4/20/2023 10:18 AM
56	I guess it's will really good for us to own it	4/20/2023 10:18 AM
57	I need to be educated in the importance of using this PSE services	4/20/2023 10:17 AM
58	A detailed information of what community solar is all about	4/20/2023 10:12 AM
59	None	4/20/2023 10:00 AM
60	Would everyone in the community benefit	4/20/2023 9:57 AM
61	I think nil	4/20/2023 9:55 AM

Q108 HOW INTERESTED ARE YOU IN INSTALLING A BATTERY IN YOUR HOME?

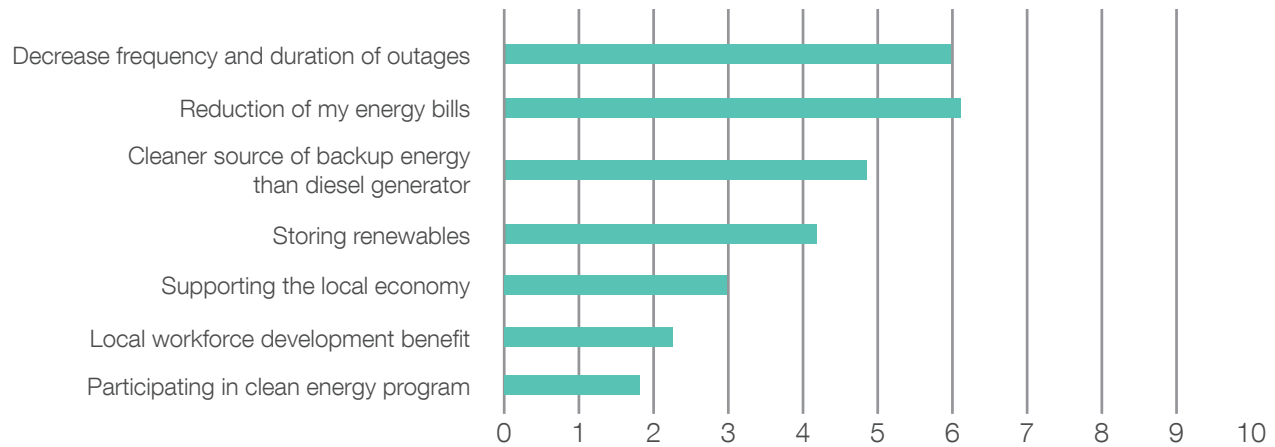
Answered: 149 Skipped: 8



Answer choices	Responses	
Very interested	57.72%	86
Somewhat interested	30.20%	45
Neither interested nor disinterested	8.72%	13
Somewhat disinterested	2.01%	3
Not at all interested	1.34%	2
Total participants: 149		

Q109 WHAT INTERESTS YOU ABOUT INSTALLING A BATTERY WHERE YOU LIVE? PLEASE RANK IN ORDER OF IMPORTANCE.

Answered: 144 Skipped: 13



Answer choices	1	2	3	4	5	6	7	Total	Score
Decrease frequency and duration of outages	43.06% 62	28.47% 41	15.97% 23	8.33% 12	2.08% 3	0.69% 0	1.39% 0	144	5.94
Reduction of my energy bills	44.44% 64	33.33% 48	10.42% 15	6.25% 9	2.78% 4	2.78% 4	0.00% 0	144	6.02
Cleaner source of backup energy than diesel generator	6.25% 9	24.31% 35	43.75% 63	13.89% 20	8.33% 12	1.39% 2	2.08% 3	144	4.94
Storing renewables	3.47% 5	7.64% 11	21.53% 31	46.53% 67	15.97% 23	2.78% 4	2.08% 3	144	4.19
Supporting the local economy	0.69% 1	1.39% 2	4.86% 7	15.97% 23	48.61% 70	18.06% 26	10.42% 15	144	2.94
Local workforce development benefit	0.00% 0	1.39% 2	0.69% 1	6.25% 9	18.75% 27	58.33% 84	14.58% 21	144	2.24
Participating in clean energy programs	2.08% 3	3.47% 5	2.78% 4	2.78% 4	3.57% 5	15.97% 23	69.44% 100	144	1.72

Q110 WHAT IS MISSING FROM THE LIST ABOVE?

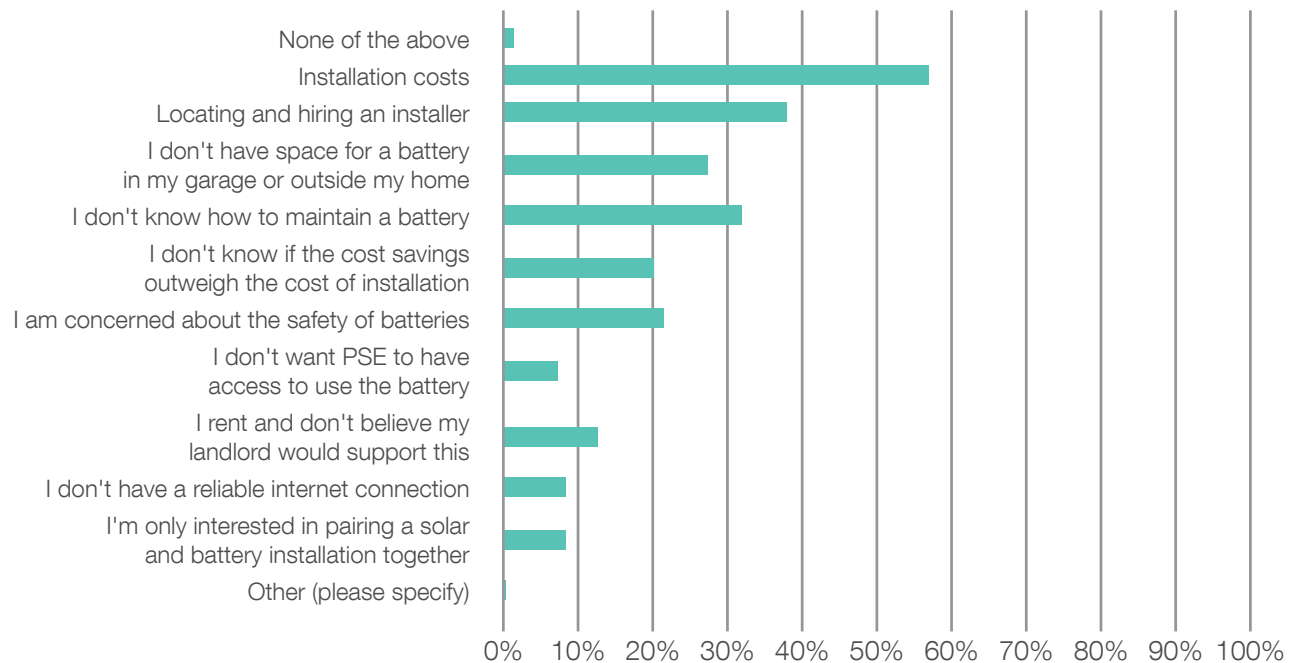
Answered: 47 Skipped: 110

#	Responses	Date
1	I love dc power source for my appliances	4/23/2023 11:39 AM
2	Back up energy	4/23/2023 11:23 AM
3	Having cheaper power	4/23/2023 10:57 AM
4	Extra energy as backup	4/23/2023 10:28 AM
5	No.	4/21/2023 8:20 AM
6	All good	4/21/2023 7:45 AM
7	Reduced carbon footprint	4/21/2023 5:49 AM
8	Nil	4/21/2023 3:24 AM
9	Batteries are portable	4/20/2023 9:02 PM
10	Its portable	4/20/2023 8:15 PM
11	It has everything	4/20/2023 8:09 PM
12	Portable source of power	4/20/2023 7:36 PM
13	N/A	4/20/2023 3:19 PM
14	None	4/20/2023 3:10 PM
15	None	4/20/2023 3:09 PM
16	None	4/20/2023 2:36 PM
17	Nil	4/20/2023 2:17 PM
18	Impact of batteries to our local society	4/20/2023 2:11 PM
19	Nil	4/20/2023 1:54 PM
20	Na	4/20/2023 1:53 PM
21	Nil	4/20/2023 1:50 PM
22	Nothing	4/20/2023 1:46 PM
23	Nothing	4/20/2023 1:25 PM
24	Nothing	4/20/2023 1:15 PM
25	Nothing	4/20/2023 1:11 PM
26	Nothing	4/20/2023 12:41 PM
27	Portability of the battery	4/20/2023 12:31 PM
28	No	4/20/2023 12:14 PM
29	Nothing	4/20/2023 12:10 PM
30	Nothing	4/20/2023 12:07 PM
31	None	4/20/2023 11:50 AM
32	None.	4/20/2023 11:29 AM
33	Way the solar are installed	4/20/2023 11:28 AM
34	Nothing	4/20/2023 11:20 AM
35	None	4/20/2023 11:11 AM
36	Nothing	4/20/2023 11:05 AM
37	Nothing	4/20/2023 11:05 AM

#	Responses	Date
38	None	4/20/2023 10:51 AM
39	N/A	4/20/2023 10:24 AM
40	Nothing	4/20/2023 10:24 AM
41	Nothing	4/20/2023 10:22 AM
42	Involving local authorities	4/20/2023 10:21 AM
43	Nothing	4/20/2023 10:12 AM
44	Both	4/20/2023 10:03 AM
45	None	4/20/2023 10:01 AM
46	Nothing	4/20/2023 9:58 AM
47	Need constant power to wheelchair and hospital bed! If power goes out, I can be trapped in my bed	4/20/2023 8:09 PM

Q111 WHAT MIGHT PREVENT YOU FROM INSTALLING A BATTERY WHERE YOU LIVE? SELECT ALL THAT APPLY.

Answered: 149 Skipped: 8



Answer choices	Responses	
None of the above	1.34%	2
Installation costs	57.05%	85
Locating and hiring an installer	38.26%	57
I don't have space for a battery in my garage or outside my home	28.86%	43
I don't know how to maintain a battery	31.54%	47
I don't know if the cost savings outweigh the cost of installation	20.13%	30
I am concerned about the safety of batteries	21.48%	32
I don't want PSE to have access to use the battery	6.71%	10
I rent and don't believe my landlord would support this	11.41%	17
I don't have a reliable internet connection	8.05%	12
I'm only interested in pairing a solar and battery installation together	8.05%	12
Other (please specify)	0.67%	1
Total participants: 149		

#	Other (please specify)	Date
1	I am disabled	4/11/2023 7:25 PM

Q112 HOW WOULD YOU SUGGEST PSE ADDRESS THESE BARRIERS?

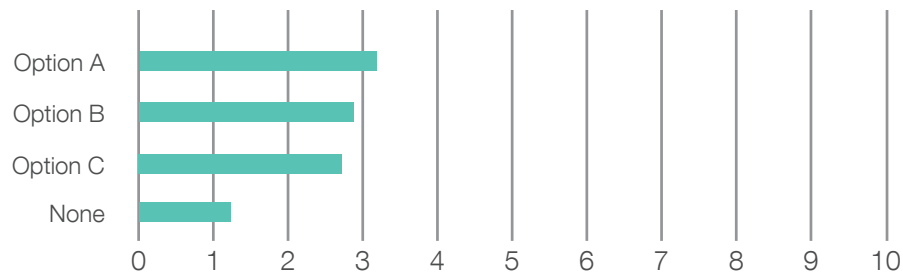
Answered: 55 Skipped: 102

#	Responses	Date
1	Reduce installation cost	4/23/2023 11:39 AM
2	Provide maintenance free batteries	4/23/2023 11:23 AM
3	Offer maintenance services to batteries	4/23/2023 10:57 AM
4	Engage the landlords	4/23/2023 10:28 AM
5	Give detailed information	4/22/2023 1:06 AM
6	Providing better batteries.	4/21/2023 8:20 AM
7	Reduce cost and pair battery with solar	4/21/2023 7:45 AM
8	Subsidize cost	4/21/2023 5:49 AM
9	Introducing seminars to advance the public.	4/21/2023 3:24 AM
10	Creating awareness	4/21/2023 2:27 AM
11	Reducing the installation cost and provide more information on how to store batteries	4/20/2023 9:02 PM
12	Reduce the cost of installation and increase information in its advantages so that landlords will not be against it	4/20/2023 8:15 PM
13	Educate more on importance of batteries in solar installation	4/20/2023 8:09 PM
14	Reduce the cost installation	4/20/2023 7:36 PM
15	Providing accessible Battery	4/20/2023 3:53 PM
16	Lower the cost of the batteries and installation	4/20/2023 3:19 PM
17	By knowing the customer ability and ensuring that it's done in their favor	4/20/2023 3:19 PM
18	Providing Assistance.	4/20/2023 2:54 PM
19	Proper Analysis	4/20/2023 2:36 PM
20	Assisting with proper tools.	4/20/2023 2:33 PM
21	Education on installation and maintenance	4/20/2023 2:17 PM
22	Creation of awareness	4/20/2023 2:17 PM
23	Nil	4/20/2023 2:11 PM
24	Creating Awareness to the people.	4/20/2023 1:54 PM
25	Na	4/20/2023 1:53 PM
26	Creating awareness to the masses.	4/20/2023 1:50 PM
27	By making us less worried about the safety of this batteries and also how to go through the installation process by ourselves I think proper information on how to install this ourselves and save us the costs would really be helpful	4/20/2023 1:46 PM
28	To give out information on how to handle the batteries	4/20/2023 1:25 PM
29	By telling us the safety processes of this batteries	4/20/2023 1:15 PM
30	Public demand	4/20/2023 12:53 PM
31	Not having access to use my battery	4/20/2023 12:41 PM
32	Reduce the cost of installation, reduce the sizes of the batteries and finally provide more information about the batteries for people to feel safe to use	4/20/2023 11:29 AM
33	Training on battery care	4/20/2023 12:29 PM

#	Responses	Date
34	By making sure their products are safe and reliable	4/20/2023 12:10 PM
35	Public awareness	4/20/2023 12:07 PM
36	Creating Awareness.	4/20/2023 12:03 PM
37	Making cost more affordable	4/20/2023 11:40 AM
38	Provide free installation Provide training on battery maintenance	4/20/2023 11:35 AM
39	Services Programs	4/20/2023 11:29 AM
40	Cost reduction	4/20/2023 11:20 AM
41	Creation of space during construction of buildings	4/20/2023 11:11 AM
42	Providing agents	4/20/2023 11:05 AM
43	I think PSE should have someone come install it	4/20/2023 11:05 AM
44	Improving in the energy requirements.	4/20/2023 10:24 AM
45	By helping me acquire the necessary items I need	4/20/2023 10:24 AM
46	Cost of purchase should be reduced	4/20/2023 10:22 AM
47	Waive initial costs	4/20/2023 10:21 AM
48	Lower the the cost of installation and hiring a installer.	4/20/2023 10:20 AM
49	Give a detailed information on how to maintain it	4/20/2023 10:16 AM
50	Making it affordable	4/20/2023 10:12 AM
51	Send a manual procedure	4/20/2023 10:03 AM
52	The installation cost should be fair	4/20/2023 10:03 AM
53	Building more space for installation	4/20/2023 10:01 AM
54	Use safe energy	4/20/2023 10:00 AM
55	Here is the cost of getting the battery if only they can let the people afford it at affordable rates	4/20/2023 9:58 AM

Q113 RANK WHICH PROGRAM MODEL YOU WOULD BE MOST INTERESTED IN PARTICIPATING IN. PLEASE NOTE THAT ALL DOLLAR VALUES ARE MEANT TO BE ILLUSTRATIVE AND ARE NOT NECESSARILY INDICATIVE OF FINAL PROGRAM COSTS OR OFFERING.

Answered: 149 Skipped: 8



Answer choices	1	2	3	4	Total	Score
Option A	39.60% 59	35.57% 53	21.48% 32	3.36% 5	149	3.11
Option B	40.94% 61	21.48% 32	28.19% 42	9.40% 14	149	2.94
Option C	18.79% 28	40.27% 60	34.23% 51	6.71% 10	149	2.71
None	0.67% 1	2.68% 4	16.11% 24	80.54% 120	149	1.23

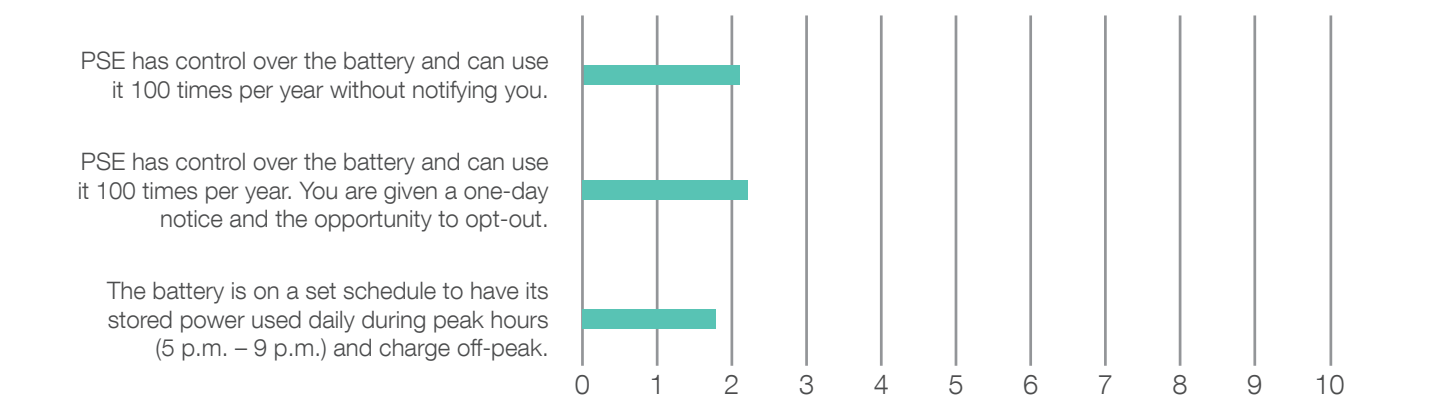
Q114 IF NONE OF THESE OPTIONS ARE IDEAL FOR YOU, PLEASE DESCRIBE YOUR IDEAL OPTION.

Answered: 22 Skipped: 135

#	Responses	Date
1	Am ok with option c	4/23/2023 11:39 AM
2	I will go with option c	4/23/2023 11:23 AM
3	Option B is ideal	4/23/2023 10:57 AM
4	I think those options are ideal	4/23/2023 10:28 AM
5	All in.	4/21/2023 7:45 AM
6	N/A	4/20/2023 9:02 PM
7	N/A	4/20/2023 8:15 PM
8	They are good for me	4/20/2023 8:09 PM
9	N/A	4/20/2023 7:36 PM
10	N/A	4/20/2023 3:10 PM
11	They're ideal	4/20/2023 2:11 PM
12	Na	4/20/2023 1:53 PM
13	They are	4/20/2023 1:46 PM
14	They are	4/20/2023 1:15 PM
15	NA	4/20/2023 12:53 PM
16	They're all ideal	4/20/2023 12:41 PM
17	N/A	4/20/2023 12:31 PM
18	None	4/20/2023 12:10 PM
19	None	4/20/2023 11:11 AM
20	N/A	4/20/2023 10:24 AM
21	B	4/20/2023 10:22 AM
22	It's ideal	4/20/2023 10:03 AM

Q115 PSE WILL COMPENSATE YOU FOR THE USE OF YOUR BATTERY TO MANAGE THE LOAD ON PSE’S GRID. USUALLY, YOU WON’T EVEN NOTICE WHEN PSE IS USING YOUR BATTERY, AND PSE WILL NOT USE IT DURING A STORM OR HEAT EVENT WHEN THERE IS A HIGHER LIKELIHOOD OF AN OUTAGE SO THAT YOU CAN USE IT FOR BACK-UP POWER. PLEASE RANK WHICH OF THE LOAD MANAGEMENT SCENARIOS YOU WOULD BE MOST LIKELY TO LEAST LIKELY TO PARTICIPATE IN.

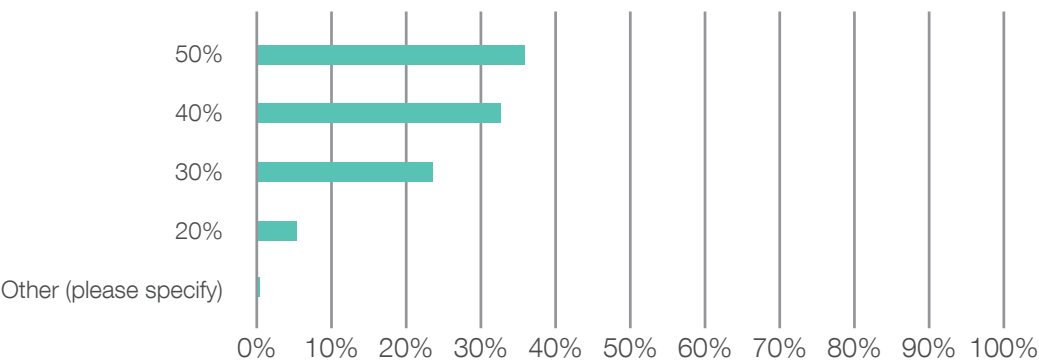
Answered: 149 Skipped: 8



Answer choices	1	2	3	Total	Score
PSE has control over the battery and can use it 100 times per year without notifying you.	38.93% 58	28.86% 43	32.21% 48	149	2.07
PSE has control over the battery and can use it 100 times per year. You are given a one-day notice and the opportunity to opt-out.	45.64% 68	28.19% 42	26.17% 39	149	2.19
The battery is on a set schedule to have its stored power used daily during peak hours (5 p.m. – 9 p.m.) and charge off-peak.	15.44% 23	42.95% 64	41.61% 62	149	1.74

Q116 HOW MUCH OF YOUR BATTERY DO YOU WANT TO RESERVE AT ALL TIMES IN CASE OF AN UNEXPECTED OUTAGE? PLEASE SELECT ONE

Answered: 149 Skipped: 8



Answer choices	Responses	
50%	35.57%	53
40%	32.89%	49
30%	23.49%	35
20%	6.71%	10
Other (please specify)	1.34%	2
Total participants: 149		

#	Other (please specify)	Date
1	More than 50%	4/21/2023 5:49 AM
2	100	4/20/2023 8:09 PM

Q117 WHAT ADDITIONAL INFORMATION WOULD YOU NEED FROM PSE BEFORE INSTALLING A BATTERY WHERE YOU LIVE?

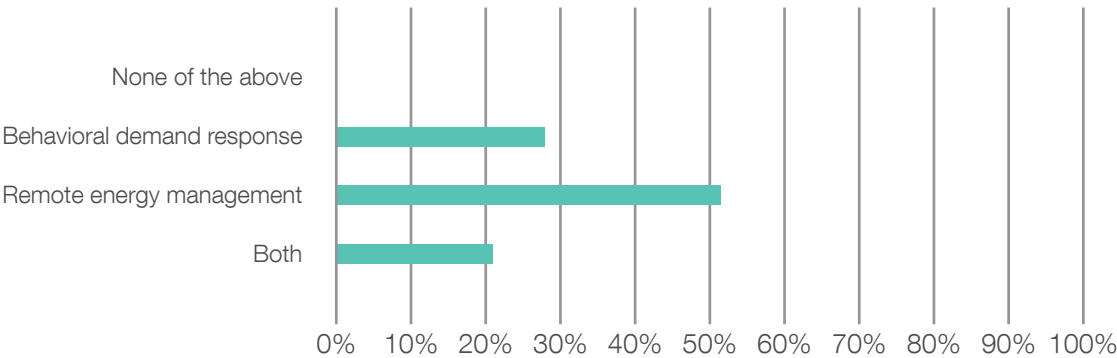
Answered: 53 Skipped: 104

#	Responses	Date
1	Notify me when using the battery	4/23/2023 11:39 AM
2	How many batteries so that i look for space in an my garage	4/23/2023 11:23 AM
3	Maximum number of batteries they can install and also the cost	4/23/2023 10:57 AM
4	Am satisfied	4/23/2023 10:28 AM
5	The strength and weakness of the battery	4/21/2023 8:51 AM
6	The potential impact on installing a battery.	4/21/2023 8:35 AM
7	Advantages and Disadvantages	4/21/2023 8:20 AM
8	Maintenance cost, return of investment.	4/21/2023 7:45 AM
9	Battery capacity, maintenance, safety, Battery type and cost	4/21/2023 5:49 AM
10	Remedies.	4/21/2023 3:24 AM
11	None	4/21/2023 1:12 AM
12	The advantages of batteries	4/20/2023 9:02 PM
13	Its advantages over not installing batteries	4/20/2023 8:15 PM
14	Advantages of installing a battery	4/20/2023 8:09 PM
15	Advantages and disadvantages	4/20/2023 7:36 PM
16	Knowledge acquisition.	4/20/2023 3:53 PM
17	Gaining more idea on how it'll bring impact.	4/20/2023 3:18 PM
18	None	4/20/2023 3:10 PM
19	The life span of the battery.	4/20/2023 2:54 PM
20	The climate	4/20/2023 2:36 PM
21	Advantages of battery installation.	4/20/2023 2:33 PM
22	None	4/20/2023 2:17 PM
23	To know the durability of the battery	4/20/2023 2:17 PM
24	The safety and precautions	4/20/2023 2:11 PM
25	Precautions of installing a battery close to the house.	4/20/2023 1:54 PM
26	Na	4/20/2023 1:53 PM
27	The safety measures	4/20/2023 1:50 PM
28	They should make the installation process less complicated	4/20/2023 1:46 PM
29	How to go about with the installation	4/20/2023 1:25 PM
30	None	4/20/2023 1:15 PM
31	Nothing	4/20/2023 1:11 PM
32	Yes	4/20/2023 12:53 PM
33	The cost of installation	4/20/2023 12:41 PM
34	How long it takes for the energy in the batteries to be fully drained	4/20/2023 12:31 PM
35	How safe it is and assurance	4/20/2023 12:10 PM
36	Nothing	4/20/2023 12:07 PM
37	Benefits and the Effect.	4/20/2023 12:03 PM

#	Responses	Date
38	Duration and maintenance	4/20/2023 12:02 PM
39	Periodic checks	4/20/2023 11:53 AM
40	None	4/20/2023 11:34 AM
41	Life span of the Battery and necessary precautions involved.	4/20/2023 11:29 AM
42	Effectiveness	4/20/2023 11:20 AM
43	I think It will be lovely to have more of my battery reserves	4/20/2023 11:05 AM
44	How could it be maintained to make sure it last long	4/20/2023 10:40 AM
45	How do I maintain it and it shelf life	4/20/2023 10:31 AM
46	N/A	4/20/2023 10:24 AM
47	Nothing	4/20/2023 10:24 AM
48	How do I maintain it	4/20/2023 10:22 AM
49	Battery should be in such a way it might notify us about usage	4/20/2023 10:22 AM
50	No comment	4/20/2023 10:20 AM
51	A detailed information about installing a battery and how to maintain it	4/20/2023 10:16 AM
52	None	4/20/2023 10:03 AM
53	I believe this battery will be good If it's less cost	4/20/2023 9:58 AM

Q118 PSE PROVIDES INCENTIVES FOR ENROLLMENT. ALL DEMAND RESPONSE PROGRAMS ARE VOLUNTARY, AND CUSTOMERS CAN ALWAYS OPT OUT OF PARTICIPATING. WHICH OF THESE DEMAND RESPONSE PROGRAMS WOULD YOU PREFER TO PARTICIPATE IN? SELECT ONE.

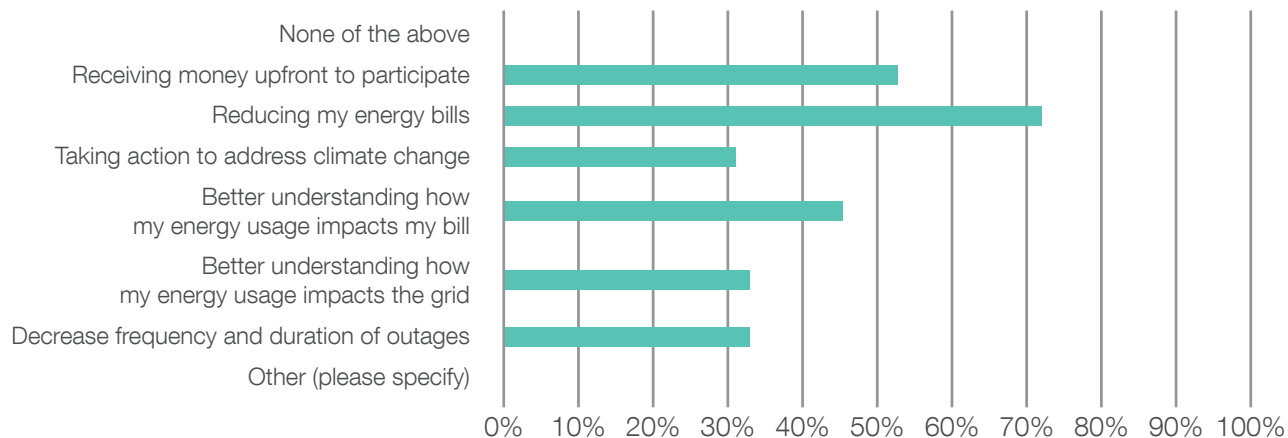
Answered: 149 Skipped: 8



Answer choices	Responses	
None of the above	0.00%	0
Behavioral demand response	28.19%	42
Remote energy management	51.01%	76
Both	20.81%	31
Total participants: 149		

**Q119 WHAT INTERESTS YOU ABOUT PARTICIPATING IN BEHAVIORAL DEMAND RESPONSE?
SELECT ALL THAT APPLY.BEHAVIORAL DEMAND RESPONSE: YOU ADJUST YOUR THERMOSTAT
OR APPLIANCES IN RESPONSE TO A REQUEST FROM PSE.**

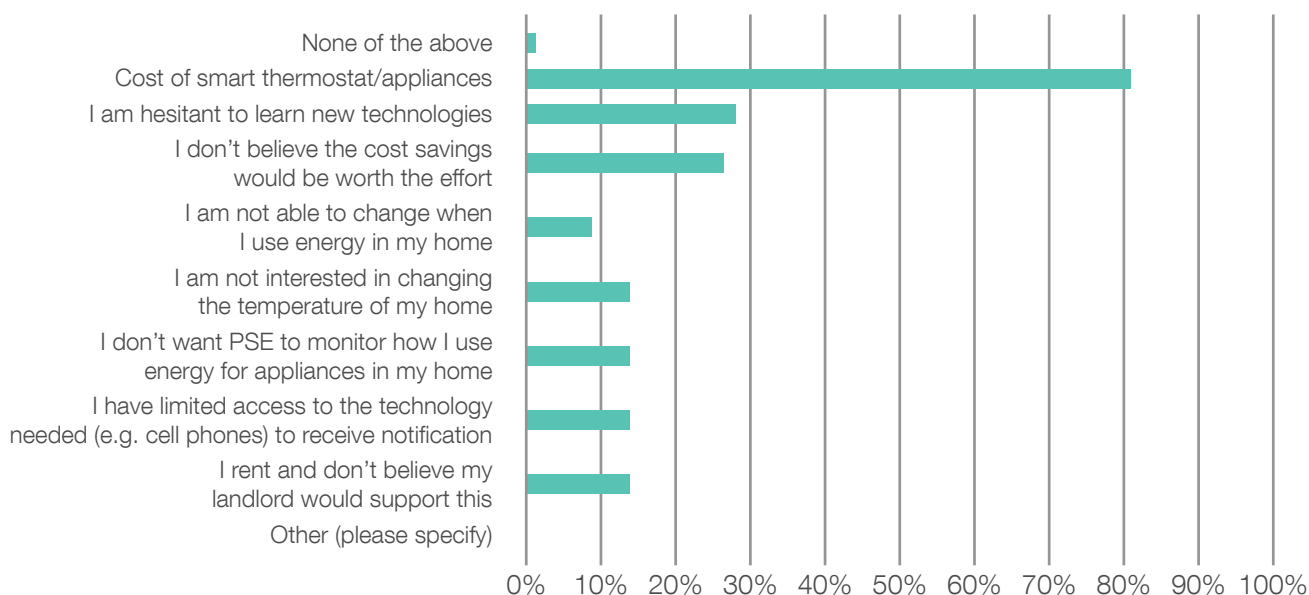
Answered: 42 Skipped: 115



Answer choices	Responses	
None of the above	0.00%	0
Receiving money upfront to participate	52.38%	22
Reducing my energy bills	71.43%	30
Taking action to address climate change	30.95%	13
Better understanding how my energy usage impacts my bill	45.24%	19
Better understanding how my energy usage impacts the grid	33.33%	14
Decrease frequency and duration of outages	33.33%	14
Other (please specify)	0.00%	0
Total participants: 42		

**Q120 WHAT MIGHT PREVENT YOU FROM PARTICIPATING IN BEHAVIORAL DEMAND RESPONSE?
SELECT ALL THAT APPLY.BEHAVIORAL DEMAND RESPONSE: YOU ADJUST YOUR THERMOSTAT
OR APPLIANCES IN RESPONSE TO A REQUEST FROM PSE.**

Answered: 42 Skipped: 115



Answer choices	Responses	
None of the above	2.38%	1
Cost of smart thermostat/appliances	80.95%	34
I am hesitant to learn new technologies	28.57%	12
I don't believe the cost savings would be worth the effort	26.19%	11
I am not able to change when I use energy in my home	9.52%	4
I am not interested in changing the temperature of my home	14.29%	6
I don't want PSE to monitor how I use energy for appliances in my home	14.29%	6
I have limited access to the technology needed (e.g. cell phones) to receive notification	14.29%	6
I rent and don't believe my landlord would support this	14.29%	6
Other (please specify)	0.00%	0
Total participants: 42		

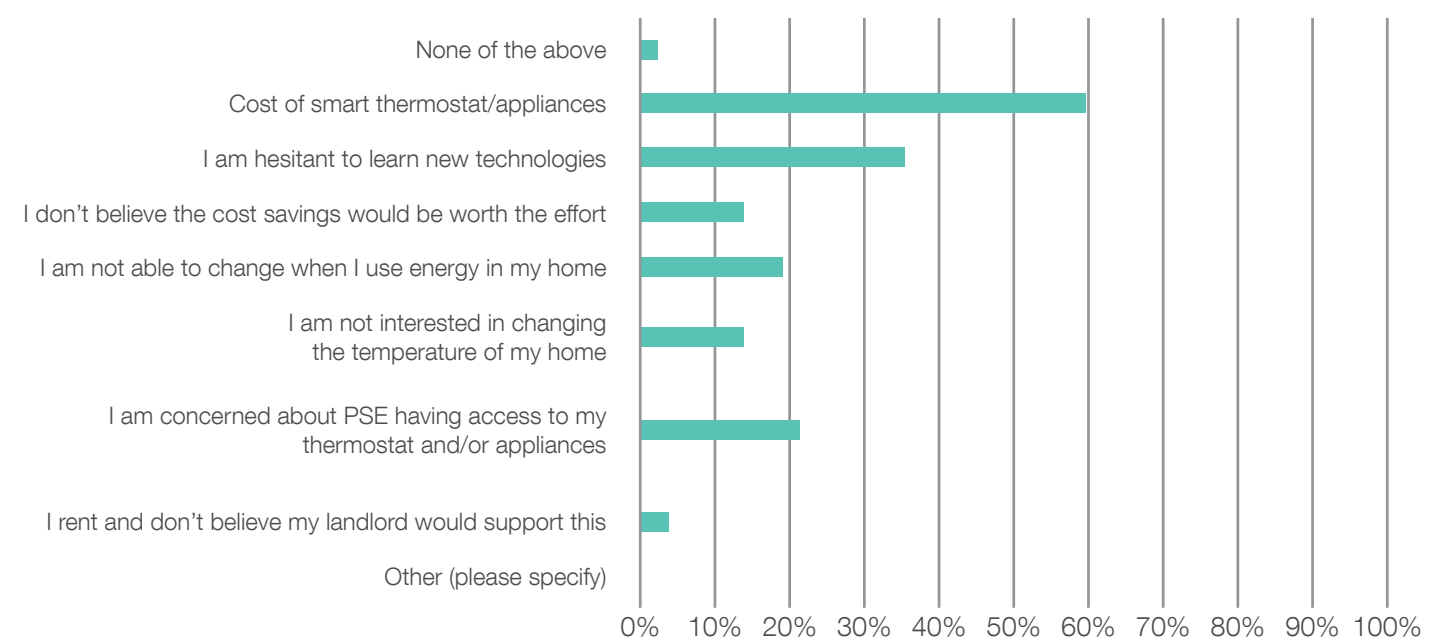
Q121 HOW WOULD YOU SUGGEST PSE ADDRESS THESE BARRIERS?

Answered: 12 Skipped: 145

#	Responses	Date
1	Provide access to technology	4/23/2023 11:24 AM
2	Provide smart thermostat	4/23/2023 10:32 AM
3	No idea	4/21/2023 7:47 AM
4	Explain further to customers on the benefits of this approach	4/21/2023 5:54 AM
5	Reduce the cost of the thermostat and increase ease of access to information to help the landlords be more informed	4/20/2023 9:18 PM
6	Flexible payment	4/20/2023 3:20 PM
7	Na	4/20/2023 1:54 PM
8	Telling us about the costs	4/20/2023 1:19 PM
9	To increase temperature rate	4/20/2023 1:14 PM
10	Not rarely used	4/20/2023 12:55 PM
11	Providing me with adequate knowledge about it	4/20/2023 10:19 AM
12	Reduce the cost	4/20/2023 10:00 AM

Q122 WHAT MIGHT PREVENT YOU FROM PARTICIPATING IN REMOTE ENERGY MANAGEMENT?
SELECT ALL THAT APPLY.REMOTE ENERGY MANAGEMENT: YOU GRANT PSE PERMISSION TO
REMOTELY ADJUST YOUR THERMOSTAT OR APPLIANCES.

Answered: 42 Skipped: 115



Answer choices	Responses	
None of the above	2.38%	1
Cost of smart thermostat/appliances	59.52%	25
I am hesitant to learn new technologies	35.71%	15
I don't believe the cost savings would be worth the effort	16.67%	7
I am not able to change when I use energy in my home	19.05%	8
I am not interested in changing the temperature of my home	16.67%	7
I am concerned about PSE having access to my thermostat and/or appliances	21.43%	9
I rent and don't believe my landlord would support this	4.76%	2
I rent and don't believe my landlord would support this	14.29%	6
Other (please specify)	0.00%	0
Total participants: 42		

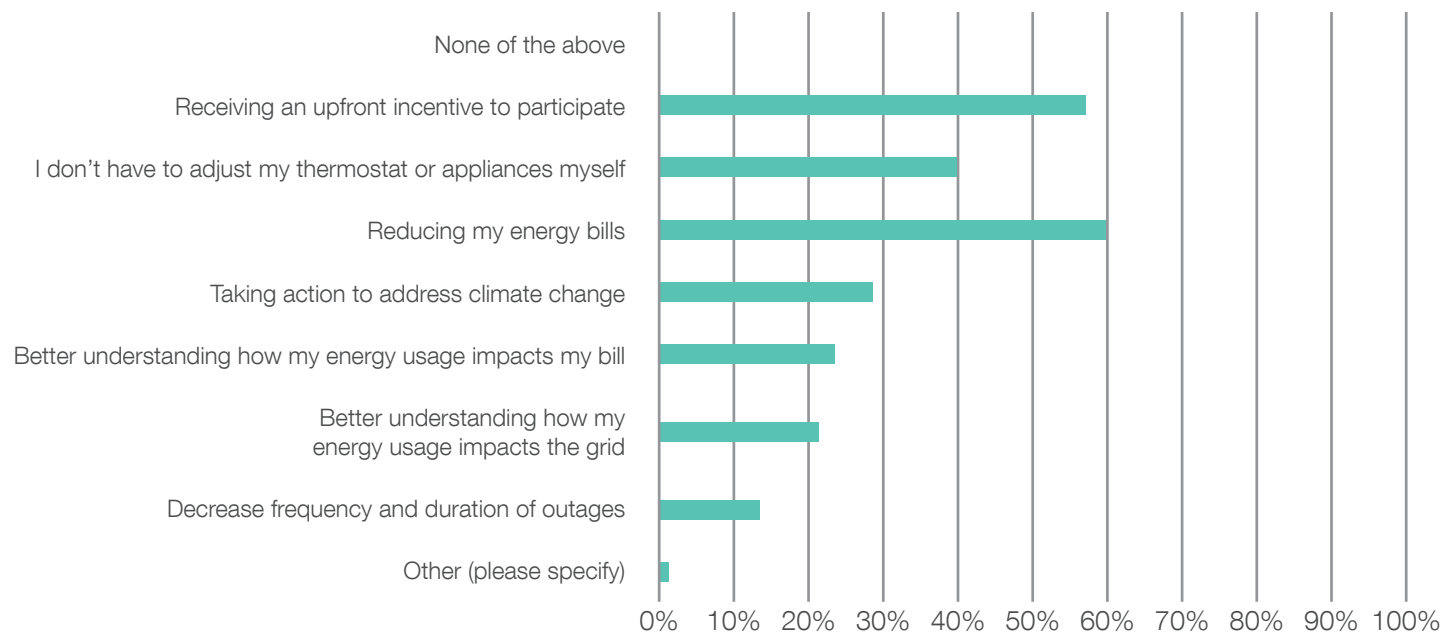
Q123 HOW WOULD YOU SUGGEST PSE ADDRESS THESE BARRIERS?

Answered: 11 Skipped: 146

#	Responses	Date
1	Smart thermostat	4/23/2023 11:24 AM
2	Education on technology	4/23/2023 10:32 AM
3	Address my trust issues	4/21/2023 7:47 AM
4	Assure customers that you cannot take away their freedom to adjust their equipment	4/21/2023 5:54 AM
5	Reduce the cost of the thermometers and increase access to information	4/20/2023 9:18 PM
6	Na	4/20/2023 1:54 PM
7	I wouldn't enjoy being monitored so it best they allow me use my light the way I want to ,then at the end of the month I'd prefer a mail of the costs of my data usage	4/20/2023 1:19 PM
8	To more advanced technology	4/20/2023 1:14 PM
9	Very true	4/20/2023 12:55 PM
10	Getting to know the customers	4/20/2023 10:41 AM
11	Nothing	4/20/2023 10:19 AM

Q124 WHAT INTERESTS YOU ABOUT PARTICIPATING IN REMOTE ENERGY MANAGEMENT?
SELECT ALL THAT APPLY.REMOTE ENERGY MANAGEMENT: YOU GRANT PSE PERMISSION TO
REMOTELY ADJUST YOUR THERMOSTAT OR APPLIANCES.

Answered: 76 Skipped: 81

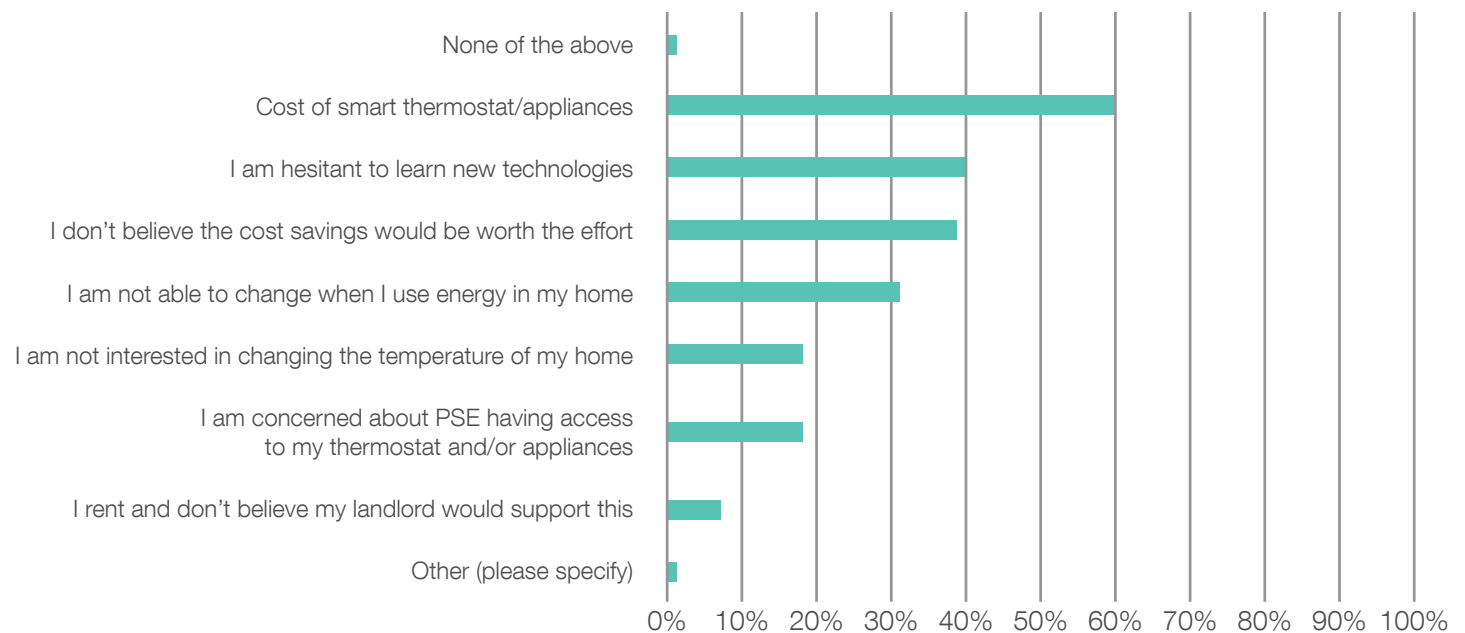


Answer choices	Responses	
None of the above	0.00%	0
Receiving an upfront incentive to participate	56.58%	43
I don't have to adjust my thermostat or appliances myself	39.47%	30
Reducing my energy bills	59.21%	45
Taking action to address climate change	28.95%	22
Better understanding how my energy usage impacts my bill	22.37%	17
Better understanding how my energy usage impacts the grid	21.05%	16
Decrease frequency and duration of outages	13.16%	10
Other (please specify)	1.32%	1
Total participants: 76		

#	Other (please specify)	Date
1	Use	4/20/2023 11:28 AM

**Q125 WHAT MIGHT PREVENT YOU FROM PARTICIPATING IN REMOTE ENERGY MANAGEMENT?
SELECT ALL THAT APPLY. REMOTE ENERGY MANAGEMENT: YOU GRANT PSE PERMISSION TO
REMOTELY ADJUST YOUR THERMOSTAT OR APPLIANCES.**

Answered: 76 Skipped: 81



Answer choices	Responses	
None of the above	1.32%	1
Cost of smart thermostat/appliances	60.53%	46
I am hesitant to learn new technologies	40.79%	31
I don't believe the cost savings would be worth the effort	38.16%	29
I am not able to change when I use energy in my home	31.58%	24
I am not interested in changing the temperature of my home	18.42%	14
I am concerned about PSE having access to my thermostat and/or appliances	18.42%	14
I rent and don't believe my landlord would support this	7.89%	6
Other (please specify)	1.32%	1
Total participants: 76		

#	Other (please specify)	Date
1	Monitoring how I use my energy supply	4/20/2023 12:18 PM

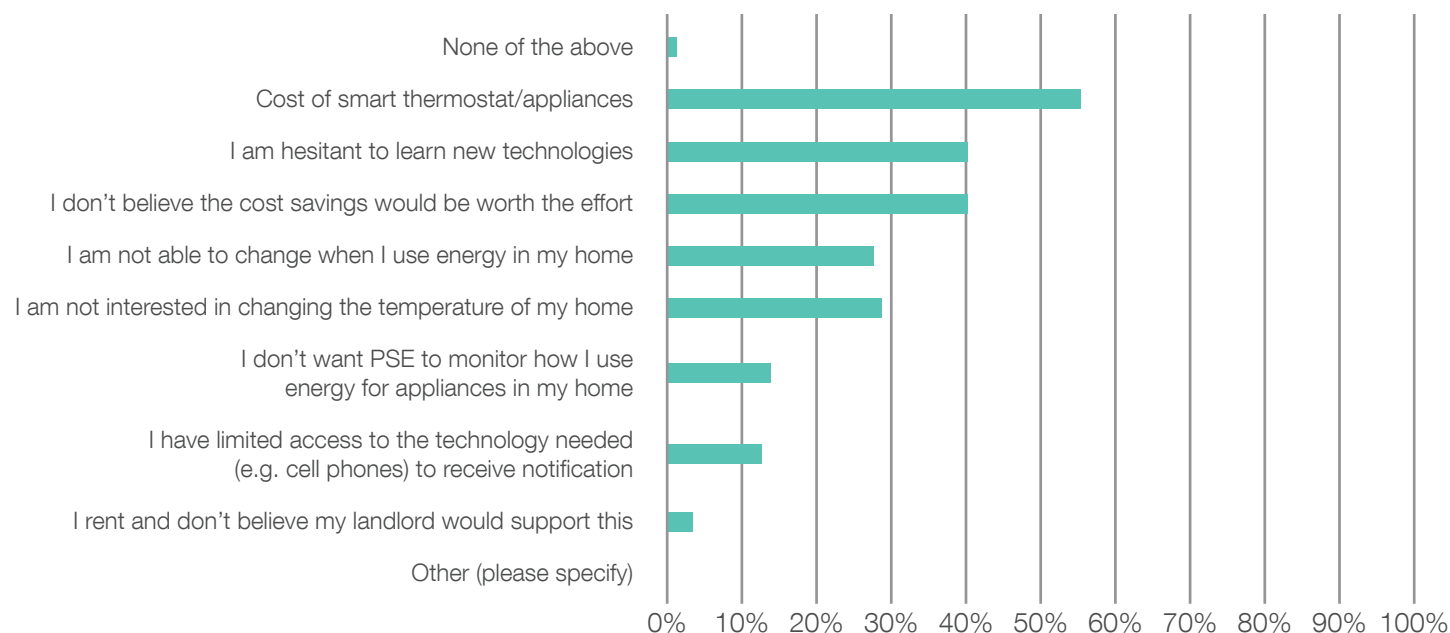
Q126 HOW WOULD YOU SUGGEST PSE ADDRESS THESE BARRIERS?

Answered: 21 Skipped: 136

#	Responses	Date
1	To only adjust this appliances after notifying me	4/23/2023 11:00 AM
2	Providing thermostat	4/21/2023 8:53 AM
3	Creating Awareness.	4/21/2023 8:36 AM
4	Through awareness creation.	4/21/2023 8:22 AM
5	Reduce the cost of production of thermostats thus leading to reduction in there prices	4/20/2023 8:17 PM
6	Increase flexibility	4/20/2023 8:11 PM
7	Reduction of the cost of installation	4/20/2023 7:45 PM
8	Active thermostat appliances.	4/20/2023 3:56 PM
9	Creating Awareness.	4/20/2023 2:56 PM
10	Creation of awareness	4/20/2023 2:37 PM
11	Giving Assistance.	4/20/2023 2:36 PM
12	Creating awareness	4/20/2023 2:19 PM
13	Making improvement.	4/20/2023 1:57 PM
14	Creation of awareness	4/20/2023 1:54 PM
15	I don't know	4/20/2023 12:46 PM
16	By giving insurance	4/20/2023 12:18 PM
17	Addressing on individual barriers.	4/20/2023 12:05 PM
18	Reduce cost of their appliances	4/20/2023 11:36 AM
19	Creating enlightenment on how it works.	4/20/2023 11:35 AM
20	Coat of installation	4/20/2023 10:25 AM
21	Talk to landlord	4/20/2023 10:04 AM

**Q127 WHAT MIGHT PREVENT YOU FROM PARTICIPATING IN BEHAVIORAL DEMAND RESPONSE?
SELECT ALL THAT APPLY. BEHAVIORAL DEMAND RESPONSE: YOU ADJUST YOUR THERMOSTAT
OR APPLIANCES IN RESPONSE TO A REQUEST FROM PSE.**

Answered: 76 Skipped: 81



Answer choices	Responses	
None of the above	1.32%	1
Cost of smart thermostat/appliances	55.26%	42
I am hesitant to learn new technologies	40.79%	31
I don't believe the cost savings would be worth the effort	39.47%	30
I am not able to change when I use energy in my home	27.63%	21
I am not interested in changing the temperature of my home	21.05%	16
I don't want PSE to monitor how I use energy for appliances in my home	14.47%	11
I have limited access to the technology needed (e.g. cell phones) to receive notification	13.16%	10
I rent and don't believe my landlord would support this	3.95%	3
Other (please specify)	0.00%	0
Total participants: 76		

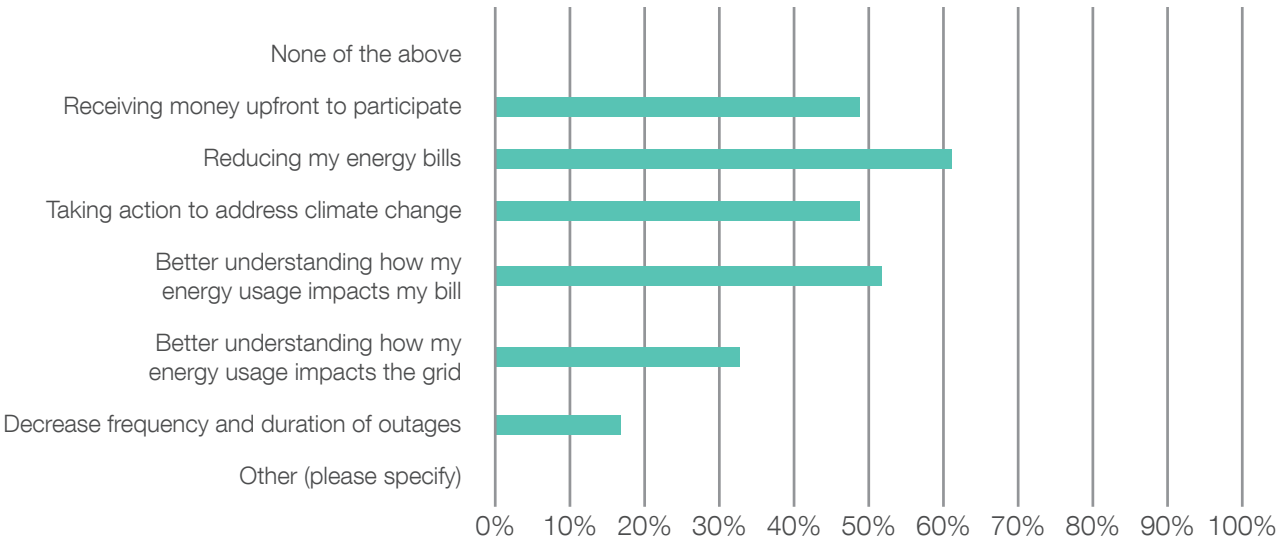
Q128 HOW WOULD YOU SUGGEST PSE ADDRESS THESE BARRIERS?

Answered: 21 Skipped: 136

#	Responses	Date
1	Provide education on the right adjustments procedure not to damage the devices	4/23/2023 11:00 AM
2	Creating Awareness	4/21/2023 8:36 AM
3	Reduce the cost of the thermostats	4/20/2023 8:17 PM
4	Reduce cost	4/20/2023 8:11 PM
5	Reduce the cost of the appliances	4/20/2023 7:45 PM
6	Installation of thermostat	4/20/2023 3:56 PM
7	Expansion.	4/20/2023 3:19 PM
8	Making it possible to afford.	4/20/2023 2:56 PM
9	Giving information	4/20/2023 2:37 PM
10	Making implementation.	4/20/2023 2:36 PM
11	Giving adequate information	4/20/2023 2:19 PM
12	Giving assistance to those in need.	4/20/2023 1:57 PM
13	Creation of awareness	4/20/2023 1:54 PM
14	By sending someone to help	4/20/2023 12:46 PM
15	None	4/20/2023 12:18 PM
16	Make improvements.	4/20/2023 12:05 PM
17	Reduce cost of their appliances	4/20/2023 11:36 AM
18	Easy access to navigate.	4/20/2023 11:35 AM
19	Cost reduction	4/20/2023 10:25 AM
20	Get across older people like me with a way they too can get involved	4/20/2023 10:16 AM
21	Mass communication	4/20/2023 10:04 AM

Q129 WHAT INTERESTS YOU ABOUT PARTICIPATING IN BEHAVIORAL DEMAND RESPONSE?
SELECT ALL THAT APPLY.BEHAVIORAL DEMAND RESPONSE: YOU ADJUST YOUR THERMOSTAT
OR APPLIANCES IN RESPONSE TO A REQUEST FROM PSE.

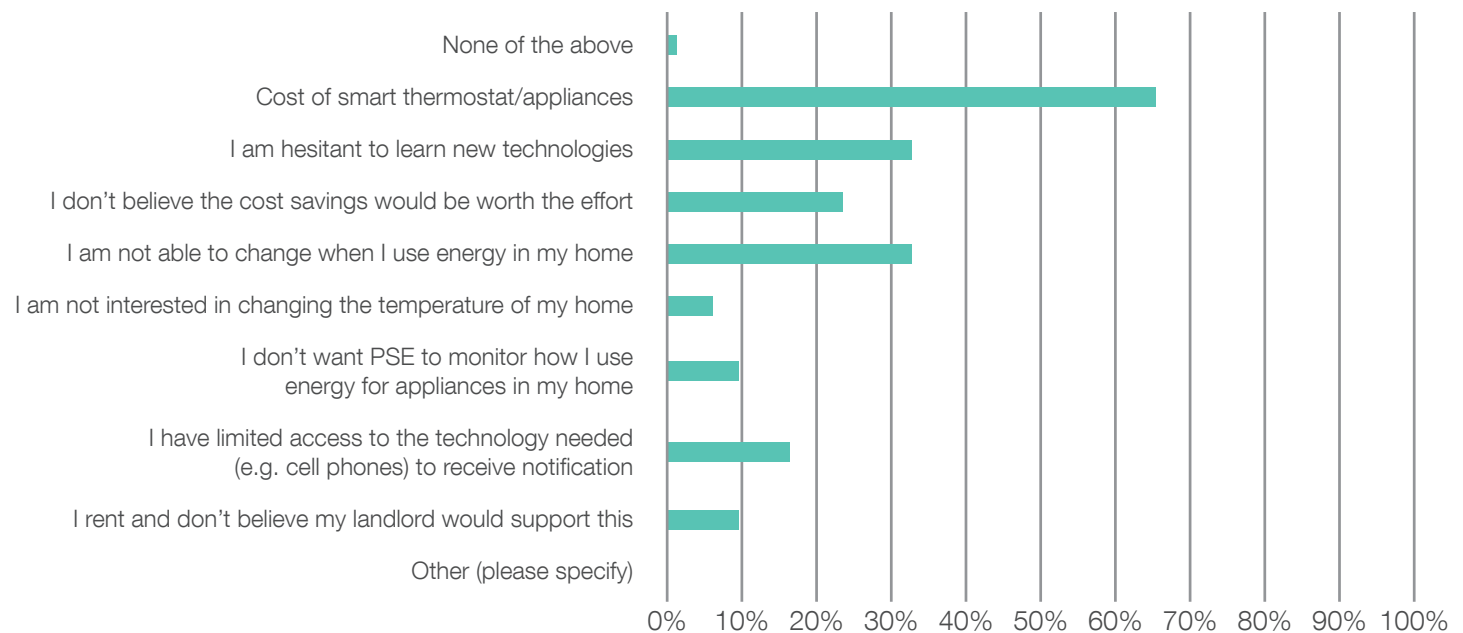
Answered: 31 Skipped: 126



Answer choices	Responses	
None of the above	0.00%	0
Receiving money upfront to participate	48.39%	15
Reducing my energy bills	61.29%	19
Taking action to address climate change	48.39%	15
Better understanding how my energy usage impacts my bill	51.61%	16
Better understanding how my energy usage impacts the grid	32.26%	10
Decrease frequency and duration of outages	16.13%	5
Other (please specify)	0.00%	0
Total participants: 76		

**Q130 WHAT MIGHT PREVENT YOU FROM PARTICIPATING IN BEHAVIORAL DEMAND RESPONSE?
SELECT ALL THAT APPLY.BEHAVIORAL DEMAND RESPONSE: YOU ADJUST YOUR THERMOSTAT
OR APPLIANCES IN RESPONSE TO A REQUEST FROM PSE.**

Answered: 31 Skipped: 126



Answer choices	Responses	
None of the above	3.23%	1
Cost of smart thermostat/appliances	64.52%	20
I am hesitant to learn new technologies	32.26%	10
I don't believe the cost savings would be worth the effort	22.58%	7
I am not able to change when I use energy in my home	32.26%	10
I am not interested in changing the temperature of my home	6.45%	2
I don't want PSE to monitor how I use energy for appliances in my home	9.68%	3
I have limited access to the technology needed (e.g. cell phones) to receive notification	16.13%	5
I rent and don't believe my landlord would support this	9.68%	3
Other (please specify)	0.00%	0
Total participants: 31		

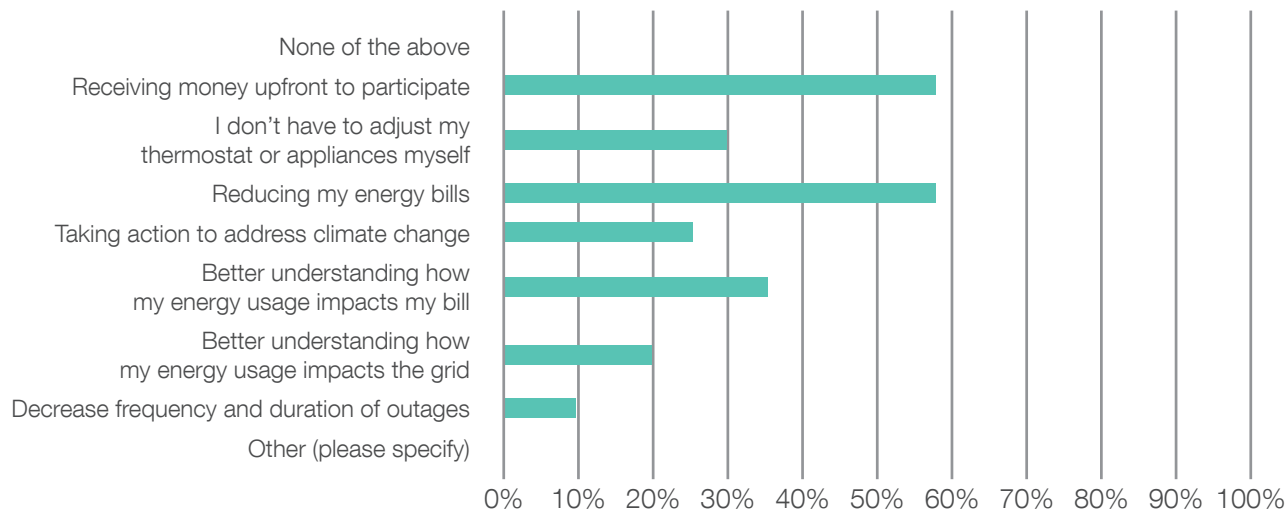
Q131 HOW WOULD YOU SUGGEST PSE ADDRESS THESE BARRIERS?

Answered: 12 Skipped: 145

#	Responses	Date
1	Provide smart thermostat	4/23/2023 11:40 AM
2	Ask the landlords for permission and enlightening them on the importance of the solar	4/21/2023 2:29 AM
3	Nil	4/20/2023 2:15 PM
4	By making things less complicated and easier to acess	4/20/2023 1:48 PM
5	Reduce the cost	4/20/2023 12:40 PM
6	Lower costs	4/20/2023 12:31 PM
7	Making it affordable	4/20/2023 11:41 AM
8	Making it flexible for me to be able to change when I want and reduced the costs	4/20/2023 11:12 AM
9	By taking a good look at it.	4/20/2023 10:27 AM
10	By adjusting to customer demand	4/20/2023 10:21 AM
11	Lower the costs	4/20/2023 10:21 AM
12	Ensuring that there are some amount saved	4/20/2023 10:05 AM

**Q132 WHAT INTERESTS YOU ABOUT PARTICIPATING IN REMOTE ENERGY MANAGEMENT?
SELECT ALL THAT APPLY. REMOTE ENERGY MANAGEMENT: YOU GRANT PSE PERMISSION TO
REMOTELY ADJUST YOUR THERMOSTAT OR APPLIANCES.**

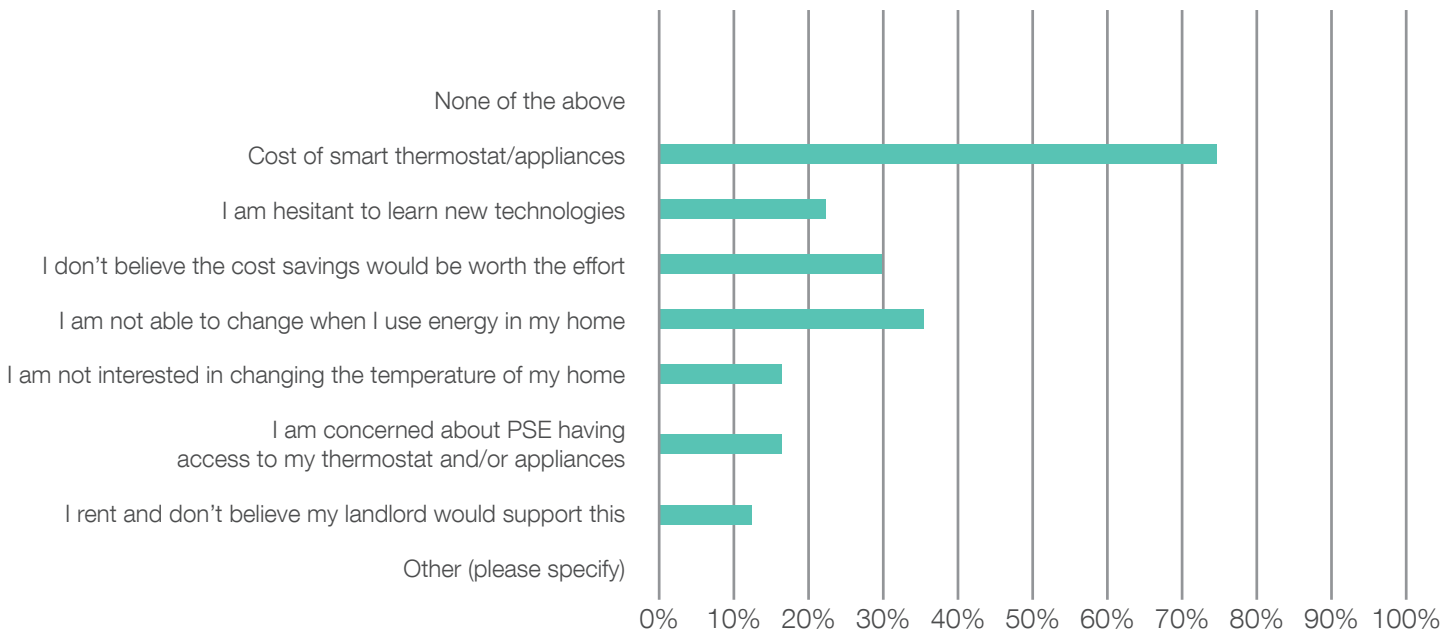
Answered: 31 Skipped: 126



Answer choices	Responses	
None of the above	0.00%	0
Receiving an upfront incentive to participate	58.06%	18
I don't have to adjust my thermostat or appliances myself	29.03%	9
Reducing my energy bills	58.06%	18
Taking action to address climate change	25.81%	8
Better understanding how my energy usage impacts my bill	35.48%	11
Better understanding how my energy usage impacts the grid	19.35%	6
Decrease frequency and duration of outages	9.68%	3
Other (please specify)	0.00%	0
Total participants: 31		

Q133 WHAT MIGHT PREVENT YOU FROM PARTICIPATING IN REMOTE ENERGY MANAGEMENT?
SELECT ALL THAT APPLY. REMOTE ENERGY MANAGEMENT: YOU GRANT PSE PERMISSION TO
REMOTELY ADJUST YOUR THERMOSTAT OR APPLIANCES.

Answered: 31 Skipped: 126



Answer choices	Responses	
None of the above	0.00%	0
Cost of smart thermostat/appliances	74.19%	23
I am hesitant to learn new technologies	22.58%	7
I don't believe the cost savings would be worth the effort	29.03%	9
I am not able to change when I use energy in my home	35.48%	11
I am not interested in changing the temperature of my home	16.13%	5
I am concerned about PSE having access to my thermostat and/or appliances	16.13%	5
I rent and don't believe my landlord would support this	12.90%	4
Other (please specify)	0.00%	0
Total participants: 76		

Q134 HOW WOULD YOU SUGGEST PSE ADDRESS THESE BARRIERS?

Answered: 10 Skipped: 147

#	Responses	Date
1	Provide outsmart devices	4/23/2023 11:40 AM
2	Ensuring it can be paid on monthly basis	4/20/2023 3:15 PM
3	The costs	4/20/2023 2:15 PM
4	They shouldn't have access to my appliances without my permission	4/20/2023 1:48 PM
5	Advice the landlords on the advantages of its usage	4/20/2023 12:40 PM
6	Making it flexible for me to be able to change when I want and reduced the costs	4/20/2023 11:12 AM
7	By looking forward to helping	4/20/2023 10:27 AM
8	I think PSE should let everyone know how useful it maybe for them to purchase this solar and the one that will really be good for them because we human believe and rely on quality.	4/20/2023 10:25 AM
9	Lower the costs.	4/20/2023 10:21 AM
10	I believe every person should give their complain so they can tackle it per person	4/20/2023 9:59 AM

**Q135 WHAT MIGHT PREVENT YOU FROM PARTICIPATING IN BEHAVIORAL DEMAND RESPONSE?
SELECT ALL THAT APPLY. BEHAVIORAL DEMAND RESPONSE: YOU ADJUST YOUR THERMOSTAT
OR APPLIANCES IN RESPONSE TO A REQUEST FROM PSE.**

Answered: 0 Skipped: 157

Answer choices	Responses	
None of the above	0.00%	0
Cost of smart thermostat/appliances	0.00%	0
I am hesitant to learn new technologies	0.00%	0
I don't believe the cost savings would be worth the effort	0.00%	0
I am not able to change when I use energy in my home	0.00%	0
I am not interested in changing the temperature of my home	0.00%	0
I don't want PSE to monitor how I use energy for appliances in my home	0.00%	0
I have limited access to the technology needed (e.g. cell phones) to receive notification	0.00%	0
I rent and don't believe my landlord would support this	0.00%	0
Other (please specify)	0.00%	0
Total participants: 0		

Q136 HOW WOULD YOU SUGGEST PSE ADDRESS THESE BARRIERS?

Answered: 0 Skipped: 157

#	Responses	Date
	There are no responses.	

**Q137 WHAT MIGHT PREVENT YOU FROM PARTICIPATING IN REMOTE ENERGY MANAGEMENT?
SELECT ALL THAT APPLY. REMOTE ENERGY MANAGEMENT: YOU GRANT PSE PERMISSION TO
REMOTELY ADJUST YOUR THERMOSTAT OR APPLIANCES.**

Answered: 0 Skipped: 157

Answer choices	Responses	
None of the above	0.00%	0
Cost of smart thermostat/appliances	0.00%	0
I am hesitant to learn new technologies	0.00%	0
I don't believe the cost savings would be worth the effort	0.00%	0
I am not able to change when I use energy in my home	0.00%	0
I am not interested in changing the temperature of my home	0.00%	0
I am concerned about PSE having access to my thermostat and/or appliances	0.00%	0
I rent and don't believe my landlord would support this	0.00%	0
Other (please specify)	0.00%	0
Total participants: 0		

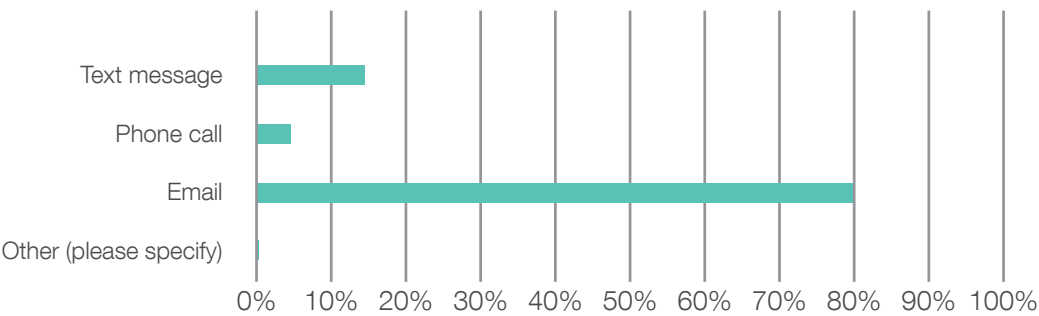
Q138 HOW WOULD YOU SUGGEST PSE ADDRESS THESE BARRIERS?

Answered: 0 Skipped: 157

#	Responses	Date
	There are no responses.	

Q139 HOW WOULD YOU PREFER TO BE NOTIFIED ABOUT A REDUCTION IN ELECTRICITY USAGE DURING PEAK PERIODS? PEAK PERIODS OCCUR WHEN DEMAND ACROSS THE GRID FOR ELECTRICITY IS HIGHEST, WHICH TYPICALLY HAPPENS ON COLD WINTER MORNINGS WHEN EVERYONE’S HEAT TURNS UP.

Answered: 149 Skipped: 8

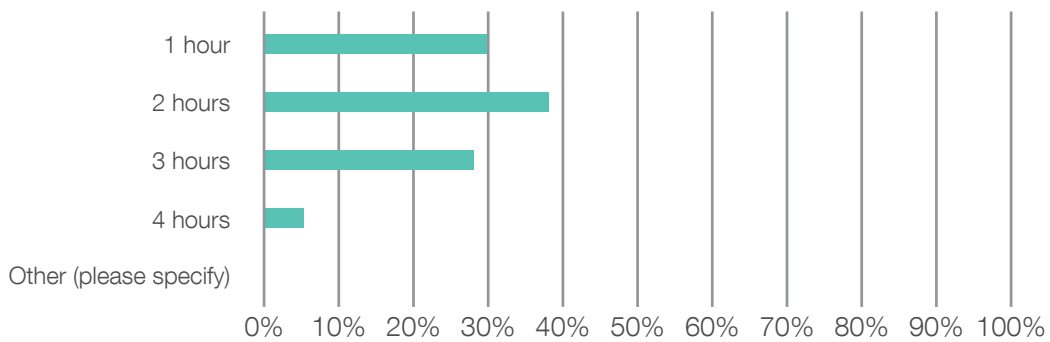


Answer choices		Responses	
Text message		14.77%	22
Phone call		5.37%	8
Email		79.19%	118
Other (please specify)		0.67%	1
Total participants: 149			

#	Other (please specify)	Date
1	Hi	4/20/2023 10:38 AM

Q140 HOW LONG OF AN ELECTRICITY REDUCTION EVENT COULD YOU PARTICIPATE IN DURING PEAK PERIODS? PEAK PERIODS OCCUR WHEN DEMAND ACROSS THE GRID FOR ELECTRICITY IS HIGHEST, WHICH TYPICALLY HAPPENS ON COLD WINTER MORNINGS WHEN EVERYONE’S HEAT TURNS UP.

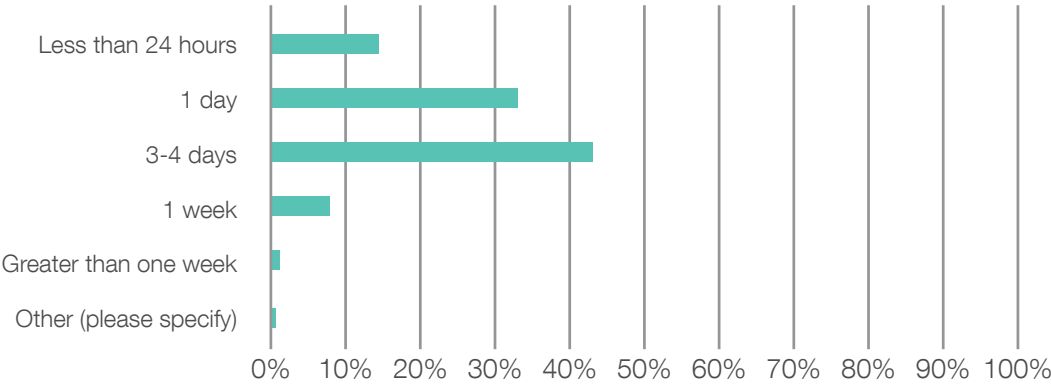
Answered: 149 Skipped: 8



Answer choices	Responses	
1 hour	29.53%	44
2 hours	37.58%	56
3 hours	27.52%	41
4 hours	5.37%	8
Other (please specify)	0.00%	0
Total participants: 149		

Q141 HOW MUCH NOTICE WOULD YOU NEED TO PREPARE FOR A DECREASE IN ELECTRICITY USAGE DURING PEAK PERIODS? PEAK PERIODS OCCUR WHEN DEMAND ACROSS THE GRID FOR ELECTRICITY IS HIGHEST, WHICH TYPICALLY HAPPENS ON COLD WINTER MORNINGS WHEN EVERYONE’S HEAT TURNS UP.

Answered: 149 Skipped: 8

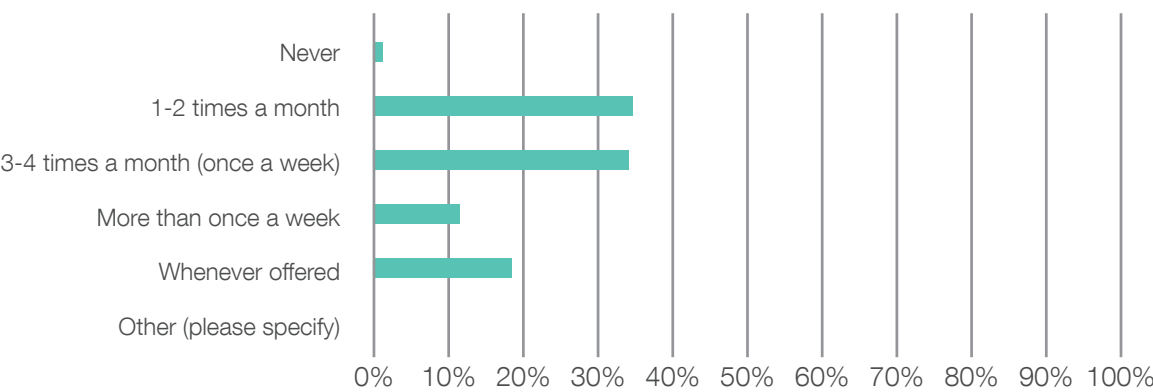


Answer choices	Responses	
Less than 24 hours	14.09%	21
1 day	32.21%	48
3-4 days	42.28%	63
1 week	8.05%	12
Greater than one week	2.68%	4
Other (please specify)	0.67%	1
Total participants: 149		

#	Other (please specify)	Date
1	9 hours	4/20/2023 1:49 PM

Q142 HOW MANY TIMES A YEAR WOULD YOU BE WILLING TO PARTICIPATE?
PLEASE SELECT ONE.

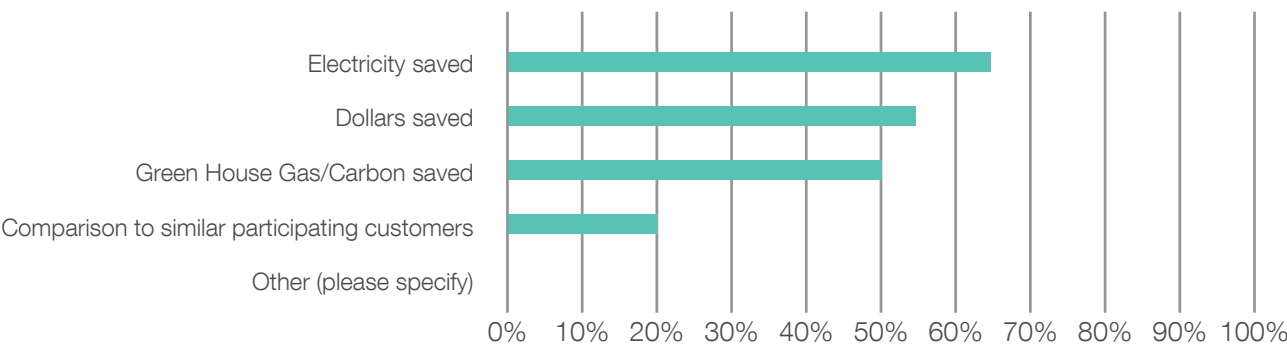
Answered: 149 Skipped: 8



Answer choices	Responses	
Never	1.34%	2
1-2 times a month	34.90%	52
3-4 times a month (once a week)	34.23%	51
More than once a week	11.41%	17
Whenever offered	18.12%	27
Other (please specify)	0.00%	0
Total participants: 149		

Q143 WHAT INFORMATION WOULD YOU LIKE PSE TO SHARE WITH YOU AFTER PARTICIPATING IN A DR EVENT?

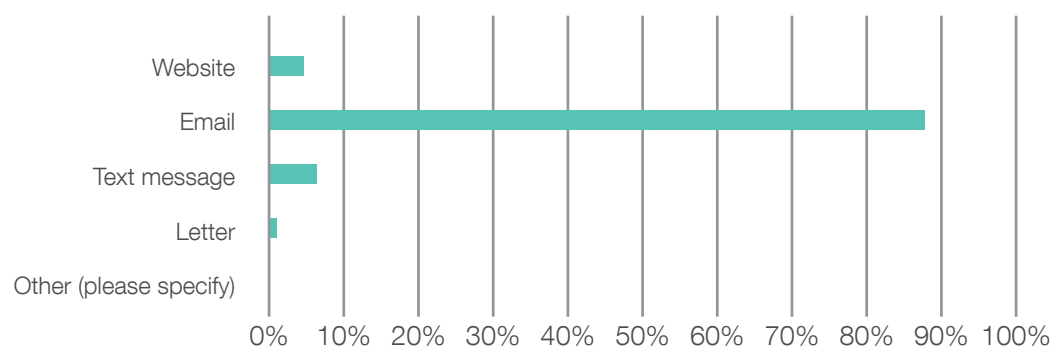
Answered: 149 Skipped: 8



Answer choices	Responses	
Electricity saved	65.10%	97
Dollars saved	55.03%	82
Green House Gas/Carbon saved	50.34%	75
Comparison to similar participating customers	20.81%	31
Other (please specify)	0.00%	0
Total participants: 149		

Q144 AFTER PARTICIPATING IN A DR EVENT, HOW WOULD YOU LIKE TO LEARN ABOUT YOUR PARTICIPATION RESULTS?

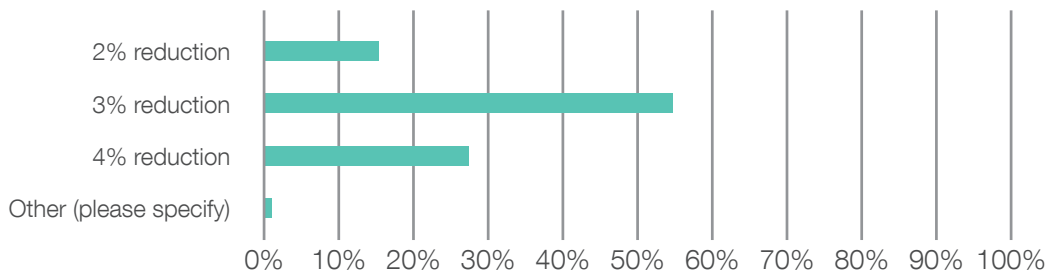
Answered: 149 Skipped: 8



Answer choices	Responses	
Website	5.37%	8
Email	87.25%	130
Text message	6.04%	9
Letter	1.34%	2
Other (please specify)	0.00%	0
Total participants: 149		

Q145 WHAT % OF SAVINGS (BILL REDUCTION) WOULD MAKE PARTICIPATION IN A DEMAND RESPONSE PROGRAM WORTHWHILE?

Answered: 149 Skipped: 8

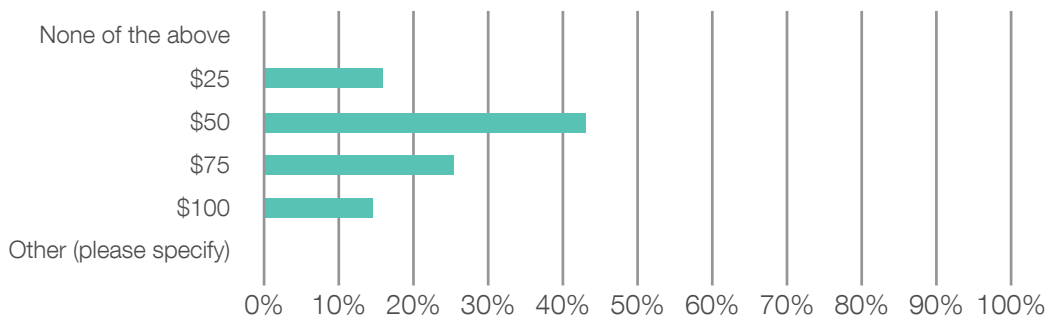


Answer choices		Responses	
2% reduction		15.44%	23
3% reduction		56.38%	84
5% reduction		27.52%	41
Other (please specify)		0.67%	1
Total participants: 149			

#	Other (please specify)	Date
1	More than 5%!	4/11/2023 7:33 PM

Q146 WHAT LEVEL OF ANNUAL PARTICIPATION PAYMENTS WOULD MAKE PARTICIPATION IN A DEMAND RESPONSE PROGRAM WORTHWHILE?

Answered: 149 Skipped: 8



Answer choices	Responses	
None of the above	0.00%	0
\$25	16.78%	25
\$50	43.62%	65
\$75	24.16%	36
\$100	15.44%	23
Other (please specify)	0.00%	0
Total participants: 149		

Q147 WHAT ADDITIONAL INFORMATION WOULD YOU NEED TO PARTICIPATE IN A DEMAND RESPONSE PROGRAM?

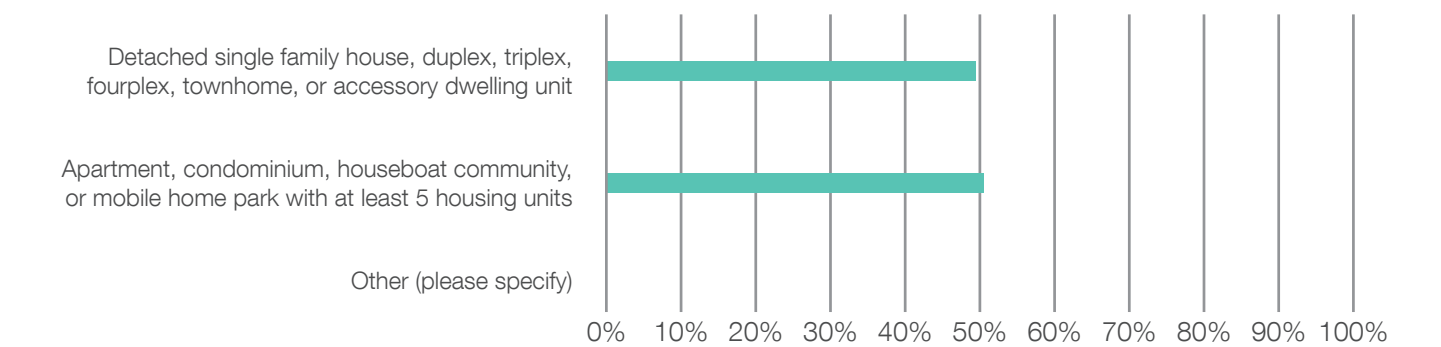
Answered: 46 Skipped: 111

#	Responses	Date
1	No thanks	4/23/2023 11:41 AM
2	No	4/23/2023 11:25 AM
3	Am good	4/23/2023 11:01 AM
4	Am ok	4/23/2023 10:33 AM
5	To know more about this program.	4/21/2023 8:55 AM
6	Knowing the insight about the program.	4/21/2023 8:37 AM
7	Expanding my thoughts.	4/21/2023 8:24 AM
8	Return of investment	4/21/2023 7:49 AM
9	I'm good	4/21/2023 5:56 AM
10	Adaquate innovations	4/21/2023 3:26 AM
11	Offering essential needs	4/21/2023 2:32 AM
12	The advantages of the programs	4/20/2023 9:20 PM
13	The advantages of the program	4/20/2023 8:20 PM
14	Advantages of participating	4/20/2023 8:14 PM
15	Non	4/20/2023 7:48 PM
16	Accessibility to navigate.	4/20/2023 3:58 PM
17	Gaining knowledge	4/20/2023 3:20 PM
18	N/A	4/20/2023 3:16 PM
19	Seeking insight.	4/20/2023 2:57 PM
20	The accessibility of the response program .	4/20/2023 2:41 PM
21	Knowing the scopes.	4/20/2023 2:39 PM
22	Giving adequate information	4/20/2023 2:22 PM
23	Incentive	4/20/2023 2:16 PM
24	The impact for Participating.	4/20/2023 2:00 PM
25	Nill	4/20/2023 1:57 PM
26	Na	4/20/2023 1:55 PM
27	Nil	4/20/2023 1:49 PM
28	None	4/20/2023 1:20 PM
29	No	4/20/2023 1:15 PM
30	NA	4/20/2023 12:56 PM
31	More about the product	4/20/2023 12:48 PM
32	Non	4/20/2023 12:44 PM
33	None	4/20/2023 12:20 PM
34	Educating my point of views.	4/20/2023 12:07 PM
35	No additional information	4/20/2023 11:41 AM
36	Better understanding more.	4/20/2023 11:39 AM
37	Non	4/20/2023 11:13 AM

#	Responses	Date
38	Are my information private	4/20/2023 10:41 AM
39	Nothing	4/20/2023 10:29 AM
40	I think it should be easy to own by everyone in terms of price reduction	4/20/2023 10:27 AM
41	N/A	4/20/2023 10:26 AM
42	No	4/20/2023 10:22 AM
43	No additional information	4/20/2023 10:20 AM
44	None	4/20/2023 10:06 AM
45	I believe it will enable people be at safe side	4/20/2023 10:01 AM
46	More information about this page	4/11/2023 7:33 PM

Q148 WHAT TYPE OF RESIDENCE DO YOU LIVE IN?

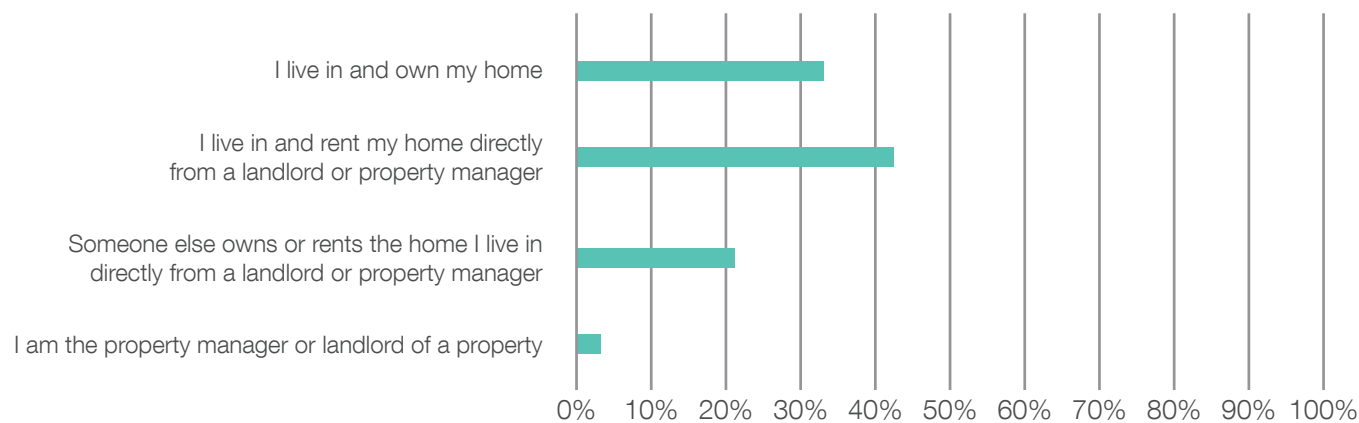
Answered: 149 Skipped: 8



Answer choices	Responses	
Detached single family house, duplex, triplex, fourplex, townhome, or accessory dwelling unit	49.66%	74
Apartment, condominium, houseboat community, or mobile home park with at least 5 housing units	50.34%	75
Other (please specify)	0.00%	0
Total participants: 149		

Q149 DO YOU OWN, RENT, OR MANAGE YOUR HOME/PROPERTY?

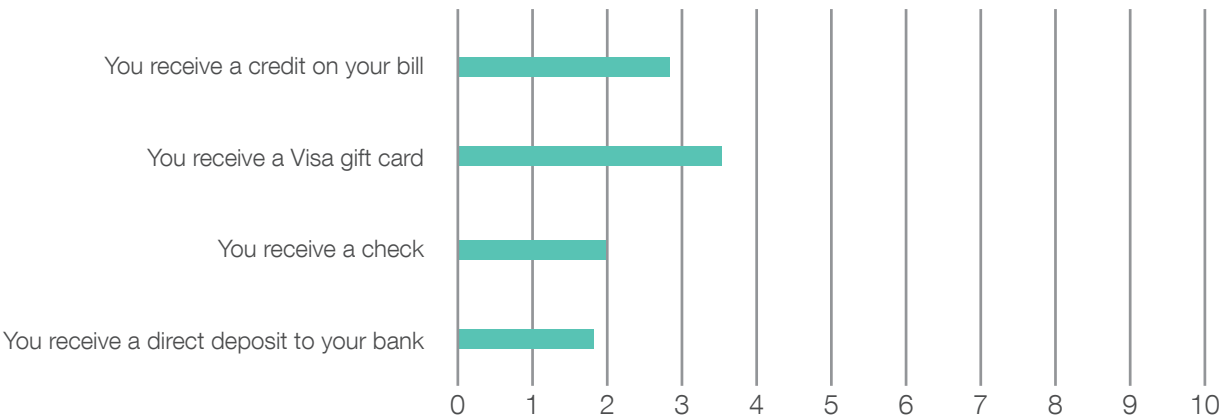
Answered: 149 Skipped: 8



Answer choices	Responses	
I live in and own my home	33.56%	50
I live in and rent my home directly from a landlord or property manager	42.95%	64
Someone else owns or rents the home I live in directly from a landlord or property manager	20.13%	30
I am the property manager or landlord of a property	3.36%	5
Total participants: 149		

Q150 FOR ANY PAYMENTS RECEIVED FROM PSE FOR PARTICIPATION IN THESE PROGRAMS, HOW WOULD YOU PREFER TO RECEIVE YOUR PAYMENT? PLEASE RANK YOUR PREFERENCES.

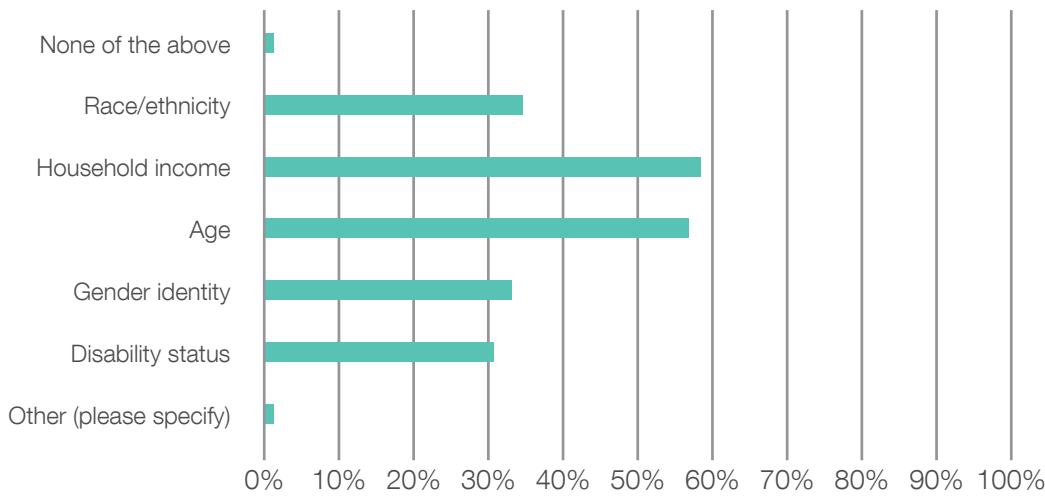
Answered: 149 Skipped: 8



Answer choices	1	2	3	4	Total	Score
You receive a credit on your bill	20.13% 30	51.68% 77	17.45% 26	10.74% 16	149	2.81
You receive a Visa gift card	71.14% 106	14.09% 21	9.40% 14	5.37% 8	149	3.51
You receive a check	4.70% 7	21.48% 32	39.60% 59	34.23% 51	149	1.97
You receive a direct deposit to your bank	4.03% 6	12.75% 19	33.56% 50	49.66% 74	149	1.71

Q151 WHAT DEMOGRAPHIC CHARACTERISTICS DO YOU THINK PSE SHOULD CONSIDER WHEN VERIFYING A CUSTOMER IS PART OF A HISTORICALLY DISADVANTAGED COMMUNITY?
SELECT ALL THAT APPLY.

Answered: 149 Skipped: 8

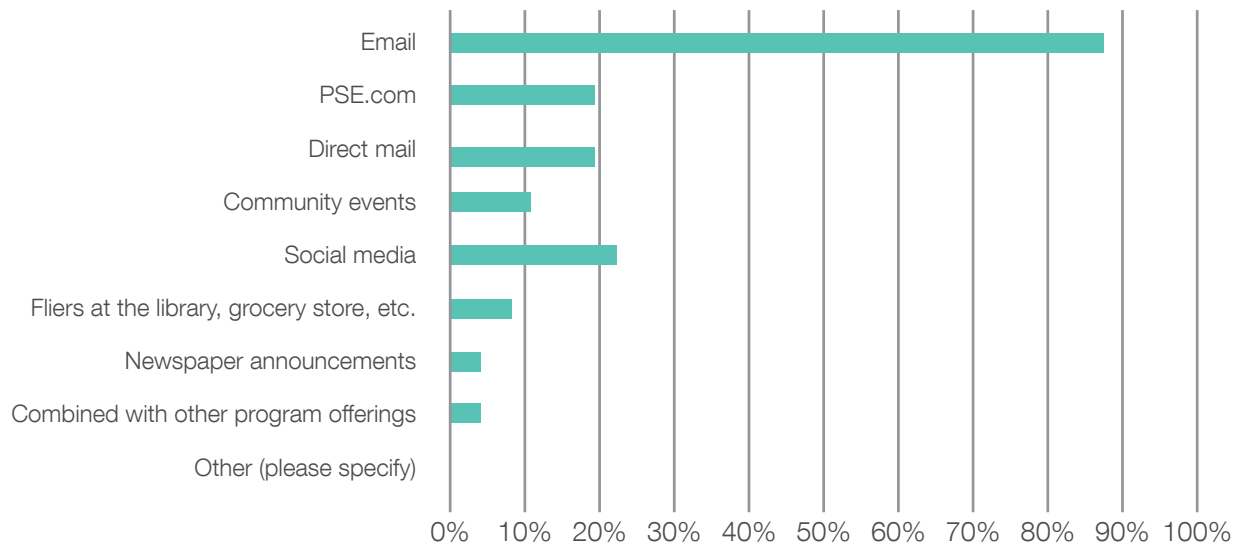


Answer choices	Responses	
None of the above	0.67%	1
Race/ethnicity	43.62%	65
Household income	58.39%	87
Age	57.72%	86
Gender identity	33.56%	50
Disability status	30.87%	46
Other (please specify)	0.67%	1
Total participants: 149		

#	Other (please specify)	Date
1		4/20/2023 10:17 AM

Q152 HOW WOULD YOU LIKE TO LEARN MORE ABOUT FUTURE PSE PROGRAMS LIKE THESE? SELECT ALL THAT APPLY.

Answered: 149 Skipped: 8



Answer choices	Responses	
Email	88.59%	132
PSE.com	19.46%	29
Direct mail	19.46%	29
Community events	10.74%	16
Social media	22.15%	33
Fliers at the library, grocery store, etc.	8.72%	13
Newspaper announcements	4.03%	6
Combined with other program offerings	4.03%	6
Other (please specify)	0.00%	0
Total participants: 149		

Q153 IS THERE ANYTHING ELSE YOU'D LIKE TO SHARE WITH US ABOUT DERS?

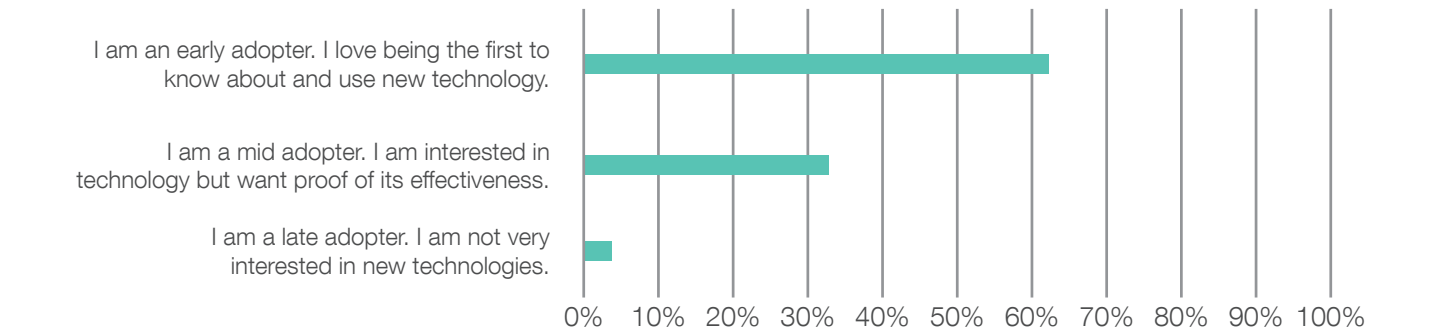
Answered: 53 Skipped: 104

#	Responses	Date
1	No	4/25/2023 11:45 AM
2	Am good	4/23/2023 11:41 AM
3	Am ok	4/23/2023 11:26 AM
4	No thanks	4/23/2023 11:02 AM
5	No thanks	4/23/2023 10:34 AM
6	No.	4/21/2023 8:56 AM
7	Null.	4/21/2023 8:38 AM
8	No.	4/21/2023 8:25 AM
9	No	4/21/2023 7:50 AM
10	No thanks	4/21/2023 5:58 AM
11	None	4/21/2023 3:28 AM
12	Non	4/20/2023 9:21 PM
13	Non	4/20/2023 8:21 PM
14	No	4/20/2023 8:17 PM
15	Non	4/20/2023 7:51 PM
16	None	4/20/2023 3:58 PM
17	No	4/20/2023 3:24 PM
18	No.	4/20/2023 3:21 PM
19	No	4/20/2023 3:17 PM
20	No	4/20/2023 3:00 PM
21	No	4/20/2023 2:42 PM
22	No.	4/20/2023 2:41 PM
23	No	4/20/2023 2:23 PM
24	Nope	4/20/2023 2:17 PM
25	Proper Analysis.	4/20/2023 2:05 PM
26	None	4/20/2023 2:01 PM
27	No	4/20/2023 1:56 PM
28	Not at all	4/20/2023 1:51 PM
29	No	4/20/2023 1:21 PM
30	No	4/20/2023 1:15 PM
31	No	4/20/2023 12:50 PM
32	Non	4/20/2023 12:46 PM
33	I think you guys need enough workers	4/20/2023 12:24 PM
34	It life span.	4/20/2023 12:09 PM
35	None	4/20/2023 12:03 PM
36	No	4/20/2023 11:56 AM
37	No	4/20/2023 11:48 AM
38	No	4/20/2023 11:44 AM

#	Responses	Date
39	Knowing more about DSRs.	4/20/2023 11:43 AM
40	No	4/20/2023 11:41 AM
41	No	4/20/2023 11:39 AM
42	No	4/20/2023 11:15 AM
43	No	4/20/2023 11:13 AM
44	No	4/20/2023 11:13 AM
45	No	4/20/2023 10:32 AM
46	No	4/20/2023 10:28 AM
47	No	4/20/2023 10:28 AM
48	N/A	4/20/2023 10:27 AM
49	No	4/20/2023 10:23 AM
50	No	4/20/2023 10:22 AM
51	None	4/20/2023 10:08 AM
52	Nil for now	4/20/2023 10:03 AM
53	No	4/20/2023 10:02 AM

Q154 HOW WOULD YOU DESCRIBE YOUR INTEREST IN ADOPTING NEW TECHNOLOGIES?
PLEASE SELECT ONE.

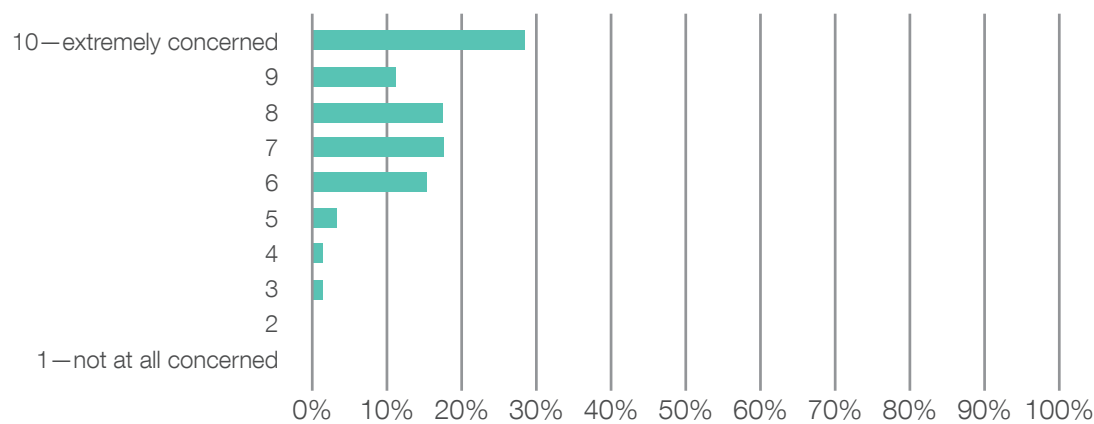
Answered: 148 Skipped: 9



Answer choices	Responses	
I am an early adopter. I love being the first to know about and use new technology.	62.84%	93
I am a mid adopter. I am interested in technology but want proof of its effectiveness.	33.11%	49
I am a late adopter. I am not very interested in new technologies.	4.05%	6
Total participants: 148		

Q155 ON A SCALE OF 1-10, 1 BEING NOT AT ALL CONCERNED AND 10 BEING EXTREMELY CONCERNED, PLEASE INDICATE YOUR LEVEL OF CONCERN ABOUT CLIMATE CHANGE.

Answered: 149 Skipped: 8



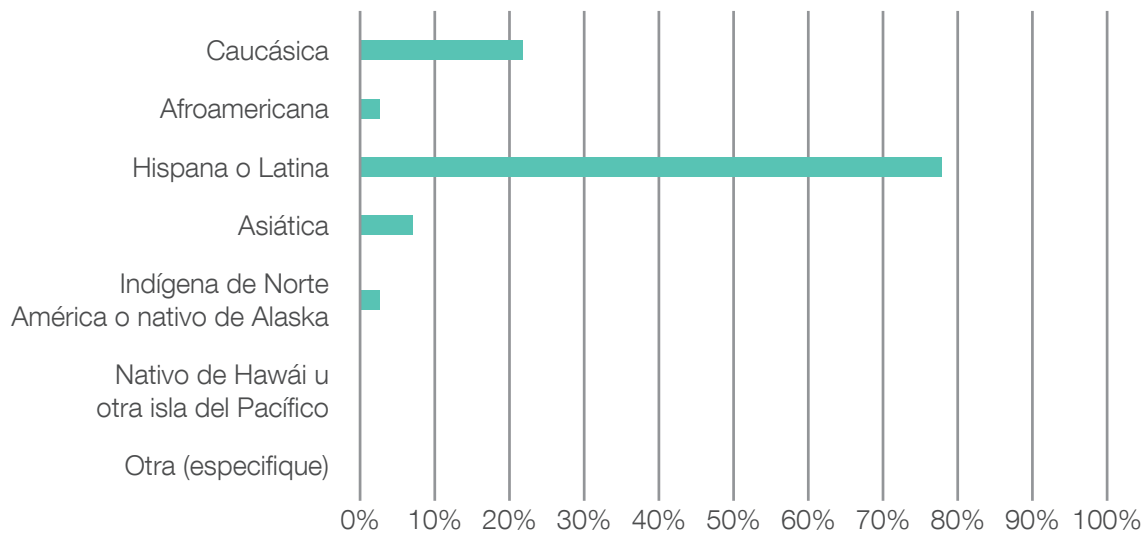
Answer choices	Responses	
10—extremely concerned	28.86%	43
9	11.41%	17
8	18.12%	27
7	18.79%	28
6	15.44%	23
5	4.70%	7
4	1.34%	2
3	1.34%	2
2	0.00%	0
1—not at all concerned	0.00%	0
Total participants: 149		

APPENDIX G: SPANISH DER SURVEY RESULTS

See next page.

Q1 ¿CON QUE RAZA SE IDENTIFICA? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN.

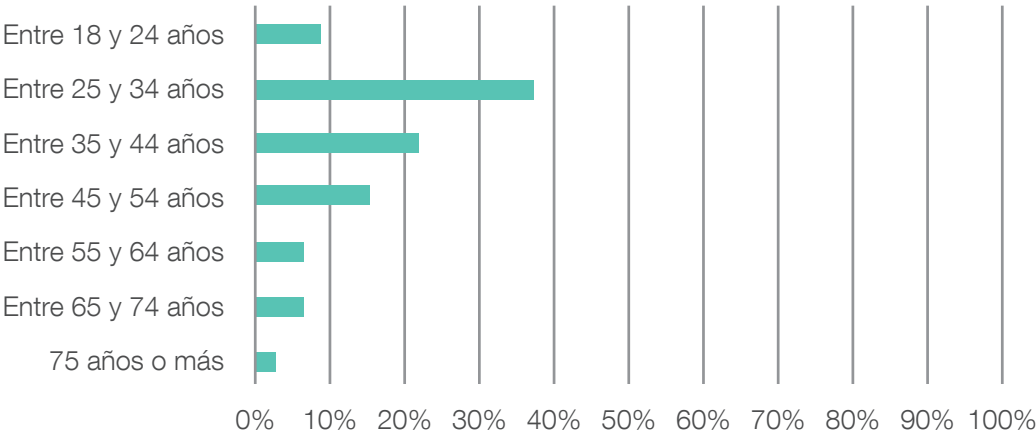
Answered: 32 Skipped: 0



Answer choices	Responses	
Caucásica	21.88%	7
Afroamericana	3.13%	1
Hispana o Latina	78.13%	25
Asiática	6.25%	2
Indígena de Norte América o nativo de Alaska	3.13%	1
Nativo de Hawái u otra isla del Pacífico	0.00%	0
Otra (especifique)	0.00%	0
Total respondents: 32		

Q2 ¿QUÉ EDAD TIENE?

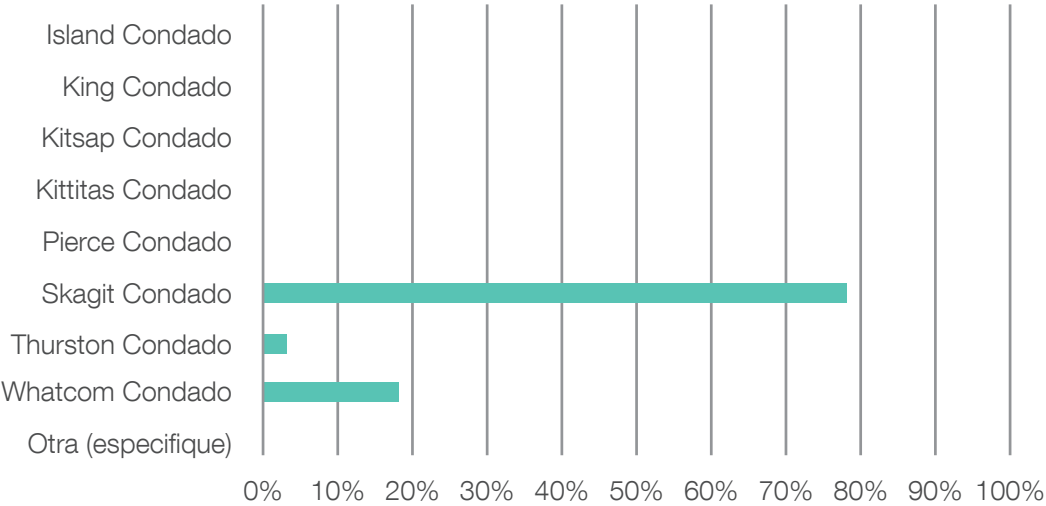
Answered: 32 Skipped: 0



Answer choices	Responses	
Entre 18 y 24 años	9.38%	3
Entre 25 y 34 años	37.50%	12
Entre 35 y 44 años	21.88%	7
Entre 45 y 54 años	15.63%	5
Entre 55 y 64 años	6.25%	2
Entre 65 y 74 años	6.25%	2
75 años o más	3.13%	1
Total participants: 32		

Q3 ¿EN QUÉ CONDADO VIVES?

Answered: 32 Skipped: 0



Answer choices	Responses	
Island Condado	0.00%	0
King Condado	0.00%	0
Kitsap Condado	0.00%	0
Kittitas Condado	0.00%	0
Pierce Condado	0.00%	0
Skagit Condado	78.13%	25
Thurston Condado	3.13%	1
Whatcom Condado	18.75%	6
Otra (especifique)	0.00%	0
Total participants: 32		

¿CUÁNTAS PERSONAS VIVEN EN SU CASA?

Answer choices	Responses	
1 persona (solo yo)	4.00%	1
2 personas	16.00%	4
3 personas	32.00%	8
4 personas	16.00%	4
5 personas	4.00%	1
6 personas	16.00%	4
7 personas	0.00%	0
8 personas	4.00%	1
9 personas	4.00%	1
10+ personas	4.00%	1
Total participants: 25		

¿CUÁL FUE EL INGRESO TOTAL DE SU HOGAR EN EL 2022?

Answer choices	Responses	
Menos que \$48,250	0.00%	0
Más que \$48,250	100%	1
Total participants: 1		
Menos que \$55,150	25%	1
Más que \$55,150	75%	3
Total participants: 4		
Menos que \$62,050	37.5%	3
Más que \$62,050	62.5%	5
Total participants: 17		
Menos que \$68,900	75%	3
Más que \$68,900	25%	1
Total participants: 4		
Menos que \$74,450	100%	1
Más que \$74,450	0.00%	0
Total participants: 1		
Menos que \$79,950	75%	3
Más que \$79,950	25%	1
Total participants: 4		
Less than \$94,200	0.00%	0
More than \$94,200	100%	1
Total participants: 1		
Menos que \$85,450	0.00%	0
Más que \$85,450	0.00%	0
Total participants: 0		
Menos que \$93,260	0.00%	0
Más que \$93,260	100%	1
Total participants: 0		
Menos que \$102,700	100%	1
Más que \$102,700	0.00%	0
Total participants: 1		
Menos que \$112,140	0.00%	0
Más que \$112,140	100%	1
Total participants: 1		

¿CUÁNTAS PERSONAS VIVEN EN SU CASA?

Answer choices	Responses	
1 persona (solo yo)	0.00%	0
2 personas	0.00%	0
3 personas	100.00%	1
4 personas	0.00%	0
5 personas	0.00%	0
6 personas	0.00%	0
7 personas	0.00%	0
8 personas	0.00%	0
9 personas	0.00%	0
10+ personas	0.00%	0
Total participants: 1		

¿CUÁL FUE EL INGRESO TOTAL DE SU HOGAR EN EL 2022?

Answer choices	Responses	
Menos que \$72,650	100%	1
Más que \$72,650	0.00%	0
Total participants: 1		

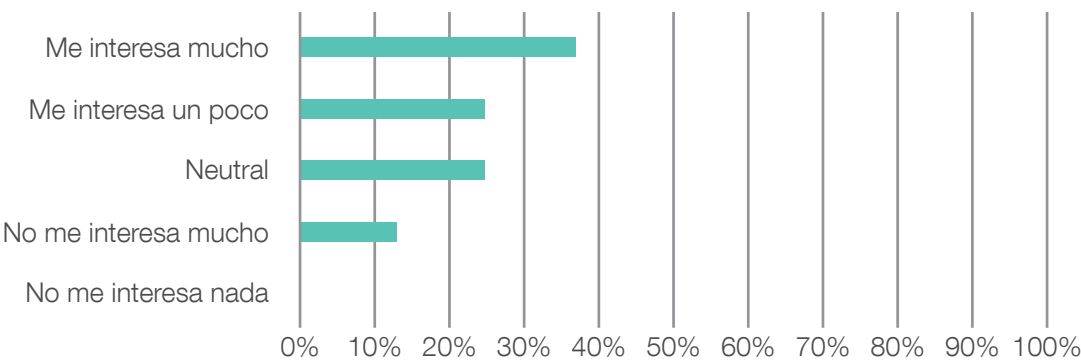
¿CUÁNTAS PERSONAS VIVEN EN SU CASA?

Answer choices	Responses	
1 persona (solo yo)	16.67%	1
2 personas	33.33%	2
3 personas	16.67%	1
4 personas	33.33%	2
5 personas	0.00%	0
6 personas	0.00%	0
7 personas	0.00%	0
8 personas	0.00%	0
9 personas	0.00%	0
10+ personas	0.00%	0
Total participants: 6		

¿CUÁL FUE EL INGRESO TOTAL DE SU HOGAR EN EL 2022?

Answer choices	Responses	
Menos que \$50,800	0.00%	0
Más que \$50,800	100%	1
Total participants: 1		
Menos que \$50,800	0.00%	0
Más que \$50,800	100%	1
Total participants: 1		
Menos que \$58,050	50%	1
Más que \$58,050	50%	1
Total participants: 2		
Menos que \$65,300	100%	1
Más que \$65,300	0.00%	0
Total participants: 1		
Menos que \$72,550	100.00%	2
Más que \$72,550	0.00%	0
Total participants: 2		

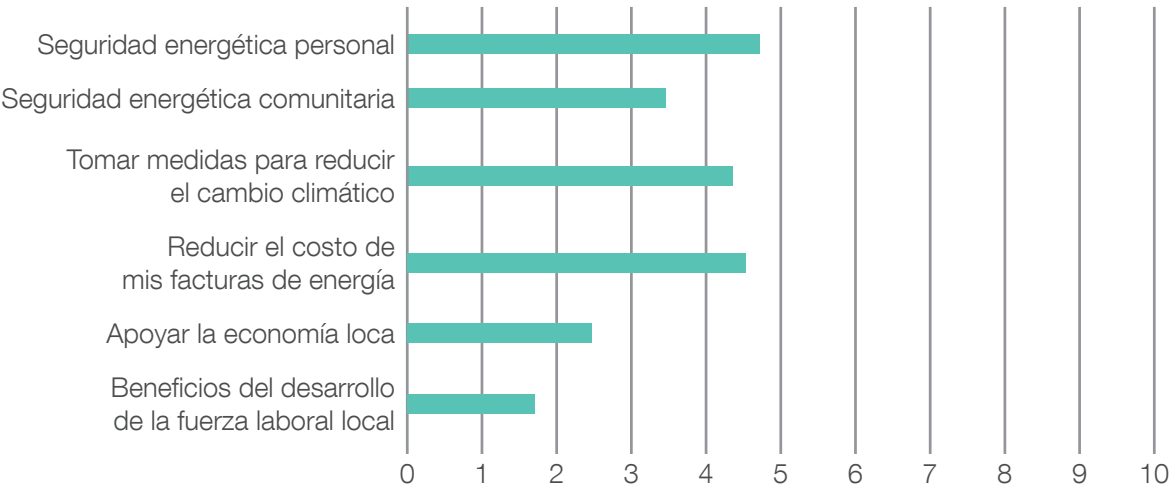
Q92 ¿LE INTERESA INSTALAR ENERGÍA SOLAR DONDE VIVE?



Answer choices	Responses	
Me interesa mucho	37.50%	6
Me interesa un poco	25.00%	4
Neutral	25.00%	4
No me interesa mucho	12.50%	2
No me interesa nada	0.00%	0
Total respondents: 16		

Q93 ¿QUÉ ES LO QUE LE INTERESA SOBRE INSTALAR ENERGÍA SOLAR DONDE VIVE? CLASIFIQUE EN ORDEN DE IMPORTANCIA.

Answered: 11 Skipped: 21



Answer choices	1	2	3	4	5	6	Total	Score
Seguridad energética personal	36.36% 4	27.27% 3	18.18% 2	9.09% 1	0.00% 0	9.09% 1	11	4.64
Seguridad energética comunitaria	9.09% 1	18.18% 2	9.09% 1	45.45% 5	0.00% 0	18.18% 2	11	3.36
Tomar medidas para reducir el cambio climático	18.18% 2	27.27% 2	25025% 4	0.00% 0	18.18% 2	0.00% 0	11	4.27
Reducir el costo de mis facturas de energía	36.36% 2	18.18% 2	9.09% 1	27.27% 3	9.09% 1	0.00% 0	11	4.45
Apoyar la economía local	0.00% 0	9.09% 1	18.18% 2	9.09% 1	45.45% 5	18.18% 2	11	2.55
Beneficios del desarrollo de la fuerza laboral local	0.00% 0	0.00% 0	9.09% 1	9.09% 1	27.27% 3	54.55% 6	11	1.73

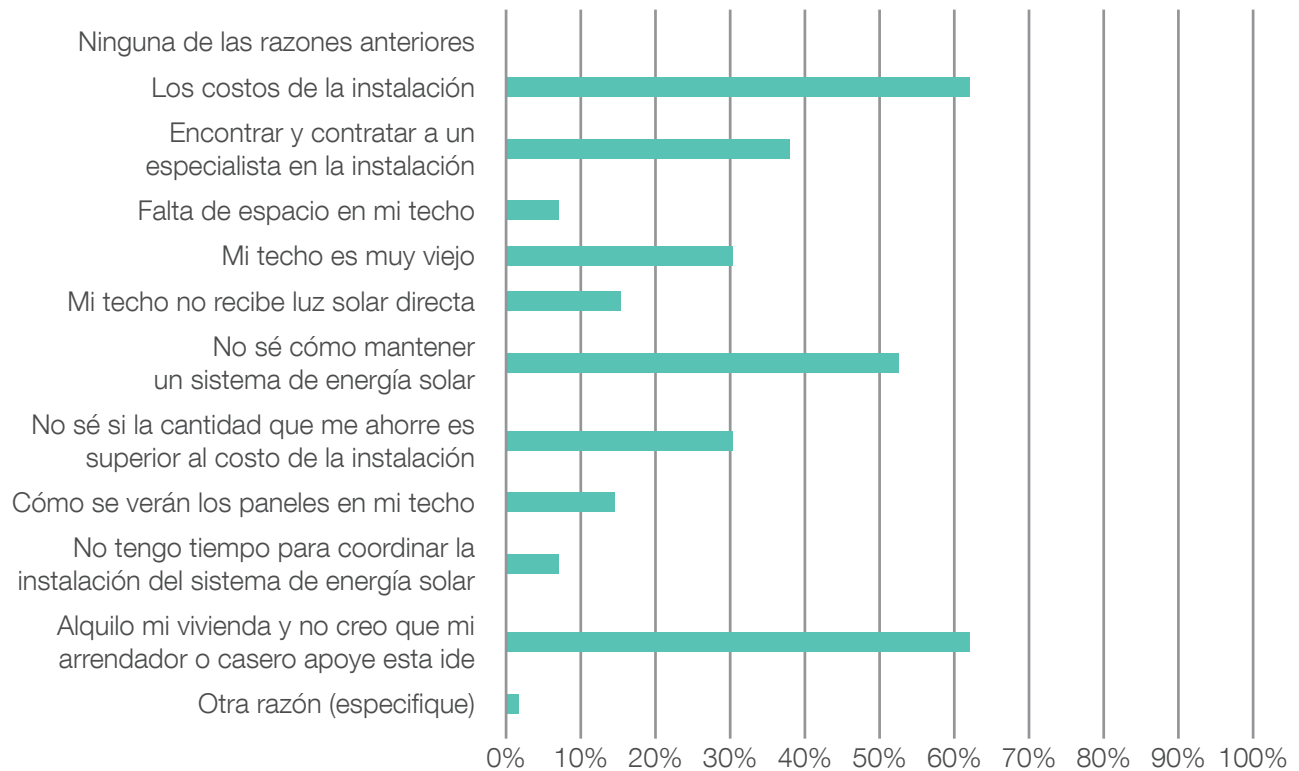
Q94 ¿QUÉ FALTA EN LA LISTA ANTERIOR?

Answered: 4 Skipped: 28

#	Responses	Date
1	N/A	4/13/2023 2:53 PM
2	mas informacion. que ustedes ofrezcan.	4/13/2023 5:23 AM
3	No Se	4/12/2023 3:56 PM
4	Outreach	4/12/2023 3:30 PM

Q95 ¿QUÉ PODRÍA IMPEDIRLE INSTALAR UN SISTEMA DE ENERGÍA SOLAR EN EL LUGAR DONDE VIVE? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN.

Answered: 13 Skipped: 19



Answer choices	Responses	
Ninguna de las razones anteriores	0.00%	0
Los costos de la instalación	61.54%	8
Encontrar y contratar a un especialista en la instalación	38.46%	5
Falta de espacio en mi techo	7.69%	1
Mi techo es muy viejo	30.77%	4
Mi techo no recibe luz solar directa	15.38%	2
No sé cómo mantener un sistema de energía solar	53.85%	7
No sé si la cantidad que me ahorre es superior al costo de la instalación	30.77%	4
Cómo se verán los paneles en mi techo	15.38%	2
No tengo tiempo para coordinar la instalación del sistema de energía solar	7.69%	1
Alquilo mi vivienda y no creo que mi arrendador o casero apoye esta idea	61.54%	8
Otra razón (especifique)	7.69%	1
Total participants: 13		

#	Other (please specify)	Date
1	El apartamento no es propio	4/12/2023 4:51 PM

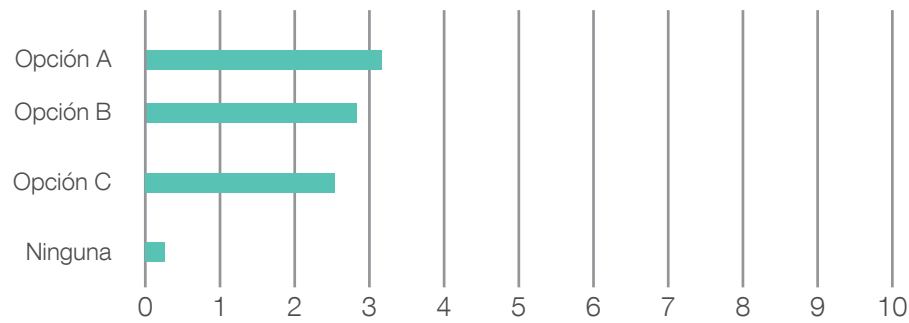
Q96 ¿CÓMO CREE QUE PSE PODRÍA ABORDAR ESTOS OBSTÁCULOS?

Answered: 8 Skipped: 24

#	Responses	Date
1	Talk to landlord	4/13/2023 2:53 PM
2	ofrecer paneles a bajo costo para personas como yo madres solteras, tratando de sobrevivir en este systema con los limites ecoeconomicos, de 25,-000 al anno. costos bajos con intsalacion y eauipo puesto por la misma compoania	4/13/2023 5:23 AM
3	No se	4/12/2023 4:51 PM
4	Ayuda y instrucciones en como mantener una energia solar	4/12/2023 3:56 PM
5	Con algun programa a bajo precio para ayudar a instalar los servicios para la luz solar	4/12/2023 3:41 PM
6	capacitaciones y información sobre sistemas de energía solar	4/12/2023 3:33 PM
7	En el momento no se puede vivo en apartamento	4/12/2023 3:19 PM
8	Hablado con mi landlord	4/12/2023 3:10 PM

Q97 CALIFIQUE EN QUÉ MODELO DE PROGRAMA LE INTERESARÍA PARTICIPAR MÁS. TENGA EN CUENTA QUE TODAS LAS CANTIDADES EN DÓLARES TIENEN EL PROPÓSITO DE SER ILUSTRATIVOS Y NO INDICAN NECESARIAMENTE LOS COSTOS U OFERTAS FINALES DEL PROGRAMA.

Answered: 13 Skipped: 19



Answer choices	1	2	3	4	Total	Score
Opción A	30.77% 4	53.85% 7	15.38% 2	0.00% 0	13	3.15
Opción B	23.08% 3	38.46% 5	30.77% 4	7.69% 1	13	2.77
Opción C	30.77% 4	7.69% 1	46.15% 6	15.38% 2	13	2.54
Ninguna	15.38% 2	0.00% 0	7.69% 1	76.92% 10	13	1.54

Q98 SI NINGUNA DE ESTAS OPCIONES ES IDEAL PARA USTED, DESCRIBA SU OPCIÓN

Answered: 4 Skipped: 28

#	Responses	Date
1	A	4/13/2023 11:00 AM
2	A	4/13/2023 5:23 AM
3	Yo rento casa	4/12/2023 3:30 PM
4	Me gustaría enstallar cuando tenga casa propia gracias por la información	4/12/2023 3:19 PM

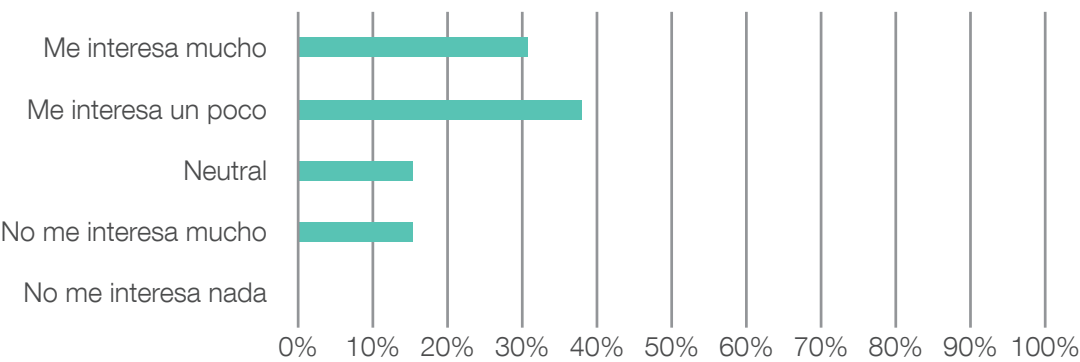
Q99 ¿QUÉ OTRA INFORMACIÓN NECESITARÍA POR PARTE DE PSE ANTES DE INSTALAR UN SISTEMA DE ENERGÍA SOLAR?

Answered: 4 Skipped: 28

#	Responses	Date
1	no se?	4/13/2023 5:23 AM
2	Pueden dar clases	4/12/2023 3:56 PM
3	Como beneficiar a la comunidad que renta las casas o apartamentos	4/12/2023 3:30 PM
4	No estoy segura	4/12/2023 3:19 PM

Q100 ¿QUÉ TANTO LE INTERESARÍA EL PROYECTO DE COMUNIDAD SOLAR?

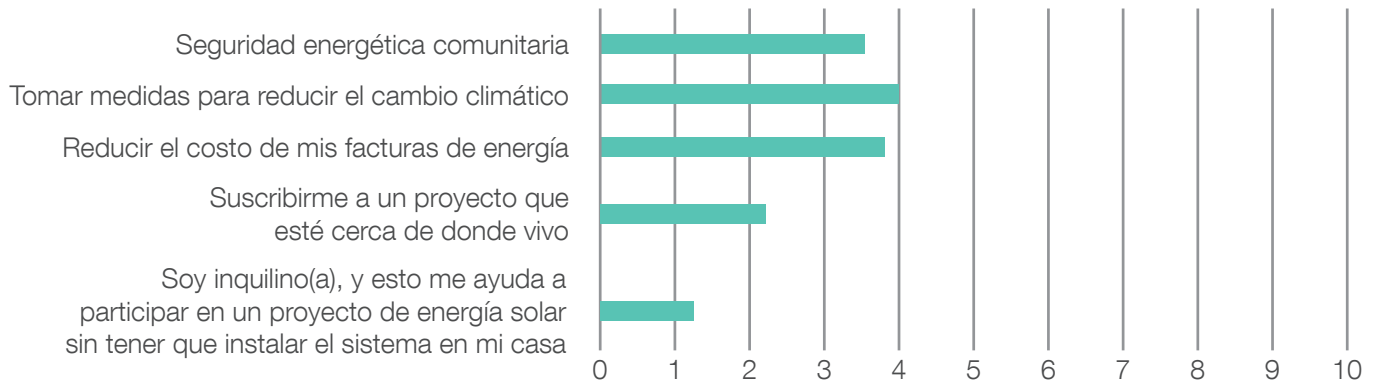
Answered: 13 Skipped: 19



Answer choices	Responses	
Me interesa mucho	30.77%	4
Me interesa un poco	38.46%	5
Neutral	15.38%	2
No me interesa mucho	15.38%	2
No me interesa nada	0.00%	0
Total participants: 13		

Q101 ¿QUÉ ES LO QUE LE INTERESA SOBRE INSCRIBIRSE EN UN PROYECTO DE COMUNIDAD SOLAR? CLASIFIQUE EN ORDEN DE IMPORTANCIA.

Answered: 9 Skipped: 23



Answer choices	1	2	3	4	5	Total	Score
Seguridad energética comunitaria	33.33% 3	22.22% 2	22.22% 2	11.11% 1	11.11% 1	9	3.56
Tomar medidas para reducir el cambio climático	33.33% 3	33.33% 3	33.33% 3	0.00% 0	0.00% 0	9	4.00
Reducir el costo de mis facturas de energía	33.33% 3	22.22% 2	33.33% 3	11.11% 1	0.00% 0	9	3.78
Suscribirme a un proyecto que esté cerca de donde vivo	0.00% 0	22.22% 2	11.11% 1	44.44% 4	22.22% 2	9	2.33
Soy inquilino(a), y esto me ayuda a participar en un proyecto de energía solar sin tener que instalar el sistema en mi casa	0.00% 0	0.00% 0	0.00% 0	33.33% 3	59.59% 87	9	1.33

Q102 ¿QUÉ FALTA EN LA LISTA ANTERIOR?

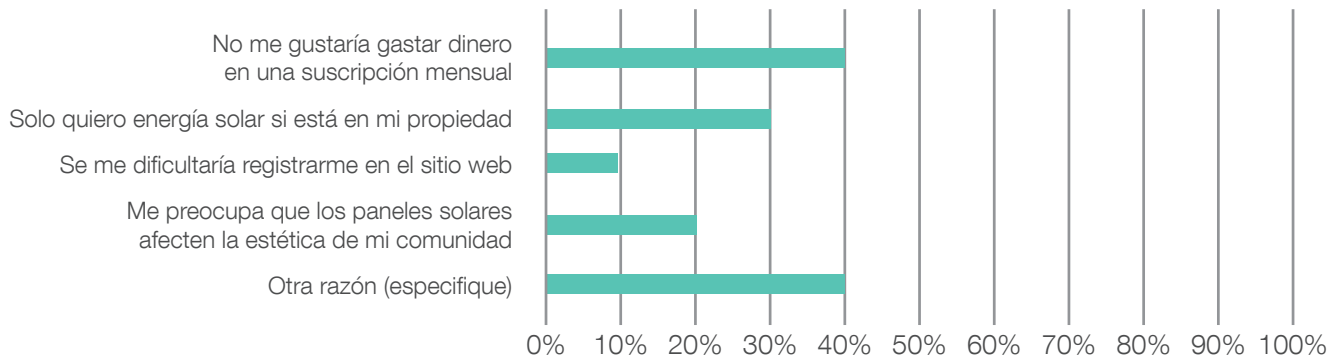
Answered: 3 Skipped: 29

#	Responses	Date
1	Nose	4/12/2023 4:22 PM
2	No se	4/12/2023 4:04 PM
3	N/a	4/12/2023 3:33 PM

Q103 ¿QUÉ LE IMPEDIRÍA PARTICIPAR EN UN PROYECTO DE COMUNIDAD SOLAR?

SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN.

Answered: 10 Skipped: 22



Answer choices	Responses	
No me gustaría gastar dinero en una suscripción mensual	40.00%	4
Solo quiero energía solar si está en mi propiedad	30.00%	3
Se me dificultaría registrarme en el sitio web	10.00%	1
Me preocupa que los paneles solares afecten la estética de mi comunidad	20.00%	2
Otra razón (especifique)	40.00%	4
Total participants: 10		

#	OTRA RAZÓN (ESPECIFIQUE)	Date
1	Rento	4/12/2023 4:22 PM
2	no tengo mucho dinero para todo eso	4/12/2023 3:40 PM
3	Yo rento!	4/12/2023 3:33 PM
4	No vivo en propia casa	4/12/2023 3:22 PM

Q104 ¿CÓMO CREE QUE PSE PODRÍA ABORDAR ESTOS OBSTÁCULOS?

Answered: 4 Skipped: 28

#	Responses	Date
1	Talk to my landlord	4/13/2023 4:42 PM
2	Nose	4/12/2023 4:22 PM
3	Ensenarlos que es la diferencia sobre energia solar y energia que agarramos por electricidad/presa. Que es la diferencia con el precio y que son los efectos en el camino.	4/12/2023 4:04 PM
4	Habla do con el dueño	4/12/2023 3:33 PM
38	Proper awareness	4/20/2023 11:39 AM

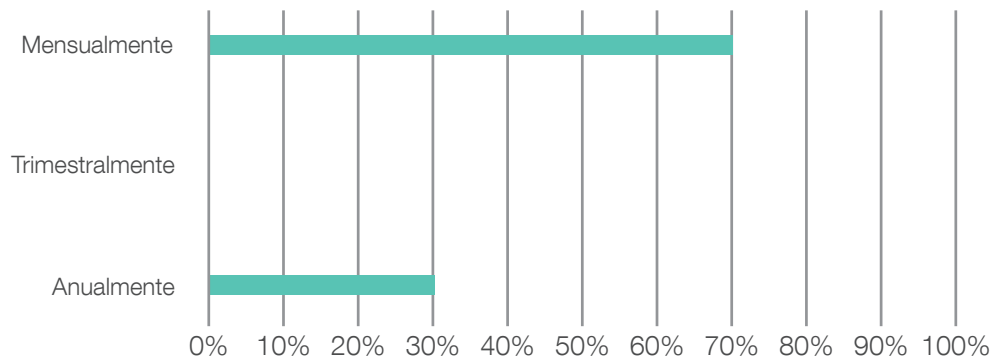
Q105 SUPONGAMOS QUE SE LE EXENTA DE PAGAR LA SUSCRIPCIÓN MENSUAL. ¿QUÉ CRÉDITO MENSUAL EN SU FACTURA LE ANIMARÍA A INSCRIBIRSE EN UN PROYECTO DE COMUNIDAD SOLAR? POR FAVOR, COMPARTA SU RESPUESTA EN DÓLARES.

Answered: 5 Skipped: 27

#	Responses	Date
1	100\$	4/13/2023 4:42 PM
2	100.00	4/12/2023 4:22 PM
3	\$50	4/12/2023 4:04 PM
4	75.00	4/12/2023 3:56 PM
5	No se nwcesito mas Informacion ...tal vez los nuevos calefaccion o thermostats	4/12/2023 3:33 PM

Q106 ¿CON QUÉ FRECUENCIA PREFERIRÍA RECIBIR LOS CRÉDITOS EN SU FACTURA?

Answered: 10 Skipped: 22



Answer choices	Responses	
Mensualmente	70.00%	7
Trimestralmente	0.00%	0
Anualmente	30.00%	3
Total participants: 10		

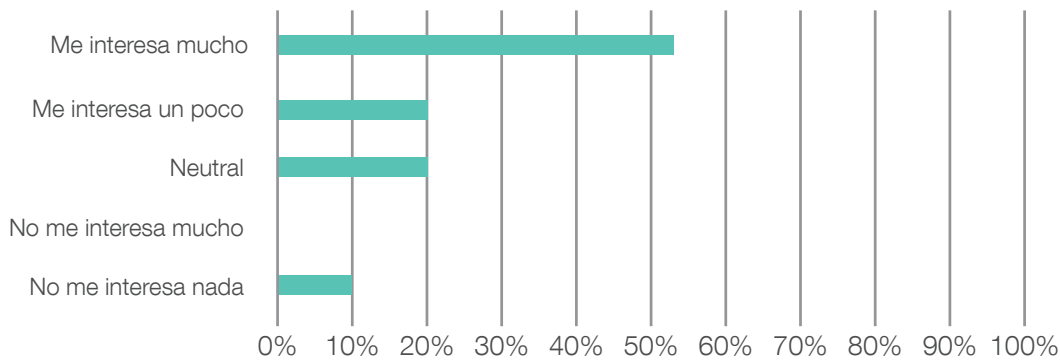
Q107 ¿QUÉ OTRA INFORMACIÓN NECESITARÍA POR PARTE DE PSE ANTES DE INSCRIBIRSE EN UN PROYECTO DE COMUNIDAD SOLAR?

Answered: 4 Skipped: 28

#	Responses	Date
1	Entender un poco mas	4/12/2023 4:22 PM
2	No se	4/12/2023 4:04 PM
3	Necesitanos nuevos yermostacis calentadores o calefaccion solar	4/12/2023 3:33 PM
4	Más beneficios y negativos	4/12/2023 3:22 PM

Q108 ¿LE INTERESA INSTALAR UNA BATERÍA EN SU HOGAR?

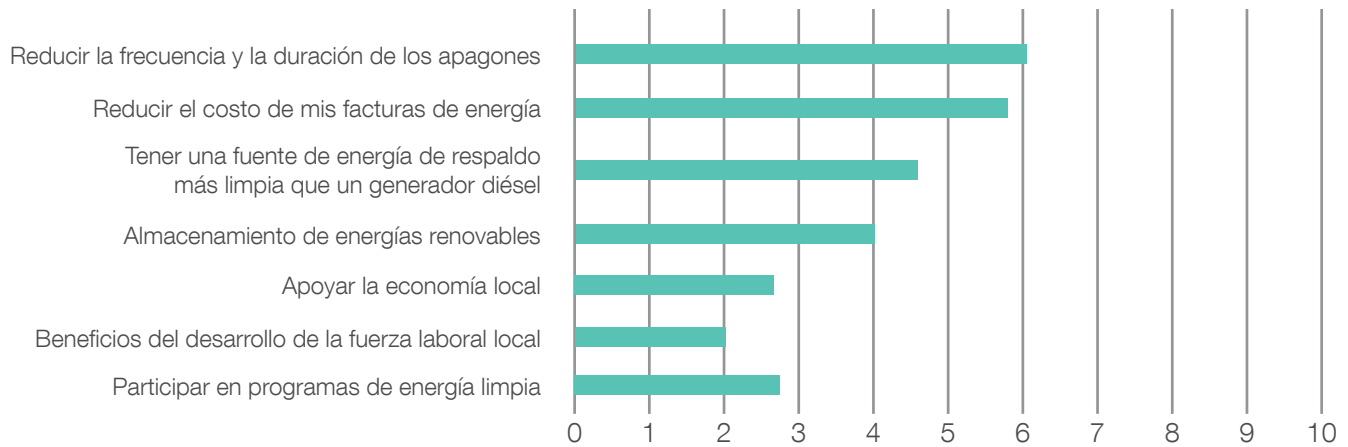
Answered: 10 Skipped: 22



Answer choices	Responses	
Me interesa mucho	50.00%	5
Me interesa un poco	20.00%	2
Neutral	20.00%	2
No me interesa mucho	0.00%	0
No me interesa nada	10.00%	1
Total participants: 10		

Q109 ¿QUÉ ES LO QUE LE INTERESA SOBRE INSTALAR UNA BATERÍA DONDE VIVE? CLASIFIQUE EN ORDEN DE IMPORTANCIA.

Answered: 9 Skipped: 23



Answer choices	1	2	3	4	5	6	7	Total	Score
Reducir la frecuencia y la duración de los apagones	55.56% 5	22.22% 2	11.11% 1	0.00% 0	11.11% 1	0.00% 0	0.00% 0	9	6.11
Reducir el costo de mis facturas de energía	22.22% 2	55.56% 5	11.11% 1	0.00% 0	11.11% 1	0.00% 0	0.00% 0	9	5.78
Tener una fuente de energía de respaldo más limpia que un generador diésel	11.11% 1	11.11% 1	22.22% 2	44.44% 4	11.11% 1	0.00% 0	0.00% 0	9	4.67
Almacenamiento de energías renovables	0.00% 0	11.11% 1	22.22% 2	33.33% 3	22.22% 2	11.11% 1	0.00% 0	9	4.00
Apoyar la economía local	0.00% 0	0.00% 0	11.11% 1	11.11% 1	33.33% 3	22.22% 2	22.22% 2	9	2.67
Beneficios del desarrollo de la fuerza laboral local	0.00% 0	0.00% 0	0.00% 0	11.11% 1	0.00% 0	66.67% 6	22.22% 2	9	2.00
Participar en programas de energía limpia	11.11% 1	0.00% 0	22.22% 2	0.00% 0	11.11% 1	0.00% 0	55.56% 5	9	2.78

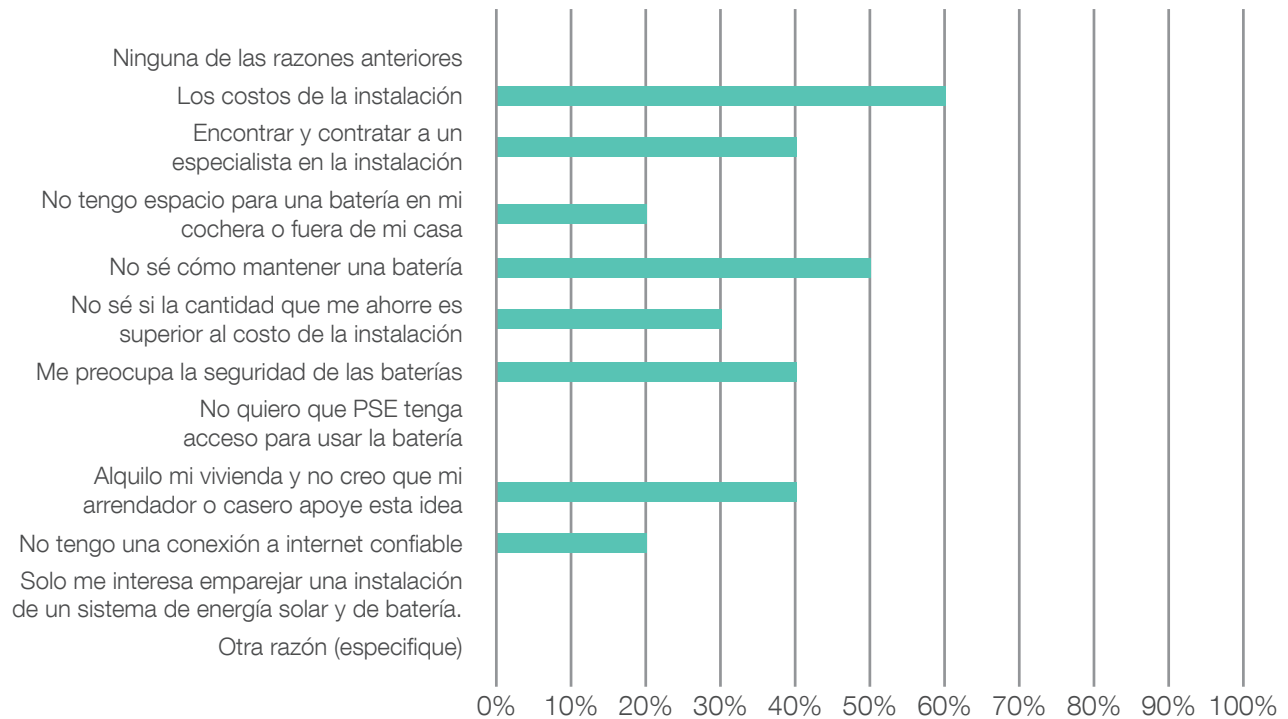
Q110 ¿QUÉ FALTA EN LA LISTA ANTERIOR?

Answered: 3 Skipped: 29

#	Responses	Date
1	nose	4/12/2023 4:25 PM
2	No se	4/12/2023 4:07 PM
3	Entrenamiento	4/12/2023 3:35 PM

Q111 ¿QUÉ LE IMPEDIRÍA INSTALAR UNA BATERÍA DONDE VIVE? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN.

Answered: 10 Skipped: 22



Answer choices	Responses	
Ninguna de las razones anteriores	0.00%	0
Los costos de la instalación	60.00%	6
Encontrar y contratar a un especialista en la instalación	40.00%	4
No tengo espacio para una batería en mi cochera o fuera de mi casa	20.00%	2
No sé cómo mantener una batería	50.00%	5
No sé si la cantidad que me ahorre es superior al costo de la instalación	30.00%	3
Me preocupa la seguridad de las baterías	40.00%	4
No quiero que PSE tenga acceso para usar la batería	0.00%	0
Alquilo mi vivienda y no creo que mi arrendador o casero apoye esta idea	40.00%	4
No tengo una conexión a internet confiable	20.00%	2
Solo me interesa emparejar una instalación de un sistema de energía solar y de batería.	0.00%	0
Otra razón (especifique)	0.00%	0
Total participants: 10		

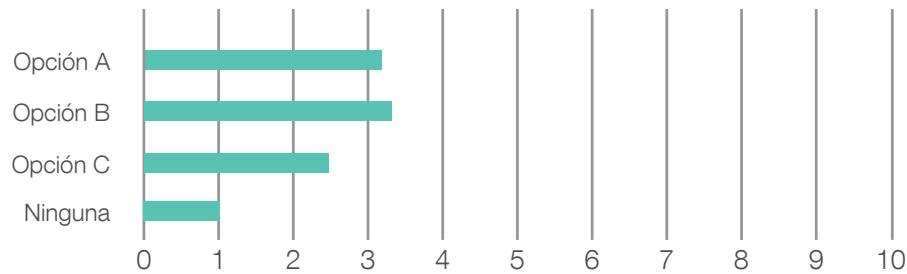
Q112 ¿CÓMO CREE QUE PSE PODRÍA ABORDAR ESTOS OBSTÁCULOS?

Answered: 3 Skipped: 29

#	Responses	Date
1	Landlord	4/13/2023 4:42 PM
2	Nose	4/12/2023 4:25 PM
3	Outreach	4/12/2023 3:35 PM

Q113 CALIFIQUE EN QUÉ MODELO DE PROGRAMA LE INTERESARÍA PARTICIPAR MÁS. TENGA EN CUENTA QUE TODAS LAS CANTIDADES EN DÓLARES TIENEN EL PROPÓSITO DE SER ILUSTRATIVOS Y NO INDICAN NECESARIAMENTE LOS COSTOS U OFERTAS FINALES DEL PROGRAMA.

Answered: 10 Skipped: 22



Answer choices	1	2	3	4	Total	Score
Opción A	40.00% 4	40.00% 4	20.00% 2	0.00% 0	10	3.20
Opción B	50.00% 5	30.00% 3	20.00% 2	0.00% 0	10	3.30
Opción C	10.00% 1	30.00% 3	60.00% 60	0.00% 0	10	2.50
Ninguna	0.00% 0	0.00% 0	0.00% 0	100.00% 10	10	1.00

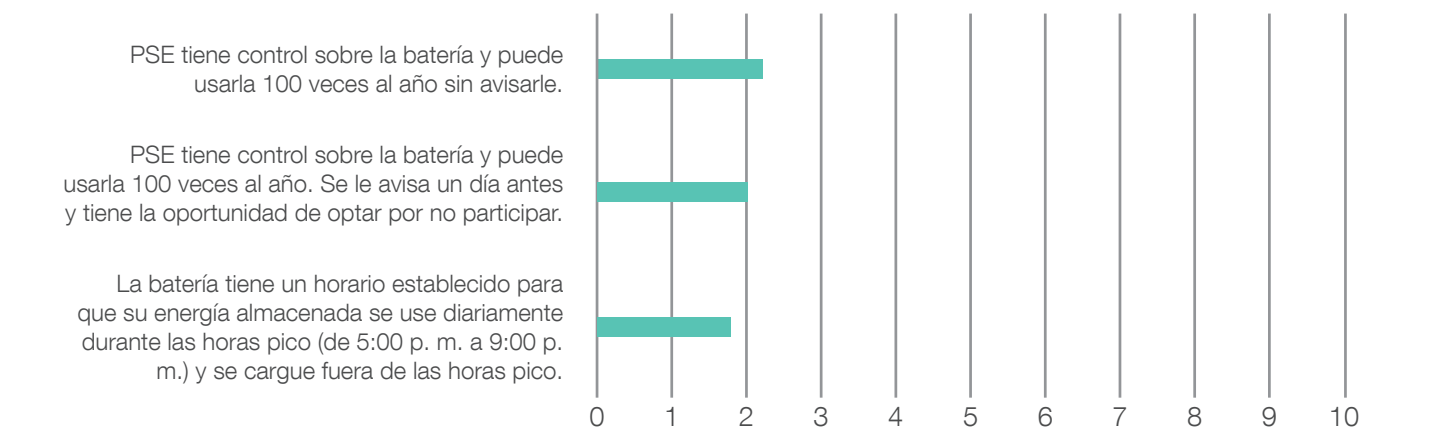
Q114 SI NINGUNA DE ESTAS OPCIONES ES IDEAL PARA USTED, DESCRIBA SU OPCIÓN IDEAL.

Answered: 1 Skipped: 31

#	Responses	Date
1	No se	4/12/2023 3:35 PM

Q115 PSE LE COMPENSARÁ POR UTILIZAR LA ENERGÍA DE SU BATERÍA Y ASÍ PODER MANEJAR LA DEMANDA EN LA RED DE PSE. NORMALMENTE, USTED NI SIQUIERA SE DA CUENTA CUÁNDO PSE UTILIZA SU BATERÍA, Y PSE NO LA USARÁ DURANTE UNA TORMENTA O MOMENTOS DE CALOR QUE ES CUANDO HAY UNA MAYOR PROBABILIDAD DE UN APAGÓN PARA QUE USTED PUEDA USARLA COMO ENERGÍA DE RESPALDO. CLASIFIQUE EN CUÁL DE LOS ESCENARIOS ES MÁS PROBABLE O MENOS PROBABLE QUE PARTICIPE.

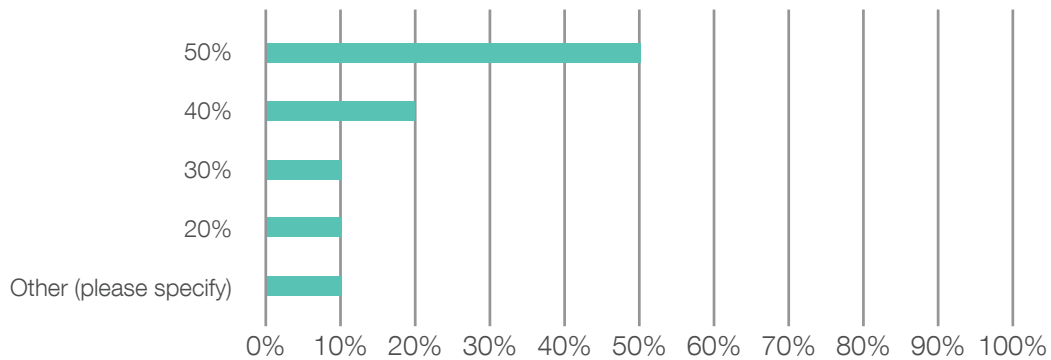
Answered: 10 Skipped: 22



Answer choices	1	2	3	Total	Score
PSE tiene control sobre la batería y puede usarla 100 veces al año sin avisarle.	40.00% 4	40.00% 4	20.00% 2	10	2.20
PSE tiene control sobre la batería y puede usarla 100 veces al año. Se le avisa un día antes y tiene la oportunidad de optar por no participar.	30.00% 3	40.00% 4	30.00% 3	10	2.00
La batería tiene un horario establecido para que su energía almacenada se use diariamente durante las horas pico (de 5:00 p. m. a 9:00 p. m.) y se cargue fuera de las horas pico.	30.00% 3	20.00% 2	50.00% 5	10	1.80

Q116 ¿QUÉ PORCENTAJE DE SU BATERÍA DESEA RESERVAR EN TODO MOMENTO EN CASO DE QUE HAYA UN APAGÓN INESPERADO? SELECCIONE UNA OPCIÓN.

Answered: 10 Skipped: 22



Answer choices	Responses	
50%	50.00%	5
40%	20.00%	2
30%	10.00%	1
20%	10.00%	1
Otro (especifique)	10.00%	1
Total participants: 10		

#	Other (please specify)	Date
1	75%	4/12/2023 4:25 PM

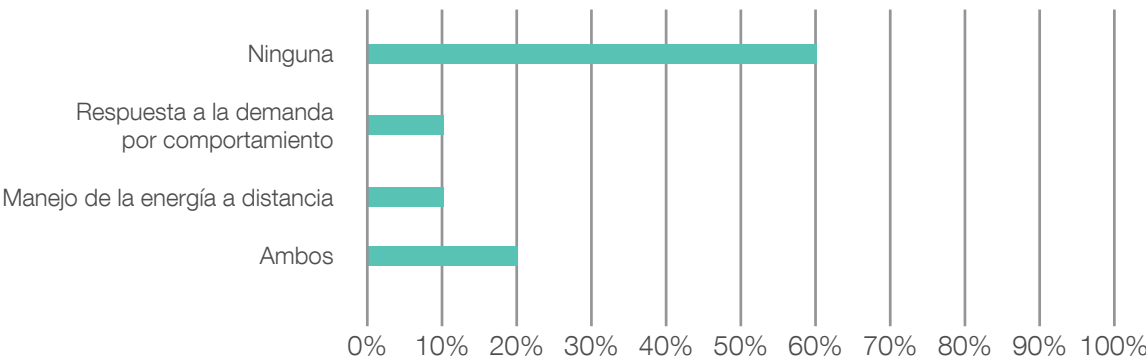
Q117 ¿QUÉ OTRA INFORMACIÓN NECESITARÍA POR PARTE DE PSE ANTES DE INSTALAR UNA BATERÍA DONDE VIVE?

Answered: 2 Skipped: 30

#	Responses	Date
1	No se	4/12/2023 4:07 PM
2	Información	4/12/2023 3:35 PM

Q118 PSE OFRECE INCENTIVOS PARA LA INSCRIPCIÓN. TODOS LOS PROGRAMAS DE RESPUESTA A LA DEMANDA SON VOLUNTARIOS Y LOS CLIENTES SIEMPRE PUEDEN DECIDIR NO PARTICIPAR. ¿EN CUÁL DE ESTOS PROGRAMAS DE RESPUESTA A LA DEMANDA PREFERIRÍA PARTICIPAR? SELECCIONE UNO.

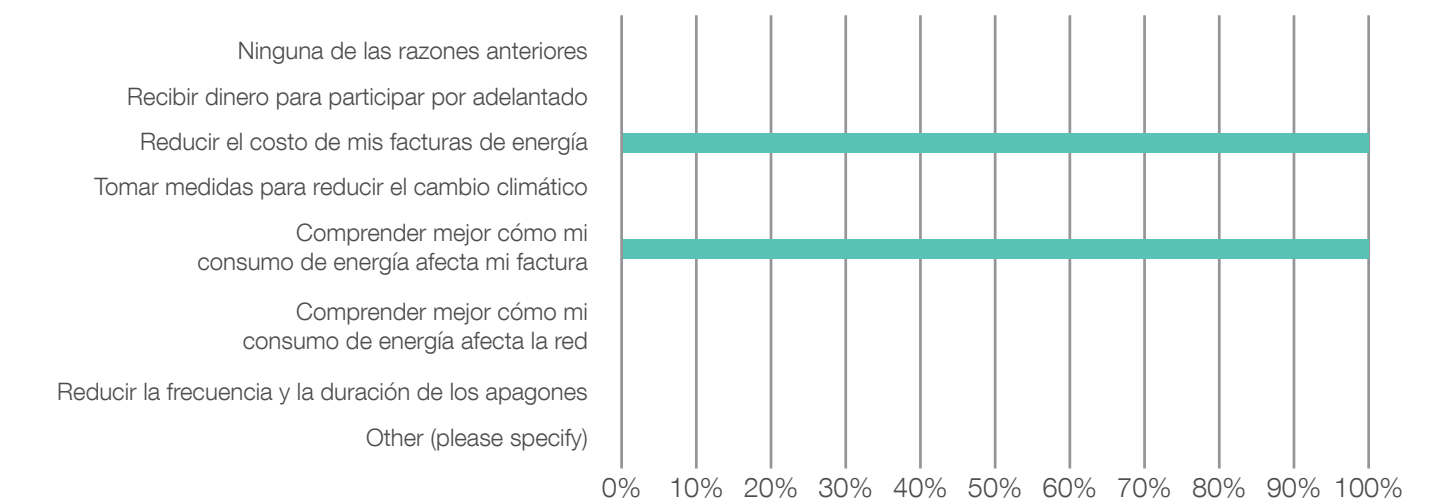
Answered: 10 Skipped: 22



Answer choices	Responses	
Ninguna	60.00%	6
Respuesta a la demanda por comportamiento	10.00%	1
Manejo de la energía a distancia	10.00%	1
Ambos	20.00%	2
Total participants: 10		

Q119 ¿QUÉ ES LO QUE LE INTERESA SOBRE PARTICIPAR EN EL PROGRAMA DE RESPUESTA A LA DEMANDA POR COMPORTAMIENTO? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN. RESPUESTA A LA DEMANDA POR COMPORTAMIENTO: AJUSTA SU TERMOSTATO O ELECTRODOMÉSTICOS A SOLICITUD DE PSE.

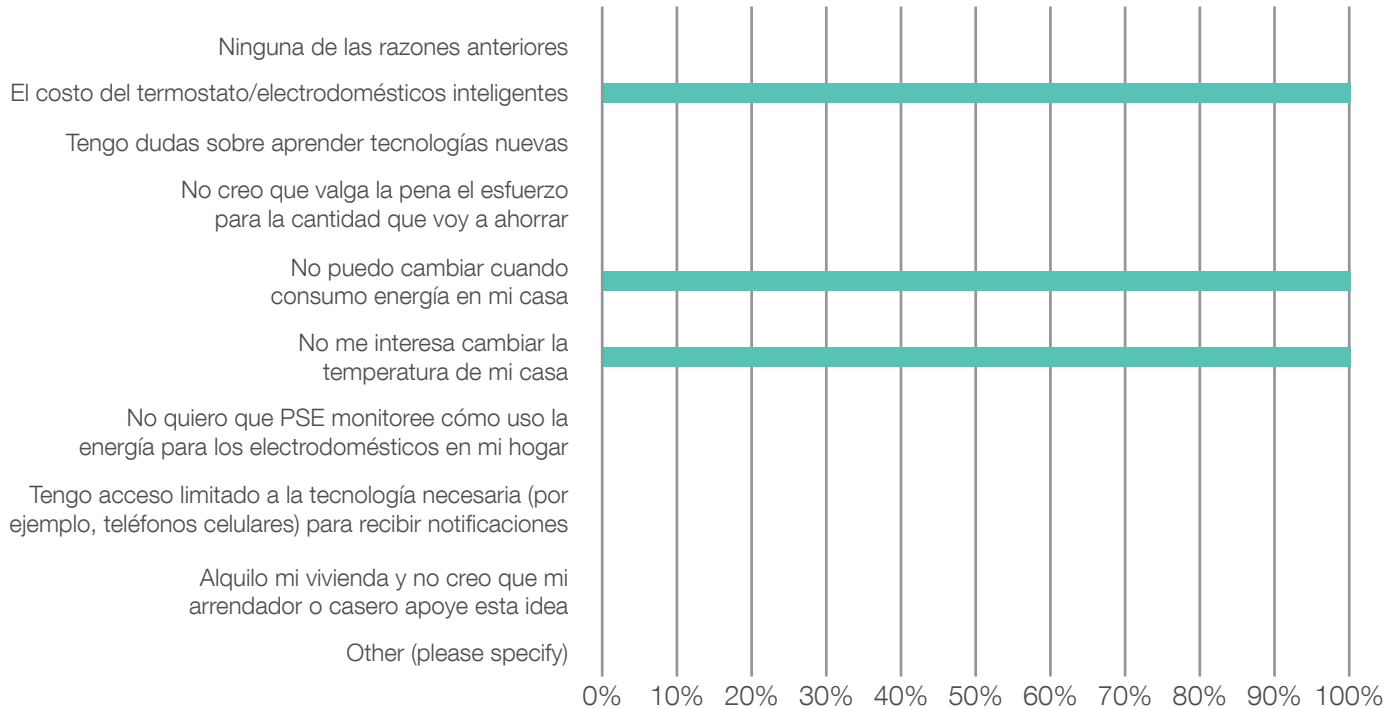
Answered: 1 Skipped: 31



Answer choices	Responses	
Ninguna de las razones anteriores	0.00%	0
Recibir dinero para participar por adelantado	0.00%	0
Reducir el costo de mis facturas de energía	100.00%	1
Tomar medidas para reducir el cambio climático	0.00%	0
Comprender mejor cómo mi consumo de energía afecta mi factura	100.0%	1
Comprender mejor cómo mi consumo de energía afecta la red	0.00%	0
Reducir la frecuencia y la duración de los apagones	0.00%	0
Otra (especifique)	0.00%	0
Total participants: 1		

Q120 ¿QUÉ LE IMPEDIRÍA PARTICIPAR EN EL PROGRAMA DE RESPUESTA A LA DEMANDA POR COMPORTAMIENTO? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN. RESPUESTA A LA DEMANDA POR COMPORTAMIENTO: AJUSTA SU TERMOSTATO O ELECTRODOMÉSTICOS A SOLICITUD DE PSE.

Answered: 1 Skipped: 31



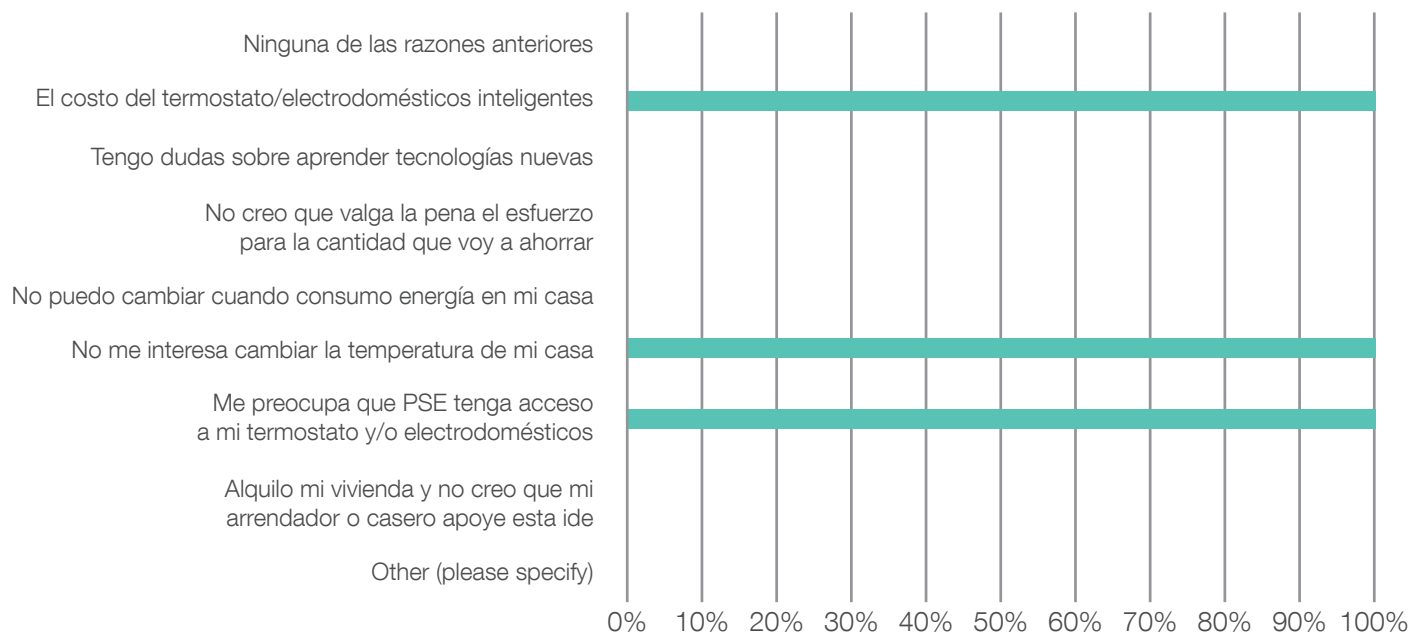
Answer choices	Responses	
Ninguna de las razones anteriores	0.00%	0
El costo del termostato/electrodomésticos inteligentes	100.00%	1
Tengo dudas sobre aprender tecnologías nuevas	0.00%	0
No creo que valga la pena el esfuerzo para la cantidad que voy a ahorrar	0.00%	0
No puedo cambiar cuando consumo energía en mi casa	100.00%	1
No me interesa cambiar la temperatura de mi casa	100.00%	1
No quiero que PSE monitoree cómo uso la energía para los electrodomésticos en mi hogar	0.00%	0
Tengo acceso limitado a la tecnología necesaria (por ejemplo, teléfonos celulares) para recibir notificaciones	0.00%	0
Alquilo mi vivienda y no creo que mi arrendador o casero apoye esta idea	0.00%	0
Otra razón (especifique)	0.00%	0
Total participants: 1		

Q121 ¿CÓMO CREE QUE PSE PODRÍA ABORDAR ESTOS OBSTÁCULOS?

Answered: 0 Skipped: 32

#	Responses	Date
	No responses	

Q122 ¿QUÉ LE IMPEDIRÍA PARTICIPAR EN EL PROGRAMA DE MANEJO DE LA ENERGÍA A DISTANCIA? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN.MANEJO DE LA ENERGÍA A DISTANCIA: OTORGA PERMISO A PSE PARA QUE AJUSTE DE FORMA REMOTA SU TERMOSTATO O ELECTRODOMÉSTICOS.



Answer choices	Responses	
Ninguna de las razones anteriores	0.00%	0
El costo del termostato/electrodomésticos inteligentes	100.0%	1
Tengo dudas sobre aprender tecnologías nuevas	0.00%	0
No creo que valga la pena el esfuerzo para la cantidad que voy a ahorrar	0.00%	0
No puedo cambiar cuando consumo energía en mi casa	0.00%	0
No me interesa cambiar la temperatura de mi casa	100.00%	1
Me preocupa que PSE tenga acceso a mi termostato y/o electrodomésticos	100.00%	1
Alquilo mi vivienda y no creo que mi arrendador o casero apoye esta idea	0.00%	0
Otra razón (especifique)	0.00%	0
Total participants: 1		

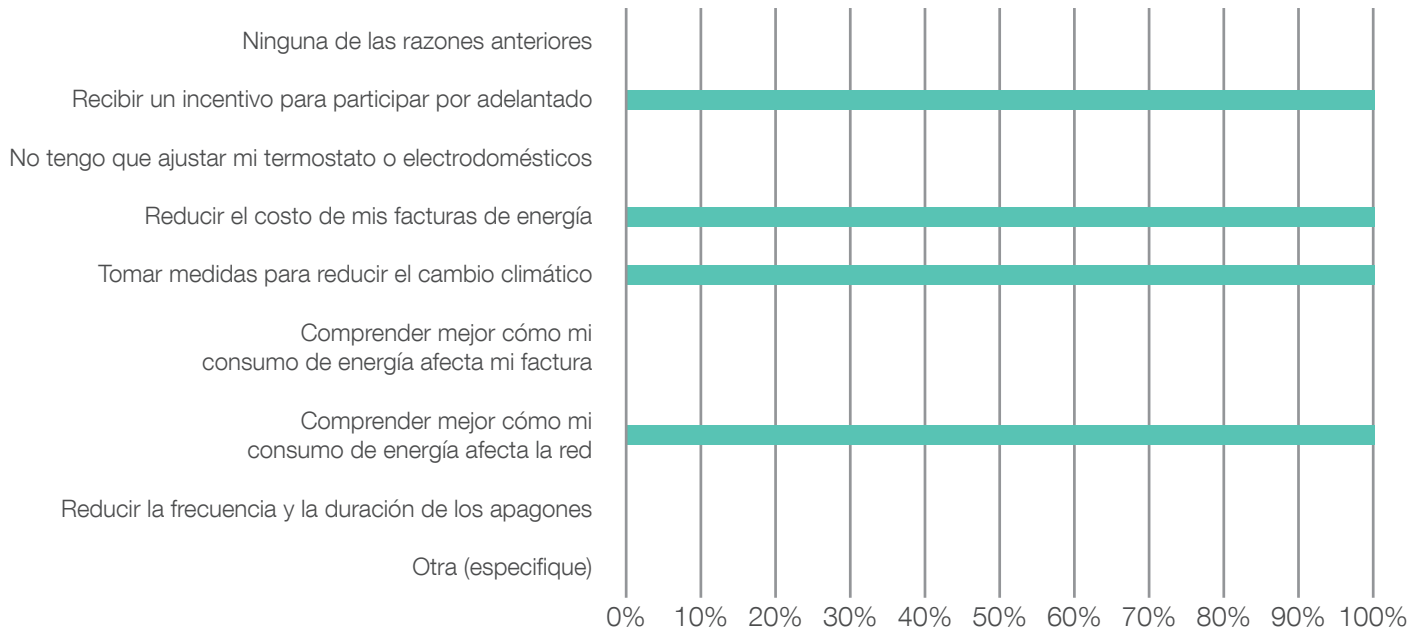
Q123 ¿CÓMO CREE QUE PSE PODRÍA ABORDAR ESTOS OBSTÁCULOS?

Answered: 0 Skipped: 32

#	Responses	Date
	No responses	

Q124 ¿QUÉ ES LO QUE LE INTERESA SOBRE PARTICIPAR EN EL PROGRAMA DE MANEJO DE LA ENERGÍA A DISTANCIA? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN.MANEJO DE LA ENERGÍA A DISTANCIA: OTORGA PERMISO A PSE PARA QUE AJUSTE DE FORMA REMOTA SU TERMOSTATO O ELECTRODOMÉSTICOS.

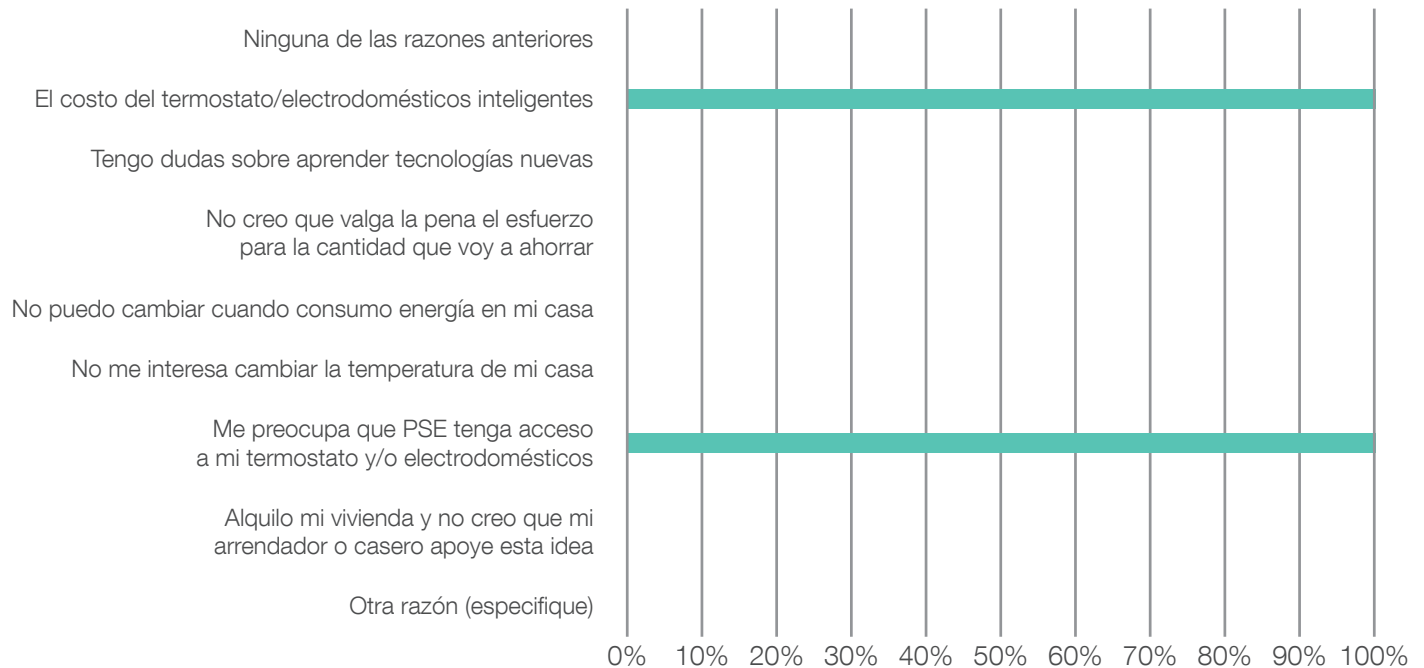
Answered: 1 Skipped: 31



Answer choices	Responses	
Ninguna de las razones anteriores	0.00%	0
Recibir un incentivo para participar por adelantado	100.0%	1
No tengo que ajustar mi termostato o electrodomésticos	0.00%	0
Reducir el costo de mis facturas de energía	100.0%	1
Tomar medidas para reducir el cambio climático	100.0%	1
Comprender mejor cómo mi consumo de energía afecta mi factura	0.00%	0
Comprender mejor cómo mi consumo de energía afecta la red	100.0%	1
Reducir la frecuencia y la duración de los apagones	0.00%	0
Otra (especifique)	0.00%	0
Total participants: 1		

Q125 ¿QUÉ LE IMPEDIRÍA PARTICIPAR EN EL PROGRAMA DE MANEJO DE LA ENERGÍA A DISTANCIA? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN.MANEJO DE LA ENERGÍA A DISTANCIA: OTORGA PERMISO A PSE PARA QUE AJUSTE DE FORMA REMOTA SU TERMOSTATO O ELECTRODOMÉSTICOS.

Answered: 1 Skipped: 31



Answer choices	Responses	
Ninguna de las razones anteriores	0.00%	0
El costo del termostato/electrodomésticos inteligentes	100.00%	1
Tengo dudas sobre aprender tecnologías nuevas	0.00%	0
No creo que valga la pena el esfuerzo para la cantidad que voy a ahorrar	0.00%	0
No puedo cambiar cuando consumo energía en mi casa	0.00%	0
No me interesa cambiar la temperatura de mi casa	0.00%	0
Me preocupa que PSE tenga acceso a mi termostato y/o electrodomésticos	100.00%	1
Alquilo mi vivienda y no creo que mi arrendador o casero apoye esta idea	0.00%	0
Otra razón (especifique)	0.00%	0
Total participants: 1		

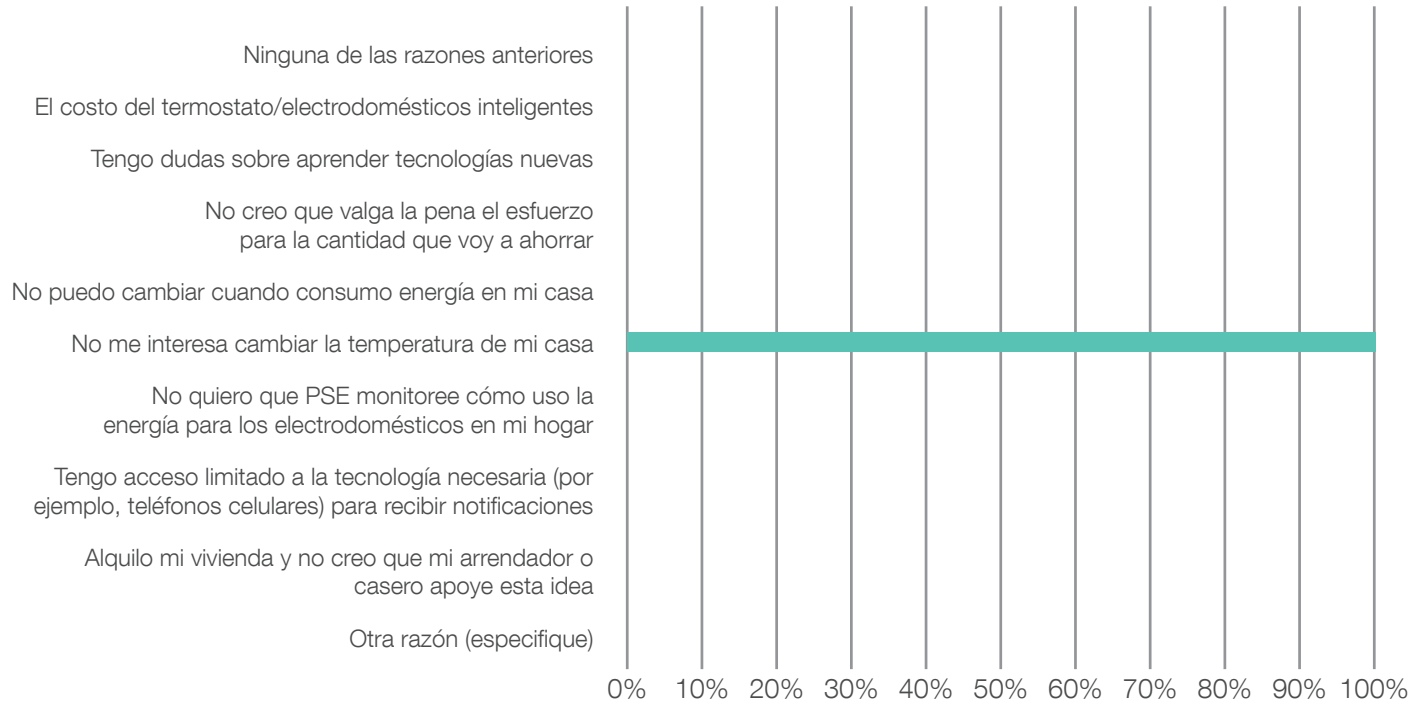
Q126 ¿CÓMO CREE QUE PSE PODRÍA ABORDAR ESTOS OBSTÁCULOS?

Answered: 0 Skipped: 32

#	Responses	Date
	No responses	

Q127 ¿QUÉ LE IMPEDIRÍA PARTICIPAR EN EL PROGRAMA DE RESPUESTA A LA DEMANDA POR COMPORTAMIENTO? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN. RESPUESTA A LA DEMANDA POR COMPORTAMIENTO: AJUSTA SU TERMOSTATO O ELECTRODOMÉSTICOS A SOLICITUD DE PSE.

Answered: 1 Skipped: 31



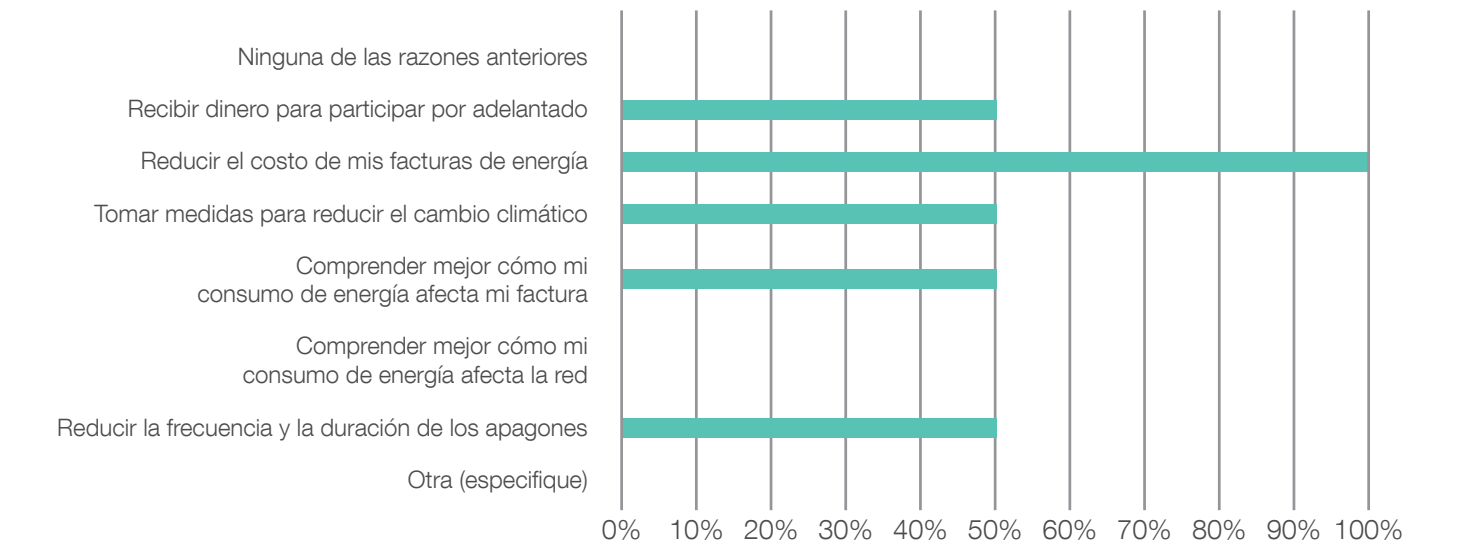
Answer choices	Responses	
Ninguna de las razones anteriores	0.00%	0
El costo del termostato/electrodomésticos inteligentes	0.00%	0
Tengo dudas sobre aprender tecnologías nuevas	0.00%	0
No creo que valga la pena el esfuerzo para la cantidad que voy a ahorrar	0.00%	0
No puedo cambiar cuando consumo energía en mi casa	0.00%	0
No me interesa cambiar la temperatura de mi casa	100.0%	1
No quiero que PSE monitoree cómo uso la energía para los electrodomésticos en mi hogar	0.00%	0
Tengo acceso limitado a la tecnología necesaria (por ejemplo, teléfonos celulares) para recibir notificaciones	0.00%	0
Alquilo mi vivienda y no creo que mi arrendador o casero apoye esta idea	0.00%	0
Otra razón (especifique)	0.00%	0
Total participants: 1		

Q128 ¿CÓMO CREE QUE PSE PODRÍA ABORDAR ESTOS OBSTÁCULOS?

Answered: 0 Skipped: 32

#	Responses	Date
	No responses	

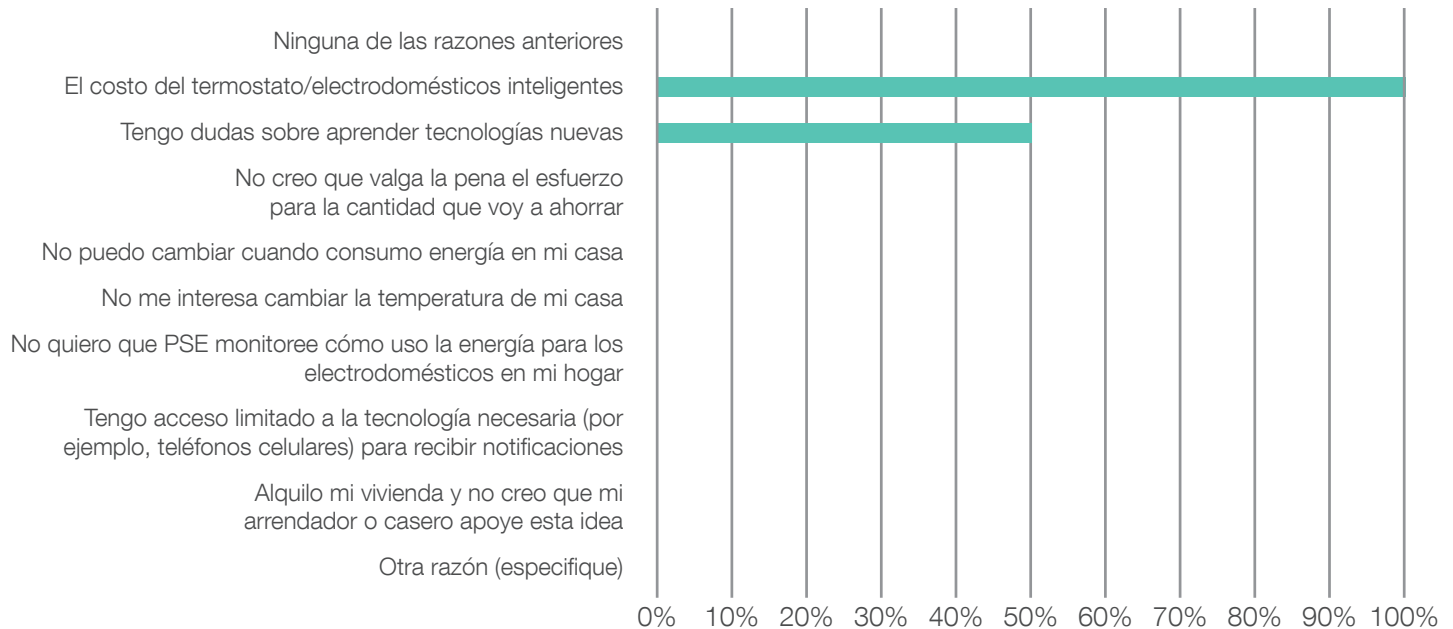
Q129 ¿QUÉ ES LO QUE LE INTERESA SOBRE PARTICIPAR EN EL PROGRAMA DE RESPUESTA A LA DEMANDA POR COMPORTAMIENTO? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN. RESPUESTA A LA DEMANDA POR COMPORTAMIENTO A: JUSTA SU TERMOSTATO O ELECTRODOMÉSTICOSA SOLICITUD DE PSE.



Answer choices	Responses	
Ninguna de las razones anteriores	0.00%	0
Recibir dinero para participar por adelantado	50.00%	1
Reducir el costo de mis facturas de energía	100.00%	2
Tomar medidas para reducir el cambio climático	50.00%	1
Comprender mejor cómo mi consumo de energía afecta mi factura	50.00%	1
Comprender mejor cómo mi consumo de energía afecta la red	0.00%	0
Reducir la frecuencia y la duración de los apagones	50.00%	1
Otra (especifique)	0.00%	0
Total participants: 76		

Q130 ¿QUÉ LE IMPEDIRÍA PARTICIPAR EN EL PROGRAMA DE RESPUESTA A LA DEMANDA POR COMPORTAMIENTO? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN. RESPUESTA A LA DEMANDA POR COMPORTAMIENTO: AJUSTA SU TERMOSTATO O ELECTRODOMÉSTICOS A SOLICITUD DE PSE.

Answered: 2 Skipped: 30



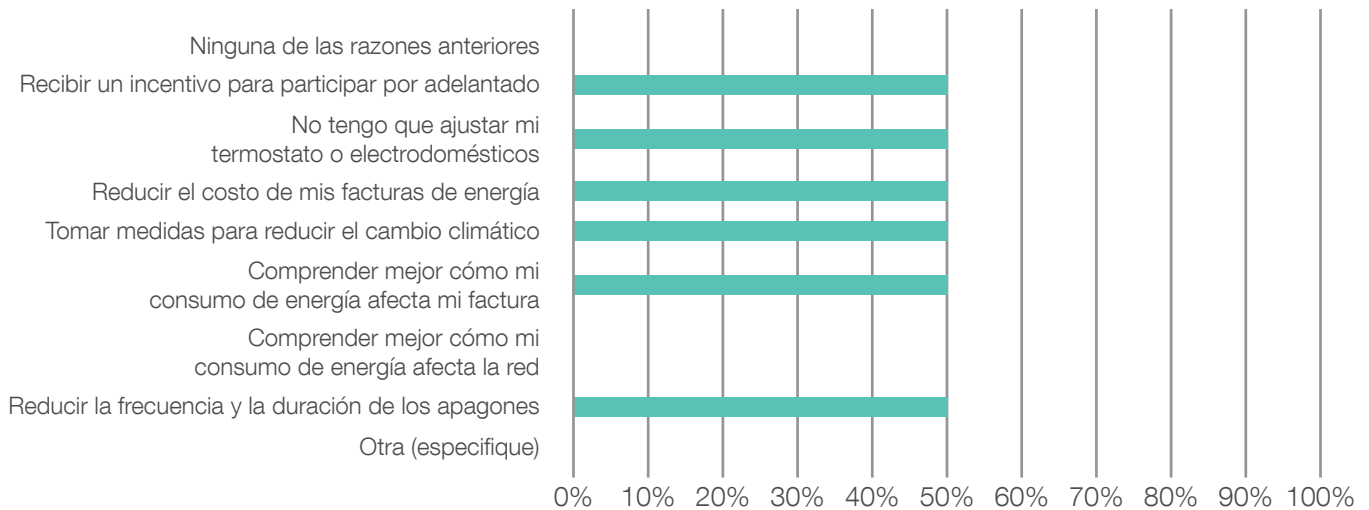
Answer choices	Responses	
Ninguna de las razones anteriores	0.00%	0
El costo del termostato/electrodomésticos inteligentes	100.00%	2
Tengo dudas sobre aprender tecnologías nuevas	50.00%	1
No creo que valga la pena el esfuerzo para la cantidad que voy a ahorrar	0.00%	0
No puedo cambiar cuando consumo energía en mi casa	0.00%	0
No me interesa cambiar la temperatura de mi casa	0.00%	0
No quiero que PSE monitoree cómo uso la energía para los electrodomésticos en mi hogar	0.00%	0
Tengo acceso limitado a la tecnología necesaria (por ejemplo, teléfonos celulares) para recibir notificaciones	0.00%	0
Alquilo mi vivienda y no creo que mi arrendador o casero apoye esta idea	0.00%	0
Otra razón (especifique)	0.00%	0
Total participants: 2		

Q131 ¿CÓMO CREE QUE PSE PODRÍA ABORDAR ESTOS OBSTÁCULOS?

Answered: 0 Skipped: 32

#	Responses	Date
	No responses	

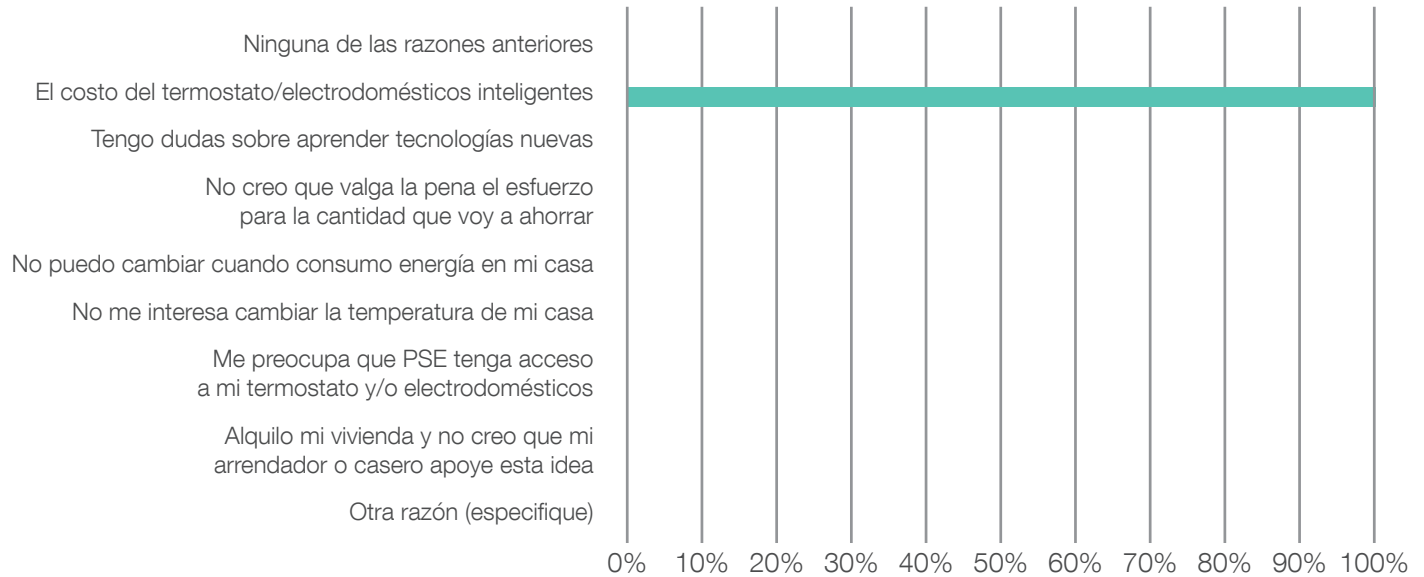
Q132 ¿QUÉ ES LO QUE LE INTERESA SOBRE PARTICIPAR EN EL PROGRAMA DE MANEJO DE LA ENERGÍA A DISTANCIA? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN.MANEJO DE LA ENERGÍA A DISTANCIA: OTORGA PERMISO A PSE PARA QUE AJUSTE DE FORMA REMOTA SU TERMOSTATO O ELECTRODOMÉSTICOS.



Answer choices	Responses	
Ninguna de las razones anteriores	0.00%	0
Recibir un incentivo para participar por adelantado	50.00%	1
No tengo que ajustar mi termostato o electrodomésticos	50.00%	1
Reducir el costo de mis facturas de energía	50.00%	1
Tomar medidas para reducir el cambio climático	50.00%	1
Comprender mejor cómo mi consumo de energía afecta mi factura	50.00%	1
Comprender mejor cómo mi consumo de energía afecta la red	0.00%	0
Reducir la frecuencia y la duración de los apagones	50.00%	1
Otra (especifique)	0.00%	0
Total participants: 2		

Q133 ¿QUÉ LE IMPEDIRÍA PARTICIPAR EN EL PROGRAMA DE MANEJO DE LA ENERGÍA A DISTANCIA? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN.MANEJO DE LA ENERGÍA A DISTANCIA: OTORGA PERMISO A PSE PARA QUE AJUSTE DE FORMA REMOTA SU TERMOSTATO O ELECTRODOMÉSTICOS.

Answered: 2 Skipped: 30



Answer choices	Responses	
Ninguna de las razones anteriores	0.00%	0
El costo del termostato/electrodomésticos inteligentes	100.00%	2
Tengo dudas sobre aprender tecnologías nuevas	0.00%	0
No creo que valga la pena el esfuerzo para la cantidad que voy a ahorrar	0.00%	0
No puedo cambiar cuando consumo energía en mi casa	0.00%	0
No me interesa cambiar la temperatura de mi casa	0.00%	0
Me preocupa que PSE tenga acceso a mi termostato y/o electrodomésticos	0.00%	0
Alquilo mi vivienda y no creo que mi arrendador o casero apoye esta idea	0.00%	0
Otra razón (especifique)	0.00%	0
Total participants: 2		

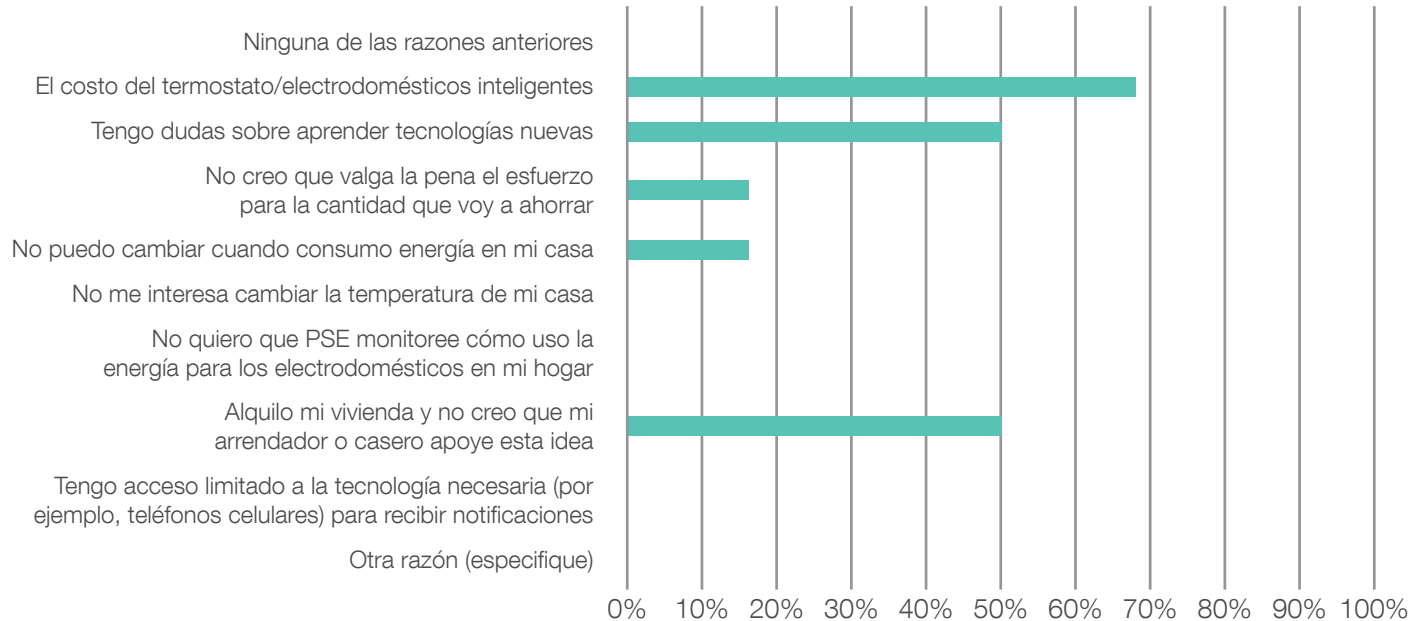
Q134 ¿CÓMO CREE QUE PSE PODRÍA ABORDAR ESTOS OBSTÁCULOS?

Answered: 0 Skipped: 32

#	Responses	Date
	No responses	

Q135 ¿QUÉ LE IMPEDIRÍA PARTICIPAR EN EL PROGRAMA DE RESPUESTA A LA DEMANDA POR COMPORTAMIENTO? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN. RESPUESTA A LA DEMANDA POR COMPORTAMIENTO: AJUSTA SU TERMOSTATO O ELECTRODOMÉSTICOS A SOLICITUD DE PSE.

Answered: 6 Skipped: 26



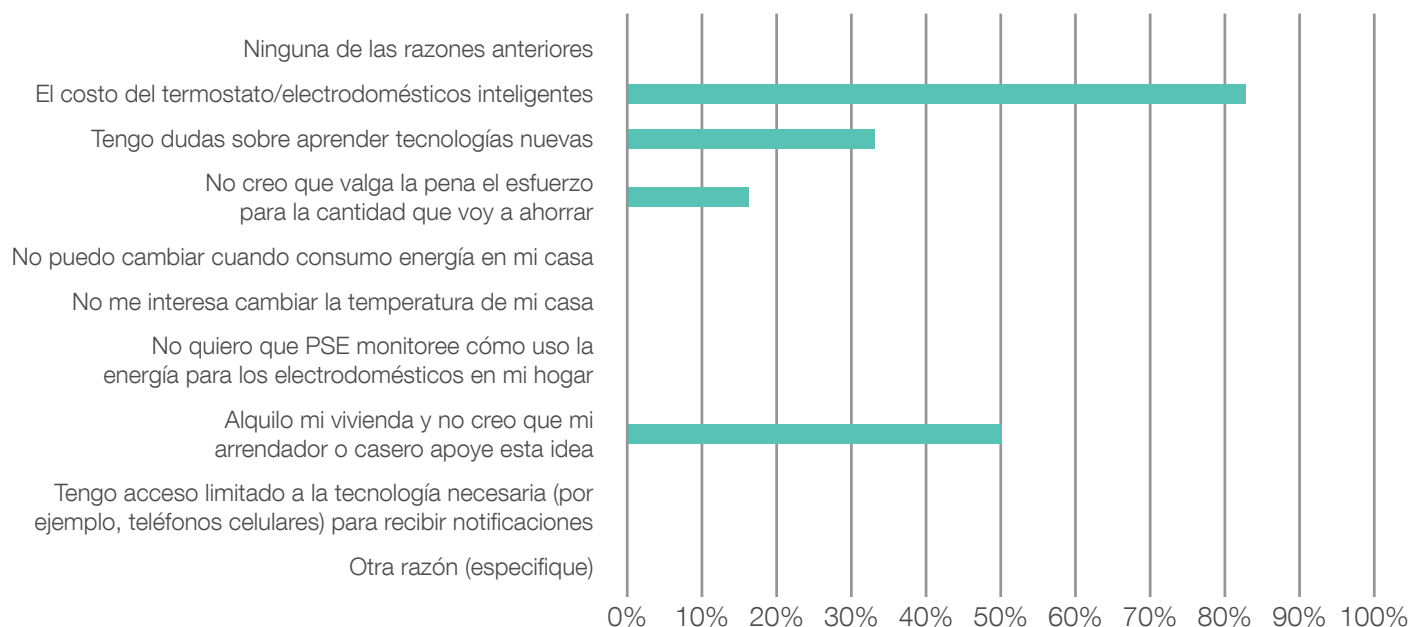
Answer choices	Responses	
Ninguna de las razones anteriores	0.00%	0
El costo del termostato/electrodomésticos inteligentes	66.67%	4
Tengo dudas sobre aprender tecnologías nuevas	50.00%	3
No creo que valga la pena el esfuerzo para la cantidad que voy a ahorrar	16.67%	1
No puedo cambiar cuando consumo energía en mi casa	16.67%	1
No me interesa cambiar la temperatura de mi casa	0.00%	0
No quiero que PSE monitoree cómo uso la energía para los electrodomésticos en mi hogar	0.00%	0
Tengo acceso limitado a la tecnología necesaria (por ejemplo, teléfonos celulares) para recibir notificaciones	0.00%	0
Alquilo mi vivienda y no creo que mi arrendador o casero apoye esta idea	50.00%	3
Otra razón (especifique)	0.00%	0
Total participants: 2		

Q136 ¿CÓMO CREE QUE PSE PODRÍA ABORDAR ESTOS OBSTÁCULOS?

Answered: 0 Skipped: 32

#	Responses	Date
	There are no responses.	

Q137 ¿QUÉ LE IMPEDIRÍA PARTICIPAR EN EL PROGRAMA DE MANEJO DE LA ENERGÍA A DISTANCIA? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN. MANEJO DE LA ENERGÍA A DISTANCIA: OTORGA PERMISO A PSE PARA QUE AJUSTE DE FORMA REMOTA SU TERMOSTATO O ELECTRODOMÉSTICOS.



Answer choices	Responses	
Ninguna de las razones anteriores	0.00%	0
El costo del termostato/electrodomésticos inteligentes	83.33%	5
Tengo dudas sobre aprender tecnologías nuevas	33.33%	2
No creo que valga la pena el esfuerzo para la cantidad que voy a ahorrar	16.67%	1
No puedo cambiar cuando consumo energía en mi casa	0.00%	0
No me interesa cambiar la temperatura de mi casa	0.00%	0
No me interesa cambiar la temperatura de mi casa	0.00%	0
Me preocupa que PSE tenga acceso a mi termostato y/o electrodomésticos	50.00%	3
Alquilo mi vivienda y no creo que mi arrendador o casero apoye esta idea	0.00%	0
Otra razón (especifique)	0.00%	0
Total participants: 6		

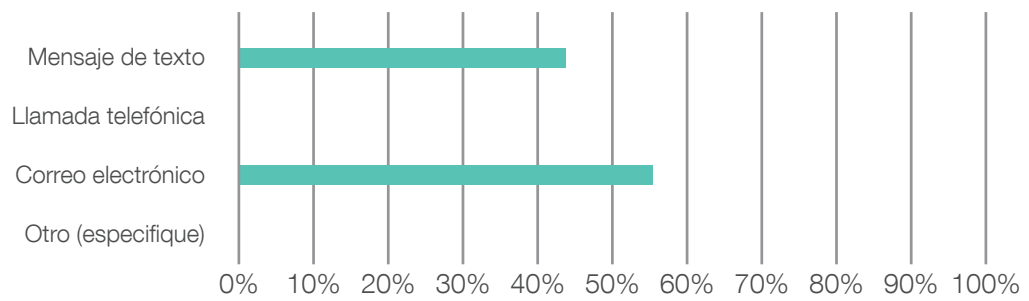
Q138 ¿CÓMO CREE QUE PSE PODRÍA ABORDAR ESTOS OBSTÁCULOS?

Answered: 0 Skipped: 32

#	Responses	Date
	There are no responses.	

Q139 ¿CÓMO PREFERIRÍA RECIBIR LAS NOTIFICACIONES SOBRE UNA REDUCCIÓN EN EL CONSUMO DE ELECTRICIDAD DURANTE LAS HORAS PICO? LOS PERÍODOS PICO OCURREN CUANDO LA DEMANDA DE ELECTRICIDAD EN TODA LA RED ES MÁS ALTA, LO QUE GENERALMENTE OCURRE EN LAS FRÍAS MAÑANAS DE INVIERNO CUANDO AUMENTA EL CALOR DE TODOS.

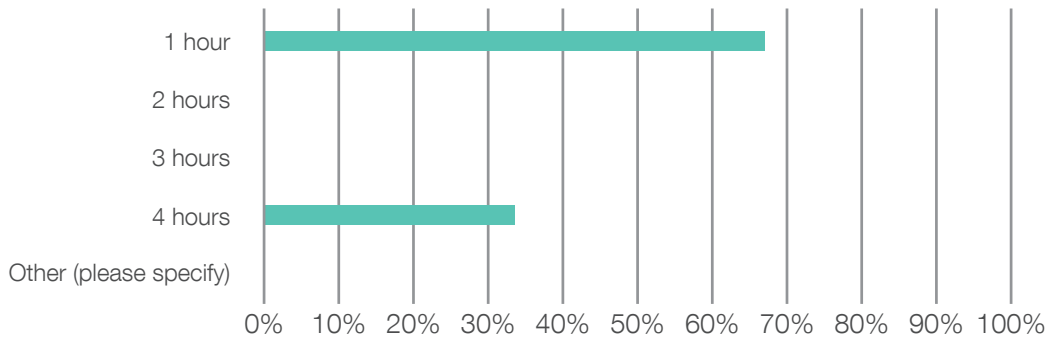
Answered: 9 Skipped: 23



Answer choices	Responses	
Mensaje de texto	44.44%	4
Llamada telefónica	0.00%	0
Correo electrónico	55.56%	5
Otro (especifique)	0.00%	0
Total participants: 149		

Q140 ¿POR CUÁNTO TIEMPO PODRÍA PARTICIPAR DURANTE UN EVENTO DE REDUCCIÓN DE ELECTRICIDAD EN HORAS PICO? LOS PERÍODOS PICO OCURREN CUANDO LA DEMANDA DE ELECTRICIDAD EN TODA LA RED ES MÁS ALTA, LO QUE GENERALMENTE OCURRE EN LAS FRÍAS MAÑANAS DE INVIERNO CUANDO AUMENTA EL CALOR DE TODOS.

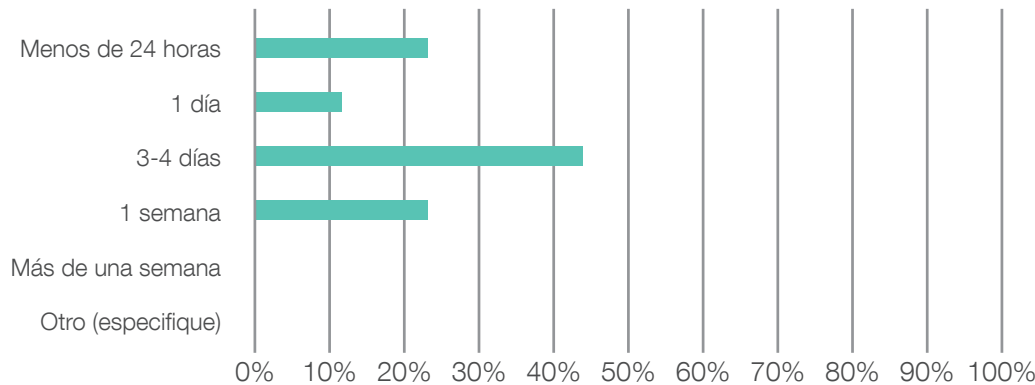
Answered: 9 Skipped: 23



Answer choices	Responses	
1 horas	66.67%	6
2 horas	0.00%	0
3 horas	0.00%	0
4 horas	33.33%	3
Otro (especifique)	0.00%	0
Total participants: 9		

Q141 ¿CUÁNTO TIEMPO NECESITARÍA PARA PREPARARSE PARA UNA REDUCCIÓN EN EL CONSUMO DE ELECTRICIDAD DURANTE LAS HORAS PICO? LOS PERÍODOS PICO OCURREN CUANDO LA DEMANDA DE ELECTRICIDAD EN TODA LA RED ES MÁS ALTA, LO QUE GENERALMENTE OCURRE EN LAS FRÍAS MAÑANAS DE INVIERNO CUANDO AUMENTA EL CALOR DE TODOS.

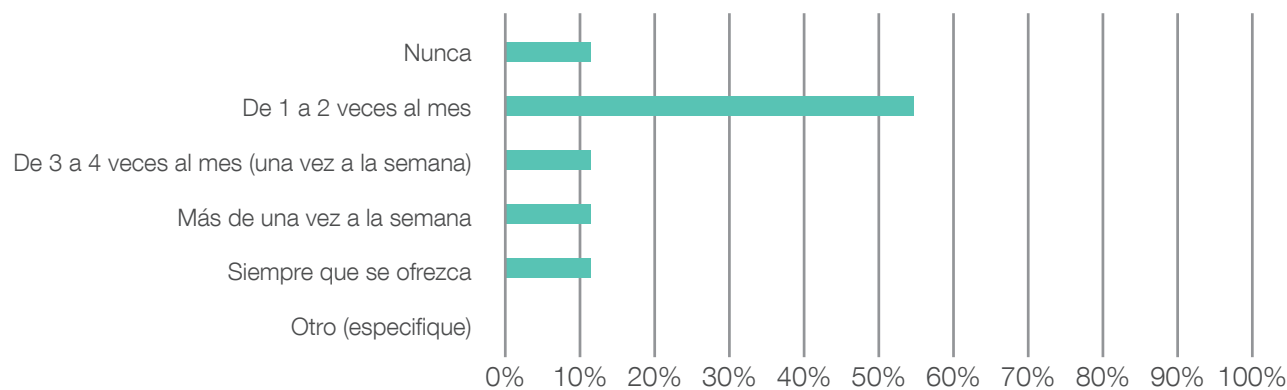
Answered: 9 Skipped: 23



Answer choices	Responses	
Menos de 24 horas	22.22%	2
1 día	11.11%	1
3-4 días	44.44%	4
1 semana	22.22%	2
Más de una semana	0.00%	0
Otro (especifique)	0.00%	0
Total participants: 9		

Q142 ¿CUÁNTAS VECES AL AÑO ESTARÍA DISPUESTO(A) A PARTICIPAR? SELECCIONE UNA OPCIÓN.

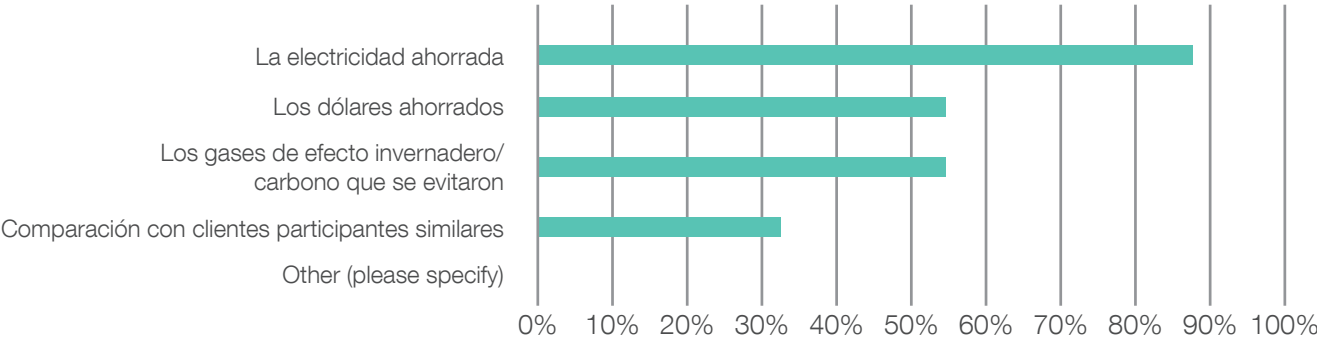
Answered: 9 Skipped: 23



Answer choices	Responses	
Nunca	11.11%	1
De 1 a 2 veces al mes	55.56%	5
De 3 a 4 veces al mes (una vez a la semana)	11.11%	1
Más de una vez a la semana	11.11%	1
Siempre que se ofrezca	11.11%	1
Otro (especifique)	0.00%	0
Total participants: 9		

Q143 ¿QUÉ INFORMACIÓN LE GUSTARÍA QUE PSE COMPARTIERA CON USTED DESPUÉS DE PARTICIPAR EN UN EVENTO DE RESPUESTA A LA DEMANDA?

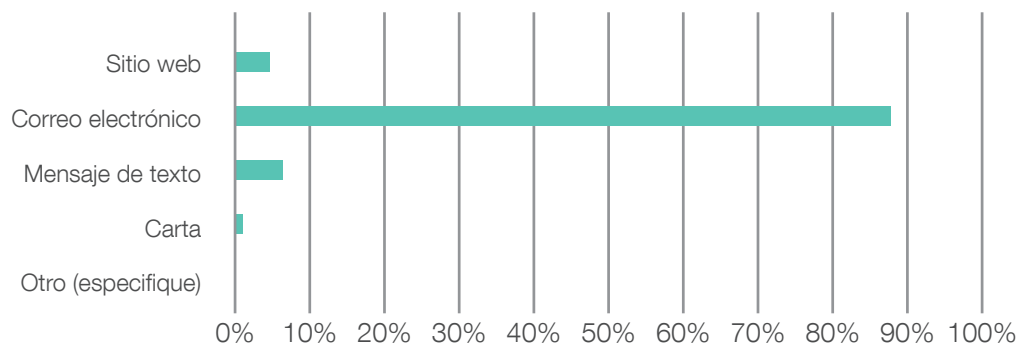
Answered: 9 Skipped: 23



Answer choices	Responses	
La electricidad ahorrada	88.89%	8
Los dólares ahorrados	55.56%	5
Los gases de efecto invernadero/carbono que se evitaron	55.56%	5
Comparación con clientes participantes similares	33.33%	3
Otro (especifique)	0.00%	0
Total participants: 149		

Q144 DESPUÉS DE PARTICIPAR EN UN EVENTO DE RESPUESTA A LA DEMANDA, ¿CÓMO LE GUSTARÍA OBTENER LOS RESULTADOS DE SU PARTICIPACIÓN?

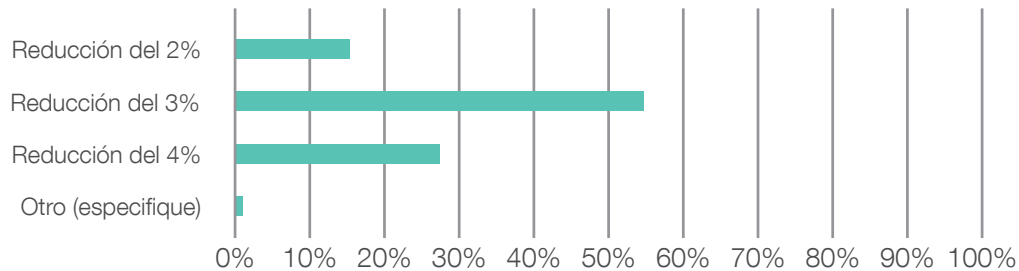
Answered: 9 Skipped: 23



Answer choices	Responses	
Sitio web	11.11%	1
Correo electrónico	44.44%	4
Mensaje de texto	22.22%	2
Carta	22.22%	2
Otro (especifique)	0.00%	0
Total participants: 9		

Q145 ¿QUÉ PORCENTAJE DE AHORRO (REDUCCIÓN EN SU FACTURA) HARÍA QUE VALIERA LA PENA PARTICIPAR EN UN PROGRAMA DE RESPUESTA A LA DEMANDA?

Answered: 9 Skipped: 23

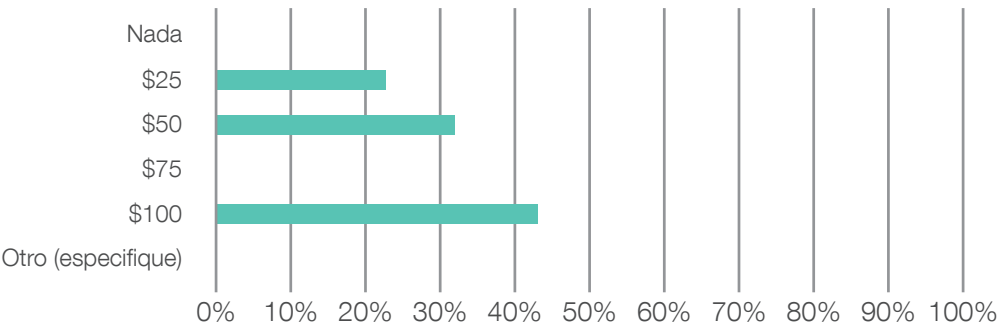


Answer choices	Responses	
Reducción del 2%	22.22%	2
Reducción del 3%	11.11%	1
Reducción del 4%	44.44%	4
Otro (especifique)	22.22%	2
Total participants: 9		

#	Other (please specify)	Date
1	50	4/12/2023 4:31 PM
2	20%	4/12/2023 3:37 PM

Q146 ¿QUÉ NIVEL DE PAGOS ANUALES POR PARTICIPACIÓN HARÍA QUE VALGA LA PENA LA PARTICIPACIÓN EN UN PROGRAMA DE RESPUESTA A LA DEMANDA?

Answered: 9 Skipped: 23



Answer choices	Responses	
Nada	0.00%	0
\$25	22.22%	2
\$50	33.33%	3
\$75	0.00%	0
\$100	44.44%	4
Other (please specify)	0.00%	0
Total participants: 9		

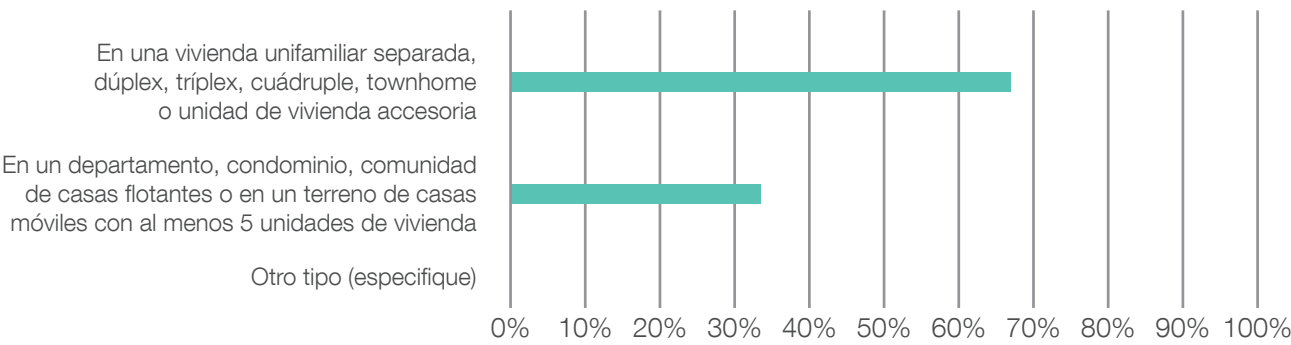
Q147 ¿QUÉ OTRA INFORMACIÓN NECESITARÍA PARA PARTICIPAR EN UN PROGRAMA DE RESPUESTA A LA DEMANDA?

Answered: 1 Skipped: 31

#	Responses	Date
1	nada mas	4/12/2023 4:11 PM

Q148 ¿EN QUÉ TIPO DE RESIDENCIA VIVE?

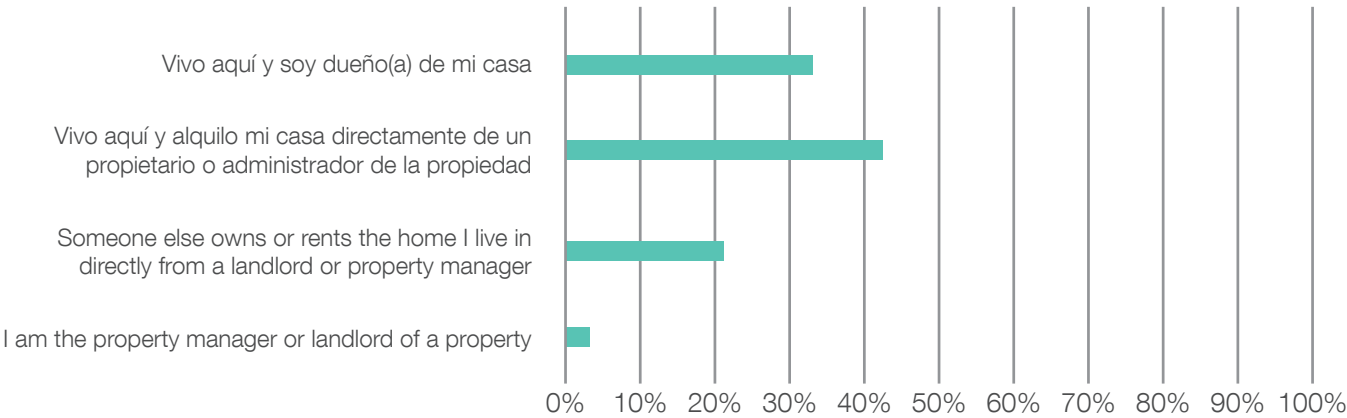
Answered: 9 Skipped: 23



Answer choices	Responses	
En una vivienda unifamiliar separada, dúplex, triplex, cuádruple, townhome o unidad de vivienda accesorio	66.67%	6
En un departamento, condominio, comunidad de casas flotantes o en un terreno de casas móviles con al menos 5 unidades de vivienda	33.33%	3
Otro tipo (especifique)	0.00%	0
Total participants: 9		

¿ES DUEÑO(A) DE, ALQUILA O ADMINISTRA SU CASA/PROPIEDAD?

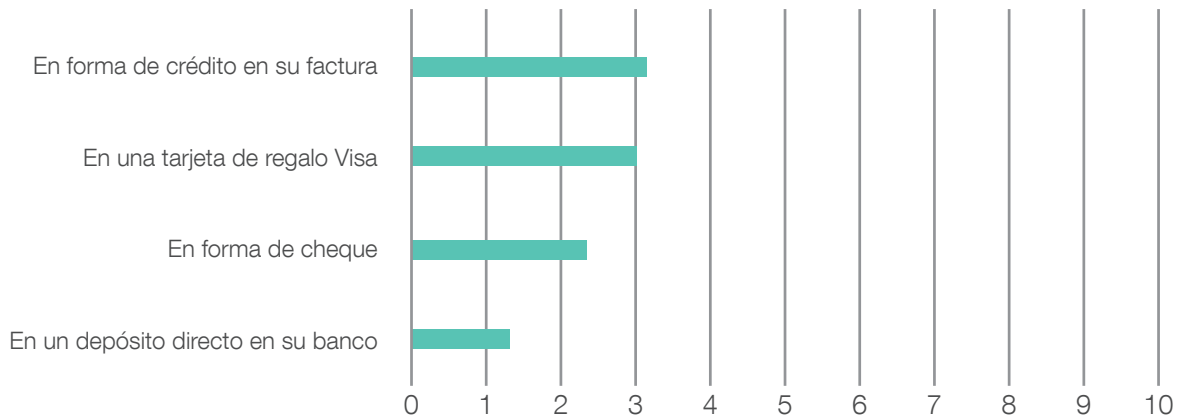
Answered: 9 Skipped: 23



Answer choices	Responses	
Vivo aquí y soy dueño(a) de mi casa	11.11%	1
Vivo aquí y alquilo mi casa directamente de un propietario o administrador de la propiedad	44.44%	4
Vivo aquí y otra persona es propietaria o alquila la casa directamente de un propietario o administrador de la propiedad	44.44%	4
Soy el administrador o propietario de la propiedad	0.00%	0
Total participants: 9		

Q150 ¿CÓMO PREFERIRÍA RECIBIR SUS PAGOS DE PSE POR SU PARTICIPACIÓN EN ESTOS PROGRAMAS? ORDENE LAS SIGUIENTES OPCIONES DE ACUERDO CON SU PREFERENCIA.

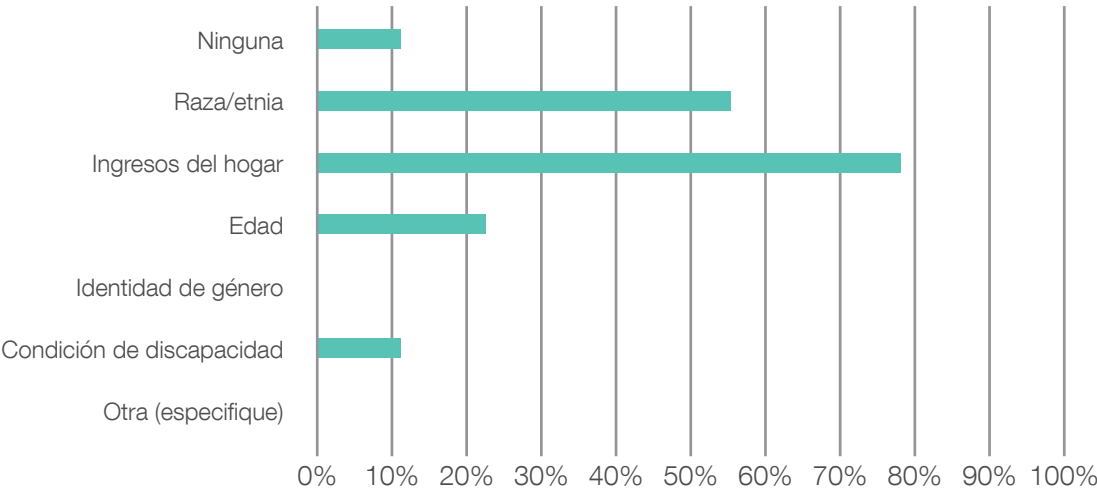
Answered: 9 Skipped: 23



Answer choices	1	2	3	4	Total	Score
En forma de crédito en su factura	55.56% 5	11.11% 1	22.22% 2	11.11% 1	9	3.11
En una tarjeta de regalo Visa	22.22% 2	66.67% 6	0.00% 0	11.11% 1	9	3.00
En forma de cheque	22.22% 2	22.22% 2	33.33% 3	22.22% 2	9	2.44
En un depósito directo en su banco	0.00% 0	0.00% 0	44.44% 4	55.56% 5	9	1.44

Q151 ¿QUÉ CARACTERÍSTICAS DEMOGRÁFICAS CREE QUE PSE DEBERÍA TENER EN CUENTA PARA VERIFICAR QUE UN CLIENTE FORMA PARTE DE UNA COMUNIDAD HISTÓRICAMENTE DESFAVORECIDA? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN.

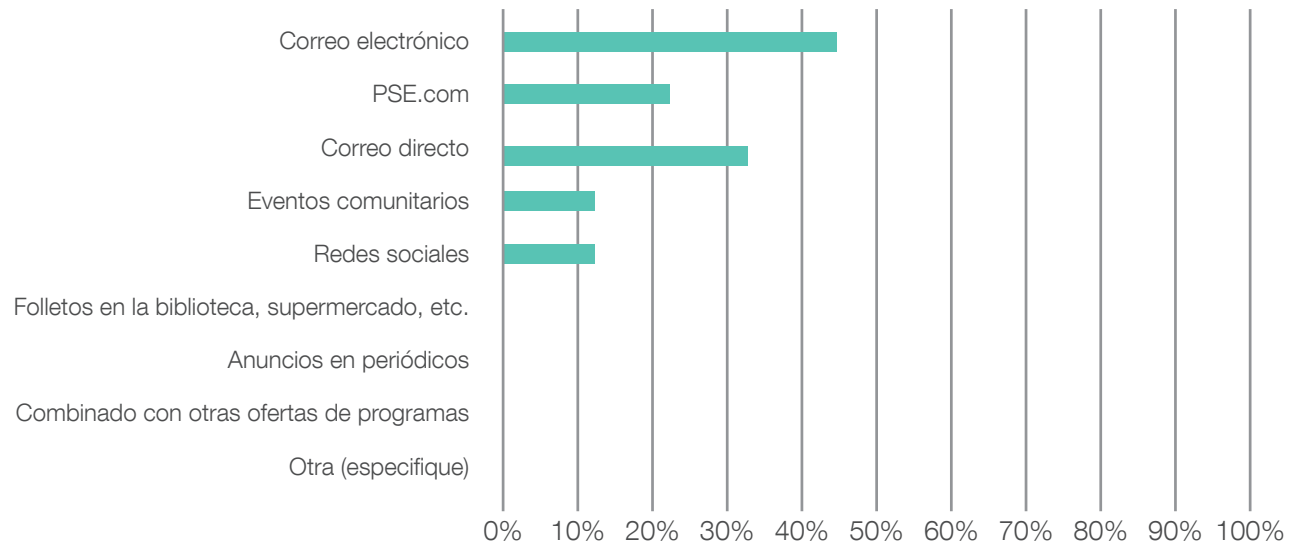
Answered: 9 Skipped: 23



Answer choices	Responses	
Ninguna	11.11%	1
Raza/etnia	55.56%	5
Ingresos del hogar	77.78%	7
Edad	22.22%	2
Identidad de género	0.00%	0
Condición de discapacidad	11.11%	1
Otra (especifique)	0.00%	0
Total participants: 9		

Q152 ¿DE QUÉ MANERA LE GUSTARÍA RECIBIR MÁS INFORMACIÓN SOBRE FUTUROS PROGRAMAS DE PSE COMO ESTOS? SELECCIONE TODAS LAS OPCIONES QUE CORRESPONDAN.

Answered: 9 Skipped: 23



Answer choices	Responses	
Correo electrónico	44.44%	4
PSE.com	22.22%	2
Correo directo	33.33%	3
Eventos comunitarios	11.11%	1
Redes sociales	11.11%	1
Folletos en la biblioteca, supermercado, etc.	0.00%	0
Anuncios en periódicos	0.00%	0
Combinado con otras ofertas de programas	0.00%	0
Otra (especifique)	0.00%	0
Total participants: 9		

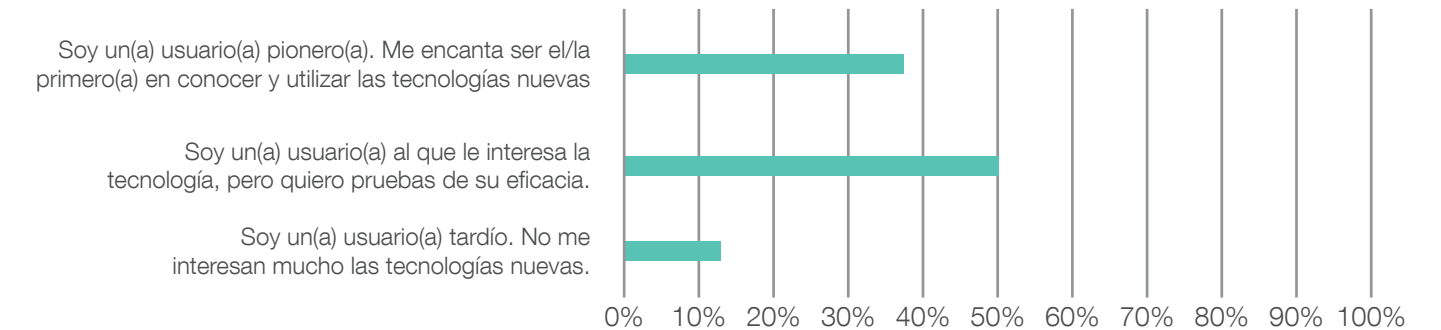
Q153 ¿HAY ALGO MÁS QUE QUIERA COMPARTIR CON NOSOTROS SOBRE LOS RECURSOS ENERGÉTICOS DISTRIBUIDOS (DER POR SUS SIGLAS EN INGLÉS)?

Answered: 1 Skipped: 31

#	Responses	Date
1	rhugha88@gmail.com	4/12/2023 3:39 PM

Q154 ¿CÓMO DESCRIBIRÍA SU INTERÉS EN ADOPTAR TECNOLOGÍAS NUEVAS? SELECCIONE UNA OPCIÓN.

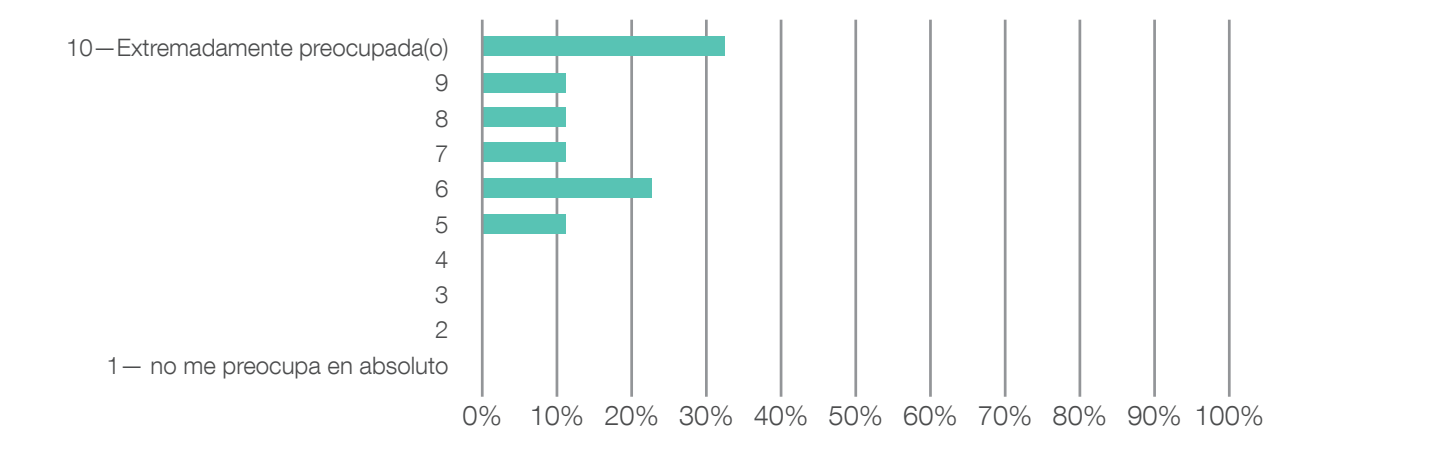
Answered: 8 Skipped: 24



Answer choices	Responses	
Soy un(a) usuario(a) pionero(a). Me encanta ser el/la primero(a) en conocer y utilizar las tecnologías nuevas.	37.50%	3
Soy un(a) usuario(a) al que le interesa la tecnología, pero quiero pruebas de su eficacia.	50.00%	4
Soy un(a) usuario(a) tardío. No me interesan mucho las tecnologías nuevas.	12.50%	1
Total participants: 8		

Q155 EN UNA ESCALA DEL 1 AL 10, SIENDO 1 QUE NO LE PREOCUPA NADA Y 10 QUE LE PREOCUPA MUCHO, INDIQUE SU NIVEL DE PREOCUPACIÓN POR EL CAMBIO CLIMÁTICO.

Answered: 9 Skipped: 23



Answer choices	Responses	
10—Extremadamente preocupada(o)	33.33%	3
9	11.11%	1
8	11.11%	1
7	11.11%	1
6	22.22%	2
5	11.11%	1
4	0.00%	0
3	0.00%	0
2	0.00%	0
1—no me preocupa en absoluto	0.00%	0
Total participants: 9		

APPENDIX H: DER FACTSHEETS AND FLIERS

See next page.

DISTRIBUTED ENERGY RESOURCES COMMUNITY ENGAGEMENT PROCESS



Demand Response (DR) is a strategy for decreasing the load on our power grid during times of peak use. It taps into individual behavior change and innovative technologies to cycle or reduce energy use during peak times, thereby reducing our reliance on carbon-intensive peaking power plants and making power more reliable and affordable for all our customers.



Solar power is generated from the sun using a solar array located on a rooftop or the ground. In addition to being a renewable energy source, solar power is generated in the same location as it is consumed, eliminating the need for carbon-intensive transportation or infrastructure.



Batteries can provide energy as a temporary back-up when you experience an outage, store energy from solar panels, help businesses manage their energy usage, and much more. Their ability to store power generated from renewables like wind and solar make using renewable energy sources more reliable over the long-term.

Distributed Energy Resources (DER), which includes Demand Response (DR), ground/rooftop solar, and Battery Energy Storage Systems (BESS) are designed to empower customers to have a key role in reducing greenhouse gas (GHG) emissions and increasing system reliability and resiliency. These options range from adjusting individual energy usage, to using new technologies that diversify PSE's renewable energy production and storage. All of these actions contribute to PSE's commitment to be a Beyond Net Zero Carbon Company by 2045. PSE's first Clean Energy Implementation Plan (CEIP) was filed in December 2021 with the Washington Utilities and Transportation Commission (WUTC). The CEIP provides a four-year roadmap to guide our clean energy investments, which includes a portfolio of solar, BESS, and DR.

WHAT ARE OUR GOALS?

Partner with community members and key stakeholders to successfully implement a robust portfolio of sustainable energy sources within communities.

1. Remove barriers to provide DER access to all customers
2. Develop and implement more DER products and services
3. Build and change our utility infrastructure to increase reliability
4. Meet the demand for renewable electricity
5. Reduce reliance on carbon-intensive energy production
6. Gather feedback from customers with mixed incomes, limited English proficiency, historically excluded communities of color, and rural communities.

PSE has existing DER demonstrations. Now, we hope to scale these demonstrations into future products and services, and develop new offerings across the full span of DR, solar, and BESS. PSE prioritizes equity as we build these products, and is looking to our communities for feedback on how to design them.

TIMELINE



November 2021
Community Solar pilots launched

December 2021
CEIP filled with WUTC

November 2022
DR pilots launched

November 2022 — April 2022
Community engagement process

April — May 2023
Integrate community feedback into tariff filing

June 2023
File tariffs for potential DER/DR products and services with WUTC

2023 — 2024
Products and services are made available to customers



COMMUNITY ENGAGEMENT: DR, SOLAR, AND BESS

We hope to hear from communities that reflect the geographic and demographic diversity of our electric service area. We seek to better understand what barriers exist in accessing DR, solar, and BESS and brainstorm how to reduce those barriers.

We’re organizing interviews, focus groups, workshops, and surveys for PSE customers living and/or operating in places that might be interested in hosting solar or BESS, or enrolling in DR products and services.

WE WILL DISCUSS AND SOLICIT FEEDBACK ON:

- 1. Benefits and barriers to products and services
- 2. Ownership, cost share, and incentive preferences
- 3. Education and outreach needs related to solar, BESS, and DR
- 4. Community feedback will be integrated into our product design that we will file with the WUTC for approval.
- 5. Examples of potential programs

EXAMPLES OF POTENTIAL PROGRAMS

Strategy category	 Demand Response (DR)	 Solar	 Battery Energy Storage Systems (BESS)
Potential product	Smart Thermostat Direct Load Control (DLC)	Community Solar	Residential Incentive
Product details	• PSE provides smart thermostat incentives to customers that voluntarily opt in, and grant PSE limited permissions to adjust the temperature during peak periods. • Customers are notified in advance of any adjustments and can always opt out. • Customers receive monthly credits on their energy bill for participating.	• PSE builds community-sited solar projects • Customers purchase shares, and earn bill credits for the solar generated by their shares. Income eligible customers receive shares at no cost.	• PSE provides incentives for customers to install their own BESS • With advanced notice and the ability to opt out, PSE discharges the BESS during peak periods to stabilize energy demand on the grid. • Customers receive monthly credits on their energy bill for participating.

SOLAR AND BATTERY ENERGY STORAGE SYSTEMS

DISTRIBUTED ENERGY RESOURCES

Distributed Energy Resources (DERs) are an important component of PSE's transition to a cleaner electricity grid. They include different types of resources, such as **distributed solar** (like solar panels on a house) and **battery energy storage systems (BESS)**, for example, batteries in your home storing power from your solar panels. DERs are connected directly to the electrical grid and can be utility- owned (we own them), or customer-owned (you own them), giving customers the opportunity to be a part of the clean energy transformation.

In addition to generating and storing electricity for the power grid, DERs give us flexible tools to ensure a balance of supply and demand for power. They play a key part in meeting renewable energy targets and creating a more resilient grid for the future.

WHAT IS DISTRIBUTED SOLAR AND HOW DOES IT WORK?

Distributed Solar refers to small-scale solar arrays, sometimes sited by customers. Even with Washington's cloudy weather, solar still produces power on overcast days, reaching up to 70 percent peak output on the days with cloud cover. And the longer days of northwest summers are perfectly suited for solar production.

Solar panels benefit you and the community – any energy that you don't use goes back to PSE's electric grid to power other customers. That's power that PSE doesn't have to spend money and resources to generate and shows up as a credit on your bill. But, when you are using more energy than the panels produce – like during cloudy winter days when your panels are not receiving much sunlight – you can still get power from PSE's grid (just like you did before you had solar panels!).

WHAT ARE BATTERY ENERGY STORAGE SYSTEMS (BESS) AND HOW DO THEY WORK?

Battery Energy Storage Systems (BESS) help provide stability and reliability for any unforeseen energy challenges such as power outages, inclement weather, and varying energy demands during peak use times. BESS can function as backup power systems and help customers manage their energy usage. BESS can also store energy from renewable resources like wind and solar, increasing the capacity for renewable energy in the PSE electrical grid.



DEMAND RESPONSE

DEMAND RESPONSE — AN EASY AND EFFICIENT WAY TO SAVE MONEY, REDUCE EMISSIONS, AND COMBAT CLIMATE CHANGE

WHAT IS DEMAND RESPONSE AND HOW DOES IT WORK?

Demand Response (DR) is simple: we incentivize you to use less power when it's in highest demand. These high demand times (when many customers want power at the same time create "peak periods") are often on the coldest, darkest days. When you participate in demand response by using less power during peak periods, this creates greater system-wide resiliency for the grid, lowers emissions, and can result in lower monthly bills. DR programs empower you to make our power grid both renewable and reliable.



Peak periods refer to times when system-wide energy use becomes high enough that the demand for power is difficult (or impossible) for a utility to meet, especially when using renewable sources to generate that energy.

One example of recurring peak periods in the Northwest is the early morning during winter, when thermostats are adjusted to warm our homes after a cold night. As part of a DR program, customers can modify their electricity use to reduce the collective load on our power grid during peak periods.

There are two primary categories of DR:

1. **Behavioral Demand Response (BDR)** refers to individually adjusting your thermostat or appliances in response to a request from PSE. This request can come in the form of alerts via text or email before a peak time.
2. **Direct Load Control (DLC)** programs grant PSE specific permissions to remotely adjust some of your equipment to manage peak demand. The equipment is most often your heating system or water heater. Program designs and manufacturer restrictions often limit the number of hours the equipment can be adjusted, so many customers report little to no noticeable change in home comfort.

PSE will provide incentives for enrolling, and for each year you remain enrolled. In some cases, PSE may even cover the costs of installing any necessary equipment to participate (such as a smart thermostat). DR programs are voluntary and, once enrolled, customers usually receive notifications one day in advance of forecasted peak periods.

RECURSOS ENERGÉTICOS DISTRIBUIDOS

PROCESO DE PARTICIPACIÓN COMUNITARIA



La respuesta a la demanda (DR)

es una estrategia para disminuir la carga en nuestra red eléctrica durante los tiempos de uso máximo. Aprovecha el cambio de comportamiento del individuo e de innovaciones tecnológicas para ciclar o reducir uso de energía durante las horas pico, reduciendo nuestra dependencia de plantas de potencia máxima intensiva en carbono plantas y hacer más energía fiable y asequible para todos nuestros clientes.



La energía solar se genera a partir del sol usando una matriz solar ubicada en una azotea o el suelo. Además de ser una fuente de energía renovable, se genera energía solar en la misma ubicación que está consumido, eliminando la necesidad para el transporte intensivo en carbono o infraestructura.



Las baterías pueden proporcionar energía como copia de seguridad temporal cuando experimenta un apagón, almacenar energía de paneles solares, ayudar a las empresas gestionan su uso de energía, y mucho más. Su capacidad para almacenar la energía generada de energías renovables como el viento y solar se hace usando fuentes de energías renovables más fiables a largo plazo.

Recursos Energéticos Distribuidos (DER), que incluye Respuesta a la Demanda (DR), energía solar en el suelo / techo y sistemas de Almacenamiento de Energía de Batería (BESS) son diseñados para empoderar a los clientes para que tengan un papel clave en la reducción de Gases de Efecto Invernadero Emisiones (GEI) y aumento de la fiabilidad y resiliencia del sistema. Estas opciones van desde el ajuste del uso individual de energía hasta el uso de nuevas tecnologías que diversifica la producción y el almacenamiento de energía renovable de PSE. Todas estas acciones contribuyen al compromiso de PSE de ser una compañía de carbono neto cero para 2045. El primer Plan de Implementación de Energía Limpia (CEIP) de PSE se presentó en diciembre de 2021 con la Comisión de Servicios Públicos y Transporte de Washington (WUTC). El CEIP proporciona un plan de cuatro años para guiar nuestras inversiones a energía limpia, que incluye un portafolio de energía solar, BESS y DR.

¿CUÁLES SON NUESTRAS METAS?

Asociarnos con miembros de la comunidad y partes interesadas clave para exitosamente implementar un portafolio robusto de fuentes de energía sostenibles dentro de las comunidades.

1. Eliminar las barreras para proporcionar acceso a DER a todos los clientes
2. Desarrollar e implementar más productos y servicios de DER
3. Construir y cambiar nuestra infraestructura de servicios públicos para aumentar la fiabilidad
4. Satisfacer la demanda de electricidad renovable
5. Reducir la dependencia de la producción de energía intensiva en carbono
6. Recopile comentarios de clientes con ingresos mixtos, aptitud limitada en el inglés, comunidades de color históricamente excluidas y comunidades rurales

PSE tiene demostraciones de DER existentes. Ahora, esperamos escalar estas demostraciones en futuros productos y servicios, y desarrollar nuevas ofertas en todo el lapso de DR, energía solar y BESS. PSE prioriza la equidad a medida que construimos estos productos, y está buscando en nuestras comunidades comentarios sobre cómo diseñarlos

offerings across the full span of DR, solar, and BESS. PSE prioritizes equity as we build these products, and is looking to our communities for feedback on how to design them.

TIMELINE



Noviembre 2021
Lanzamiento de pilotos solares comunitarios

Diciembre 2021
CEIP presentado ante la UTC

Noviembre 2022
Lanzamiento de pilotos de DR

Noviembre 2022 — Abril 2023
Proceso de participación comunitaria

Abril — Mayo 2023
Integrate community feedback into tariff filing

Junio 2023
Presentar tarifas para posibles DER/DR productos y servicios con WUTC

2023 — 2024
Productos y servicios son disponibles a los clientes



PARTICIPACIÓN COMUNITARIA: DR, SOLAR, Y BESS

Esperamos escuchar de las comunidades que reflejan la diversidad geográfica y demográfica de nuestra área de servicio eléctrico. Buscamos comprender mejor qué barreras existen para acceder a DR, energía solar y BESS y hacer una lluvia de ideas sobre cómo reducir esas barreras.

Estamos organizando entrevistas, grupos focales, talleres y encuestas para clientes de PSE que viven y/o operan en lugares que podrían estar interesados en alojar energía solar o BESS, o inscribirse en productos y servicios de DR.

DISCUTIREMOS Y SOLICITAREMOS COMENTARIOS SOBRE

1. Beneficios y barreras a productos y servicios
2. Propiedad, costo compartido y preferencias de incentivos
3. Necesidades de educación y alcance relacionadas con la energía solar, BESS y DR
4. Los comentarios de la comunidad se integrarán en el diseño de nuestro producto que presentaremos ante el WUTC para su aprobación.
5. Ejemplos de programas potenciales

EJEMPLOS DE PROGRAMAS POTENCIALES

Categoría de estrategia	 Respuesta a la demanda (DR)	 Solar	 Almacenamiento de Energía de Batería (BESS)
Potencial del producto	Termostato inteligente directo control de cargo (DLC)	Solar comunitario	Incentivo residencial
Detalles del producto	• PSE proporciona incentivos para termostatos inteligentes a los clientes que optan voluntariamente, y otorgan a PSE permisos limitados para ajustar la temperatura durante períodos pico. • Se notifica a los clientes antes de cualquier ajuste y siempre pueden optar no participar. • Los clientes reciben créditos mensuales en su factura de energía por participar.	• PSE construye proyectos solares comunitarios • Los clientes compran acciones y ganan créditos de factura por la energía solar generada por sus acciones. Los clientes elegibles por ingresos reciben acciones sin ningún costo.	• PSE proporciona incentivos para clientes para instalar su propio BESS. • Con previo aviso y la posibilidad de optar no participar, PSE descarga el BESS durante los periodos pico para estabilizar la demanda de energía en la red. • Los clientes reciben créditos mensuales en su factura de energía por participar.

SOLAR Y SISTEMAS DE ALMACENAMIENTO DE ENERGÍA DE BATERÍAS

RECURSOS ENERGÉTICOS DISTRIBUIDOS

Los recursos energéticos distribuidos (DER) son un componente importante de la transición de PSE a una red eléctrica más limpia. Incluyen diferentes tipos de recursos, como sistemas solares distribuidos (como paneles solares en una casa) y sistemas de almacenamiento de energía de baterías (BESS), por ejemplo, baterías en su hogar que almacenan energía de sus paneles solares. Los DER están conectados directamente a la red eléctrica y pueden ser propiedad de la empresa de servicios públicos (nosotros los poseemos) o propiedad del cliente (usted los posee), lo que brinda a los clientes la oportunidad de ser parte de la transformación de energía limpia.

Además de generar y almacenar electricidad para la red eléctrica, los DER nos brindan herramientas flexibles para garantizar un equilibrio entre el suministro y la demanda de energía. Desempeñan un papel clave en el cumplimiento de los objetivos de energía renovable y en la creación de una red más resistente para el futuro.

¿QUE ES SOLAR DISTRIBUIDO Y CÓMO FUNCIONA?

Distributed Solar refers to small-scale solar arrays, sometimes sited by customers. Even with Washington's cloudy weather, solar still produces power on overcast days, reaching up to 70 percent peak output on the days with cloud cover. And the longer days of northwest summers are perfectly suited for solar production.

Solar panels benefit you and the community – any energy that you don't use goes back to PSE's electric grid to power other customers. That's power that PSE doesn't have to spend money and resources to generate and shows up as a credit on your bill. But, when you are using more energy than the panels produce – like during cloudy winter days when your panels are not receiving much sunlight – you can still get power from PSE's grid (just like you did before you had solar panels!).

¿QUE SON SISTEMAS DE ALMACENAMIENTO DE ENERGÍA DE BATERÍAS (BESS) Y CÓMO FUNCIONAN?

Los sistemas de almacenamiento de energía de la batería (BESS) ayudan a proporcionar estabilidad y fiabilidad para cualquier desafío energético imprevisto, como cortes de energía, inclemencias del tiempo y demandas de energía variables durante las horas pico de uso. BESS puede funcionar como sistemas de energía de respaldo y ayudar a los clientes a administrar su consumo de energía. BESS también puede almacenar energía de recursos renovables como el viento y la solar, aumentando la capacidad de energía renovable en la red eléctrica de PSE.



RESPUESTA A LA DEMANDA

RESPUESTA A LA DEMANDA – UNA FORMA FÁCIL Y EFICIENTE DE AHORRAR DINERO, REDUCIR LAS EMISIONES Y COMBATIR EL CAMBIO CLIMÁTICO

¿QUE ES LA RESPUESTA A LA DEMANDA Y CÓMO FUNCIONA?

La respuesta a la demanda (DR) es simple: Le incentivamos a usar menos energía cuando tiene la mayor demanda. Estos momentos de alta demanda (cuando muchos clientes quieren energía al mismo tiempo crean “períodos pico”) a menudo son los días más fríos y oscuros. Cuando participa en la respuesta a la demanda al usar menos energía durante los períodos pico, esto crea una mayor resiliencia de todo el sistema para la red, reduce las emisiones y puede resultar en facturas mensuales más bajas. Los programas de DR le permiten hacer que nuestra red eléctrica sea renovable y confiable.



Los períodos pico se refieren a los momentos en que el uso de energía en todo el sistema se vuelve lo suficientemente alto como para que la demanda de la energía es difícil (o imposible) de satisfacer para una empresa de servicios públicos, especialmente cuando se utilizan fuentes renovables para generar esa energía.

Un ejemplo de períodos pico recurrentes en el noroeste es la madrugada durante el invierno, cuando los termostatos se ajustan para calentar nuestros hogares después de una noche fría. Como parte de un programa de DR, los clientes pueden modificar su uso de electricidad para reducir la carga colectiva en nuestra red eléctrica durante los períodos pico.

Hay dos categorías principales de DR:

1. **La respuesta conductual a la demanda (BDR)** se refiere al ajuste individual de su termostato o electrodomésticos en respuesta a una solicitud de PSE. Esta solicitud puede venir en forma de alertas por mensaje de texto o correo electrónico antes de una hora pico.
2. **Los programas de control de carga directa (DLC)** otorgan a PSE permisos específicos para ajustar de forma remota algunos de sus equipos para manejar la demanda pico. El equipo es más a menudo su sistema de calefacción o calentador de agua. Los diseños del programa y las restricciones del fabricante a menudo limitan la cantidad de horas que se puede ajustar el equipo, por lo que muchos clientes informan poco a ningún cambio notable en la comodidad del hogar.

PSE proporcionará incentivos para inscribirse, y por cada año que permanezca inscrito. En algunos casos, PSE puede incluso cubrir los costos de instalación de cualquier equipo necesario para participar (como un termostato inteligente). Los programas de DR son voluntarios y, una vez inscritos, los clientes generalmente reciben notificaciones un día antes de los períodos pico pronosticados.



SHARE YOUR VOICE IN THE TRANSITION TO CLEAN ENERGY!

JOIN PUGET SOUND ENERGY (PSE) TO DISCUSS ITS CLEAN ENERGY PLANS AND DISTRIBUTED ENERGY RESOURCE (DER) PROGRAMS!

Participate in a discussion in Spanish about DERs. DERs are an important component of PSE's transition to a cleaner electric grid and provide opportunities for customers like you to be part of the clean energy transformation.

DURING THE WORKSHOP, WE WILL DISCUSS:



Solar: Is generated from the sun using a solar array located on a rooftop or the ground.



Batteries: Can provide energy as a temporary back-up when you experience an outage, store energy from solar panels, and much more.



Demand Response: A strategy for decreasing the load on our power grid during times of peak use.

When

Tuesday, April 18, 5-7 p.m.

Where

Online Zoom meeting (10–15 participants total).

To participate, you will need a computer/laptop and reliable internet access.

Participants receive a \$100 Visa gift card as a stipend for participating.

If interested, please call Kim Zamora Delgado at 206-981-2226 or email at kzamoradelgado@triangleassociates.com



¡COMPARTA SU VOZ EN LA TRANSICIÓN A LA ENERGÍA LIMPIA!

¡ÚNASE A UN TALLER CON PUGET SOUND ENERGY (PSE) SOBRE SUS PLANES DE ENERGÍA LIMPIA Y LOS RECURSOS ENERGÉTICOS DISTRIBUIDOS (DER)!

Participe en una discusión en español sobre los DERS. DERS son un componente importante de la transición de PSE a una red eléctrica más limpia y brindan oportunidades a los clientes como usted para ser parte de la transformación a energía limpia.

DURANTE EL TALLER, HABLAREMOS SOBRE:



Energía solar: Se genera a partir del sol mediante un panel solar ubicado en un techo o en el suelo



Baterías: Pueden proporcionar energía como respaldo temporal cuando experimenta un apagón, almacenar energía de paneles solares y mucho más.



Respuesta a la Demanda: Es una estrategia para disminuir la carga en nuestra red eléctrica durante los momentos de mayor uso.

¿CUANDO?

Martes, 18 de abril, de 5–7 p.m.

¿ADONDE?

Virtual por Zoom (10–15 participantes en total).

Para participar necesitará una computadora/ laptop y acceso a un servicio de Internet confiable.

Los participantes recibirán un estipendio de \$100 de Visa por su tiempo.

Para participar, llamen a Kim Zamora Delgado al 206-981-2226 o envíenle un correo electrónico a kzamoradelgado@triangleassociates.com.

