

**From:** IRP -- mail -- <IRP@pse.com>

**Sent:** Thursday, October 17, 2019 12:18 PM

**To:** rsb2@turbonet.com

**Cc:** Netik, Irena <irena.netik@pse.com>

**Subject:** Response to your Sept. 19 questions Re: Upstream gas assumptions in PSE's 2019 IRP

Rob,

Keith Faretra responds to your questions as follows:

1. PSE uses the methane characteristics published by DOE/EIA for gas composition calculations:

Heating value of natural gas delivered = 1,078 Btu/ft<sup>3</sup>

Energy content of natural gas = 100,000 Btu/therm

Density of methane = 0.6785 kg/m<sup>3</sup>

Methane in natural gas = 95%

Unit Conversion = 35.3 ft<sup>3</sup>/m<sup>3</sup>

The underlying assumptions used to calculate methane emissions in each segment of the supply chain are published in the Final SEIS for the Tacoma LNG plant (including associated spreadsheets) made available by the Puget Sound Clean Air Agency (PSCAA).

2. PSE relied on the sensitivities published in the PSCAA SEIS analysis. Please also see on page 2 of the document you referenced in your September 19 email, Updated Natural Gas Pathways in the GREET1\_2018, October 2018, where Andrew Burnham writes:

“We find the EPA GHGI to be the best data source that provides detailed process-level emissions needed to update GREET. As described below, Alvarez et al. (2018) has detailed NG sector emissions, however assumptions from the GHGI and other sources are needed to estimate process-level emissions.”

3. PSE is using the 100-year GWP from AR4 to remain consistent with current state and federal regulatory reporting requirements.

This message will be shared with the TAG as an attachment to the September 19, TAG meeting #9 final meeting notes, and also uploaded on [www.pse.com/irp](http://www.pse.com/irp), along with the September 19 communication from you, already uploaded.

Respectfully sent on behalf of PSE Resource Planning & Analysis,

Michele

Michele Kvam

Resource Planning & Analysis

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**From:** rsb2 <[rsb2@turbonet.com](mailto:rsb2@turbonet.com)>  
**Sent:** Wednesday, September 18, 2019 11:22 PM  
**To:** Netik, Irena <[irena.netik@pse.com](mailto:irena.netik@pse.com)>  
**Cc:** Kvam, Michele <[michele.kvam@pse.com](mailto:michele.kvam@pse.com)>  
**Subject:** Upstream Gas Assumptions in PSE 2019 IRP

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Hi Irena,

I have attached a letter to this email intended to address the outstanding issue from previous TAG meetings related to upstream methane emission values and the basis for those assumptions.

I indicated to Michele that I do not consider the action item on this closed but am hopeful that, pending review of this letter by your technical people, we can bring the issue to closure.

Best regards,

Rob Briggs  
IRP TAG Member representing Vashon Climate Action Group

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