Amendment of the Site Certificate for the Carty Generating Station

Date: 25 September 2016

To: Sarah Esterson, Siting Analyst
Oregon Department of Energy
625 Marion St. NE
Salem, OR 97301
sarah.esterson@oregon.gov

Subject: Technical Comments, NWCMTF 3 of 4

From: NW Climate Methane Task Force (http://nw-climate-methane-task-force.org/downloads/NWCMTF-3of4-Rev-1)

Sierra Club, Portland Chapter	Out for approval
350PDX	Out for approval
Engineers for a Sustainable Future	Out for approval

Technical Comments to PGE Carty Station Site Certificate Amendment

1. Carty Unit 3 appears unjustifiable as a clean energy projects when UN IPCC standards for GWP from 2013 are factored with current natural gas life cycle data.
2. Upstream methane leakages and releases from logistics infrastructure supplying Unit 3 are not quantified with publicly accessible data from owners and operators of the natural gas supply chain, precluding direct due diligence calculations of global warming damage associated with Carty natural gas operations.
3. Peer reviewed technical reports conducted by third-party NGO experts put methane leakage and release at 5% of delivered product (some report 12%).
4. It is possible to conduct simple checkbook calculations to determine the amount of natural gas supplied, the amount of upstream methane released, and the consequences bearing on Oregon GHG goal attainment.
5. We conclude from simple calculations that Unit 3 represents a potentially stranded asset as the cost of grid energy storage declines, resulting from high volume production efficiencies, and as economic externalities are offset for example by the social cost of carbon.
6. Our findings are to be shared with PGE and the Oregon Global Warming Commission.
7. Activist organizations are expected to endorse the significance of these findings as they relate to the root cause of declining climate.

Principal Findings

Peak Generation Using Natural Gas

- is effective in balancing grid resources
- is not the only technology matching supply to demand
- may not have a role beyond near term transition from fossil energy generation

Oregon Convergence on Climate Goals

- depends upon baseload generation as well as peak balancing
- cannot be judged from a reading of the 2015 Oregon GHG Inventory because goals and inventory are expressed in inconsistent numerical units
- cannot be predicted when peak compensation produces GHG spikes at random
- depends on the GHG uncertainties stemming from other natural gas peak plants

Details:

Carty Natural Gas Plant – Unit 3

The Carty Unit 3 Peak Generation plant would have a rated full load capacity of 330 MW. This corresponds to 1,078,00 metric tons of CO2 annually if running full time while burning natural gas 50% cleaner. But given that a peak plant is deployed only when needed, assume a 50% duty cycle producing 0.5 x 1,078,000 = 539,000 metric tons of CO2 annually.

CO2 ←  ← **CH4**

Any Natgas-Fueled Installation
[Turbine compressor, elect gen, cogen],
LNG Distribution Center (Tacoma, WA), etc

Compute the amount CH4 needed to run the facility.

Start with expected amount of CO2 being produced.
CO2 Prod x molecular wt ratio of CH4/CO2 = CH4 fuel delivered
Example: Carty Cogen Plant, 539,000 metric tons CO2 annually
539,000 metric tons x (16/44) = 196,000 metric tons CH4 annually

Compute the amount of CH4 leakage upstream prior to delivery

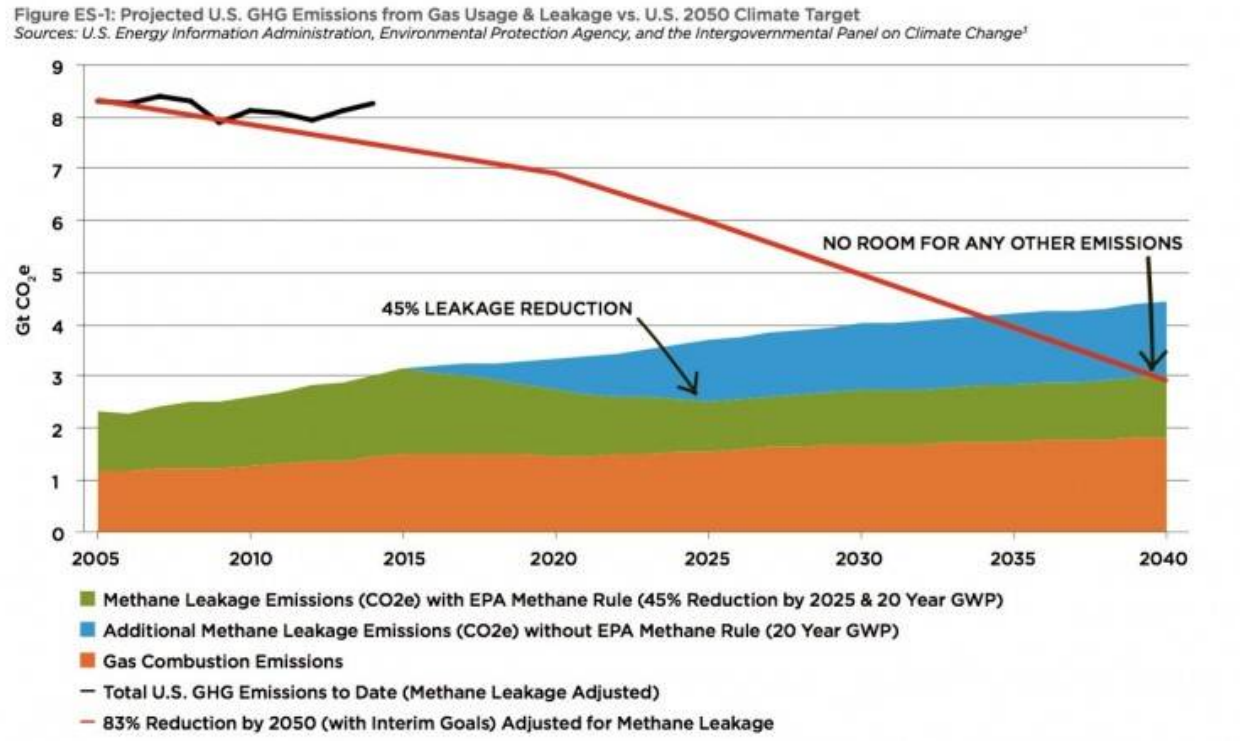
Range of estimated leakage is 1% to 9% (industry does not provide measurements)
196,000 metric tons x 5% = 9,800 metric tons lost to climate annually

Compute equivalent CO2 (CO2e) of leaked CH4
The standard warming potential for CH4 is 84x CO2 for the 20 years after release
6,800 metric tons x 84 = 823,200 metric tons CO2e
CO2e exceeds CO2 produced by a factor of 1.5 (same as 150%).

Impact on Oregon Climate Goal Attainment. The intermittent supply of wind and solar renewable energy determines the need for randomly calling up peak power generation. This drives intermittency into Oregon's GHG Inventory when natural gas is employed, as in existing peaker plants. There is no acknowledgement of random variation of GHG emissions from existing peak plants in the current 2015 OGWC Report to Legislators. Readers have no possibility of concluding the impact of an additional peak plant on goal attainment.

Another difficulty with the report is the absence of GHG trends plotted against a planned upper bound for emissions that leads to climate success in 2050. Examples of such a graphic exist. For example, natural gas emissions are predicted in Figure ES-1 in the report, "A BRIDGE TOO FAR: HOW APPALACHIAN BASIN GAS PIPELINE EXPANSION WILL UNDERMINE U.S. CLIMATE GOALS". Ref
http://priceofoil.org/content/uploads/2016/08/bridge_too_far_report_v6.3.pdf

For convenience this figure is provided below, and it is further captioned in Figure 8 in the reference report. Actuals, goals and fuel predictions are integrated in the same graphic.



Practical alternative to peaking plants. A recent report summarizes progress in developing alternative technology that serves the same grid balancing function as peaker plants.

www.ercot.com/content/wcm/key_documents_lists/85512/03._Storage_Update_ETWG.pptx

Coincidentally the California Public Utilities Commission has directed public utilities to invest in direct electricity grid energy storage, to make up for the tragic and negligent Aliso Canyon natural gas storage well rupture. Utilities having nothing to do with natural gas are impacted.

Community support in other states for direct grid energy storage is evident in posted public comments. For example, Texas.

http://interchange.puc.state.tx.us/WebApp/Interchange/Documents/40000_180_732177.PDF