

## DOCKETED

<b>Docket Number:</b>	08-AFC-09C
<b>Project Title:</b>	Palmdale Energy Project (Formerly Palmdale Hybrid Power Plant) - Compliance
<b>TN #:</b>	206407
<b>Document Title:</b>	City of Lancaster's First Set of Data Requests
<b>Description:</b>	Data Requests
<b>Filer:</b>	GLORIA SMITH
<b>Organization:</b>	City of Lancaster
<b>Submitter Role:</b>	Intervenor
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October 20, 2015

Thomas Johns, Project Manager  
Palmdale Energy, LLC  
801 2nd Avenue, Suite 1150  
Seattle, WA 98104  
Email: [tjohns@summitpower.com](mailto:tjohns@summitpower.com)  
cc: Docket 08-AFC-09C

**Re: PALMDALE ENERGY PROJECT (08-AFC-09C),  
City of Lancaster's Data Requests Set No. 1**

Dear Mr. Johns:

Pursuant to Title 20, California Code of Regulations, Section 1716, the City of Lancaster requests the information specified in the enclosed data requests regarding the revised petition to amend ("Petition") for the Palmdale Energy Project ("modified project") proposed by Palmdale Energy, LLC before the California Energy Commission.

These data requests are numbered 1 through 13. Written responses to the enclosed data requests are due to Lancaster on or before November 19, 2015.

If you are unable to provide the information requested, need additional time, or object to providing the requested information, please send a written notice to me and the Committee within 20 days of receipt of this notice. The notification must contain the reasons for the inability to provide the information or the grounds for any objections (*see* Title 20, California Code of Regulations, Section 1716 (f)). If you have any questions regarding the enclosed data requests, please feel free to contact me.

Sincerely,



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**City of Lancaster**  
**Data Requests Set #1 (Nos. 1–13)**  
**for**  
**Palmdale Energy Project**  
**Revised Petition to Amend (08-AFC-09C)**

October 20, 2015

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**GENERAL**

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**Background:      SUPPORTING DOCUMENTATION FOR PETITION**

Appendices 2 through 8 contain information to support the analyses presented in the Petition. A number of spreadsheets, drawings, and maps are truncated and/or illegible. Further, some modeling files were provided to the Commission on CD. Please provide all requested spreadsheets or modeling input/output files in electronic, native, unprotected format, if necessary under confidential cover.

**Data Requests:**

1. Please provide non-truncated, legible copies of:
  - a. Appendix 4.1-A:
    - i. Construction schedule
    - ii. Attachment 4.1A-1, Parts 1 and 2, Turbine Performance Spec Sheets
  - b. Appendix 4.1B-1: Facility Plot Plan
  - c. Appendix 4.1B-2a, -2b, -2c: Site Layout
  - d. Appendix 4.1B-3a, -3b: Facility Elevation Views
  - e. Appendix 4.1D
  - f. Appendix 6-A: Parcel Split Documentation
  - g. Appendix 6-B: Construction Worker Estimates
  
2. Appendix 4.1 refers to CDs containing modeling input/output files. Please provide a copy of these CDs with files in electronic, native format, including:
  - a. AERMOD modeling input/output files
  - b. HARP Version 2.03 risk assessment input and output files
  
3. On October 13, 2015, Palmdale Energy submitted a supplemental cumulative air quality impact analysis report to the Commission which refers to modeling CD containing modeling input and output files. Please provide a copy of these files in native, electronic format.

## LICENSING

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### **Background: CERTIFICATION AMENDMENT VS. NEW APPLICATION FOR CERTIFICATION**

The Petition aims to amend the Commission's certification for the Palmdale Hybrid Power Project ("approved project") which was issued on August 10, 2011. The approved project was certified as a nominal 570-megawatt ("MW") hybrid of natural gas-fired combined-cycle generating equipment integrated with solar thermal generating equipment. The approved project's stated objectives were to provide baseload power to increase the reliability of the electrical supply for the City of Palmdale and use solar technology as an integral part of the facility to generate a portion of the power output and thereby support the state of California's goal of increasing the percentage of renewable energy in the state's electricity mix. The EPA specifically added conditions to the prevention of significant deterioration ("PSD") permit it issued to the approved project in 2011 to ensure that the solar component would be constructed:

Conditions III.B, III.C, and X.I.11 have been added to the permit to require construction of a solar-thermal plant designed to generate 50 MW of power.<sup>1</sup>

In contrast, the modified project would provide "fast-start flexible generation ... to assist in the integration of renewable energy;" would increase the nominal output of the natural gas-fired combined-cycle generating equipment to 645 MW; would no longer directly provide power to Palmdale but instead utilize the existing CAISO Large Generator Interconnection Agreement; would eliminate the solar component; and would substantially increase operational emissions of nitrogen oxides ("NOx") from 115 to 139 tons/year, volatile organic compounds ("VOC") from 40 to 52 tons/year, sulfur oxides ("SOx") from 9 to 11 tons/year, carbon monoxide ("CO") from 255 to 351 tons/year, and carbon dioxide-equivalent ("CO<sub>2</sub>e") greenhouse gas ("GHG") emissions from 1.85 million metric tons/year ("MMT<sub>CO<sub>2</sub>e/year</sub>") to 1.95 MMT<sub>CO<sub>2</sub>e/year</sub>.<sup>2</sup> In sum, the modified project has little in common with the approved project other than the project site.

### **Data Requests:**

4. Please describe why the modified project should be processed as an "amendment" to the approved project as opposed to a new application for certification ("AFC") when the stated objectives are substantially different, the proposed operating capacity is different, the operating scenario is different, the proposed equipment is substantially different and

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<sup>1</sup> EPA, In re: Palmdale Power Project, PSD Permit No. SE-09-01, PSD Appeal No. 11-07, February 17, 2012, EPA Region 9's Excerpts of Record, Excerpt 4, Responses to Public Comments on the Proposed Prevention of Significant Deterioration Permit for the Palmdale Hybrid Power Project, October 2011, Response to Comment 40, p. 39;  
[http://yosemite.epa.gov/oa/eab\\_web\\_docket.nsf/filings%20by%20appeal%20number/b1b1430c6ca6e85c852579a7006f57f2/\\$file/response%20to%20petition%20excerpts%20of%20record%20...24.01.pdf](http://yosemite.epa.gov/oa/eab_web_docket.nsf/filings%20by%20appeal%20number/b1b1430c6ca6e85c852579a7006f57f2/$file/response%20to%20petition%20excerpts%20of%20record%20...24.01.pdf).

<sup>2</sup> See Petition, pp. 1-3 through 1-3, Table 4.1-1, and p. 4.1-28; PHPP Final Staff Assessment, Table 3.

eliminates the solar component as an integral part of the facility, and all emission scenarios (and emission rates) are substantially different than for the approved project.

5. Please describe all communications between the applicant and EPA concerning the modified project; and provide all written documentation for such communications.
6. Please describe how the substantially increased generating capacity for the modified project compared to the approved project was determined.

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## AIR QUALITY, GREENHOUSE GASES, AND PUBLIC HEALTH

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### **Background: EMISSION REDUCTION CREDITS FOR NO<sub>x</sub> AND VOCs**

The City of Lancaster is concerned that emissions from the modified project which would be located at the boundary between the cities of Palmdale and Lancaster, will adversely impact local and regional air quality. Of particular concern are the banked emission reduction credits (“ERCs”) that had been proposed for offsetting NO<sub>x</sub> and VOC emissions from the Approved Project since many of them are very old (some dating to 1987), were found by the EPA to have been unlawfully created, were transferred via inter-district, inter-basin transfers, and have not yet been incorporated into the Antelope Valley Air Quality Management District (“AVAQMD”) ozone plan.<sup>3</sup>

In communications between the applicant, Summit Power Project Holdings, LLC and Lancaster public officials, Summit conveyed that it intends to acquire substitute ERCs to offset emissions from the modified project instead of using the original ERCs identified by the City of Palmdale in its original AFC for the approved project. Yet, review of Appendix 4.1G, shows that the modified project proposes to offset NO<sub>x</sub> and VOC emissions with the same ERCs proposed for the approved project. Specifically, Appendix 4.1D, refers to a December 17, 2013 resolution adopted by the AVAQMD to approve the transfer of 60 tons of VOC ERCs from the SJVAPCD and 150 tons of NO<sub>x</sub> ERCs from the MDAQMD.

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<sup>3</sup> See Marvin Crist, City of Lancaster, Letter to Karen Douglas, California Energy Commission, December 20, 2013; [http://docketpublic.energy.ca.gov/PublicDocuments/08-AFC-09C/TN201500\\_20131231T115341\\_121613\\_Letter\\_to\\_Gloria\\_D\\_Smith\\_re\\_Review\\_of\\_Requested\\_InterDis.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/08-AFC-09C/TN201500_20131231T115341_121613_Letter_to_Gloria_D_Smith_re_Review_of_Requested_InterDis.pdf); and Petra Pless, Pless Environmental, Inc., Letter to Gloria Smith, The Law Offices of Gloria D. Smith, Re: Review of Requested Inter-District Transfer of Emission Reduction Credits from Mojave Desert Air Quality Management District and San Joaquin Valley Air Pollution Control District, Respectively, to Antelope Valley Air Quality Management District for Use as Offsets for Palmdale Hybrid Power Project, December 16, 2013; [http://docketpublic.energy.ca.gov/PublicDocuments/08-AFC-09C/TN201500\\_20131231T115341\\_121613\\_Letter\\_to\\_Gloria\\_D\\_Smith\\_re\\_Review\\_of\\_Requested\\_InterDis.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/08-AFC-09C/TN201500_20131231T115341_121613_Letter_to_Gloria_D_Smith_re_Review_of_Requested_InterDis.pdf).

## Data Requests:

7. Please provide the substitute VOC and NO<sub>x</sub> ERCs Summit referred to in its communications with Lancaster and explain why such ERCs were not incorporated into the Petition.
8. According to Petition, p. 4.2-15, there “may be a lack for available ERCs for purchase from the existing and surrounding air basins to satisfy the maximum operational scenario for NO<sub>x</sub> and VOCs (Operational Scenario 1). If this case arises, then PEP is proposing to lower the operational emissions to a level based on the available emission offsets until such time that the offsets are available.” Please describe how daily operations would be curtailed to ensure that maximum ramp-up for renewables would be maintained. Please provide emission calculations for the curtailed scenario to support this proposal.

## Background:      **CRITERIA POLLUTANT AND PRECURSOR BACT DETERMINATIONS**

According to the Petition, pp. 4.1-4 through 4.1-6 and 4.1-28, the modified project would trigger best available control technology (“BACT”) requirements for NO<sub>x</sub>, VOC, TSP, PM<sub>10</sub>, PM<sub>2.5</sub>, and CO under AVAQM new source review (“NSR”) Regulation XIII, Rule 1303. It would also require EPA to issue a PSD permit under the Clean Air Act, which also triggers BACT.

Petition, Table 4.1-17 and Appendix 4.1F, Table 4.1F-1, provide proposed BACT emission limits for criteria pollutant and precursor emissions from the modified project’s combustion turbines and auxiliary boiler and the proposed systems to achieve these limits. The proposed BACT emission limits for the combustion turbines are based on BACT determinations for other large natural gas-fired combined-cycle facilities. According to Petition, Appendix 4.1F, the most recent determinations for combined-cycle turbines were compiled from 2008 through 2015. Review of the summary tables in Appendix 4.1F show that for turbines, NO<sub>x</sub> BACT determinations were compiled for 2000 through 2011, CO BACT determinations for 2006 through 2011, particulate matter (“PM”) BACT determinations for 2008 through 2011, and VOC BACT determinations from 2008 through 2011. Appendix 4.1F also provides a range of BACT emission limits for these pollutants from April 2011 through April 2015 based on EPA’s RACT/BACT/LAER Clearinghouse (“RBLC”). The Petition, Appendix 4.1F, does not provide information regarding the control systems or status of the respective facilities.

This approach violates the procedure for a top-down BACT analysis established in EPA’s *New Source Review Workshop Manual* (“NSR Manual”), which requires the following steps:

- 1) Identify all available control technologies
- 2) Eliminate technically infeasible options
- 3) Rank remaining control technologies by control effectiveness
- 4) Evaluate most effective controls and document results
- 5) Select BACT<sup>4</sup>

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<sup>4</sup> EPA, *New Source Review Workshop Manual*, Prevention of Significant Deterioration and Nonattainment Permitting, October 1990, Table B-1; <http://www.epa.gov/ttn/naaqs/aqmguide/collection/nsr/1980wman.pdf>.

Further, neither the Petition nor the RBLC BACT summary in Appendix 4.1F, Table 4.1F-1, present averaging periods for the respective BACT emission limits, which are an essential part of BACT emission limits.<sup>5</sup> Moreover, the Petition does not specify separate limits for firing the combustion turbines with or without duct burners or for startup and shutdown.

<b>Emission Standards for &gt; 1200 hp Generator Set<sup>a</sup></b> (g/hp-hr)	
<b>EPA Tier 2</b>	<b>EPA Tier 4F</b>
NO <sub>x</sub> + NMHC <sup>b</sup> : 6.4 CO: 3.5 PM: 0.20	NO <sub>x</sub> : 0.50 NMHC: 0.14 CO: 2.6 PM: 0.02

a From: FR Vol. 71, No. 132, July 11 2006, 39156

b Non-methane hydrocarbons

As shown, Tier 4F emission standards are considerably lower for all pollutants. Thus, BACT for the emergency generator should be considered EPA Tier 4F certification.

Finally, the Petition, p. 4.18, specifies that the modified project would deploy a 140-hp Tier 3-certified diesel-powered Clarke or equivalent emergency fire pump. The proposed Puente Power Project proposes to use electric fire pumps backed up by the diesel-powered emergency generator set.<sup>6</sup> This configuration eliminates emissions from testing emergency fire pumps; thus, BACT for the emergency fire pump should be considered backup power from the emergency generator.

**Data Requests:**

9. Please provide a top-down BACT analysis for the modified project’s combustion sources (natural gas-fired turbines, auxiliary boiler, emergency generator, and emergency fire pump) per EPA’s NSR Manual including averaging times and methods to assure compliance with those limits (stack tests access ports, test methods, other emission monitoring methods, monitoring, and special recordkeeping methods) based on the most recent BACT determinations and achieved-in-practice emission levels.
  - a. For the combustion turbines, please specify separate BACT emission limits with and without duct firing and for startup and shutdown. Please specifically address the 1.5 parts per million (“ppm”) NO<sub>x</sub> limit (1-hour average) and determined as BACT for the IDC Bellingham facility in Massachusetts in your analysis. The fact that the facility has been cancelled is not sufficient justification for not

<sup>5</sup> NSR Manual, *op. cit.*, p. B.56 (“BACT emission limits or conditions must be met on a continual basis at all levels of operation (e.g., limits written in pounds/MMbtu or percent reduction achieved), demonstrate protection of short term ambient standards (limits written in pounds/hour) and be enforceable as a practical matter (contain appropriate averaging times, compliance verification procedures and recordkeeping requirements);” *emphasis added*).

<sup>6</sup> *Ibid.*

establishing NOx BACT at that level.<sup>7</sup> Further, please specifically address the 1.5 ppm CO limit without duct firing and 2.0 ppm CO limit with duct firing (1-hour average) determined as BACT for the Avenal Energy Project in your analysis.

- b. For the diesel-fired emergency generator, please include EPA Tier 4F certification in your BACT analysis.
- c. For the emergency fire pump, please include the use of an electric emergency fire pump powered by the emergency backup generator set in your BACT analysis.

**Background: GREENHOUSE GAS BACT DETERMINATIONS**

According to the Petition Table 4.1-6, the modified project would be a major stationary source triggering PSD requirements for CO<sub>2</sub>e, which requires the use of BACT. The modified project would have a PTE of more than 2.1 million tons CO<sub>2</sub>e/year,<sup>8</sup> with the majority (99.7%) emitted by the combustion turbines.<sup>9</sup> Yet, the Petition does not provide a CO<sub>2</sub>e BACT analysis and CO<sub>2</sub>e BACT emission limits for any of the modified project's combustion equipment. Instead, according to the Petition, p. 4.1-32, the modified project would comply with the CO<sub>2</sub>e emission standard in EPA's forthcoming NSPS Part 60 *Greenhouse Gas Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units*. NSPS emission standards are not a substitute for a project-specific BACT analysis. Instead, the standards establish a BACT floor, *i.e.*, a minimum control requirement that must be met. The NSPS Part 60 *Greenhouse Gas Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units* is clear:

BACT is a case-by-case review that considers a number of factors. These factors include the availability, technical feasibility, control effectiveness, and the economic, environmental and energy impacts of the control option. See GHG Permitting Guidance at 17-46. The fact that a minimum control requirement (*i.e.*, the BACT Floor) is established by the EPA through an applicable NSPS does not bar a permitting agency from justifying a more stringent control level as BACT for a specific PSD permit.<sup>10</sup>

Petition Appendix 4.1F further provides a one-page summary of proposed GHG BACT limits for the modified project's combustion sources and circuit breakers, which proposes compliance with

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<sup>7</sup> See NSR Manual, *op. cit.*, p. B.7. ("For example, in cases where the level of control in a permit is not expected to be achieved in practice (e.g., a source has received a permit but the project was cancelled, or every operating source at that permitted level has been physically unable to achieve compliance with the limit), and supporting documentation showing why such limits are not technically feasible is provided, the level of control (but not necessarily the technology) may be eliminated from further consideration. However, a permit requiring the application of a certain technology or emission limit to be achieved for such technology usually is sufficient justification to assume the technical feasibility of that technology or emission limit.")

<sup>8</sup> Petition, Table 4.1-3, p. 4.1-5.

<sup>9</sup> (2,112,350 tons CO<sub>2</sub>e/year) / (2,117,730 tons CO<sub>2</sub>e/year) = 0.997.

<sup>10</sup> Promulgated on August 3, 2015.



the current California GHG emissions performance standards for baseload power facilities at 1100 lb/MWh net and heat rates for turbine operations plus duct burners at 7100 Btu/kWh and turbine operations without duct burners at 8030 Btu/kWh on a 365-day rolling average. In contrast, the PSD permit for the approved project sets BACT limits for carbon dioxide emissions at 774 lb/MWh source-wide net output and 7319 Btu/kWh source-wide net heat rate on a 365-day rolling average.<sup>11</sup> EPA noted in its response to comments on the proposed PSD permit for the approved project:

The solar component of the Project was described in the EJ [environmental justice] Analysis, but was not the basis for any specific determination or conclusion in our analysis of the proposed permit's limits or impacts. *Upon review of this comment, we find it appropriate to clearly state that the solar component is a lower-emitting GHG technology at this facility.* Because the solar component is integrated into the heat recovery portion of the project, it has the potential to reduce GHG emissions by reducing use of the duct burners during peak energy demand. The Project, as described in the application, includes the development of 50 MW of solar energy. *As an integrated part of the Project with the ability to reduce GHG emissions, we consider the solar component to be part of the GHG BACT determination for the combustion turbines and associated heat recovery system. In addition, the permit has been revised to ensure that the solar component is a required part of the facility.*<sup>12</sup>

The Petition, Appendix 4.1F, contains no discussion whatsoever in its GHG BACT analysis why a solar component was not or cannot be incorporated into the facility.

Further, according to Appendix 4.1F, states that based upon the Approved Project GHG BACT analysis “the use of carbon capture and/or sequestration were found to be not technically feasible for the project at its current location, nor were these options found to be cost-effective.” The Petition may not rely on a several years-old BACT analysis that was prepared for an entirely different facility. Since, carbon capture and/or sequestration may have become technically feasible or cost-effective and other new technologies may have become available. The latter include, for example, bulk energy storage with flywheels, compressed air, heat pumps, or thermal utility-scale batteries (*e.g.*, from Aquion Energy,<sup>13</sup> Electrovaya<sup>14</sup>). The Con Edison Project in the Central Valley, for example, will include an 8-MWh lithium-ion energy storage system provided by General Electric<sup>15</sup> and NextEra Energy, a Fortune 200 firm with utility revenues of \$17 billion and 44,900 megawatts of generating capacity intends on deploying \$100 million in energy storage projects in the next 12 months in PJM, California and Arizona.<sup>16</sup>

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<sup>11</sup> PHPP PSD Permit, p. 8.

<sup>12</sup> EPA, In re: Palmdale Power Project, Excerpt 4, *op. cit.*, Response to Comment 40, p. 39.

<sup>13</sup> Aquion Energy, Bulk Energy Storage; <http://www.aquionenergy.com/products/grid-scale-batteries>.

<sup>14</sup> Electrovaya, Lithium Ion SuperPolymer® 2.0 Battery Solutions for Grid & Uninterrupted Power Supply; <http://www.electrovaya.com/applications/gridApp/gridApplications.aspx>.

<sup>15</sup> GE Providing 8 MWh of Utility-Scale Energy Storage for Cali Con Edison Project; <http://cleantechnica.com/2015/04/29/ge-providing-8-mwh-utility-scale-energy-storage-cali-con-edison-project/>.

<sup>16</sup> Eric Wesoff, Greentech Media, NextEra on Storage: ‘Post 2020, There May Never Be another Peaker Built in the US,’ September 30, 2015; <http://www.greentechmedia.com/articles/read/NextEra-on-Storage-Post-2020-There->

Finally, the heat rates of duct burners are approximately the same, or worse, than the efficiency of new internal combustion engine generators; in other words, the use of duct burners is very inefficient as a source of peaking generation capability. Addressing the least efficient part of a proposed facility, the duct burning peak topping generation, can significantly increase a plant's overall efficiency without redefining the project. There are numerous alternatives for short-term, peak power generation at the scale proposed for duct burning at the modified project that would achieve significant reductions in emissions of not only GHGs but also other pollutants. These include bulk energy storage options (standalone or with a solar hybrid configuration), a small combustion turbine, or using the auxiliary boiler for supplemental steam.

**Data Requests:**

10. Please provide a project-specific top-down BACT analysis for facility-wide GHG emissions.
  - a. Please include carbon capture and/or sequestration and bulk energy storage options (flywheel, compressed air, heat pumps, utility-scale batteries, etc.) in your analysis and analyze their potential to eliminate the use of duct burners.
  - b. Please specifically address the use of a solar photovoltaic and/or solar thermal component, both as a standalone component and/or in connection with the above energy storage options to reduce facility GHG emissions in your analysis.
  - c. Please specifically address the elimination of duct burners as an option, instead relying on bulk energy storage options (standalone or with a solar hybrid configuration), a small combustion turbine, or using the auxiliary boiler for supplemental steam as a source of peaking generation capability.
  
11. The Petition, Appendix 4.1F, refers to combined-cycle operations (turbines plus duct burners) and simple-cycle operations (without duct burners). Simple-cycle operations, *i.e.*, operations without heat recovery steam generators (“HRSGs”) are not discussed elsewhere in the Petition. Please verify that the modified project would not operate in simple-cycle mode and revise Appendix 4.1F accordingly or provide a discussion and analysis of simple-cycle operations.

**Background: SF<sub>6</sub> EMISSIONS FROM CIRCUIT BREAKERS**

The Petition provides estimates for CO<sub>2</sub>e emissions for facility potential to emit (“PTE”), which exclude emissions from emergency equipment (Table 4.1-6: 2,117,730 tons CO<sub>2</sub>e/year) and maximum facility emissions, which include emissions from emergency equipment (Table 4.1-13:

2,117,775 tons CO<sub>2</sub>e/year). Review of these estimates based on the calculations provided in the Petition, Appendix A, shows that these emissions estimates only include stationary combustion equipment; the calculations do not include emissions of sulfur hexafluoride (“SF<sub>6</sub>”) from circuit breakers. SF<sub>6</sub> is a potent GHG gas which must be included in the PTE and maximum facility emissions.

**Data Requests:**

12. Please provide estimates of SF<sub>6</sub> emissions from circuit breakers for the modified project.

**Background: GLOBAL WARMING POTENTIALS**

The direct global warming potential (“GWP”) is a relative measure of how much heat a greenhouse gas traps in the atmosphere; it compares the amount of heat trapped by a gas in question to the amount of heat trapped by carbon dioxide based on a certain time horizon. To calculate CO<sub>2</sub>-equivalent emissions, the Petition, Appendix 4.1A, Tables 4.1A-1A, 4.1A-5, and 4.1A-6, relies upon GWPs from the “IPCC/SAR,” *i.e.*, the *Second Assessment Report* (“SAR”) published by the International Governmental Panel on Climate Change (“IPCC”) in 1996. For methane (“CH<sub>4</sub>”) and nitrous oxide (“N<sub>2</sub>O”), the SAR established GWPs of 21 and 310 over a 100-year time horizon, respectively, which are incorporated into the Petition’s calculations. These GWPs have been updated since. In 2007, the IPCC’s *Fourth Assessment Report* (“AR4”) revised the GWP for CH<sub>4</sub> to 25 over a 100-year time horizon and the GWP for N<sub>2</sub>O to 298 over a 100-year time horizon;<sup>17</sup> EPA accordingly updated its GHG reporting rule in 2013.<sup>18</sup> The most recent IPCC report, the *Fifth Assessment Report* (“AR5”), which was finalized in November 2014, incorporates climate-carbon feedback and updates the GWP for methane to 34 over a 100-year time horizon,<sup>19</sup> a 36 percent increase over the IPCC’s 2007 recommendation<sup>20</sup> and a 62 percent increase over the IPCC’s 1996 recommendation<sup>21</sup> which the Petition relied upon.

**Data Requests:**

13. Please revise Project GHG emission estimates using the most recent GWPs over a 100-year time horizon established by the IPCC (34 for CH<sub>4</sub>, 298 for N<sub>2</sub>O, and 23,500 for SF<sub>6</sub>).

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<sup>17</sup> IPCC, Climate Change 2007, The Physical Science Basis, Table TS-2; [http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4\\_wg1\\_full\\_report.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4_wg1_full_report.pdf).

<sup>18</sup> EPA, 40 CFR Part 98, [EPA-HQ-OAR-2012-0934; FRL-9902-95-OAR], RIN 2060-AR52, 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantially Revised Data Elements, November 15, 2013, Table 2, page 21; <http://www.epa.gov/ghgreporting/documents/pdf/2013/documents/2013-data-elements.pdf>.

<sup>19</sup> IPCC, Climate Change 2013, The Physical Science Basis, Chapter 8: Anthropogenic and Natural Radiative Forcing, Appendix 8.A: Lifetimes, Radiative Efficiencies and Metric Values, Table 8.A.1; [http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5\\_ALL\\_FINAL.pdf](http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_ALL_FINAL.pdf).

<sup>20</sup> (34)/(25) = 1.36.

<sup>21</sup> (34)/(21) = 1.62.