

**DOCKETED**

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<b>Document Title:</b>	Statement of CEC Staff Approval of Post Certification Change
<b>Description:</b>	Hydrogen generation and energy storage clean energy project
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## **STATEMENT OF CEC STAFF APPROVAL OF POST- CERTIFICATION CHANGE PALOMAR ENERGY CENTER (01-AFC-24C)**

On August 12, 2021, and August 16, 2021, San Diego Gas & Electric Company (project owner) filed a petition for post-certification change (TNs 239299 and 239330) with the California Energy Commission (CEC) for the Palomar Energy Center (PEC).

The PEC is a 588-megawatt (MW) combined-cycle, natural gas facility (which includes the operation of two natural gas-fired, combustion turbine generators (CTGs), and a steam turbine generator) that was certified by the CEC on August 6, 2003, and began commercial operation on April 1, 2006. The facility is located in the city of Escondido in San Diego County, California.

### **DESCRIPTION OF PROPOSED CHANGE**

The project owner seeks approval for a hydrogen generation and energy storage clean energy project at the PEC and to install all of the following new equipment and facilities:

- Hydrogen generation and storage with the use of an electrolyzer and hydrogen storage vessels;
- 300 kilowatts of photovoltaic solar panels on canopies over existing parking areas; and
- A hydrogen fueling station for the project owner's on-site maintenance vehicles and off-site fleet vehicles (cars and trucks).

The hydrogen generator project would be used to produce hydrogen, which would be injected into the natural gas stream used in the CTGs and used for fueling hydrogen fuel-cell electric vehicles. Hydrogen generated on site would also be used for generator cooling and would replace the hydrogen stored on site in compressed gas cylinders, which are currently purchased from an off-site vendor.

For additional information, the [CEC's project webpage](#), <https://www.energy.ca.gov/powerplant/combined-cycle/palomar-energy-project>, has a link to the petition accessible through the webpage in the box labeled "Compliance Proceeding." Click on the option.

## **CEC STAFF REVIEW AND CONCLUSIONS**

California Code of Regulations, title 20, section 1769 requires a project owner to petition the CEC for the approval of any change the project owner proposes to the project design, operation, or performance requirements of a certified facility.

Consistent with California Code of Regulations, title 20, section 1769(a)(3)(A), the CEC technical staff (CEC staff) reviewed the petition for potential environmental effects; consistency with the applicable laws, ordinances, regulations, and standards (LORS); and PEC's conditions of certification. CEC staff has determined the modified PEC (1) would not have a significant effect on the environment, (2) would continue to comply with the applicable LORS and (3) would not require a change to, or deletion of, any conditions of certification as adopted in the Final Commission Decision (Final Decision) except for those related to Air Quality.

For the changes to the Air Quality conditions of certification in the Final Decision and consistent with California Code of Regulations, title 20 section 1769(a)(3)(B), CEC staff has determined that the modified PEC (1) would not have a significant effect on the environment, (2) would continue to comply with the applicable LORS, and (3) would not increase any daily, quarterly, annual, or other emission limit. The details of the proposed changes to Air Quality conditions of certification can be found under the Air Quality section in this Statement of Staff Approval.

Lastly, staff concluded the proposed change does not meet the criteria requiring the production of subsequent or supplemental review consistent with California Code of Regulations, title 14, section 15162(a).

CEC staff's conclusions for all technical and environmental areas are summarized in **Table 1**. The bases for each of CEC staff's conclusions are provided below the table.

**Table 1**  
**Summary of Conclusions for Each Technical Area**

Technical Areas Reviewed	CEQA				Conforms with applicable LORS
	Potentially Significant Impact	Less Than Significant Impact with Mitigation (with Revised or New COCs)	Less Than Significant Impact (with or without Existing COCs)	No Impact	
Air Quality			X		X
Biological Resources			X		X
Cultural Resources			X		X
Efficiency				X	
Facility Design					X
Geological and Paleontological Resources				X	X
Hazardous Materials Management			X		X
Land Use			X		X
Noise and Vibration			X		X
Public Health			X		X
Reliability					
Socioeconomics			X		
Soil and Water Resources				X	X
Traffic and Transportation			X		X
Transmission Line Safety and Nuisance				X	X
Transmission System Engineering					X
Visual Resources			X		X
Waste Management				X	X
Worker Safety and Fire Protection			X		X

Areas shown in gray are not subject to CEQA consideration or have no applicable LORS PEC must comply with.

## Environmental Setting

Staff reviewed CalEnviroScreen 4.0 data to determine whether the United States census tract where the MSP is located (6071011600) is identified as a disadvantaged community. This science-based mapping tool is used by the California Environmental Protection Agency (CalEPA) to identify disadvantaged communities based on geographic, socioeconomic, public health, and environmental hazard criteria pursuant to Health and Safety Code section 39711 as enacted by Senate Bill 535 (De León, Chapter 830, Statutes of 2012). The CalEnviroScreen 4.0 overall percentile score for this census tract is 57 and, thus, is not identified as a disadvantaged community<sup>1</sup>.

### AIR QUALITY

The proposed hydrogen storage and generation project would not increase any daily, quarterly, annual, or other emission limit. The proposed changes in the Air Quality conditions of certification (as described below) would align CEC's conditions of certification in the Final Decision with the requirements in the permits for PEC issued by the San Diego County Air Pollution Control District (SDAPCD).

The proposed hydrogen project would be constructed within the existing PEC footprint in an area currently used for storage and a parking lot. The area was extensively graded and disturbed during the initial power plant construction. The construction impacts of the proposed project would be less than significant. The project owner would also need to comply with the SDAPCD Rule 55 for fugitive dust control during the construction phase.

The generation of hydrogen in the electrically powered electrolyzer system would not result in direct operational emissions of pollutants. There could be indirect emissions due to the electricity used to operate the electrolyzer, but the criteria air pollutant emissions footprint of the electricity used cannot be specified. However, as the local electrical grid that might power the electrolyzer adds higher percentages of renewable sources of power generation, the indirect emissions due to electricity would diminish.

The addition of up to 2 percent of hydrogen as a fuel source for the natural gas turbines is not expected to increase emissions.

Greenhouse gas (GHG) emissions during the construction phase are considered short term because these emissions would cease once construction is complete, ensuring GHG emissions impacts are less than significant.

The project owner estimated the indirect GHG emissions from electricity use to operate the electrolyzer to be approximately 2,724 metric tons of carbon dioxide equivalent per year (MTCO<sub>2</sub>e/yr.), which is below the 10,000 MTCO<sub>2</sub>e/yr. significance threshold for industrial sources recommended by California Air Pollution Control Officers Association (CAPCOA). As stated above, it is expected that the percentage of renewable sources of power will increase and, thus, the indirect GHG emissions from electricity use at PEC would decrease.

In addition, burning hydrogen would not result in direct GHG emissions. The proposed project change would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

To ensure the CEC's conditions of certification in the Final Decision match the SDAPCD's permit requirements, the project owner proposes to revise Condition of Certification **AQ-2** to allow for the use of blended natural gas and up to 2 percent hydrogen fuel in the CTGs and revise Conditions of Certification **AQ-37** and **AQ-44** to require the monitoring of the hydrogen gas flow rate to the turbine and the quantity of hydrogen used. The project owner also proposes to revise Condition of Certification **AQ-28** to change the startup pivot temperature from 500 degrees Fahrenheit (°F) to 750°F, which is not related to the hydrogen project but rather ongoing PEC power plant operations. CEC staff also proposes the deletion of Conditions of Certification **AQ-50** through **AQ-55** for the completed Advanced Gas Path (AGP) upgrade project to match the current Authority to Construct (ATC) permit conditions as issued by the SDAPCD.

Please see the Air Quality analysis within this Statement of Staff Approval for additional details of CEC staff's conclusions, including Public Health and GHG emissions.

## **BIOLOGICAL RESOURCES**

The proposed installation of a hydrogen generation and energy storage project on the existing PEC site would entail no trench work and would occur in previously disturbed areas, impacting 18,000 square feet (ft<sup>2</sup>) of existing parking canopy for solar and 7,200 ft<sup>2</sup> for hydrogen generation. There is no native habitat remaining on the site, and, therefore, there would be no impacts associated with the loss of habitat. Conditions of Certification **BIO-2** (Designated Biologist Selection), **BIO-3** (Designated Biologist Duties), **BIO-4** (Designated Biologist Authority), **BIO-5** (Worker Environmental Awareness Program), and **BIO-8** (Construction Mitigation Management to Avoid Harassment or Harm) in the Final Decision would ensure any impacts to wildlife that may enter the work area would be less than significant and ensure the project continues to comply with LORS. No impacts to special-status vegetation would occur as the site is previously developed/disturbed.

## **CULTURAL RESOURCES**

As proposed, the installation of a hydrogen generation and energy storage project would not impact any known cultural resources. If construction and excavation were to go below the levels of previous disturbance, then buried, as-yet unknown cultural resources could be impacted. If native soils are encountered, Conditions of Certification **CUL-1** through **CUL-7** would require cultural resources monitoring in the area and would reduce any potential impact to a less than significant level. The proposed implementation of a hydrogen generation and energy storage project would also continue to comply with all applicable LORS.

## **EFFICIENCY**

Allowing for the use of an up to 2 percent blended hydrogen with natural gas, as proposed by the project owner, would not have an impact on PEC's overall heat rate and thermal efficiency.

## **FACILITY DESIGN**

The installation of a hydrogen generation and storage project with the use of electrolyzer and hydrogen storage vessels, 300 kilowatts of photovoltaic solar panels, and a hydrogen-fueling station for the project owner's on-site maintenance vehicles and off-site vehicles on the PEC must be in accordance with the 2019 edition of the California Building Standards Code. The implementations of the existing Facility Design conditions of certification adopted in the Final Decision in addition to construction compliance oversight by the CEC's delegate chief building official would ensure this compliance.

## **GEOLOGICAL AND PALEONTOLOGICAL RESOURCES**

There would be minimal ground disturbance within the existing PEC footprint in an area that has already been disturbed during original plant construction. Thus, no new or amended conditions of certification related to either paleontology, geology, or mineral resources are necessary. There will be no impact.

## **HAZARDOUS MATERIALS MANAGEMENT**

During the installation of the proposed new hydrogen generation and storage system, continued compliance with existing Condition of Certification **WORKER SAFETY-1** ensures the proposed project would not have a significant impact on the general public located off-site the PEC or the environment and would continue to comply with all applicable LORS.

## **LAND USE**

The impacts to land use would be less than significant. The installation of a hydrogen generation and storage project would occur entirely on the PEC and would not physically divide an existing community or conflict with any applicable habitat conservation plan or natural community conservation plan. The hydrogen generation and storage project also would be a use consistent with the land use designation and zoning. The implementation of existing Condition of Certification **LAND-1** would require the project owner to comply with the design and performance standards for Planning Area 1 as set forth in the Escondido Research and Technology Center Specific Plan. This condition would ensure that the hydrogen generation and storage project would not conflict with any applicable land use plan, policy, or regulation adopted by an agency for the purpose of avoiding or mitigating an environmental effect.

## **NOISE AND VIBRATION**

The construction associated with the installation of a hydrogen generation and storage project would be temporary and would occur during daytime hours, which are consistent

with the local requirements of the city of Escondido Municipal Code. Any noise generated during these activities would result in a less –than significant impact with the implementation of the existing conditions of certification for Noise in the Final Decision.

The installation of the hydrogen generation and storage vessels, photovoltaic solar panels, and a hydrogen-fueling station would not increase noise for nearby residents (approximately 1,000 feet away). Furthermore, the PEC would continue to meet the operational noise requirements set forth in the Final Decision. Therefore, the installation of a hydrogen generation and storage project would create a less –than significant impact due to operational noise.

### **PUBLIC HEALTH**

The use of diesel-powered construction equipment would emit diesel particulate matter, which is a carcinogen and a composite of toxic air contaminants (TACs) containing a variety of hazardous substances. CEC staff expects impacts to public health during the construction of the hydrogen generation and installation project would be less than significant.

There would be no direct impacts of TAC emissions from the operation of the proposed hydrogen generation and storage project. Public health impacts attributed to the proposed hydrogen generation and storage project would be less than significant.

There would be no increase in toxic emissions due to the proposed increase of startup pivot reheat bowl temperature from 500°F to 750°F.

Please see the Air Quality (including Public Health and GHG emissions) analysis included with this Statement of Staff Approval for details of CEC staff’s conclusions.

### **RELIABILITY**

Power plant reliability would remain the same.

### **SOCIOECONOMICS**

The installation of a hydrogen generation and storage project at PEC would require six to eight workers and take approximately six months to complete. The proposed modifications would not require any changes in the operations workforce. From a socioeconomics standpoint, the hydrogen generation and storage project would have insignificant workforce-related impacts on housing and community services.

### **SOIL AND WATER**

The installation of a hydrogen generation and storage project would be constructed on a previously disturbed site, and construction would occur on a previously disturbed, graded, and leveled area. If needed, the project owner would update the PEC’s Stormwater Pollution Prevention Plan to ensure that impacts to soils are minimized.

## **TRAFFIC AND TRANSPORTATION**

The installation and operation of the hydrogen generation and storage system and associated electrical equipment, solar photovoltaic panels, and hydrogen-fueling station would generate a minimal number of construction and operation trips and would not generate significant vehicle miles travelled. The hydrogen generation and storage project would not increase the number of operations employees, and while the hydrogen-fueling station would generate a small number (up to five) daily trips by hydrogen fuel-cell electric vehicles, the generation of hydrogen on-site would reduce the number of hydrogen delivery trips to the PEC. The construction would last approximately six months and generate a limited number of temporary trips, with approximately 18 daily trips during demolition, four daily trips during construction, and one daily trip during the architectural coating of the facilities. All construction would occur on-site and would not obstruct any components of the local transportation network. Applicable Conditions of Certification include **TRANS-1**, **TRANS-2**, and **TRANS-3**, which require the project owner obtain and report on any necessary transportation and encroachment permits. **TRANS-4** and **TRANS-5** are also applicable and require compliance with existing parking and traffic control plans. Impacts to the transportation system from the installation of the hydrogen generation and storage project would be less than significant.

## **TRANSMISSION LINE SAFETY AND NUISANCE**

The solar photovoltaic system will require an interconnection on-site, but no substantial changes to the off-site transmission system are anticipated due to the installation of hydrogen generation and storage project. Therefore, the impacts related to the transmission system are expected to be less than significant. The implementation of the existing conditions of certification adopted in the Final Decision would ensure continued compliance with LORS.

## **TRANSMISSION SYSTEM ENGINEERING**

Any changes to the switchyard must comply with LORS, and the project owner must submit a completed set of final as-built drawing for the PEC.

## **VISUAL RESOURCES**

The tallest structures proposed as part of the installation of a hydrogen generation and storage project, the electrolyzer equipment at 20 feet and the solar photovoltaic canopies at 15 feet, would be screened by an earthen berm to the east of the PEC and would not cause significant visual resources impacts. The implementation of existing Conditions of Certification **VIS-3**, **VIS-5**, **VIS-6**, and **VIS-9** would ensure that visual resources impacts would be less than significant. These conditions would minimize visual intrusion, contrast, glare, and lighting impacts, and would ensure the incorporation of measures into the design of the PEC to achieve consistency with the design standards and policies of the Escondido Research and Technology Center Specific Plan.

## **WASTE MANAGEMENT**

The installation of a hydrogen generation and storage system will result in minimal ground disturbance in previously disturbed areas of existing project footprint. No significant change in the quantity or type of solid waste generated would occur during construction or operation.

## **WORKER SAFETY AND FIRE PROTECTION**

During the installation of the proposed new hydrogen generating system, continued compliance with existing Condition of Certification **WORKER SAFETY-1** ensures the project change would not have a significant impact on worker health and safety and would comply with all applicable LORS.

## **Environmental Justice**

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**Environmental Justice – Figure 1** shows 2010 census blocks in the six-mile radius of the PEC with a minority population greater than or equal to 50 percent. The population in these census blocks represents an environmental justice (EJ) population based on race and ethnicity as defined in the United States Environmental Protection Agency's *Guidance on Considering Environmental Justice During the Development of Regulatory Actions*. Staff conservatively obtains demographic data within a six-mile radius around a project site based on the parameters for dispersion modeling used in staff's air quality analysis. Air quality impacts are generally the type of project impacts that extend the farthest from a project site. Beyond a six-mile radius, air emissions have either settled out of the air column or mixed with surrounding air to the extent the potential impacts are less than significant. The area of potential impacts would not extend this far from the project site for most other technical areas included in CEC staff's EJ analysis.

Based on California Department of Education data in the **Environmental Justice – Table 1**, staff concluded that the percentage of those living in the Escondido Union school district (in a six-mile radius of the PEC site) and enrolled in the free or reduced-price meal program is larger than those in the reference geography. Thus, the population in the

school district is considered an EJ population based on low income as defined in *Guidance on Considering Environmental Justice During the Development of Regulatory Actions*.

**Environmental Justice – Figure 2** shows where the boundaries of the school district are in relation to the six-mile radius around the PEC site.

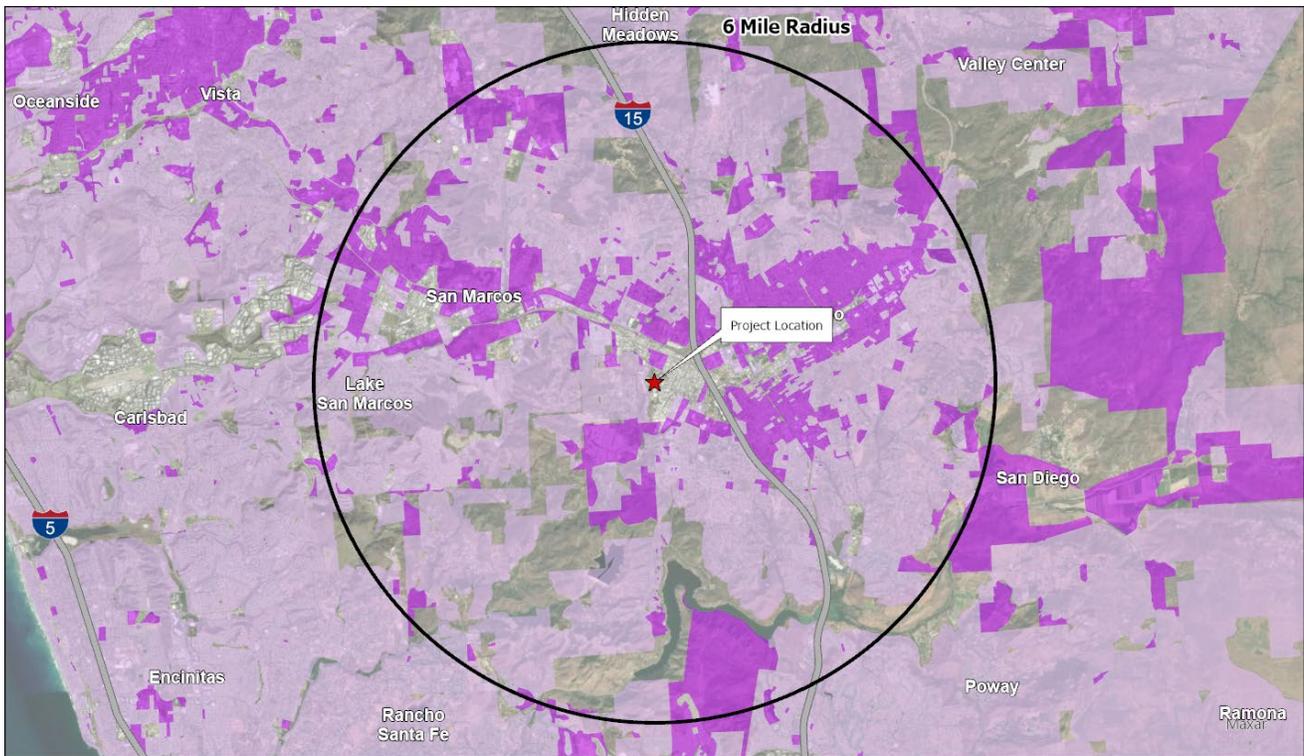
**Environmental Justice – Table 1  
 Low Income Data within the Project Area**

SCHOOL DISTRICTS IN SIX-MILE RADIUS	Enrollment Used for Meals	Free or Reduced-Price Meals	
Escondido Union	17,944	12,598	70.2%
Rancho Santa Fe Elementary	547	25	4.6%
San Marcos Unified	19,894	5,768	29.0%
REFERENCE GEOGRAPHY			
San Diego County	490,068	240,102	49.0%
<b>Source:</b> CDE 2021. California Department of Education, DataQuest, Free or Reduced-Price Meals, District level data for the year 2020-2021, < <a href="http://dq.cde.ca.gov/dataquest/">http://dq.cde.ca.gov/dataquest/</a> >.			

The following technical areas (if affected) consider impacts to EJ populations: Air Quality, Cultural Resources (indigenous people), Hazardous Materials Management, Land Use, Noise and Vibration, Public Health, Socioeconomics, Soil and Water Resources, Traffic and Transportation, Transmission Line Safety and Nuisance, Visual Resources, Waste Management, and Worker Safety and Fire Protection.

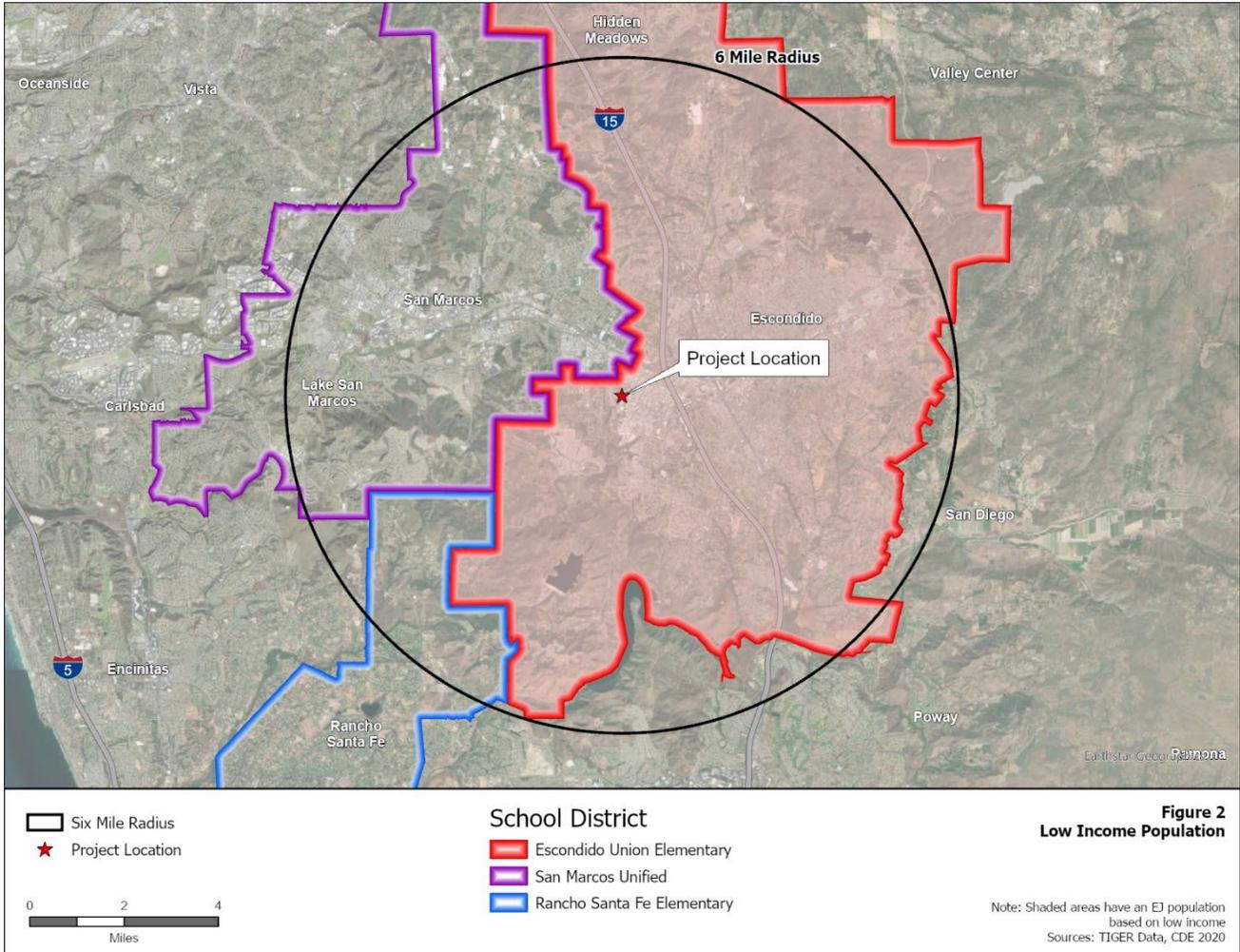
**Environmental Justice Conclusions**

For this petition, CEC staff concludes that impacts would be less than significant, and, thus, would be less than significant on the EJ population represented in **Environmental Justice – Figure 1, Figure 2, and Table 1**.



**Figure 1**  
**Minority Population and**  
**Disadvantaged Communities**

Sources: Census 2010 PL 94-171 Data



## **CEC STAFF DETERMINATION**

CEC staff has reviewed the petition pursuant to California Code of Regulations, title 20, section 1769(a) (Changes in Project Design, Operation, or Performance) and has determined the proposed changes meet all the required criteria for approval by CEC staff.

California Code of Regulations, title 20, section 1769(a)(3)(A) requires:

- i. There is no possibility that the change may have a significant effect on the environment, or the change is exempt from the California Environmental Quality Act;
- ii. The change would not cause the project to fail to comply with any applicable laws, ordinances, regulations, or standards; and
- iii. The change will not require a change to, or deletion of, a condition of certification adopted by the Commission in the Final Decision or subsequent amendments.

Additionally, California Code of Regulations, title 20, section 1769(a)(3)(B) requires when there is a change to Air Quality conditions of certification:

- i. The change meets the criteria in subdivisions (a)(3)(A)(i) and (ii); and
- ii. No daily, quarterly, annual or other emission limit will be increased as a result of the change.

CEC staff has first determined the proposed project change would result in no impacts or less than significant impacts on the environment and the project would remain in compliance with the applicable LORS, consistent with California Code of Regulations, title 20, section 1769(a)(3)(A). CEC staff secondly determines the proposed project change would require only a change to, or deletion of, Air Quality conditions of certification in the Final Decision. Those changes to the Air Quality conditions of certification would result in no impact or less than significant impacts on the environment, continued compliance with the applicable LORS, and no daily, quarterly, annual, or other emission limit being increased as a result of the change, consistent with California Code of Regulations, title 20, section 1769(a)(3)(B).

CEC staff also concludes that the proposed changes do not meet the criteria requiring production of subsequent or supplemental review as specified in California Environmental Quality Act Guidelines in California Code of Regulations, title 14, section 15162(a).

## **WRITTEN COMMENTS**

This statement of CEC staff approval of the proposed project changes has been filed in the docket for this project. Pursuant to California Code of Regulations, title 20, section 1769(a)(3)(C), any person may file an objection to CEC staff's determination within 14 days

of the filing of this statement on the grounds that the project change does not meet the criteria set forth in sections 1769(a)(3)(A) or 1769(a)(3)(B). Absent any objections as specified in section 1769(a)(3)(C), this petition will be approved 14 days after this statement is filed.

Written comments or objections to CEC staff's determination may be submitted using the CEC's e-Commenting feature, as follows: Go to the [CEC's project webpage](#) and click on either the "[Submit e-Comment](#)" link. When your comments are filed, you will receive an email with a link to them.

Written comments or objections may also be mailed to:

California Energy Commission  
Docket Unit, MS-4  
Docket No. 01-AFC-24C  
715 P Street  
Sacramento, CA 95814-5512

All comments and materials filed with the Docket Unit will be added to the facility Docket Log and be publicly accessible on the CEC's webpage for the facility.

If you have questions about this statement, please contact Keith Winstead, Compliance Project Manager, Office of Compliance, Monitoring, and Enforcement at (916) 208-3849 776-0609, or via e-mail at [Keith.Winstead@energy.ca.gov](mailto:Keith.Winstead@energy.ca.gov) or [Elizabeth.Huber@energy.ca.gov](mailto:Elizabeth.Huber@energy.ca.gov).

For information on public participation, please contact the Public Advisor, at (916) 957-7910 or email [publicadvisor@energy.ca.gov](mailto:publicadvisor@energy.ca.gov).

News media inquiries should be directed to the CEC Media Office at (916) 654-4989, or by email at [mediaoffice@energy.ca.gov](mailto:mediaoffice@energy.ca.gov).

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List Serve: Palomar Energy Center

**Palomar Energy Center (01-AFC-24C)**  
**Palomar Hydrogen Project**  
**AIR QUALITY, PUBLIC HEALTH, AND GREENHOUSE GASES**  
**Wenjun Qian, Ph.D., P.E.**

## **INTRODUCTION AND SUMMARY**

On August 12, 2021, San Diego Gas & Electric Company (SDG&E or project owner) submitted a petition (SDG&E 2021a) to the California Energy Commission (CEC) to implement a hydrogen generation and energy storage project at the Palomar Energy Center (PEC). The project owner proposes to install: 1) hydrogen generation and storage with the use of an electrolyzer and hydrogen storage vessels; 2) 300 kilowatts (kW) of photovoltaic (PV) solar panels on canopies over existing parking areas; and 3) a hydrogen-fueling station for the project owner's on-site maintenance vehicles and off-site fleet vehicles (cars and trucks).

These facilities would be used to produce hydrogen, which would be injected into the natural gas stream used in the combustion turbine generators (CTGs) and stored for fueling hydrogen fuel-cell electric vehicles (FCEVs) and for generator cooling, which is currently provided by purchasing hydrogen in compressed gas cylinders. On August 16, 2021, the project owner provided an updated petition with a corrected rated power of 2.5 megawatts (MW) for the electrolyzer (SDG&E 2021b). The project is proposed as a tool to meet the project owner's objective to move toward a 100 percent renewable and net zero carbon-free future.

The project owner submitted an application for the hydrogen project to the San Diego County Air Pollution Control District (SDAPCD) on December 16, 2021. The SDAPCD performed an engineering evaluation and issued an Authority to Construct (ATC) permit on February 3, 2022 (CEC 2022). On February 22, 2022, the project owner provided another updated petition to CEC to reflect the ATC issued by SDAPCD (SDG&E 2022).

To ensure the CEC conditions of certification language matches the SDAPCD permit conditions, the project owner proposes to revise Air Quality Condition of Certification **AQ-2** to allow for the use of blended natural gas and up to 2 percent hydrogen fuel in the CTGs and revise Conditions of Certification **AQ-37** and **AQ-44** to require the monitoring of the hydrogen gas flow rate to the turbine and the quantity of hydrogen used. The project owner also proposes to revise Condition of Certification **AQ-28** to change the startup pivot temperature from 500 degrees Fahrenheit (°F) to 750 °F, which is not related to the hydrogen project but ongoing operations. CEC staff also proposes the deletion of Conditions of Certification **AQ-50** through **AQ-55** for the completed Advanced Gas Path (AGP) upgrade project to match the current ATC permit conditions.

The modified project would comply with all laws, ordinances, regulations, and standards (LORS). Air quality, public health, and greenhouse gas emissions impacts from the evaluated changes would be less than significant, including the impacts to environmental justice populations. Therefore, there are no air quality, public health, or greenhouse gas emissions environmental justice issues related to the evaluated PEC modifications, and no minority or low-income populations would be significantly or adversely impacted.

## **LAWS, ORDINANCES, REGULATIONS, AND STANDARDS COMPLIANCE**

The 2003 Final Staff Assessment (FSA [CEC 2003]) included a detailed analysis of the LORS. The CEC staff (staff) has not identified any additional applicable LORS relative to the current petition. The CEC staff reviewed the petition and the SDAPCD evaluation for consistency with all federal, state, and SDAPCD LORS. The SDAPCD issued the ATC permit on February 3, 2022, demonstrating that the proposed changes would comply with all applicable LORS. The project owner needs to submit an application to the SDAPCD for a Minor Modification to the existing PEC Title V Operating Permit.

The proposed hydrogen project is not expected to affect the PEC's compliance with LORS. The conditions of certification in the Final Commission Decision (Final Decision) amendments thereafter ensure that the PEC would remain in compliance with all LORS.

## **ANALYSIS**

### **1. Air Quality**

#### *Construction*

The proposed hydrogen project would be constructed within the existing PEC footprint in an area currently used for storage and a parking lot. The area was extensively graded and disturbed during initial PEC construction. The solar PV installation and construction and testing of the hydrogen components would take approximately six months.

The project owner used the California Emissions Estimator Model (CalEEMod) version 2020.4.0 to estimate the construction emissions. The project owner ran CalEEMod in default mode for the land use category "General Light Industry" for the entire 7,000-square-foot project area. The analysis assumed maximum demolition debris of approximately 76 tons of old asphalt and concrete to clear the project area, or eight truckloads. No site preparation or grading would be necessary or performed. For fugitive dust control from exposed soil on the small, previously graded construction site, a twice daily water application was assumed in CalEEMod.

**Air Quality Table 1** shows the estimated daily (in pounds per day [lbs/day]) and annual emissions (in tons per year [tpy]) estimated for construction of the proposed hydrogen project. The San Diego County Guidelines for Determining Significance, Air Quality (County 2007) was used as a basis for determining the significance of the impact to air quality. **Air Quality Table 1** shows that the construction emissions would be much lower than the screening-level thresholds from the County's guidelines. The construction impacts of the proposed project would be less than significant, and an air quality impacts analysis is not required according to the County's guidelines.

In addition, CEC staff compared the construction emissions of the proposed project shown in **Air Quality Table 1** with those for the initial construction of the PEC shown in the 2003 FSA (CEC 2003). The construction emissions of the proposed hydrogen project would be less than 1 percent of those for the initial construction of the PEC. In addition, the proposed

project construction would not involve large earthmoving equipment and would be of a small size (7,000 square feet) and short duration (about six months). The project owner would need to comply with the SDAPCD’s Rule 55 for fugitive dust control during the construction phase. The CEC staff expects the air quality impacts of the proposed hydrogen project construction would be less than significant.

**Air Quality Table 1**  
**Daily and Annual Construction Emissions and Significance Evaluation**

Criteria Pollutants	Daily Emissions (lbs/day)	Screening-level Threshold (lbs/day)	Annual Emissions (tpy)	Screening-level Threshold (tpy)	Significance
VOC	16.43	75	0.1	13.7	Less than Significant
NOx	7.09	250	0.4	40	Less than Significant
CO	7.76	550	0.4	100	Less than Significant
SOx	0.01	250	0.0	40	Less than Significant
Total PM10	0.51	100	0.02	15	Less than Significant
Total PM2.5	0.36	55	0.02	10	Less than Significant

Sources: P 2021b, County 2007

***Operation***

The generation of hydrogen in the electrically powered electrolyzer system would result in no direct operational emissions of pollutants. The principal byproduct gas from electrolysis is oxygen (O<sub>2</sub>). There could be indirect emissions attributable to the production of electricity used to operate the electrolyzer. Since the electrolyzer electricity cannot be specifically tied to renewable generation, the emissions footprint of the electricity used cannot be specified. However, as the local grid that powers the electrolyzer adds higher levels of renewable generation, the indirect emissions would diminish.

The project owner expects the normal CTG operating condition to be a 1 percent blend of hydrogen in the natural gas fuel in one of the PEC’s CTGs, with the maximum design blend of 2 percent per CTG. Adding hydrogen to the fuel blend would increase the heating value of the fuel, but this increase is expected to be within the normal variability of the heating value of natural gas at these levels of hydrogen mixing. Increased combustion temperatures could increase emissions of NOx, but the post-combustion selective catalytic reduction (SCR) system would deal with any such increases and the facility would continue to comply with current emission limits. With the current oxidation catalysts in use on the two CTGs, PEC would continue to meet permit limits related to volatile organic compounds (VOC) and carbon monoxide (CO). The emissions of VOC, particulate matter (PM), CO, sulfur oxides (SOx) of the CTGs with blended hydrogen fuel are expected to be the same or less than

those with 100 percent pipeline-quality natural gas. Therefore, there is no expected emissions increase associated with adding negligible amounts of hydrogen as a fuel source for the gas turbines (CEC 2022).

In addition to the hydrogen project petition, the project owner worked with the SDAPCD to revise the steam turbine reheat bowl temperature<sup>1</sup> from 500°F to 750°F, which is used to determine whether a startup of the CTGs is considered a regular (120-minute) or an extended (360-minute) startup in permit condition 28. SDAPCD determined that a Best Available Control Technology (BACT) review is triggered for the proposed increase in reheat bowl temperature. In practice, the project owner has not consistently achieved emission standards within the regular 120-minute startup period when the bowl temperature is below 750°F. During instances when the turbine does not achieve regular emission standards within 120 minutes, the project owner has been doing a “double start” in which they shut off the equipment to avoid a violation of their permit conditions and then re-start the equipment. Alternatively, in order to meet emission limits within a 120-minute startup period, the site sometimes has to deviate from the recommended manufacturer’s procedures that causes excessive wear on the turbines. Since the equipment cannot consistently achieve compliance within 120 minutes at bowl temperatures below 750°F, it is not considered to be technologically feasible and cannot be considered BACT. Allowing extended startups at up to 750°F would eliminate the need for double starts and forced starts that could potentially lead to lower emissions overall and decreased wear and tear on the turbine. Therefore, this modification would be considered BACT (CEC 2022). No increase in actual emissions is expected. SDAPCD approved the increase of the reheat bowl temperature from 500°F to 750°F in permit condition 28. The change of the reheat bowl temperature would be consistent with LORS and would not lead to an increase in emissions.

## 2. Public Health

### *Construction*

The use of diesel-powered construction equipment would emit diesel particulate matter (DPM), which is a carcinogen and a composite of toxic air contaminants (TACs) containing a variety of hazardous substances. The 2003 FSA shows the health risks of the 21-month initial construction of the PEC was less than significant. The duration of the construction of the proposed hydrogen project would be much shorter (about six months). The construction of the proposed hydrogen project would not involve large earthmoving equipment and would be of small size (7,000 square feet). In addition, the PM emissions for the proposed project shown in **Air Quality Table 1** would only be less than 1 percent of those estimated for the initial construction of the PEC shown in the 2003 FSA. In addition, the project owner

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<sup>1</sup> The reheat bowl temperature is measured to indicate the metal temperature of the steam turbine. During a startup, especially after the steam turbine has been shut down for several days to cool down, the rate at which the steam system may be heated needs to be limited to prevent damage to the equipment due to thermal stress. Before the steam turbine is sufficiently heated, the gas turbine is unable to operate in its lowest NOx emitting combustion mode and add-on control systems such as selective catalytic reduction systems are not as efficient at lower temperatures.

would need to comply with the SDAPCD Rule 55 for fugitive dust control during the construction phase. Therefore, CEC staff expects impacts to public health during the construction of the proposed project would be less than significant.

### ***Operation***

The current oxidation catalysts in use on the two CTGs at PEC are expected to continue to meet SDAPCD's permit limits related to VOC and TACs when burning up to 2 percent hydrogen in the fuel. The PM emissions of the CTGs with blended hydrogen fuel would also be the same or less than those with 100 percent pipeline-quality natural gas. Therefore, there would be no direct impacts of TAC emissions from the operation of the proposed hydrogen project. Public health impacts due to the proposed hydrogen project would be less than significant.

There would be no increase in toxic emissions due to the proposed increase of startup pivot reheat bowl temperature from 500°F to 750°F.

## **3. Greenhouse Gas Emissions**

### ***Significance Criteria***

SDAPCD does not publish CEQA significance criteria related to greenhouse gas (GHG) emissions. The criteria published by San Diego County and the city of Escondido are used for this analysis.

Because the SDAPCD has not adopted numerical GHG thresholds, the SDAPCD relies on the 2018 San Diego County *Guidelines for Determining Significance, Climate Change* (County 2018) and the 2008 California Air Pollution Control Officers Association (CAPCOA) publication *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act* (CAPCOA 2008).

Per the County Guidelines, a proposed project would have a less than significant cumulatively considerable contribution to climate change impacts if it is found to be consistent with the County's Climate Action Plan (CAP) and would normally have a cumulatively considerable contribution to climate change impacts if it is found to be inconsistent with the CAP (County 2018).

Consistency with the County CAP is determined through the CAP Consistency Review Checklist for discretionary development projects (County 2018). However, the project falls outside the scope of the CAP Consistency Review because it is not a land use development project and would not be growth-inducing.

For industrial projects (stationary sources), the CAPCOA-recommended numeric GHG emissions threshold is 10,000 metric tons of carbon dioxide equivalent per year (MTCO<sub>2</sub>e/yr [CAPCOA 2008]). This threshold has been adopted by other California air districts, such as the South Coast Air Quality Management District (SCAQMD) and Bay Area Air Quality

Management District (BAAQMD). Projects with incremental increases below this threshold would not be considered cumulatively considerable.

The city of Escondido's 2021 CAP sets GHG reduction targets and proposes achievable, locally based strategies to reduce GHG emissions from both municipal and community activities (City 2021). To meet the city's 2030 and 2035 GHG reduction targets under Health and Safety Code sections 38550 and 38566 (AB 32 and SB 32, respectively), the 2021 city CAP defines nine GHG emissions reduction strategies and 31 specific measures across five source categories.

In addition, the 2019 Building Energy Efficiency Standards requires designed-in energy conservation features, such as high-efficiency lighting and high-efficiency electric motors for new construction (CEC 2019).

### ***Construction***

The project owner estimated the direct on-site and off-site GHG emissions for project construction using CalEEMod. The total annual construction GHG emissions would be 60 MTCO<sub>2</sub>e/yr. The project owner compared this with the CAPCOA industrial significance threshold of 10,000 MTCO<sub>2</sub>e/yr and concluded impacts would be less than significant. However, CEC staff understands that the 10,000 MTCO<sub>2</sub>e/yr significance threshold only applies to operational GHG emissions, not construction GHG emissions. CEC staff is not aware of any GHG significance threshold applicable for construction activities. Instead, some air districts, such as BAAQMD, recommend that GHG emissions from construction be quantified and disclosed. BAAQMD further recommends the incorporation of best management practices (BMPs) to reduce GHG emissions during construction, as feasible and applicable (BAAQMD 2017).

Because construction emissions would cease once construction is complete, they are considered short term. The quantity of construction related GHG emissions would be limited to occur only during the construction phase, which would ensure GHG impacts are less than significant.

### ***Operation***

The new hydrogen system would consist of five main groups of electrically powered components: the electrolyzer; two storage cylinder compressors (A/B); the utility air compressor; the paired hydrogen fueling station compressors; ancillary equipment, such as supervisory control and data acquisition (SCADA); and nighttime lighting. A 300-kW solar PV array would provide some offsetting renewable power that would decrease the amount of grid power used by the system in aggregate. But the majority of the electricity would be provided by the electrical grid. The project owner estimated the indirect GHG emissions from electricity use to be approximately 2,724 MTCO<sub>2</sub>e/yr, which is below the 10,000 MTCO<sub>2</sub>e/yr significance threshold for industrial sources recommend by CAPCOA. It should be noted that the estimated indirect GHG emissions were based on the project owner's power mix with a GHG content of approximately 542 pounds CO<sub>2</sub>e per megawatt-hour. As

the GHG content of the grid reduces over time, the indirect GHG emissions from electricity use would decrease. In addition, burning hydrogen would not result in direct GHG emissions. The proposed project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

In addition, the proposed project would be consistent with and directly support some of the city of Escondido's CAP strategies: increase the use of zero-emission or alternative fuel vehicles, reduce fossil fuel use, and increase renewable and zero-carbon energy. The hydrogen system, supplemented with on-site PV renewable power generation and a hydrogen vehicle fueling station, would support the use of zero-emission and alternative fuel vehicles, reduce fossil fuel use, and promote zero-carbon energy. Therefore, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

The proposed project would also utilize all-new equipment that meets current energy efficiency standards, such as high-efficiency electric motors and LED lighting. The proposed project would also offset approximately 10 percent of its energy requirements with on-site PV renewable power generation. The proposed hydrogen project would be in compliance with applicable energy efficiency standards.

The impact from GHG emissions during the operation of the proposed hydrogen project would be less than significant. And over time, as the GHG average from grid electricity available from the project owner for the electrolyzer improves (reduces), GHG emission rates from PEC would improve (decrease).

There would be no increase in GHG emissions due to the proposed increase of startup pivot reheat bowl temperature from 500°F to 750°F.

#### **4. Proposed Changes to the Conditions of Certification**

The project owner proposes to update the Air Quality conditions of certification to bring the Final Decision and the current SDAPCD air permit requirements and for the proposed project modifications into agreement.

The existing Condition of Certification **AQ-2** only allows the project owner to use California Public Utility Commission (PUC) quality natural gas in the CTGs. The project owner proposes to revise the condition to allow for the use of blended natural gas and up to 2 percent of hydrogen fuel in the CTGs. SDAPCD approved the proposed change to the ATC condition 2. Staff agrees.

SDAPCD also added a monitoring requirement for the hydrogen flow rate and the quantity of hydrogen used in ATC conditions 37 and 44. The project owner proposes the same changes to Conditions of Certification **AQ-37** and **AQ-44**. CEC staff agrees.

SDAPCD approved the increase of startup pivot reheat bowl temperature from 500°F to 750°F in permit condition 28. Project owner proposes to make the same change in Condition of Certification **AQ-28**. CEC staff agrees.

In addition, CEC staff noticed that the new ATC does not include conditions for the AGP upgrade project, which was approved in 2017. The CEC staff confirmed with SDAPCD that these conditions were only included in the previous ATC for the AGP upgrade. Since the AGP upgrade was completed in April 2021, these conditions are no longer needed. Therefore, the current ATC permit does not include these conditions. CEC staff proposes to delete Conditions of Certification **AQ-50** through **AQ-55** to be consistent with the current ATC permit.

## CONCLUSIONS AND RECOMMENDATIONS

CEC staff recommends the approval of the proposed hydrogen project. There would be no change in the permitted emissions limits at PEC. With the proposed revisions to Air Quality Conditions of Certification **AQ-2**, **AQ-28**, **AQ-37**, **AQ-44**, and deletion of Conditions of Certification **AQ-50** through **AQ-55**, the PEC would continue to comply with all applicable LORS.

## AMENDED CONDITIONS OF CERTIFICATION

The modifications to the Air Quality conditions of certification are included below. **Bold underline** indicates new language. ~~Strikethrough~~ indicates deleted language.

**AQ-2** The unit shall be fired on Public Utility Commission (PUC) quality natural gas **blended with up to 2% hydrogen by volume** only. The project owner shall maintain quarterly records of sulfur content (grains/100 dscf) and higher and lower heating values (Btu/dscf) of the ~~natural gas~~ **blended fuel** and provide such records to the District personnel upon request.

**Verification:** The project owner shall certify compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**) and shall make the site and data available for inspection by representatives of the District, ARB or Energy Commission.

**AQ-28** A startup period is the period of time that begins when fuel flows to the combustion turbine following a nonoperational period. For purposes of determining compliance with the emission limits of this permit, the duration of a startup period shall not exceed 120 consecutive minutes if the steam turbine reheat bowl temperature is above **750**~~500~~°F when the startup period begins and shall not exceed 360 consecutive minutes if the steam turbine reheat bowl temperature is less than or equal to **750**~~500~~°F when the startup period begins.

**Verification:** The project owner shall certify compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**) and shall make the site and data available for inspection by representatives of the District, ARB or Energy Commission.

**AQ-37** Continuous emission monitoring system (CEMS) shall be installed and properly maintained and calibrated to measure, calculate and record the following, in accordance with the District approved CEMS protocol:

- A. Hourly average concentration of Oxides of Nitrogen (NO<sub>x</sub>) corrected to 15 percent oxygen, in parts per million (ppmvd);
- B. Concentration of Carbon Monoxide (CO) corrected to 15 percent oxygen, in parts per million (ppmvd);
- C. Percent oxygen (O<sub>2</sub>) in the exhaust gas (%) for each clock hour period;
- D. Average concentration of Oxides of Nitrogen (NO<sub>x</sub>) for each rolling 3-hour period, in parts per million (ppmv) corrected to 15 percent oxygen;
- E. Hourly and Monthly mass emissions of Oxides of Nitrogen (NO<sub>x</sub>), in pounds;
- F. Rolling 12 month mass emissions of Oxides of Nitrogen (NO<sub>x</sub>), in tons;
- G. Hourly and monthly mass emissions of Carbon Monoxide (CO), in pounds;
- H. Annual mass emissions of Carbon Monoxide (CO), in tons.
- I. Natural gas flow rate to combustion turbine in scf/hr.
- J. Natural gas flow rate to duct burner in scf/hr.
- K. Concentration of Volatile Organic Compounds (VOC) corrected to 15 percent oxygen, in parts per million (ppmvd) for each rolling 3-hour period, based upon the approved VOC/CO surrogate relationship.
- L. Hourly and monthly mass emissions of VOC in pounds
- M. Rolling 12-month mass emissions of VOC in tons.

**N. Hydrogen gas flow rate to combustion turbine in scf/hr.**

The CEMS shall be in operation in accordance with the District approved CEMS monitoring protocol at all times when the combustion turbine is in operation. A copy of the District approved CEMS monitoring protocol shall be maintained on site and made available to District personnel upon request.

**Verification:** The project owner shall provide the information necessary for compliance with this condition in the permanent CEMS protocol required under Condition **AQ-36**.

**AQ-44** Operating logs or Data Acquisition System (DAS) records shall be maintained to record the beginning and end times and durations of all startups, shutdowns, low load operations, and tuning periods to the nearest minute; quantity of **natural gas** fuel-used (in each clock hour, calendar month, and 12 calendar month period) in standard cubic feet; **quantity of hydrogen used (in each clock hour, calendar month, and 12 calendar month period) in standard cubic feet,** hours of daily operation; and total cumulative hours of operation during each calendar year.

**Verification:** The project owner shall certify compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**) and shall make the site and data available for inspection by representatives of the District, ARB or Energy Commission.

~~**AQ-50** The conditions stated in this authorization shall take effect upon completion of construction of the modified equipment as described in applications APCD2015-APP-003970 and APCD2015-APP-003971. Any conditions referring to hour, day, month, year, clock hour, calendar day, calendar month or calendar year shall apply to the entire duration of that period if the equipment is operated for any portion of the corresponding period under this authorization. This condition does not relieve the owner or operator from complying with any other applicable conditions of other permits or authorizations.~~

~~**Verification:** The project owner shall make the site available for inspection of equipment and records by representatives of the District, ARB, and the Energy Commission.~~

~~**AQ-51** Prior to operating the modified emission unit, the project owner shall submit an initial certification of compliance, to the District and EPA, for the modified emission unit, in accordance with Rule 1414(f)(3)(ix), and 40 CFR 70.5(c)(9), that includes the identification of each applicable term or condition of the final permit for which the compliance status is being certified, the current compliance status and whether the modified equipment was in continuous or intermittent compliance during the certification period, identification of the applicable permitted method used to determine compliance during the certification period, and any other information required by the District to determine the compliance status. This requirement may be fulfilled by submitting District form 1401-I along with the construction completion notice. The modified equipment shall not be operated until written authorization is received from the District in accordance with Rule 1410(b)(2) or the project owner has submitted an application for an administrative amendment in accordance with Rule 1410(q)(6).~~

~~**Verification:** The project owner shall provide copies of all related correspondence with the District within 15 days of submittal/receipt to the CPM for review.~~

~~**AQ-52** Not later than 60 calendar days after completion of construction for each combustion turbine, an Initial Emissions Source Test shall be conducted on that turbine to demonstrate compliance with the NO<sub>x</sub>, CO, VOC, PM<sub>10</sub>, and ammonia emission standards of this permit. The source test shall be conducted according to an approved protocol if testing is not performed by the District and the protocol shall comply with all applicable requirements dictated in this permit for routine source tests and/or RATAs. The protocol shall be submitted to the District for approval at least 60 days prior to the proposed test date.~~

~~**Verification:** The project owner shall submit to the CPM for review and the District for approval the source test protocol at least 60 days prior to the proposed test date.~~

~~**AQ-53** After completion of construction, the NO<sub>x</sub> and O<sub>2</sub> CEMs described in this permit shall be recertified according to the timelines and applicable requirements of Sections 75.10 and 75.12 of Title 40, Code of Federal Regulations Part 75 (40 CFR75), the performance specifications of Appendix A of 40 CFR 75, the quality assurance procedures of Appendix B of 40 CFR 75 and the CEMs protocol approved by the District. The Carbon Monoxide (CO) CEMs shall be recertified in accordance with 40 CFR 60, Appendices B and F, unless otherwise specified in this permit.~~

~~**Verification:** The project owner shall demonstrate compliance with this condition and provide copies of all CEMs recertification documents within 15 days of submittal/receipt to the CPM for review.~~

~~**AQ-54** After completion of construction, a Relative Accuracy Test Audit (RATA) and all other required certification tests shall be performed and completed on the CEMS in accordance with applicable provisions of 40 CFR part 75 Appendix A and B performance specifications. At least 30 days prior to the test date, the project owner shall submit a test protocol to the District for approval. Additionally, the District shall be notified a minimum of 21 days prior to the test so that observers may be present.~~

~~**Verification:** The project owner shall submit to the CPM for review and the District for approval a test protocol at least 30 days prior to the proposed test date. The project owner shall also notify the CPM and District of the test date at least 21 days prior to conducting the RATA and other certification tests.~~

~~**AQ-55** At least 30 days prior to completion of construction of this equipment, the owner or operator shall submit a protocol to the District for approval to be used in calculating emissions to show compliance with all annual (ton/yr) emission limits of this permit. The protocol must contain the following information/meet the following requirements:~~

- ~~a. The protocol must provide procedures for calculating annual emissions of NO<sub>x</sub>, CO, VOC and PM<sub>10</sub>.~~
- ~~b. NO<sub>x</sub> and CO emissions from the combustion turbine shall be calculated using CEMS data during all periods CEMS data is valid. For all other times the protocol must specify data substitution procedures or other calculation methodology.~~
- ~~c. During all times except periods of startup, shutdown, low load operation and tuning, VOC and PM<sub>10</sub> emissions from the combustion turbine shall be calculated using measured fuel flow and/or operating time and the results of the most recent District witnessed source tests. The protocol shall specify procedures for calculating emissions during all other times for these pollutants.~~
- ~~d. Total emissions from the combustion turbines shall include the sum of all emissions during all periods of operation.~~

- e. ~~The protocol shall also specify procedures for calculating annual emissions from emission units located at this source, other than the combustion turbines, if they are subject to the annual emission limit included in this permit. These emissions shall be added to the totals for the combustion turbines to determine emissions from the stationary source.~~
- f. ~~For any parameter used in calculating emissions that is measured in more than one location (e.g. fuel flow) or using more than one monitoring protocol or procedure, an indication of which monitoring location, protocol or procedure will be used for this calculation.~~
- g. ~~Averaging times or other aggregation procedures for CEMS data if different than those specified in the applicable CEMS protocol.~~
- h. ~~For any instance where the CEMS protocol provides for correcting raw CEMS data prior to reporting, an indication of whether corrected or uncorrected data will be used for the calculation.~~

**Verification:** ~~The project owner shall submit to the CPM for review and the District for approval a protocol to be used in calculating emissions to show compliance with all annual emission limits at least 30 days prior to completion of construction of this equipment.~~

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