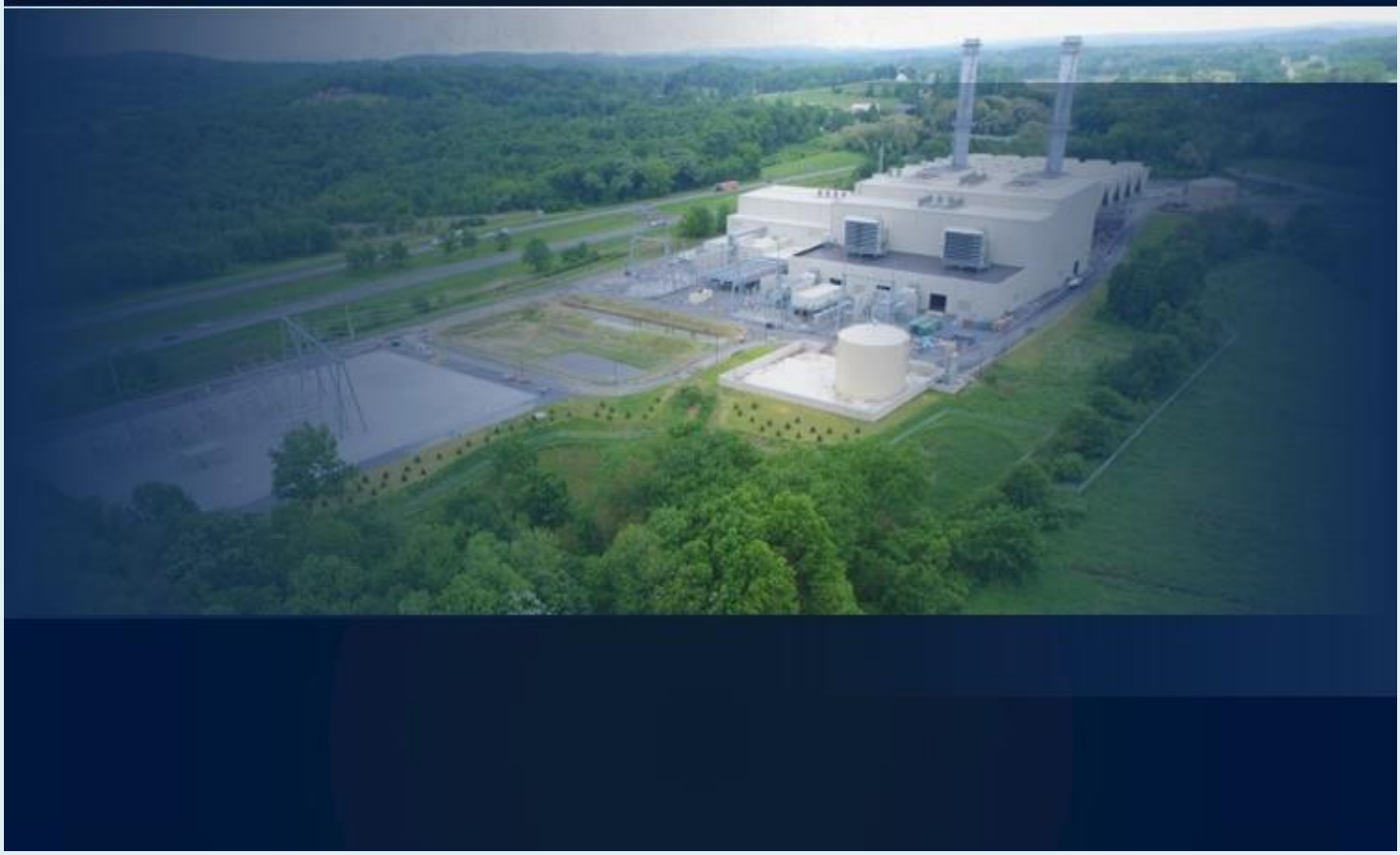
CPV Valley Energy Center

Responsible Energy Starts With Us



Disadvantaged Communities (DAC) Burden Analysis

June 25, 2024

Rev. November 22, 2024

CPV Valley, LLC

DEC ID 3-3356-00136/000010 & 00009

Table of Contents

B. Tables

C. Appendices

SECTION 1: INTRODUCTION, OBJECTIVE, AND OVERVIEW

This Disadvantaged Communities (DAC) Evaluation has been prepared by CPV Valley, LLC (hereinafter referred to as Applicant or Valley) to comply with the requirements of 6 NYCRR § 621.3(a)(13) and the New York State Department of Environmental Conservation (NYSDEC) Program Policy DEP 24-1, Permitting and Disadvantaged Communities (DEP 24-1) for the Valley Energy Center permit applications under Title V (Air) and Title IV (Acid Rain) of the Clean Air Act.

This report has been developed in accordance with the guidance and procedures established in DEP 24-1 to evaluate potential impacts associated with continued operation of the Valley Energy Center, in or likely to affect a DAC, that result in greenhouse gas (GHG), or co-pollutant emissions regulated pursuant to the Climate Leadership and Community Protection Act (Chapter 106 of the Laws of 2019) (the CLCPA), Article 75 of the Environmental Conservation Law (ECL). This DAC Evaluation provides the following:

Section 2: provides a project location and facility overview, a description of the proposed action, and relevant procedural history related to the Clean Air Act Title IV/V applications.

Section 3: discusses Valley Energy Center's compliance with CLCPA § 7(2) GHG emissions limits, project design, project justification, and project alternatives.

Section 4: provides spatial data and identifies surrounding DAC baseline risk indicators for Census Tracts 36071011801, 36071001500, and 36071001600.

Section 5: sets forth a DAC Burden Analysis, including GHG emissions data, co-pollutant emissions data, an evaluation of GHG co-pollutant emissions impacts to DACs, and analyzes other relevant existing burdens to DACs.

Section 6: discusses existing project benefits and additional immediately employable mitigation measures and benefits to nearby DACs in accordance with CLCPA § 7(3).

Section 7: discusses Applicant's Enhanced Public Participation efforts under 6 NYCRR 621.3(a)(13) and NYSDEC's CP-29.

Section 8: provides DAC Evaluation conclusions.

[*section 2 follows*]

SECTION 2: DESCRIPTION OF THE PROPOSED ACTION

A. Overview

Valley currently operates the Valley Energy Center, a nominal net 680-megawatt (MW) combined-cycle gas turbine electric generating facility, on a site located at 3330 Route 6, Middletown, NY 10940 - Town of Wawayanda, Orange County Tax Parcels 4-1-38.32, 4-1-38.3, and 4-1-40.22.

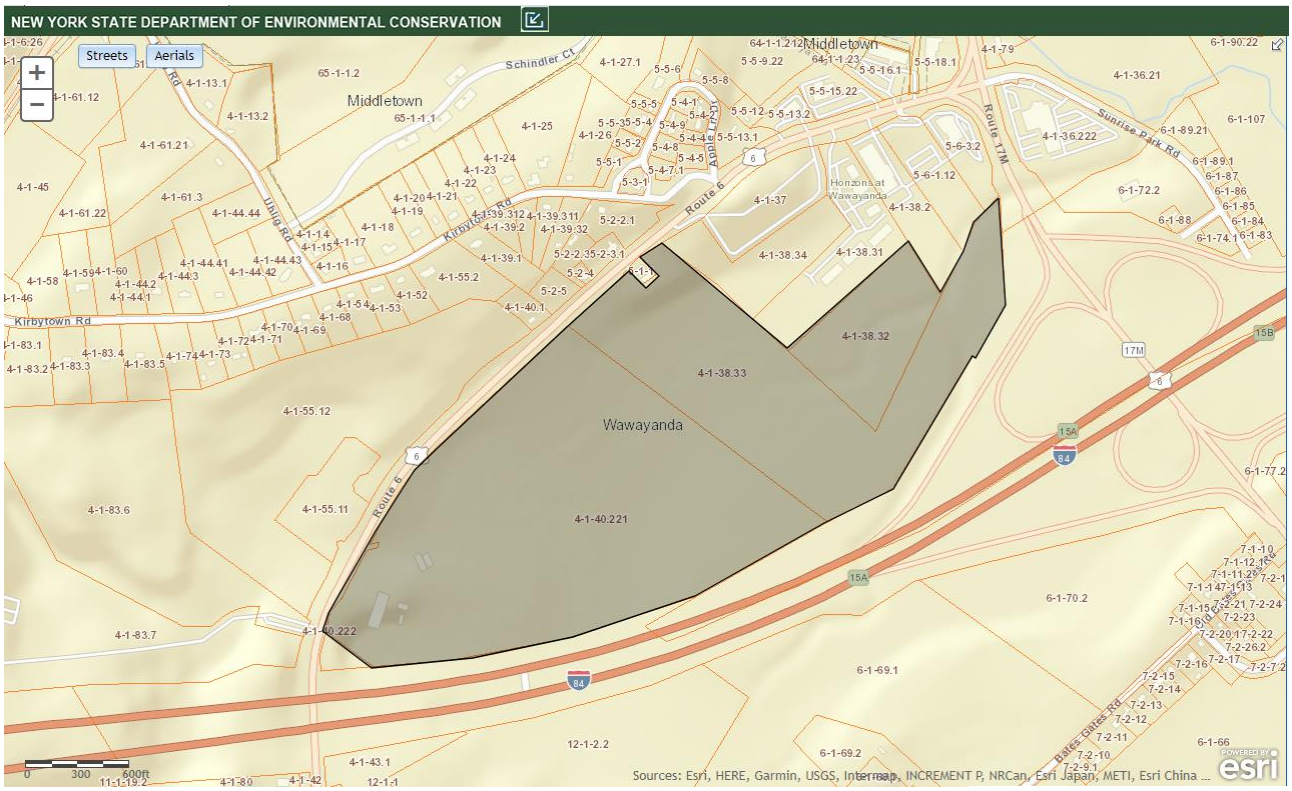


Figure 1: Project Location

The Valley Energy Center commenced operation in 2018 under an air state facility permit (ASF) (ASF Permit ID: 3-3356-00136/00001) and a pre-construction Prevention of Significant Deterioration (PSD) permit issued by the NYSDEC and continues to operate under the automatic permit extension provision in the State Administrative Procedure Act (SAPA) § 401 (2).

The Valley Energy Center was approved by the Town of Wawayanda Planning Board, acting as the lead agency under the State Environmental Quality Review Act (SEQRA) after a full environmental review and preparation of an environmental impact statement (EIS), including an enhanced public participation plan under the Commission's CP-29. The initial ASF permit for the Valley Energy Center was issued on August 1, 2013 and required Valley to apply for a Title V permit. Valley submitted applications for Title V and Title IV Acid Rain air permits to NYSDEC under to 6 NYCRR Part 201.

As one of the state's documented newest, most efficient, and highly flexible generating units, the Valley Energy Center is an important part of the New York State

electric generation and transmission system and will play an important part to reliably transition the State of New York to the increased use of intermittent renewable generation and energy storage in furtherance of state energy policy.

The Valley Energy Center's design features highly efficient technology and state-of-the-art emissions controls, making it one of New York's documented cleanest natural gas energy facilities in existence. The Valley Energy Center has enough electricity to power more than 650,000 homes, helping to meet the demand for local, affordable and reliable power in the lower Hudson Valley.

Figure 2. Existing Facility

B. Nature of Proposed Action

The proposed action is for the approval of an application for permits under Title V (Air) and Title IV (Acid Rain) of the Clean Air Act. (NYSDEC Application Id. No. 3-3356-00136/000010 & 00009) submitted on or about August 24, 2018 for the Valley Energy Center.

The Facility is a nominal net 680-megawatt (MW) combined-cycle gas turbine electric generating facility consisting of two Siemens F-class combustion turbine generators operating in combined-cycle mode with supplemental firing of the heat recovery steam generators. The Facility includes a natural gas-fired auxiliary boiler and an ultra-low-sulfur diesel fired emergency fire pump engine. The auxiliary boiler and emergency fire pump

engine have the same rating and emissions as those contained in the original ASF permit issued by NYS DEC. In addition to the air emitting equipment, the Facility has one steam turbine generator, an air-cooled condenser and associated auxiliary equipment and systems. Each combined cycle generating unit is exhausted through its own stack.

After a full environmental review, including the preparation of an environmental impact statement (EIS), the initial ASF permit for the Facility was issued on August 1, 2013 and required Valley to apply for a Title V permit within 1 year from start of operations. The Facility commenced operations in January 2018. Valley submitted applications for Title V and Title IV Acid Rain air permits to NYS DEC under to 6 NYCRR Part 201 in August 2018 as per the ASF permit condition and continued operations under SAPA § 401. Valley's application was deemed complete by the Department on May 27, 2019 commencing an 18-month technical review period under Part 201.

NYSDEC revoked its initial completeness determination and issued a Notice of Incomplete Application (NOIA) on November 29, 2020, in part, due to new requirements under Section 7 of the CLCPA. Since then, Valley has provided NYSDEC the following additional information showing compliance and consistency with the CLCPA:

1. March 8, 2021: Valley's response to NYSDEC's NOIA demonstrating that Valley's Application, if approved, would not interfere with the attainment of the CLCPA GHG emission limits established under ECL Article 75 and the Part 496 regulations along with a Greenhouse Gas Analysis[1]; demonstrating consistency with the state's long-term energy targets of a zero-emissions statewide electric system by 2040; and an assessment on how future physical climate risk has been considered in accordance with the Community Risk and Resiliency Act (CRRA).

2. March 30, 2021: Valley's response to NYSDEC's NOIA along with an Alternative Fuels analysis demonstrating the technical feasibility of using renewable natural gas (RNG) and hydrogen sourced using renewable energy at the Facility.

3. October 7, 2021: Valley's response to NYSDEC's August 20, 2021 Request for Information (RFI) along with a Supplemental Greenhouse Gas Analysis[2] regarding (1) methane assumptions, (2) individual GHG calculations displayed in carbon dioxide equivalents (CO2e), (3) upstream emission factors and calculations, (4) environmental justice considerations, and (5) additional technical and environmental feasibility of utilizing RNG or hydrogen at Valley's Facility.

4. April 22, 2022: Valley's response to NYSDEC's August 20, 2021 RFI along with an

[1] *Greenhouse Gas Analysis for CPV Valley Energy Center Title V Application* (ICF, Mar. 8, 2021, last revised January 6, 2023) (GHG Report) (attached as **Appendix 1**).

[2] *Supplement to March 8, 2021 Report - Greenhouse Gas Analysis for CPV Valley Energy Center Title V Application* (ICF, Oct. 7, 2021) (October 2021 Supplement) (attached as **Appendix 2**).

Additional Reliability Study[3] prepared by the New York Independent System Operator (NYISO) for the Facility and a Consultant Analysis[4] prepared by Hudson Energy Economics, LLC regarding the NYISO Study.

5. January 9, 2023: Valley's response to NYSDEC's August 24, 2022 RFI providing an analysis under Program Policy DAR-21 § V (E) of immediately employable mitigation, as well as longer-term options to achieve economywide GHG reductions consistent with the CLCPA along with (1) a second Supplemental GHG Analysis[5] using 2021/2022 statewide emission factors; (2) a Feasibility Report[6] providing an analysis of incorporating operational limits as a potential mitigation measure for consistency with the requirements of the CLCPA; and (3) Co-Pollutant Emissions Analysis[7] from each GHG source at the Facility including alternatives or mitigation measures to reduce the impact of those emissions on potential environmental justice (EJ) communities.

6. March 13, 2023: Valley's response to NYSDEC's August 24, 2022 RFI providing an assessment of alternative or additional immediately employable mitigation measures that prioritize reductions of GHG emissions and co-pollutants within Census Tract 36071011801 identified as a DAC; and an updated SEQRA Environmental Assessment Form (EAF) Part 1.

7. May 31, 2023: Valley's Revised Public Participation Plan in accordance with Commissioner Policy 29, Environmental Justice and Permitting (CP-29).

8. August 15, 2023: Revised SEQRA EAF Part 1 with corrections to methane emission calculations.

[*section 3 follows*]

[3] *Additional Reliability Study: CPV Valley* (NYISO, Mar. 09, 2022) (Reliability Study) (attached as **Appendix 3**).

[4] *CLCPA Project Justification - Grid Reliability* (Hudson Energy Economics, LLC, Apr. 21, 2022) (Reliability Study Analysis) (attached as **Appendix 4**).

[5] *Supplemental Greenhouse Gas Analysis for CPV Valley Energy Center Title V Application* (ICF, Jan. 6, 2023) (GHG Report Update) (attached as **Appendix 5**).

[6] *Supplemental Emissions Analysis for CPV Valley Energy Center Title V Application* (ICF, Jan. 6, 2023) (Feasibility Report) (attached as **Appendix 6**).

[7] *Measures and Alternatives to Mitigate the Impacts of Co-Pollutant Emissions from Greenhouse Gas Emission Sources*, (TRC Companies, Dec. 2022) (2022 Co-pollutant Report) (attached as **Appendix 7**).

SECTION 3: CLCPA § 7(2) CONSIDERATIONS

A. GHG Emissions Limits

CLCPA § 7(2) states, in part, that "[i]n considering and issuing permits . . . agencies . . . shall consider whether such decisions are inconsistent with or will interfere with the attainment of the statewide greenhouse gas emissions limits established in article 75 of the environmental conservation law." As discussed below in Section 5(A), and in Valley's prior submissions,[8] Valley has established that continuing its operations under a Title V permit is not inconsistent with and will not interfere with the attainment of the statewide GHG emissions limits. Indeed, the Valley Energy Center is precisely the type of highly efficient and dispatchable generation that is required to reliably transition the State of New York to the increased use of intermittent renewable generation and energy storage to meet the CLCPA.

B. Project Design

As an existing generation facility in operation, opportunities for design measures that ensure that the project will not disproportionately burden the disadvantaged community are limited. However, Valley Energy Center has been designed with state-of-the-art control technology which exceed regulatory requirements and is among the most efficient electric generating facilities in the state.[9]

The 2022 Co-pollutant Report details the mitigation measures already implemented at the Facility. These include use of more expensive but thermally efficient combined cycle combustion units that minimizes fuel use resulting in reduced / more efficient project heat rates[10] (meaning less GHG and co-pollutants emitted per unit of electricity generated), and reduced carbon dioxide equivalents released.[11] Each combined-cycle unit is equipped with an oxidation catalyst reducing products of incomplete hydrocarbon combustion, trace metals, CO, and VOC. The combined-cycle unit also utilizes dry low emission combustors and a selective catalytic reduction resulting in overall decreased NO_x formation and emission. The Facility also includes an auxiliary boiler to pre-heat steam plant reducing start-up duration where the combined-cycle units are less efficient.

In sum, Valley Energy Center's project design already incorporates these mitigation measures, requiring increased capital investment and ongoing additional operating and maintenance costs, but which results in quantifiable reductions in GHGs and its co-

[8] GHG Report (Appendix 1, Appendix 5).

[9] *See* Valley's January 9, 2023 response to NYSDEC's August 24, 2022 RFI.

[10] Project heat rates (in Btu/kWh) equal to 6,659 (2019); 6,938 (2020); 6,934 (2021); and 6,917 (2022) as compared to Valley's current permit limit of 7,605 Btu/kWh and a heat rate of 7,599 Btu/kWh for all Northeast Power Coordinating Council (NPCC) upstate New York subregion combustion generation plants.

[11] Project emitted 822 pounds of carbon dioxide equivalents released to generate one megawatt-hour of electricity (lb. CO2e/MWh) in 2020 as compared to Valley's current permit limit of 925 lb CO2e/MWh and other combustion generation plants, fossil fuel generation plants, and non-baseload generation plants located in the NPCC upstate New York subregion emitted, respectively, 836, 852, and 881 lb CO2e/MWh.

pollutants (*see* Section 5 (A) [discussing GHG emissions] and Section 5 (B) [discussing co-pollutant emissions]) when compared to both Valley's allowable permit limits and other non-baseload combustion generation plants in the NPCC upstate New York subregion.

The mitigation measures Valley has already implemented at the Facility results in "avoidance of impacts to any identified EJ areas" (Findings Statement at 38) and DACs, and the additional proposed mitigation measures discussed herein further confirms that Valley's continued operation does not disproportionately burden DACs and is consistent with the CLCPA.

C. Justification Statement

CLCPA § 7(2) also states, in part, that "[w]here such decisions are deemed to be inconsistent with or will interfere with the attainment of the statewide greenhouse gas emissions limits, each agency . . . shall provide a detailed statement of justification as to why such limits/criteria may not be met, and identify alternatives or greenhouse gas mitigation measures to be required where such project is located."

While there is no support that Valley's continued operation under a new Title V permit would be inconsistent with or would interfere with the attainment of the Statewide GHG emission limits, Valley previously submitted the NYISO) Reliability Study (Appendix 3), and the Reliability Study Analysis (Appendix 4) in support of Valley's Application. As detailed in the Reliability Study Analysis, without the Valley Energy Center as a generation resource (i) the loss of load expectation increases significantly and would exceed the resource adequacy criterion in 2031 and barely meet targets in 2030; (ii) a Transmission Security Analysis assuming no forced outages on generating units shows insufficient resources to meet the peak load plus operating reserve requirement in 2030; (iii) recognizing the risk of historic unit outage rates the NYISO will have insufficient resources to meet peak load plus reserves in every year from 2023 through 2031; (iv) assuming no forced outages on generating units the system will be 845 MW short of meeting 90/10 heatwave peak plus reserves in 2023 and more than 1,400 MW short in 2031; and (v) assuming historic generating unit outage rates the system would have insufficient resources to meet the 90/10 peak load in 2025 and would fail to meet the peak load by 540 MW in 2031.

NYISO's Study prepared for the Valley Energy Center is consistent with NYISO's recently released 2022 Reliability Needs Assessment[12] for the 2026-2032 study period, which in summary concludes amongst other findings that (i) with increased renewable intermittent generation for achievement of the CLCPA goal of 70% renewable energy by 2030, at least 17,000 MW of existing fossil generating units must be retained to continue to reliably serve forecasted demand; (ii) resource adequacy and transmission security margins are tightening over time across the New York State Bulk Power Transmission Facilities; (iii) demand forecast uncertainty or potential heatwaves of various degrees pose risks throughout the next ten years, especially in 2025; (iv) New York's current reliance on

[12] 2022 Reliability Needs Assessment (NYISO, 2022) accessible at https://www.nyiso.com/documents/20142/32940528/2022RNA_Draft1Report_forAug23ESPWG_v2.pdf/6289c7ab-ad8b-5531-a050-37a00c8024f0 (last accessed June 25, 2024).

neighboring electric systems is expected to continue through the next ten years and without emergency assistance from neighboring regions New York would not have adequate resources throughout the next ten years; and (v) extreme events such as heatwaves or storms could result in deficiencies to serve demand statewide, especially in New York City.

D. Project Alternatives

The Valley Energy Center is an operating electric generation facility contributing 680 MW of power to NYISO Zone G. The only alternative to allowing continued operations under a Title V permit is to deny the application, thereby forcing a plant closure, or imposing operational limits to reduce power output.

Given NYISO's resource adequacy concerns and forecast uncertainly discussed above, a forced shutdown would adversely impact reliability and transmission security and would result in an overall increase in state-wide or aggregate GHG emissions. This is because while such mitigation measures may result in onsite GHG emissions reductions, total state-wide or aggregate GHG emissions would actually increase, defeating the purpose of mitigation efforts. As one of the state's documented newest, most efficient, and highly flexible generating units, closure of Valley Energy Center would necessarily require older, dirtier, and less efficient plants go online to make up for any resource shortfalls. In such a scenario, there would be a significant resulting increase in economy-wide GHG emissions.

Similarly, operational limits could potentially cause Valley Energy Center to be unavailable during peak load periods leaving the grid operator with inadequate resources to meet peak load plus requirements. Not only would such limitations adversely impact reliability and transmission security, operational limitations on the Valley Energy Center intended as a GHG mitigation measure would also likely result in an overall increase in state-wide or aggregate GHG emissions. In such a scenario, there would be a resulting increase in GHG emissions when compared to a scenario where the Valley Energy Center did not have operational limits and was able to provide the same resource but with less GHG and co-pollutant emissions.

Such a result is not rational because it would have the exact opposite effect intended by the mitigation measure. A full analysis on why operational limits as a GHG mitigation measure is set forth in the Feasibility Report (Appendix 6).

[*section 4 follows*]

SECTION 4: DAC LOCATIONS

A. Spatial data

As background, CLCPA § 7(3) requires, in part, that in considering or issuing permits, State agencies shall not disproportionately burden DACs, which includes consideration of GHG co-pollutants. The CLCPA Climate Council's Climate Justice Working Group (CJWG) has developed a list identifying DACs to ensure that underserved communities benefit from the state's GHG reduction initiative. The CJWG has identified the following DACs in the Mid-Hudson region:

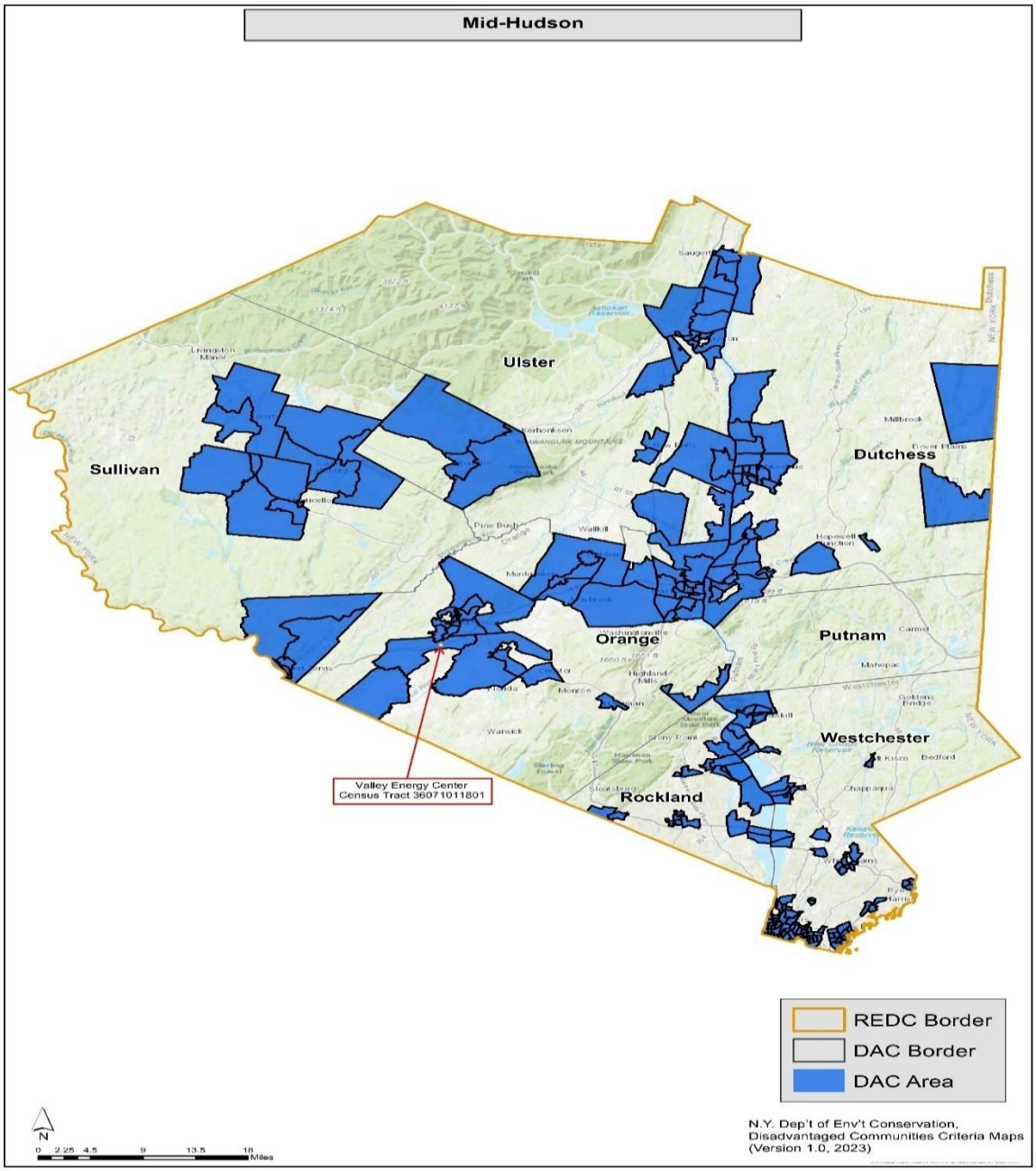


Figure 3. Mid-Hudson Region DACs

The Valley Energy Center is located within Census Tract 36071011801 (population 4,162) and is on the CJWG's list of DACs.[13]

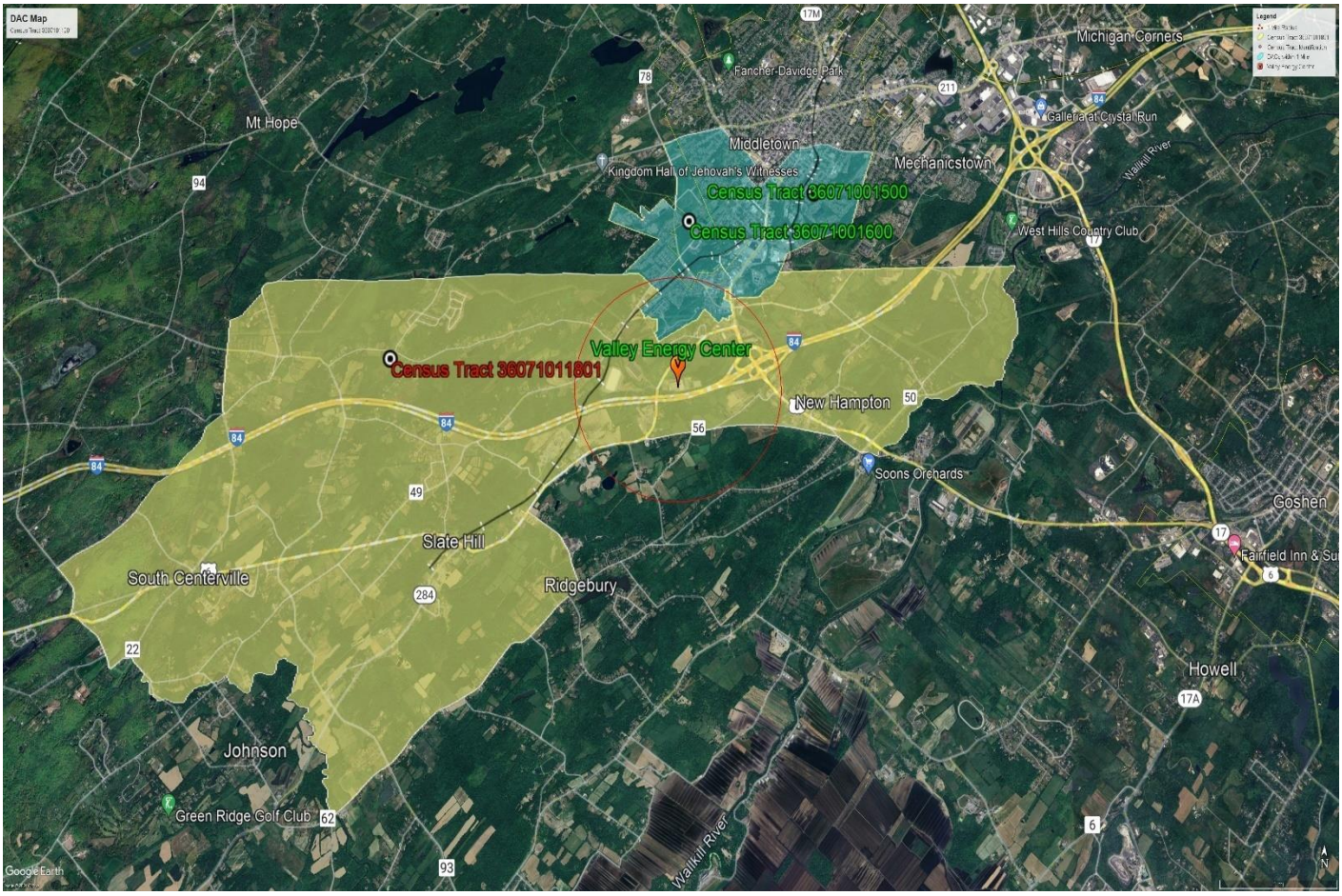


Figure 4. Spatial Data

In addition, the CJWG has identified Census Tracts 36071001500 (population 4,537) and 36071001600 (population 7,377) as DACs located within a one-mile radius of the Facility. CJWG DAC baseline data and risk indicators for Census Tracts 36071011801, 36071001500, and 36071001600 is discussed below.

[13] CJWG List of Disadvantaged Communities, *accessible at:* https://climate.ny.gov/-/media/Project/Climate/Files/Disadvantaged-Communities-Criteria/List-of-Disadvantaged-Communities.pdf (last accessed June 11, 2024).

B. Census Tract 36071011801 Baseline Data on Existing Burdens

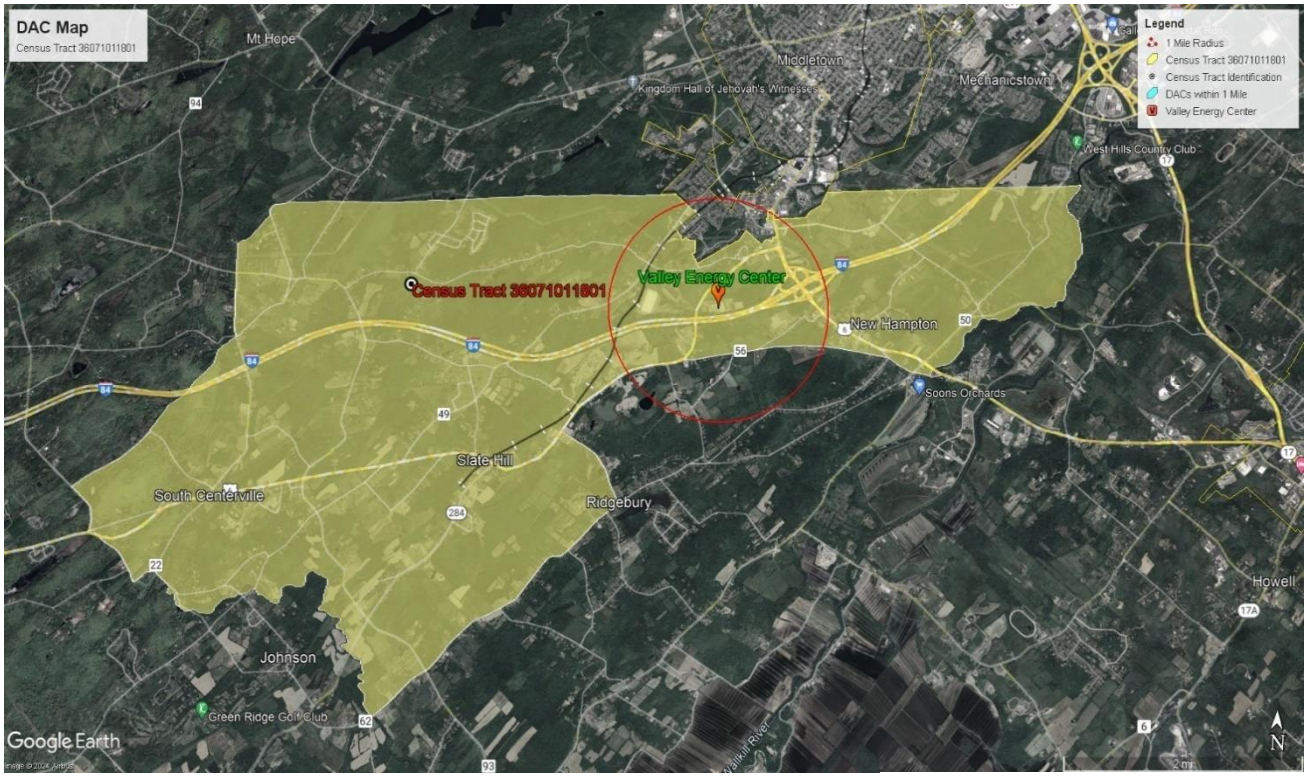


Figure 5. Census Tract 36071011801

Population Characteristics & Vulnerability

Health Impacts & Burdens	Asthma ED visits	24%
	COPD ED visits	31%
	Heart attack (MI) Hospitalization	56%
	Low Birthweight	68%
	Pct Adults Age 65+	26%
	Pct w/ Disabilities	61%
	Pct w/o Health Insurance	70%
	Premature Deaths	63%
Housing, Mobility, Communications	Energy Poverty / Cost Burden	83%
	Homes Built Before 1960	19%
	Housing Cost Burden (Rental C..	65%
	Manufactured Homes	65%
	Pct Renter-Occupied Homes	40%
	Pct w/o Internet (home or cellul..	30%
Income	Pct <100% of Federal Poverty ..	69%
	Pct <80% Area Median Income	15%
	Pct Single-Parent Households	84%
	Pct w/o BachelorÆs Degree	38%
	Unemployment Rate	54%
Race/Ethnicity	Limited English Proficiency	9%
	Pct Asian	47%
	Pct Black or African American	62%
	Pct Latino/a or Hispanic	66%
	Pct Native American or Indigen..	85%

Environmental Burden & Climate Change Risk

Land Use & Historic Discrimination	Active Landfills	0%
	Housing Vacancy Rate	42%
	Industrial/Manufacturing/Mining La..	12%
	Major Oil Storage Facilities	27%
	Municipal Waste Combustors	0%
	Power Generation Facilities	29%
	Regulated Management Plan (Ch..	70%
	Remediation Sites	0%
	Scrap Metal Processing	75%
Potential Climate Change Risk	Agricultural Land Use	80%
	Coastal Flooding and Storm Risk ..	0%
	Driving Time to Urgent/Critical Care	92%
	Extreme Heat Projections (>90? d..	63%
	Inland Flooding Risk Areas	40%
	Low Vegetative Land Cover	16%
Potential Pollution Exposure	Benzene Concentration (Modeled)	23%
	Particulate Matter (PM2.5)	39%
	Traffic: Diesel Trucks	92%
	Traffic: Number of Vehicles	27%
	Wastewater Discharge	52%

Figure 6. DAC Indicators for Census Tract 36071011801

C. Census Tract 36071001500 Baseline Data on Existing Burdens

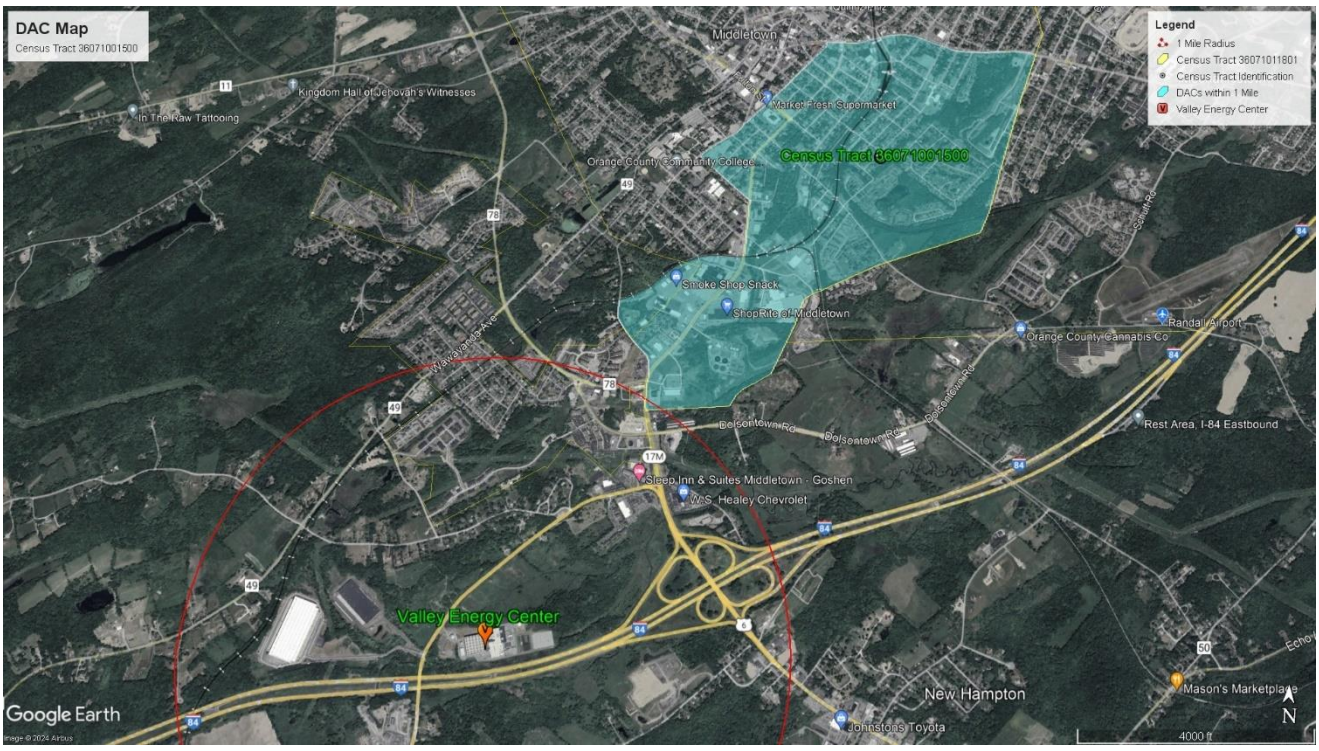


Figure 7. Census Tract 36071001500

Population Characteristics & Vulnerability

Health Impacts & Burdens	Asthma ED visits	73%
	COPD ED visits	86%
	Heart attack (MI) Hospitalization	63%
	Low Birthweight	48%
	Pct Adults Age 65+	35%
	Pct w/ Disabilities	75%
	Pct w/o Health Insurance	83%
	Premature Deaths	70%
Housing, Mobility, Communications	Energy Poverty / Cost Burden	83%
	Homes Built Before 1960	36%
	Housing Cost Burden (Rental C..	36%
	Manufactured Homes	14%
	Pct Renter-Occupied Homes	61%
	Pct w/o Internet (home or cellul..	87%
Income	Pct <100% of Federal Poverty ..	73%
	Pct <80% Area Median Income	85%
	Pct Single-Parent Households	79%
	Pct w/o Bachelor's Degree	80%
	Unemployment Rate	6%
Race/Ethnicity	Limited English Proficiency	60%
	Pct Asian	65%
	Pct Black or African American	74%
	Pct Latino/a or Hispanic	89%
	Pct Native American or Indigen..	97%

Environmental Burden & Climate Change Risk

Land Use & Historic Discrimination	Active Landfills	0%
	Housing Vacancy Rate	69%
	Industrial/Manufacturing/Mining La..	84%
	Major Oil Storage Facilities	0%
	Municipal Waste Combustors	0%
	Power Generation Facilities	54%
	Regulated Management Plan (Ch..	88%
	Remediation Sites	87%
	Scrap Metal Processing	0%
Potential Climate Change Risk	Agricultural Land Use	43%
	Coastal Flooding and Storm Risk ..	0%
	Driving Time to Urgent/Critical Care	79%
	Extreme Heat Projections (>90? d..	63%
	Inland Flooding Risk Areas	81%
	Low Vegetative Land Cover	45%
Potential Pollution Exposure	Benzene Concentration (Modeled)	37%
	Particulate Matter (PM2.5)	38%
	Traffic: Diesel Trucks	24%
	Traffic: Number of Vehicles	30%
	Wastewater Discharge	75%

Figure 8. DAC Indicators for Census Tract 36071001500

D. Census Tract 36071001600 Baseline Data on Existing Burdens

Figure 9. Census Tract 36071001600

Population Characteristics & Vulnerability

Health Impacts & Burdens	Asthma ED visits	73%
	COPD ED visits	86%
	Heart attack (MI) Hospitalization	63%
	Low Birthweight	48%
	Pct Adults Age 65+	50%
	Pct w/ Disabilities	75%
	Pct w/o Health Insurance	39%
	Premature Deaths	70%
Housing, Mobility, Communications	Energy Poverty / Cost Burden	83%
	Homes Built Before 1960	14%
	Housing Cost Burden (Rental C..	80%
	Manufactured Homes	0%
	Pct Renter-Occupied Homes	57%
	Pct w/o Internet (home or cellul..	24%
Income	Pct <100% of Federal Poverty ..	56%
	Pct <80% Area Median Income	51%
	Pct Single-Parent Households	72%
	Pct w/o BachelorÆs Degree	78%
	Unemployment Rate	68%
Race/Ethnicity	Limited English Proficiency	39%
	Pct Asian	47%
	Pct Black or African American	80%
	Pct Latino/a or Hispanic	86%
	Pct Native American or Indigen..	11%

Environmental Burden & Climate Change Risk

Land Use & Historic Discrimination	Active Landfills	0%
	Housing Vacancy Rate	31%
	Industrial/Manufacturing/Mining La..	0%
	Major Oil Storage Facilities	0%
	Municipal Waste Combustors	0%
	Power Generation Facilities	46%
	Regulated Management Plan (Ch..	77%
	Remediation Sites	0%
	Scrap Metal Processing	0%
Potential Climate Change Risk	Agricultural Land Use	50%
	Coastal Flooding and Storm Risk ..	0%
	Driving Time to Urgent/Critical Care	82%
	Extreme Heat Projections (>90? d..	63%
	Inland Flooding Risk Areas	35%
	Low Vegetative Land Cover	33%
Potential Pollution Exposure	Benzene Concentration (Modeled)	33%
	Particulate Matter (PM2.5)	38%
	Traffic: Diesel Trucks	28%
	Traffic: Number of Vehicles	25%
	Wastewater Discharge	67%

Figure 10. DAC Indicators for Census Tract 36071001600

SECION 5: DAC BURDEN ANALYSIS

A. GHG Emissions

In support of its Applications, Valley submitted the GHG Report (Appendix 1) in response to NYSDEC's November 29, 2020 NOIA The GHG Report was updated by October 2021 Supplement (Appendix 2) providing data for each individual GHG emitted in CO_2e using the Global Warming Potential-20 (GW20); and the January 6, 2023 GHG Report Update (Appendix 5) providing updated GHG calculations based on new emissions factors set forth in Appendix A of the Department's 2021 Statewide GHG Emissions Report and the 2022 Statewide GHG Emissions Report (GHG Report, October 2021 Supplement, and GHG Report Update, collectively referred to as GHG Report). In addition, Valley submitted the Feasibility Report (Appendix 6) providing an analysis of incorporating operational limits as a potential mitigation measure for consistency with the requirements of the CLCPA.

The GHG Report demonstrates that Valley's Application, if approved, would not interfere with the attainment of the CLCPA GHG emission limits established under ECL Article 75 and the Part 496 regulations. The GHG Report analyzed the impact on both direct and indirect (upstream) GHG emissions associated with the operation of the Facility. The analysis shows that between 2025 and 2040, operation of the Facility results in a significant reduction of direct and upstream GHG emissions in NYS (GHG Report § 2.3). These net annual reductions in GHG emissions are attributed to the fact that the Facility is one of the most efficient thermal generators in NYS, displacing less efficient (and higher emitting) generation sources, without any negative impact to renewable generation (GHG Report § 2.2). The analysis of the Facility's GHG emission impacts are fully set forth in section 4.2. This section shows the GHG emissions from less efficient NYS generators anticipated to be displaced (GHG Report § 4.2, Supplemental Table 4-8b), impact of the Facility on GHG emissions (GHG Report § 4.2, Table 4-9b), and net reduction on statewide GHG emissions from the Facility's operation (GHG Report § 4.2, Supplemental Table 4-10b).

B. Co-Pollutant Emissions

The CLCPA defines co-pollutants as hazardous air pollutants (HAPs) that are emitted by a sources that emits GHG. These criteria co-pollutants include nitrogen oxides (NO_X), carbon monoxide (CO), volatile organic compounds (VOC), sulfur dioxide (SO_2), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), and ozone (O_3) and its precursors.

Valley commissioned TRC Environmental Corp. to undertake and update co-pollutant calculations in 2022 set forth in the 2022 Co-pollutant Report (Appendix 7).

Since Valley has now been in operation for over four years under an ASF permit, the 2022 Co-pollutant Report is based, in part, on actual reported emissions data for each of its six emission sources, rather than projected data that was used in the EIS. The 2022 Co-

pollutant Report provides emissions data on all HAPs. A summary of the criteria co-pollutant calculations set forth in the 2022 Co-pollutant Report is as follows:

***Table 1**: Co-pollutant Potential to Emit (PTE) calculations for the two combustion turbines and their associated duct-burners*

Co-Pollutant	Emissions for Two Units (ton/yr)		
	Case 1 8,760 hr/yr Nat Gas	Case 2 8,760 hr/yr Nat Gas	Maximum of Cases 1 & 2
Criteria Pollutants			
NOx	146	171	171
CO	115	113	115
VOC	28.0	28.1	28.1
SO_2	42.1	40.9	42.1
PM2.5 / PM10	108	137	137
Total HAPs	10.1	11.4	11.4

***Table 2**: Co-pollutant PTE calculations for the auxiliary boiler*

Co-Pollutant	Emission Factor (lb/MMbtu)	Hourly Emission (lb/hr)	Annual Emission (ton/yr)
Criteria Pollutants			
NOx	0.05	2.29	2.29
CO	0.08	3.85	3.85
VOC	5.39E-3	0.25	0.25
SO_2	5.88E-4	0.03	0.03
PM2.5 / PM10	7.45E-3	0.35	0.35
Total HAPs			0.09

***Table 3**: Co-pollutant PTE calculations for the emergency diesel generator*

Co-Pollutant	Emission Factor (lb/MMbtu)		Hourly Emission (lb/hr)	Annual Emission (ton/yr)
	(lb/MMbtu)	(g/kWh)		
Criteria Pollutants				
NOx		5.42	13.3	3.33
CO		0.80	1.97	0.49
VOC		0.23	0.57	0.14
SO_2	1.53E-03		2.36E-02	5.90E-03
PM2.5 / PM10		0.80	1.97	0.49
Total HAPs				5.34E-03

***Table 4**: Co-pollutant PTE calculations for the firewater pump engines*

Co-Pollutant	Emission Factor (lb/MMbtu)	Hourly Emission (lb/hr)	Annual Emission (ton/yr)
Criteria Pollutants			
NOx	0.0364	0.46	2.00
CO	0.073	0.92	4.02
VOC	0.005	0.06	0.28
SO_2	5.88E-4	7.39E-3	0.03
PM2.5 / PM10	7.45E-3	0.09	0.41
Total HAPs			1.94E-03

***Table 5**: Co-pollutant PTE calculations for the two fuel gas heaters*

Co-Pollutant	Emission Factor (lb/MMbtu)	Hourly Emission (lb/hr)	Annual Emission (ton/yr)
Criteria Pollutants			
NOx	0.0364	0.46	2.00
CO	0.073	0.92	4.02
VOC	0.005	0.06	0.28
SO_2	5.88E-4	7.39E-3	0.03
PM2.5 / PM10	7.45E-3	0.09	0.41
Total HAPs			2.17E-01

***Table 6**: Total Annual PTE (pounds / year)*

Co-Pollutant	Potential to Emit (lb/yr)					
	EU 1 & 2	EU 3	EU 4	EU 5	EU 6	Total
Criteria Pollutants						
NOx	341,758	4,578	6,662	683	4,008	357,689
CO	230,148	7,692	983	440	8,032	247,295
VOC	56,125	504	283	38.2	550	57,499
SO_2	84,104	54.9	11.8	1.54	64.7	84,237
PM2.5 / PM10	273,114	696	983	36.6	820	275,649
Total HAPs	22,767	173	10.7	3.87	435	23,389

Co-pollutant impacts on EJ communities were also evaluated in the Draft Environmental Impact Statement (DEIS) at § 7.5 (**Appendix 8**), Final Environmental Impact Statement (FEIS) at § 4.1.16 **(Appendix 9**), and the SEQRA Findings Statement (**Appendix 10**).

The EJ analysis considered disproportionate adverse human health and environmental impacts on minority and low-income populations using methodologies based upon the NYSDEC EJ Policy (CP-29, Environmental Justice and Permitting, Mar. 19, 2003) and federal guidance documents prepared by the United States Environmental Protection Agency (USEPA) for use in preparing a National Environmental Policy Act environmental justice analysis.

The DEIS also includes a substantive EJ analysis evaluating relevant data showing the maximum predicted impacts of CO, SO_2, PM_{10}, and NO_2 (DEIS § 7.5.4.1) for comparison with significant impact levels (SILs), as well as the sum of maximum Project impacts with conservative background air quality levels so that total predicted concentrations can be compared to the corresponding National Ambient Air Quality Standards (NAAQS) as set forth in DEIS Table 7-16 (Appendix 8).

Table 7*: DEIS Maximum Modeled Concentrations*

Pollutant	**Averaging Period**	**SIL ($\mu g/m^3$)**	**NAAQS ($\mu g/m3$)**	**Background Concentration b/ ($\mu g/m^3$)**	**Maximum Ground-Level Project Impact ($\mu g/m^3$)**	**Total Ground-Level Concentration c/ ($\mu g/m^3$)**
CO	1-Hour	2,000	40,000	3,898	563	4,456
	8-Hour	500	10,000	3,206	182	3,382
SO_2	3-Hour	25	1,300	55.0	3.3	58
	24-Hour	5	365	28.8	0.6	29
	Annual	1	80	5.2	0.04	5.2
PM_{10}	24-Hour	5	150	78	9.9	88
	Annual	1	50	35	0.2	35
NO_2	Annual	1	100	41.4	0.8	42

Notes:

a/ Maximum modeled ground-level concentration due to the worst case overall facility operating scenario (i.e., the facility operating scenario that resulted in the maximum modeled air quality impact) for each pollutant.

b/ Background concentrations are the highest second highest short term (1-, 3-, 8-, and 24-hour) and maximum annual concentrations.

c/ Total concentration = background concentration + maximum modeled (i.e., ground-level) concentration.

Source: TRC Environmental Corp.

As concluded in the EJ analysis, (1) the Facility "is not considered to have any adverse air quality impacts"; the study area "will not receive a disproportionate share of the maximum short-term Project Impacts"; and that "the maximum predicted annual impacts are always below the corresponding SIL, so there will be no adverse impact from the Project. (DEIS § 7.5.4.1) (Appendix 8).

The EJ analysis also considered and found no adverse / disproportionate impacts throughout the EJ area regarding traffic and transportation impacts, noise impacts; visual impacts, and impacts on water resources.

In the SEQRA Findings Statement, the Town of Wawayanda Planning Board, serving as the SEQRA Lead Agency, concluded that "[b]ased on the EIS Documents, the Planning Board's findings are that positive socioeconomic impacts will result from the project with no adverse EJ impacts" (Appendix 9, Findings Statement at 34). The Lead Agency's conclusion was first based on its finding that the Valley Energy Center EJ analysis was conducted "consistent with the principles set forth in Executive Order 12898, entitled 'Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations' and NYSDEC Policy CP-29" (Appendix 9, Findings Statement at 37).

Further, the Lead Agency determined that the EJ analysis demonstrated that (1) the "potential air emission concentrations did not cause violations of the National Ambient Air Quality Standards (NAAQS) within the EJ study area, and therefore are not adverse"; (2) that the use of hazardous materials such as "oil, aqueous ammonia, and other chemicals at the project site would not result in a disproportionate or adverse impact to the identified potential EJ area"; and (3) that noise and visual impacts within the study area "are not considered adverse or disproportionate" (Appendix 9, Findings Statement at 37-38).

As a result, the Lead Agency determined that "[b]ecause of the socioeconomic benefits arising from the project, and the avoidance of impacts to any identified EJ areas, no specific mitigation measures are warranted" (Appendix 9, Findings Statement at 38). The Lead Agency's findings and conclusions are supported by the SEQRA record, which fully addresses any questions regarding potential impacts to EJ areas or DACs.

C. Evaluation of GHG Co-Pollutant Emissions Impacts to DACs

The CJWG identified certain environmental burdens and climate change risk indicators calculated by percentile rank[14] for Census Tract 36071011801 (*see* Section 4 (B), *above*).

Relevant baseline data on existing burdens, including the DAC risk indicators used to designate the disadvantaged community that are related to electricity generation, air quality, and air-related health effects have been identified and include: (1) benzene concentrations; (2) $PM_{2.5}$; (3) truck traffic on highways; (4) traffic volume; (5) wastewater discharge; (6) industrial land use; (7) landfills; (8) oil storage; (9) municipal waste

[14] Meaning percent of populations, households, or tract area exposed to a particular environmental burden or risk factor.

combustors; (10) power generation facilities; and (11) scrap metal processing. The relevant DAC risk indicators for Census Tract 36071011801 is as follows:

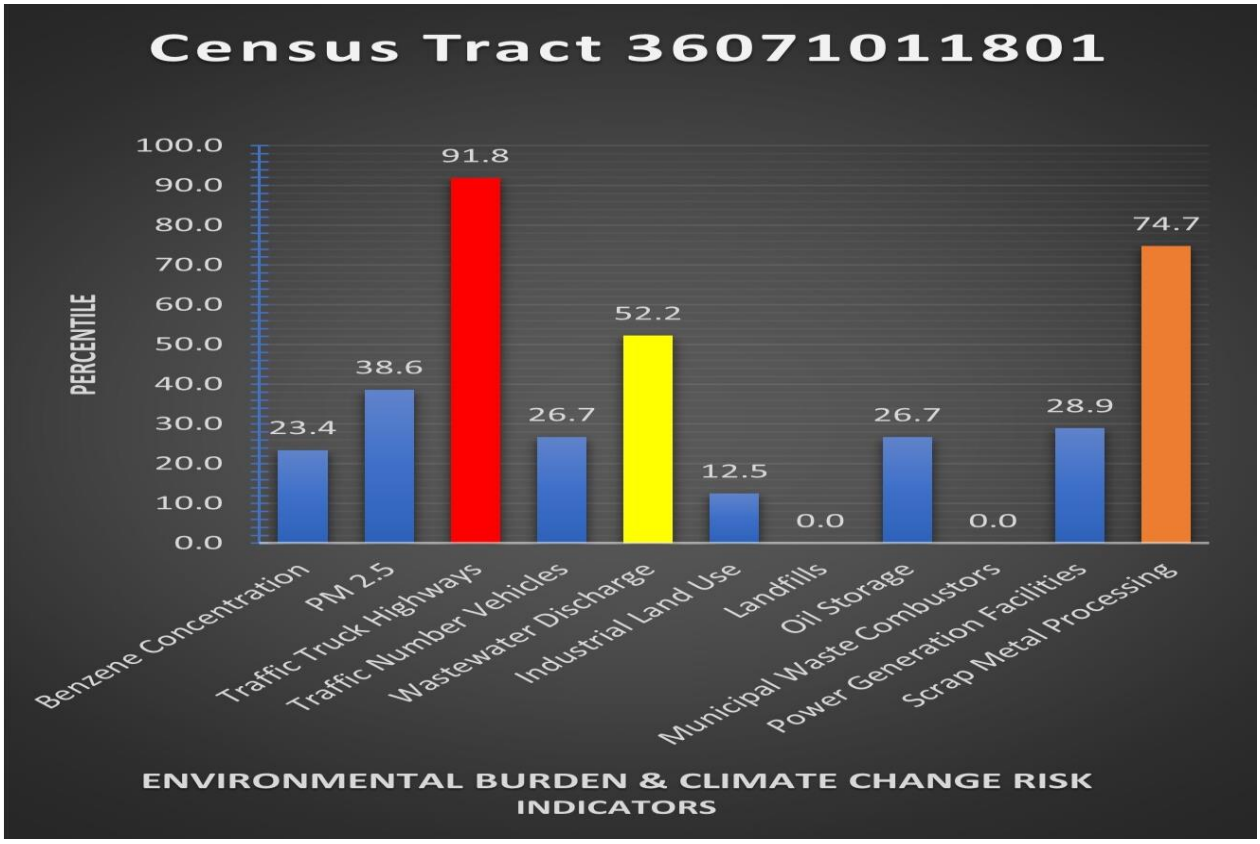


Figure 11: Census Tract 36071011801 Risk Indicators

GHG co-pollutants were calculated and impacts fully analyzed in Valley's EIS, and appropriate mitigation was considered and implemented through the SEQRA Findings Statement. A full air quality analysis is set forth in DEIS § 9.0. In addition, DEIS § 9.6 provides additional air quality analysis regarding fine particulates ($PM_{2.5}$); acid deposition; toxic air pollutants; accidental releases; visible plumes; local source cumulative analysis; impacts at nearby sensitive receptors; and global warming. With respect to fine particulate matter, the air quality analysis concluded that Facility "impacts for PM_{25}, when added to background levels, would be below the associated NAAQS" and that "the Project would not have any significant adverse public health impacts with regard to PM_{25}" (DEIS § 9.6.1).

In addition to the SEQRA record showing no disproportionate impacts to EJ areas (which includes Census Tract 36071011801 and nearby DACs), the 2022 Co-pollutant Report (Appendix 7) makes clear that Valley's continued operation does not disproportionately burden DACs with respect to benzene concentrations and $PM_{2.5}$ and other HAPs. As set forth in Table 6 of the 2022 Co-pollutant Report, total $PM_{2.5}$ and PM_{10} emissions is far below than the calculated potential emission rates relied on in the DEIS (DEIS Table 9-3). Similarly, benzene emissions in the 2022 Co-pollutant Report are

consistent with the values relied on in the DEIS, which were found to "not result in any significant adverse impacts to air quality" (Finding Statement at pg. 41) (Appendix 9).

With respect to impacts on DACs, Census Tract 36071011801 is well below the state median DAC indicator for benzene concentration (23.4%) and $PM_{2.5}$ (38.6%), environmental burdens and risk generally associated with natural gas-powered electric generation facilities. Benzene concentration and $PM_{2.5}$ DAC indicators for Census Tract 36071001500 are 37.2% and 38.4% respectively. Similarly, Census Tract 36071001600 has a DAC indicator of 33.3 % for benzene concentration and 38.4 % for $PM_{2.5.}$

As the CJWG DAC indicators for these environmental burdens were developed after Valley Energy Center went into operation, the indicated values presumedly already include any impacts from the Facility. As such, CJWG own data confirms that Valley's operation is not impacting the identified DACS with respect the indicators for benzene concentration and $PM_{2.5.}$

D. Evaluation of Other Relevant Existing Burdens to DACs

Based on CJWG's data and analysis, Census Tract 36071011801 is above the NY state median for the following other relevant risk indicators: highway truck traffic[15] (91.8%); proximity to wastewater discharge[16] (52.2%); and scrap metal processing[17] (74.7%). The relevant environmental burdens and risk indicators in Census Tract 36071011801 that are above the NY state median for which the Facility has the potential to impact (*e.g.* truck and bus traffic, wastewater discharge, etc.) have been considered in the EIS and SEQRA Findings Statement and are discussed below.

(1) Traffic

A full traffic and transportation analysis is set forth in DEIS § 8.0. The traffic analysis consisted of a detailed review of existing land-use, roadway, and traffic conditions near the Facility site and an analysis of future conditions. The results of the traffic study were summarized in DEIS Table 8-22. The traffic impact analysis concludes that vehicle traffic generated by the Valley Energy Center is negligible in that no Level of Service determined for the No Build condition would change as a result of the traffic generated by the proposed Facility (DEIS § 8.9.2, § 8.12) and that vehicle trips "would not impact traffic flow conditions throughout the environmental justice area" (DEIS § 7.5.4.2). These conclusions were also adopted in the SEQRA Findings Statement (Findings Statement at pgs. 39-41 [discussing traffic impacts]; Findings Statement at 34-38 [discussing impacts to EJ areas]) (Appendix

[15] Census Tract is in the 91.8 percentile for annual average daily count of diesel trucks and buses occurring on the roads within the census tract.

[16] Census Tract is in the 52.2 percentile for population within 500 meters of toxicity-weighted wastewater discharges or stream concentrations.

[17] Census Tract is in the 74.7 percentile for the number of scrap metal processing and vehicle dismantler facilities.

10). As the Valley Energy Center has been in operation since 2018, Valley can confirm that actual and existing traffic volumes are consistent with the DEIS impact analysis.

(2) Wastewater Discharge

Valley Energy Center uses an air cooled condenser for heat dissipation to minimize both water supply and wastewater discharge requirements. The Facility's innovative design incorporates advanced dry cooling, which utilizes air instead of water for cooling and reduces water use by approximately 85%, as compared to an equivalent facility using wet cooled technology. In addition, as part of the effort to minimize the use of water resources, the Facility's process makeup water uses tertiary treated effluent from the City of Middletown Sewage Treatment Plant. After receipt of the greywater from the City of Middletown, additional on-site treatment of the greywater is conducted before use at the Facility. Process wastewater is then discharged back to the City of Middletown Sewage Treatment Plant. Wastewater discharge data is provided to the City of Middletown as required under Valley's Industrial Pretreatment Program Wastewater Discharge Permit with the City of Middletown to ensure compliance with local sewer use regulations. Sanitary wastewater is discharged to the City of Middletown Sewage Treatment Plant via the town sewer system (*see* DEIS § 12.3). Stormwater runoff is discharged to on-site wetlands. The Facility's use of greywater from the City of Middletown Sewage Treatment Plant and discharge back to the plant generates approximately $ 615,000.00 of additional revenues to the City of Middletown.

Accordingly, Valley Energy Center's continued operation does not contribute to the wastewater discharge burden identified in Census Tract 36071011801 and the additional revenues directly benefit the DAC.

(3) Scrap Metal Recycling

Solid waste generated at the Facility is limited to small quantities of office waste and general plant refuse. All solid waste is loaded into on-site dumpsters and removed from the site under a contract with a local private vendor. Newspapers, corrugated cardboard and metals used at the Facility during operation is recycled to the maximum extent practicable. Over the last five years, the Facility has exported approximately 48.64 tons of scrap metal for recycling, which is sent to Marangi Disposal in Middletown, NY. Other wastes typical of power generation activities include oils collected in the oil/water separator, spent lubricating oils, oil filters from the combustion turbines and air filters. These wastes are transported off-site by an outside contractor and properly recycled or disposed (DEIS § 12.1).

[*section 6 follows*]

SECTION 6. CLCPA § 7(3) CONSIDERATIONS- DAC BENEFITS

CLCPA § 7(3) states, in part, that "[i]n considering and issuing permits . . . agencies . . .shall not disproportionately burden disadvantaged communities [and] shall also prioritize reductions of greenhouse gas emissions and co-pollutants in disadvantaged communities. . ." As discussed in Section 5, issuance of the Title V permit would not disproportionately burden any disadvantaged communities. Moreover, continued operation of the Valley Energy Center provides significant benefits to the local host community and surrounding DACs.

A. Existing DAC Benefits

The community benefits and positive economic impacts of Valley cannot be understated. During its three-year construction phase, Valley created approximately 900 jobs and currently provides 23 full time jobs to workers who have been employed since the plant began operations in 2018. Valley also is a significant contributor to the local tax base and is projected to contribute in excess of $41 million over its first 20 years of operation.

In addition, pursuant to a March 22, 2013 Host Community Agreement (HCA) by and between Valley and the Town of Wawayanda Local Development Corporation (subsequently assigned to the Town of Wawayanda), Valley has committed to contributing $11 million in HCA payments as additional compensation to the community for impacts from the Project over the approximate twenty two-year term of the agreement. HCA payments are made directly to the Town and intended to benefit the host community, including the DAC where the facility is located. Valley has already paid $3,721,596.00 in HCA payments as follows:

- $927,300.00 paid during the construction period;
- $361,989.00 paid during Operation Year 1 (August 2019 - July 2020);
- $370,187.00 paid during Operation Year 2 (August 2020 - July 2021);
- $378,631.00 paid during Operation Year 3 (August 2021 - July 2022);
- $387,328.00 paid during Operation Year 4 (August 2022 - July 2023);
- $396,286.00 paid during Operation Year 5 (August 2023 - July 2024); and
- $449,875.00 paid during Operation Year 6 (August 2024 - July 2025).

To date, $7,728,404.00 remains to be paid. Valley will continue to make annual HCA payments for each operational year until 2039 totaling $11,000,000.00.

The positive economic impacts, and specifically the host community agreement payments directly benefit Census Tract 36071011801 and nearby DACs.

B. Additional Mitigation - Grant Program

Should NYSDEC determine that continued operation under a new Title V permit would disproportionately burden disadvantaged communities and that additional mitigation is required, Valley proposes to establish a disadvantaged community benefits grant program ("DAC Grant Program Fund") for programs and/or projects that prioritize reductions

of GHG / co-pollutants emissions and provide direct benefits within the DACs identified in Section 4 of this report ("Identified Communities").

Valley's proposed total DAC Grant Program fund commitment would be $1,000,000.00 to be used over a 5 year period with each of the identified Communities with the Town of Wawayanda (Census Tract 36071011801), the City of Middletown (Census Tracts 36071001500 and 36071001600) receiving a proportional share based on the DAC census tract population as follows: 27% to Census Tract 36071011801 (population 4,162) located in Town of Wawayanda, 28% to Census Tract 36071001500 (population 4,537) located in the City of Middletown, and 45% to Census Tract 36071001600 (population 7,377) located in the City of Middletown.

Valley's DAC Grant Program Fund would be available to local and county governments serving the Identified Communities, tax-exempt, not-for-profit environmental organizations and land trusts, and private tax-exempt organizations under IRS Section 501(c)(3). The DAC Grant Program funds are intended to support programs and/or projects that demonstrate quantifiable reductions in GHG and its co-pollutants or that reduce or eliminate environmental burdens within the Identified Communities. For examples, DAC Grant Program funds would be available to the Town of Wawayanda and the City of Middletown to provide financial assistance focused on the electrification of public transportation and buildings, publicly available electric vehicle charging stations, local decarbonization efforts, green spaces, or other similar programs that would benefit the surrounding DACs. Funding will not, however, be available to individuals, religious or political organizations, paid solicitors, or for program advertising.

A portion of the DAC Grant Program fund, up to 25% would be allocated to New York State Clean Heat Program through the local electric distribution company Orange & Rockland ("O&R"). The New York State Clean Heat Program helps utility customers cover the cost of replacing gas, oil, or electric baseboard heating with heat pumps, the most efficient heating and cooling technology available. Valley would match the current heat pump rebate programs offered by O&R to property owners within the identified Communities. Valley will request that the local electric distribution company programs utilize heat pumps that are consistent with the then best current technology intended to reduce GHG emissions. Valley will coordinate with O&R to assess the requirements for implementation of this program following the issuance of a notice of complete application.

Regarding implementation of the DAC Grant Program Fund, Valley would establish an internal committee to receive, review and process applications for funding under the grant program. Valley's DAC benefit committee would be responsible for ensuring that funding under the program would help to reduce or eliminate environmental burdens within the Proximate DACs and ensure applicants meet the aforementioned criteria. Grant programs and/or funded projects would be required to demonstrate that they would help to reduce or eliminate environmental burdens within the Identified Communities. Once Valley's application is complete, Valley is committed to continued coordinating with its local municipal partners, interested stakeholders, and Department Staff to further refine specific programs. Valley will also provide compliance reporting to the NYSDEC for its review of

the grant program operations. Additional guidelines and eligibility criteria regarding Valley's proposed DAC Grant Fund Program is set forth in **Appendix 11**.

Should it be required as a condition of approval, Valley would fully fund the proposed DAC Grant Program programs immediately following issuance of the Title V Application. The funding for the programs would be made available until the funds are exhausted or until the 5 year period expires.

[*section 7 follows*]

SECTION 7: ENHANCED PUBLIC PARTICIPATION

Valley prepared a Public Participation Plan (PPP) to fulfill and comply with the requirements of NYSDEC's Commissioner Policy 29, Environmental Justice and Permitting (CP-29) for the Valley Energy Center (https://cpv.com/wp-content/uploads/2023/07/1.-CPV-Valley-Public-Participation-Plan-w-appxs.pdf). This PPP was developed in accordance with the procedures established in CP-29 Section V.D to and reviewed by NYSDEC to ensure meaningful and effective public participation throughout the NYSDEC environmental permit review process.

Valley held two virtual public information meetings on August 1, 2023 to keep the public informed about the proposed action and the environmental permit review process. The meetings were facilitated by Valley representatives during which they presented a brief overview of the project, including background information, details on the permitting action, scope of work, schedule, and community impacts. The meetings also included a question-and answer-portion where the floor will be open for attendees to ask questions, make remarks, and/or express concerns. A total of 8 speakers provided comments in the morning session and 7 speakers during the evening session. Topics and issues raised to date included:

- How environmental justice communities were identified;
- How the study area was defined;
- Public notice protocols;
- Timeline of CLCPA mitigation implementation;
- Efficiency of the facility;
- Need for additional generation capacity;
- Co-pollutant analysis and dispersion modelling;
- Impact of NYISO studies on Valley's continued operations;
- Emissions monitoring and reporting;
- Localized public health impacts;
- Impacts and data for use of grey water

Valley documented a record of comments and questions raised in the meeting and respective answers were provided during each session and in a post-meeting written response to comments.

A digest of all oral and written comments, along with Valley's responses were prepared and made publicly available (https://cpv.com/wp-content/uploads/2025/01/2023-08-04-CPV-Valley-Response-to-Public-Meeting-Comments.pdf). Other relevant application documents are also publicly available for the community and interested stakeholders on Valley's online document repository accessible at https://www.cpv.com/our-fleet/cpv-valley-energy-center/.

With respect to public participation during future public comment periods or public hearings, Valley will continue to engage with the community on the proposed mitigation detailed in this report. Valley will utilize a range of engagement strategies and outreach

activities to facilitate participation, involvement, and direct communication with the affected community during the permit application review process as detailed in the PPP.

Valley has prepared a stakeholder identification and contact list of individuals and organizations with a direct stake in the Application or who have expressed interest in the Valley Energy Center. The stakeholder list was developed in consultation with NYSDEC and includes stakeholders from the following categories: local government and elected officials; business owners, residents, and occupants; local civic, community, environmental and religious organizations; local news media; administrator/operator of any school or day care that live, work and/or represent a neighborhood or community within a 1-mile radius of the Valley Energy Center. Valley will periodically review and update the stakeholder list as appropriate throughout the permit application review process.

Once NYSDEC determines the application(s) for the proposed Action is complete and issues the Notice of Complete Application (NOCA), Valley will distribute the NOCA and draft permit, if applicable, to the meeting attendees and identified interested parties in the stakeholder list by mail or email. The notice will provide information regarding the start of the NYSDEC public comment period and to announce the deadline for submission of written comments to NYSDEC. Valley will also post notice on its publicly available project website and publish in the Times Herald-Record, which is a weekly newspaper printed and circulated in the City of Middletown and Town of Wawayanda. These outreach efforts will be in addition to any notice and publication requirements required by law.

[*section 8 follows*]

SECTION 8: CONCLUSIONS

The Valley Energy Center has demonstrated a consistent commitment to complying with the requirements of the CLCPA and other regulatory frameworks. Throughout this evaluation, several key findings underscore the Facility's adherence to environmental standards and its proactive approach to mitigating potential impacts on DACs.

1. **Regulatory Compliance and Environmental Impact**: The facility has been designed with state-of-the-art emissions control technologies, which exceed regulatory requirements and contribute to its status as one of New York's most efficient natural gas energy facilities. The Valley Energy Center's operational practices have ensured that it does not disproportionately burden DACs with GHG emissions or co-pollutants. The comprehensive environmental reviews have consistently shown that the Facility's emissions are well within regulatory standards and will not interfere with the CLCPA's GHG emissions limits and reduction requirements.

2. **Public Participation and Transparency**: Valley Energy Center has actively engaged with the community through its Enhanced Public Participation Plan. Multiple public meetings and ongoing communications have ensured that stakeholders are informed and have opportunities to voice concerns. This transparency aligns with NYSDEC's Commissioner Policy 29 requirements, fostering transparency and cooperation between the Facility and the community.

3. **Socioeconomic Benefits**: The continued operation of the Valley Energy Center provides significant socioeconomic benefits to the local community, including employment opportunities, significant tax benefits, and economic contributions. The Facility's innovative use of greywater from the City of Middletown Sewage Treatment Plant for cooling purposes further exemplifies its commitment to sustainable practices and community benefits. Valley is a significant contributor to the local tax base and is projected to pay over $41 million over its first 20 years of operation. Valley has also committed to contributing an additional $11 million in host community agreement payments.

4. **Additional Future Mitigation and DAC Benefits**: Should NYSDEC determine that continued operation under a new Title V permit would disproportionately burden nearby DACS, Valley proposes to establish a DAC Grant Program Fund with a commitment of $1,000,000.00 for programs and/or projects that would benefit the identified disadvantaged communities located in the Town of Wawayanda and the City of Middletown.

In conclusion, the Valley Energy Center stands as a model for balancing the critical need for reliable energy production with the equally important imperative of environmental stewardship and social responsibility. The findings of this DAC Evaluation affirm that the facility's operations align with the principles of the CLCPA, ensuring that disadvantaged communities are protected, and that the state's environmental and public health goals are advanced.

APPENDIX 1

Greenhouse Gas Analysis for CPV Valley Energy Center Title V Application (ICF, Mar. 8, 2021)

Greenhouse Gas Analysis for CPV Valley Energy Center Title V Permit Application

March 8, 2021

Prepared for:
Competitive Power Ventures

Prepared by:
ICF

Table of Contents

1 EXECUTIVE SUMMARY

ICF submits this report in connection with CPV Valley, LLC's (Valley) application to the New York State Department of Environmental Conservation (NYSDEC) for a Clean Air Act (CAA) Title V (Air) permit for its Valley Energy Center generating facility (the Facility) and in response to NYSDEC's November 29, 2020 Notice of Incomplete Application.

This report analyzes whether Valley's draft Title V permit, if approved, would be consistent with the attainment of New York State's (NYS) greenhouse gas (GHG) emission limits established in Climate Leadership and Community Protection Act (CLCPA), Article 75 of the Environmental Conservation Law (ECL), and regulations under 6 NYCRR Part 496.

ICF finds that issuance of the Title V permit to Valley would be consistent with the long-term statewide greenhouse gas reduction goals of NYS for the following reasons:

- The Facility is among the most efficient electric generating facilities in NYS and will reduce statewide GHG emissions by 90 thousand short tons per year between 2025 and 2040 through the displacement of less efficient and higher emitting generating facilities in NYS. In 2040 and beyond, the Facility and other NYS thermal resources are assumed to be zero-emitting by converting to burning RNG or hydrogen.
- The Facility complements existing and anticipated intermittent renewable energy resources added to the NYS electric grid by providing a flexible resource to the electric system due to its controllable power output level and quick ramp rate.
- As thermal resources will continue to be an important part of the NYS electric grid beyond 2040, the Facility, if converted to use renewable natural gas (RNG) or hydrogen, will be integral to grid reliability while still meeting the state's goal of 100% of statewide electric generation from zero emissions energy systems.[1]

2 INTRODUCTION

2.1 Background

Valley owns and operates the Valley Energy Center, a nominal net 680-megawatt (MW) combined cycle gas turbine (CCGT) facility located in NYISO Load Zone G in Lower Hudson

[1] To meet CLCPA goals and statewide GHG limit regulations, electricity demand is anticipated to significantly increase (65% to 80% relative to current load), which may lead to challenges in meeting demand reliably. Periods of low renewable generation availability could place added stress on the system without the availability of flexible and efficient thermal RNG or hydrogen-capable resources such as the Facility. See Energy+Environmental Economics, New York State Decarbonization Pathways Analysis, June 24, 2020, § 4.4 [Source: https://climate.ny.gov/-/media/CLCPA/Files/2020-06-24-NYS-Decarbonization-Pathways-Report.pdf].

Valley. The Facility started operations in January 2018 under an Air State Facility (ASF) permit. Valley filed its Clean Air Act Title V operating permit on August 24, 2018. NYSDEC's Notice of Complete Application was published on May 29, 2019. NYSDEC revoked its prior application completeness determination and issued a Notice of Incomplete Application on November 29, 2020 seeking additional information under the CLCPA.

CLCPA Section 7(2) requires all state agencies to consider whether their permit approval decisions are inconsistent with or will interfere with the attainment of the statewide GHG emission limits established in ECL section 75-0107 and promulgated at 6 NYCRR Part 496 (eff. December 30, 2020). Part 496 requires reductions of statewide GHG emissions to 60% of 1990 levels by 2030 and to 15% of 1990 levels by 2050, but the rule does not impose compliance obligations on individual sources. Further, the CLCPA amends the Public Service Law (PSL) to require the New York State Public Service Commission (PSC) to implement a program to achieve the following targets: 1) 70% of statewide electric generation from renewable energy systems by 2030; and 2) zero emissions from the statewide electric system by 2040.

NYSDEC has required Valley to provide the following as part of its Title V application:

- An assessment of how the Facility's operations would be consistent with the greenhouse gas emissions limits established under ECL Article 75 and 6 NYCRR Part 496.
- An assessment of how the Facility's operations would be consistent with the electric sector targets of the CLCPA that mandate 70% renewable generation by 2030, and zero emissions from the statewide electric system by 2040.

This report provides the analysis in response to the NYSDEC's requests and assesses the impact of the Facility on GHG emissions.

2.2 Scope of Analysis and Modeling Approach

ICF's analysis addresses the following two key questions:

- Whether the Facility's operation is consistent with CLCPA GHG reduction requirements, and
- Whether the Facility will interfere with NYS long-term energy targets of a zero-emissions statewide electric system by 2040?

To evaluate the Facility's consistency with the CLCPA, ICF first developed a forward-looking resource mix for NYS using its proprietary Integrated Planning Model (IPM). This resource mix was optimized to meet all clean energy and zero-emissions targets while meeting reserve margin requirements. The optimization also accounted for transmission capabilities, capital costs and other assumptions. After determining the most economic resource mix, ICF followed the typical approach to assessing the impacts of a proposed facility on the electricity system, which is to first model the system without the facility (the Base Case), and then to model it with the facility (the Change Case). ICF used ABB's PROMOD production cost modeling software to assess the impacts of the Facility based on the resource mix determined using IPM. The Facility's impact was estimated for the 2025-2050 forecast period, with 2025, 2030, 2040 and 2050 being the model run years.

This analysis does not address all potential future scenarios impacting Facility operations. Specifically, the Facility could retire if declining market prices or competition with other resources compel it to. Alternatively, the Facility could add carbon capture and sequestration technology to eliminate carbon emissions. The financial risk of closure or capital investment to comply would be borne entirely by Valley since the Facility was built without any financial assistance from NYS or its ratepayers. Additionally, the Facility could be required by NYS to continue to operate using natural gas in 2040 in order to meet NERC and other reliability requirements.[2] This analysis does not address this scenario due largely to the extreme complexity involved and uncertainty regarding future conditions.

ICF calculated the impact on both direct and indirect (upstream) GHG emissions associated with the operation of the Facility. It compared the Facility's projected emissions with the weighted average emission rates of NYS's displaced fossil generators and corresponding upstream emission impacts based on projected electric generation and corresponding fuel consumption of the Facility. Since the Facility is one of the most efficient thermal generators in NYS, displacement of less efficient (and higher emitting) generation leads to a net reduction in GHG emissions. The net impact of the Facility on statewide greenhouse gas emissions is calculated by the following equation:

$$\begin{aligned} &Net\ Impact\ of\ the\ Project\ on\ Statewide\ GHG\ Emissions \\ &\quad = Increase\ in\ emissions\ from\ the\ Project\ in\ tons \\ &\quad - \Big[displacement\ of\ other\ NYS\ thermal\ generation\ in\ MWh \\ &\quad * average\ emissions\ rate\ in \frac{tons}{MWh}\Big] \end{aligned}$$

The total amount of other NYS thermal generation displaced by the Facility is equal to the projected generation of the Facility itself and is summarized in the tables below.[3] The average emissions rate of displaced NYS thermal generation was calculated based on the heat rate of displaced generation and estimated to be 0.46 ton CO_2e/MWh. This includes emissions of N_2O which were calculated using a weighted average historical emission rate of NYS fossil

---

[2] The CLCPA added a new Section 66-p to the Public Service Law entitled "Establishment of a Renewable Energy Program," which, among other things, specifically provides in subsection (2): "In establishing such program, the [Public Service Commission] shall consider and where applicable formulate the program to address impacts of the program on safe and adequate electric service in the state under reasonably foreseeable conditions. The [Public Service Commission] may, in designing the program, modify the obligations of jurisdictional load serving entities and/or the targets upon consideration of the factors described in this subdivision." Further, in Section 66-p(4) further states that the Public Service Commission "may temporarily suspend or modify the obligations under such program provided that the commission, after conducting a hearing as provided in section twenty of this chapter, makes a finding that the program impedes the provision of safe and adequate electric service; the program is likely to impair existing obligations and agreements; and/or that there is a significant increase in arrears or service disconnections that the commission determines is related to the program."

[3] ICF models renewable resources as "must-run" in PROMOD. As such, generation from the Facility does not impact renewable generation and only displaces other less efficient NYS resources.

generators from EPA's most recently available eGRID data.[4,5] In comparison, the Facility's emission rate is 0.43 ton CO_2e/MWh. Upstream emission impacts were calculated using emissions factors developed by the NYSDEC, associated with the change in fuel consumption for electric generation in NYS.

Table 2-1: Projected Generation and Fuel Consumption of the Facility using RNG in 2040 and 2050

Impact		2025	2030	2040	2050
Projected Generation of the Facility (GWh)		4,395	2,365	1,142	1,661
Projected Fuel Consumption of the Facility (Thousand MMBtu)	Natural Gas	32,592	17,850	-	-
	RNG	-	-	8,862	12,695

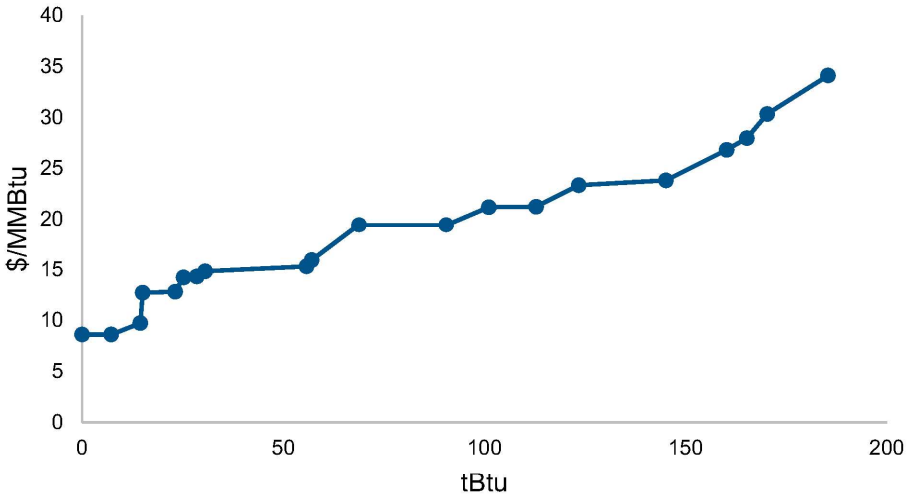
Table 2-2: Projected Generation and Fuel Consumption of the Facility using Hydrogen in 2040 and 2050

Impact		2025	2030	2040	2050
Projected Generation of the Facility (GWh)		4,395	2,365	797	1,100
Projected Fuel Consumption of the Facility (Thousand MMBtu)	Natural Gas	32,592	17,850	-	-
	Hydrogen	-	-	6,253	8,423

ICF developed cost and volume estimates for two zero-emissions fuels, RNG and hydrogen, to inform its analysis of the Facility's consistency with the CLCPA electric system targets. To estimate RNG potential for NYS in 2040, ICF drew upon a previous assessment of RNG potential it had developed for the American Gas Foundation (AGF).[6] The estimate was based on an inventory of RNG feedstocks and production volumes accessible to NYS. ICF then developed cost estimates for RNG production from various feedstocks such as landfill gas, municipal solid waste, animal manure, food waste, etc. The cost estimates were further refined by region to arrive at a cost versus availability estimate. The figures below present the RNG cost curve used in this study. ICF's detailed methodology to develop the cost curve is provided in Appendix A-3.

[4] N_2O is a by-product of combustion and has a 20-year Global Warming Potential (GWP) of 264.
[5] EPA eGrid 2018. Weighted average historical emission rate in NYS was 0.00039 lb/MMBtu. [Source: https://www.epa.gov/egrid]
[6] ICF, Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment, December 2019 [Source: https://gasfoundation.org/2019/12/18/renewable-sources-of-natural-gas/].

Figure 2-1: RNG Cost Curve in 2040 and beyond



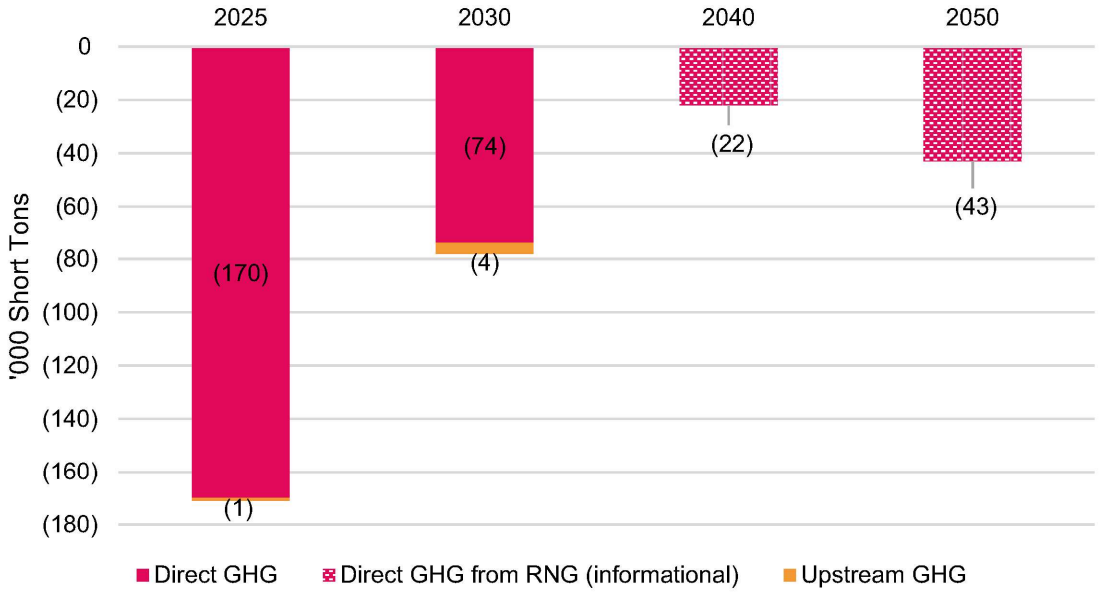
It is important to note that ICF assumed that RNG would be considered a CLCPA-compliant fuel source in 2040 and beyond.[7] As a biogenic fuel, the CO_2 emissions from combustion are assumed not to add to the atmospheric loading. A complete accounting of the sources of RNG may result in net negative methane emissions, as capturing RNG prevents methane emissions at source. However, in accordance with Part 496, Statewide GHG Emission Limits, combustion emissions from RNG must be included in the statewide greenhouse gas emissions.[8] Thus, notwithstanding ICF's assumption that RNG may be considered a CLCPA-consistent fuel source, this report includes direct combustion emissions from RNG in 2040 and 2050, for informational purposes.

2.3 Key Findings

Reduction in GHG emissions: Between 2025 and 2040, operation of the Facility results in a reduction of 90 thousand short tons per year of direct and upstream GHG emissions in NYS. Much of the reduction is driven by direct emission reductions (see Figure 2-2). In 2040 and 2050, all NYS thermal resources running on RNG and Hydrogen are assumed to be zero-emissions. However, as mentioned above, combustion emissions from RNG are included in this analysis for informational purposes.

[7] NY DEC staff suggested that ICF may include an assumption that RNG will be considered zero emissions by the NY PSC. [Source: Binder, Jonathan A. "RE: ICF CPV Valley Title V Analysis Assumptions Documents." E-mail message to ICF, Valley and Harris Beach, LLC. February 10, 2021]
[8] 6 NYCRR Part 496, Statewide Greenhouse Gas Emission Limits, NY DEC. [Source: https://www.dec.ny.gov/regulations/121052.html]

Figure 2-2: GHG Impacts of the Facility in NYS



Efficient, RNG or hydrogen-capable thermal resources such as the Facility play an important role in NYS's resource mix: ICF's analysis found that the most cost-effective solution for a future resource mix that is consistent with the CLCPA targets involves retaining some existing thermal resources, combined with large amounts of new renewable and energy storage resources. The thermal resources that are retained post-2040 would be retrofitted to burn RNG or hydrogen. Figure 2-3, Figure 2-4 and Figure 2-5 show NYS's capacity and generation mix (including the Facility) in 2040. Post-2040, only offshore wind and battery storage capacity is added to the resource mix.

Figure 2-3: CLCPA-Consistent Resource Mix (in GW) in 2040 in NYS

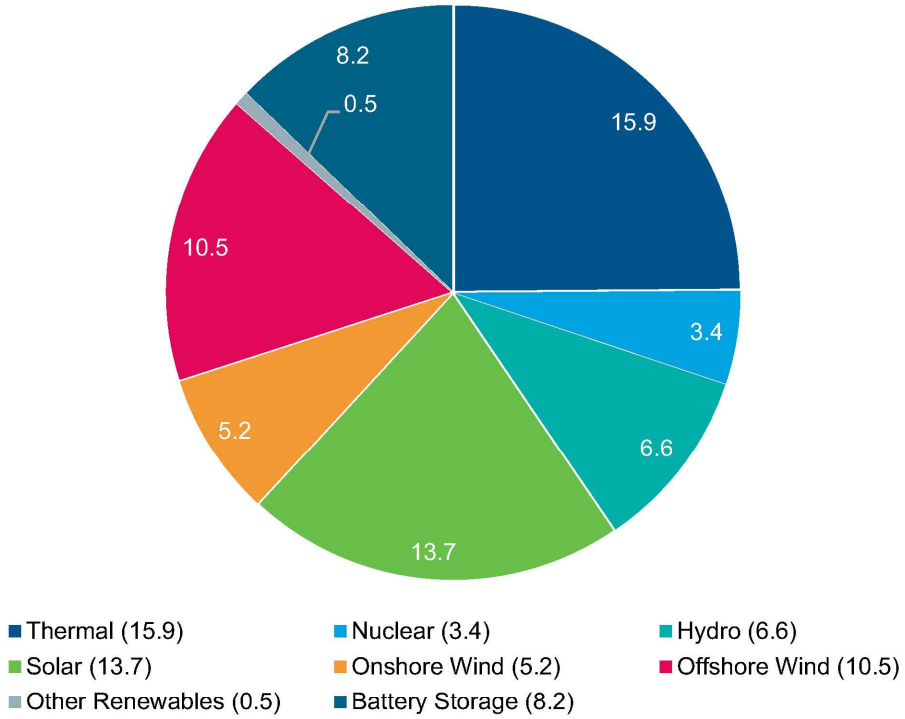


Figure 2-4: CLCPA-Consistent Generation Mix (in TWh) using RNG in 2040 in NYS

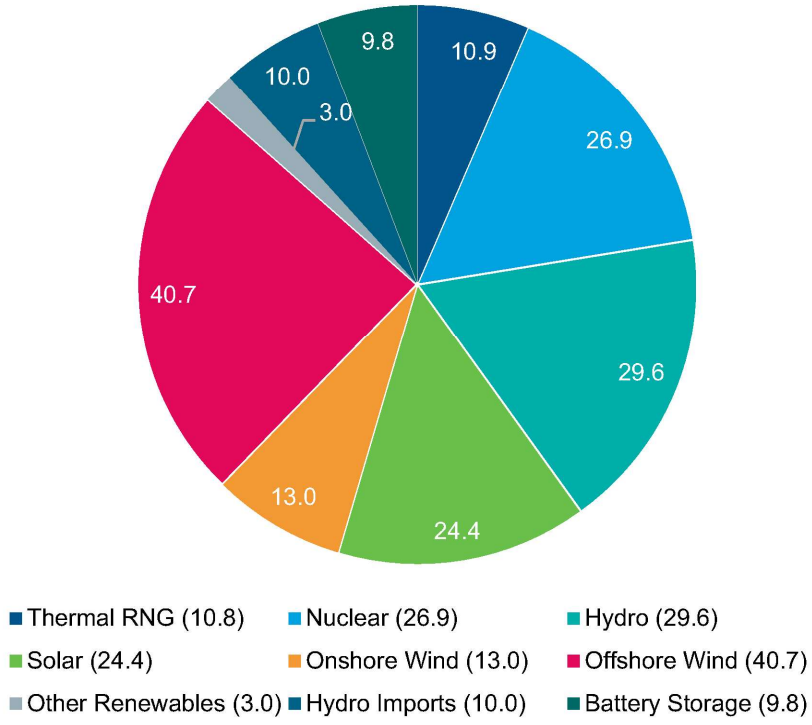
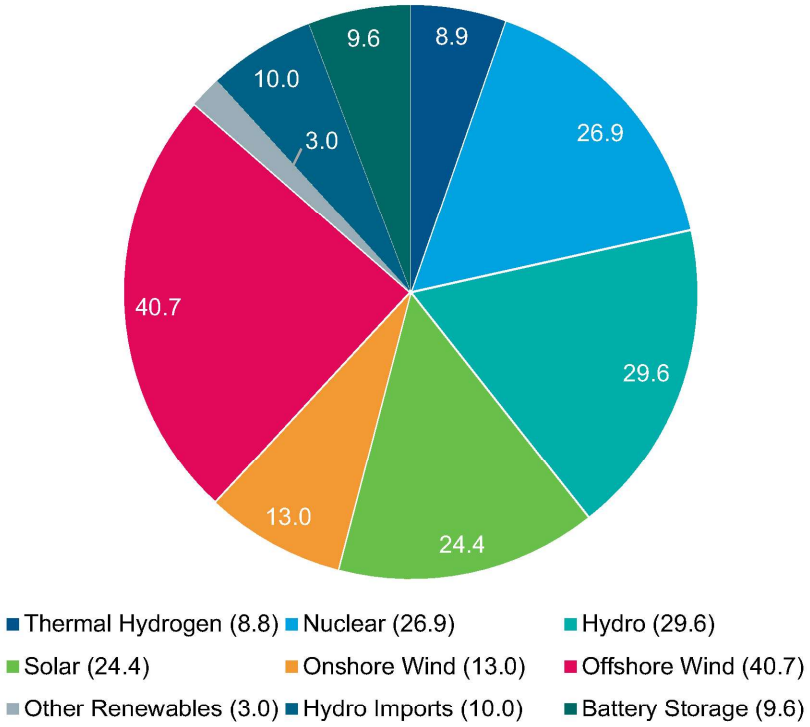


Figure 2-5: CLCPA-Consistent Generation Mix (in TWh) using Hydrogen in 2040 in NYS



The least-cost resource mix is driven by two primary requirements 1) to maintain adequate reserve margin, and 2) to meet the CLCPA targets of 70% renewable energy by 2030 and a 100% zero-emission electric system by 2040. Due to the rapidly falling capital costs and minimal variable costs of renewable resources, ICF finds it optimal to utilize these resources to meet the CLCPA targets. Thus, renewable and battery storage resources make up most of the generation capacity. However, since renewable resources do not provide much reserve margin contribution (solar PV only provides 2% in the winter), it is more cost effective and supportive of reliability objectives to retain some thermal resources to meet resource adequacy requirements. Thus, in 2040, ICF's projected capacity resource mix comprises 15.9 GW of thermal RNG or hydrogen resources, 10.5 GW of offshore wind, 5.2 GW of onshore wind, 13.7 GW of utility-scale solar PV, and 8.2 GW of 4 and 8-hour battery storage. In 2050, only incremental offshore wind and battery storage additions are required, and they reach a total of 17.8 GW and 12.8 GW, respectively. The thermal capacity retained in 2040 comprises the most efficient and flexible combined cycle gas turbines (CCGT) and combustion turbines (CT). These resources play an important role as capacity and load-following resources to help meet reserve margin and reliability requirements. Given the relatively high costs of RNG (see Appendix A-3), the average capacity factor of thermal RNG generators in 2040 is only about 8%, and they are projected to provide only 6% of the state's zero-emissions electricity. Given the even higher costs of hydrogen (see Appendix A-4), the average capacity factor of thermal hydrogen generators in 2040 is only 6%, and they are projected to provide only 5% of the state's zero-emissions electricity.

The Facility provides for flexible, on-demand dispatchable capacity: By 2040, as renewable resources become dominant, the need for flexible, on-demand dispatchable capacity rises in order to supplement the intermittent nature of renewable generation. Due to its quick start-up and ramp times, the Facility will provide key load-following services to address any shortfalls in renewable generation due to resource unavailability. Due to its high efficiency and fast ramp times, the Facility operates at a capacity factor of 18.3% on RNG in 2040, which is higher than the 8% average of all converted thermal RNG resources.

Hydrogen interacts with renewable output: The quantity of available hydrogen is infinite (as long as water is available), but its cost is a function of the cost of power. At current estimates, the cost of hydrogen in 2040 is $45/MMBtu (in nominal terms). However, the greater the reliance on renewables, the lower the hydrogen price to the extent excess renewable production is used to produce hydrogen.

2.4 Consistency with Other Long-Term Studies in New York and California

ICF's findings are consistent with recent deep decarbonization studies for New York and California. These studies have shown that some level of thermal generation in the form of advanced quick-start, dispatchable combined cycle plants like the Facility will likely be required in power systems pursuing deep decarbonization. A study conducted for New York State Energy Research and Development Authority (NYSERDA) found that in a high electrification scenario, meeting heating loads during winter months would be challenging due to low renewable energy production, which can stretch over several days.[9] The study concluded that this long-duration reliability challenge can be solved through a combination of large-scale hydro, RNG, hydrogen, carbon capture and storage (CCS), and nuclear power.[10] Separately, the NYISO commissioned the Brattle Group to simulate resources that can meet state policy objectives and energy needs through 2040.[11] The study similarly concluded that dispatchable zero-emission sources such as RNG-fired thermal units would grow in capacity in order to meet the 2040 zero-emission energy and resource adequacy needs.[12] In the Brattle Group report, the generation from these plants decreases but capacity needed increases, showing a falling capacity factor.[13]

Studies for California have yielded similar conclusions. A study sponsored by the California Energy Commission (CEC) concluded that "by 2050, 85% to 95% zero-carbon electricity is expected to be required; however, 100% zero-carbon electricity is likely to be cost prohibitive

[9] Energy+Environmental Economics, New York State Decarbonization Pathways Analysis, June 24, 2020
[10] Ibid, pg. 21
[11] New York's Evolution to a Zero Emission Power System, Modeling Operations and Investment Through 2040, May 18, 2020, prepared for New York Stakeholders, Prepared by the Brattle Group.
[12] Ibid. pg. 22
[13] Ibid, pg. 23

compared to alternative GHG mitigation strategies."[14] In a California Public Utilities Commission (CPUC) November 2019 study,[15] the CPUC forecasts for 2045 concluded:

- "Almost all gas fired capacity retained past 2030 due to high peak demand" under all 2045 scenarios examined[16]
- "Gas capacity necessary to maintain reliability, even with significant buildout of out of state transmission or offshore wind"[17]
- "Electricity sector generation will result in CO_2 emissions in all scenarios"[18]

California also expects to rely on biofuels and hydrogen as additional options for the continued use of gas-fired power plants. For example, in the CPUC study, the Commission identifies three 2045 decarbonization scenarios – high electrification, high biofuels and high hydrogen. The high biofuels and high hydrogen scenarios focus on alternative types of gaseous fuels whose combustion would not increase CO_2 emissions.[19] Gas power plants can use these fuels, creating the option to extend the reliance on existing gas power plants. The CPUC study concludes that almost all existing gas power plants will be retained in these cases.[20]

In both the cases of California and New York, the growing reliance on electrification will increase the importance of reliability and resiliency because energy delivery will increasingly rely on one delivery system – power – rather than multiple systems such as natural gas, power and oil. Therefore, there will be an even greater need for flexible thermal generation. Similar to the conclusion of the NYSERDA study, the CPUC study finds that higher electrification increases electricity demand and leads to challenges in meeting demand reliably.[21] As such, if electricity demand is high in winter months in California, periods of low solar generation could place added stress on the system, and further diminish the likelihood that California will eschew the critical reliability contribution of its existing gas fleet.

3 MODELING TOOLS AND ASSUMPTIONS

3.1 Modeling Tools

ICF's proprietary modeling tool, IPM, was used to analyze the power sector outlook. IPM was developed by ICF to be the primary modeling tool for the US Environmental Protection Agency to analyze the impact of emission regulations on the power and fuel industries at national and regional levels. ICF has utilized IPM for a variety of clients such as Regional Greenhouse Gas

---

[14] California Energy Commission, Deep Decarbonization in a High Renewables Future, June 2018
[15] California Public Utilities Commission (CPUC), 2019-2020 Proposed Reference System Plan, CPUC Energy Division, November 6, 2019
[16] Ibid, Page 158
[17] Ibid, Page 161
[18] Ibid, Page 152,
[19] Ibid, page 150. Combustion of hydrogen produced via electrolysis using renewable power during excess generation periods results in emission of water. Biofuels such as renewable natural gas is sourced in a manner which prevents the release of methane into the atmosphere.
[20] Ibid, page 158.
[21] Ibid, pages 150 -165

Initiative (RGGI), NYSERDA, and utilities to assess the impacts of alternative policy and market assumptions on New York CO_2 emissions and NYISO markets.

ICF used ABB PROMOD IV, an industry-standard and NY DPS-approved software, for production cost modeling. PROMOD considers generating unit characteristics, forced outages, transmission topology and constraints, and market system operations to simulate security-constrained economic dispatch of generating units.

3.2 Modeling Assumptions

Table 3-1 below summarizes ICF's modeling assumptions for this analysis.

Table 3-1: Summary of Modeling Assumptions

Parameter	Modeling Assumption
Modeling Years	2025, 2030, 2040, 2050
Environmental Regulations	Full CLCPA Compliance
Peak Load Forecast	2020 NYISO Gold Book Baseline Forecast adjusted for high BTM Solar and high energy efficiency from Low Load Scenario
Energy Use Forecast	2020 NYISO Gold Book Baseline Forecast adjusted for high BTM Solar and high energy efficiency from Low Load Scenario
DERs and Energy Storage	2020 NYISO Gold Book Baseline Forecast of Energy Storage; High BTM Solar from Low Load Scenario
Energy Efficiency	High Energy Efficiency from 2020 NYISO Gold Book Low Load Scenario
Firm Builds	Updated as per 2020 Gold Book, and 2018 CARIS Phase 2 Base Case Assumptions and Preliminary Results. Includes Cricket Valley, Copenhagen Wind, Arkwright Summit, Cassadaga Wind, Baron Wind, 8 Point Wind, Number 3 Wind, Bluestone Wind, Roaring Brook Wind, Ball Hill Wind, Canisteo Wind, Alle Cat Wind, Deer River Wind
Firm Retirements	Updated as per 2020 Gold Book, and 2018 CARIS Phase 2 Base Case Assumptions and Preliminary Results. Includes Indian Point units 2 and 3. Also includes Cayuga and Somerset.
Renewable Build Costs	Costs based on NREL 2019 ATB with EPA regionalization factors for NY

Parameter	Modeling Assumption
Thermal Build Costs (excluding CCGT with CCS)	NREL 2019 ATB with EPA regionalization factors for NY
CCGT with CCS Capital Cost	EPA v6
RNG and Hydrogen Fuel Availability and Price Forecast	Based on several feedstocks (landfill gas, animal manure, etc.) from the eastern seaboard, weighted by New York's share of natural gas consumption
Natural Gas Fuel Price Forecast	2018 CARIS Phase 2 fuel forecasts, applied on a monthly basis
Emissions Price Forecast	Updated as per 2018 CARIS Phase 2 Base Case Assumptions and Preliminary Results

ICF used a combination of the Baseline Forecast and the Low Load Forecast from the NYISO's 2020 Gold Book to model a conservative demand scenario. This scenario uses the Baseline Forecast modified to include high energy efficiency and high BTM solar PV from the low load forecast (Table 3-1). Thus, the peak and energy demand used are lower than the Gold Book's baseline forecast. This is a very conservative scenario since it does not assume completion of many of the other economy-wide CLCPA targets such as electrification of space heating and transportation. Appendix A-1 contains detailed peak and energy assumptions.

ICF's capital cost assumptions for renewable energy and storage technologies were derived from the 2019 NREL Annual Technology Baseline (ATB). Assumptions for non-renewable technologies were sourced from EPA's Power Sector Modeling Platform v6 and EIA's Annual Energy Outlook (AEO 2019). Additionally, the capital costs were scaled according to region based on EPA's cost regionalization factors from its Power Sector Modeling Platform v6. Detailed capital cost assumptions are provided in Appendix A-2.

Table 3-2 below shows the Facility's plant parameters.

Table 3-2: Plant Parameters for the Facility

Parameter	Modeling Assumption
Fuel Type	Natural Gas/RNG/Hydrogen (with minor modifications)
Prime Mover	Combined Cycle Gas Turbine
Primary Gas Hub(s)	F-I Blend, 2018 CARIS Phase 2 fuel forecast
Online Year	2018
Summer DMNC[22] UCAP (MW)	658

[22] Dependable Maximum Net Capability

Parameter	Modeling Assumption
Winter DMNC UCAP (MW)	726
Base Block Full Load Average Output (MW)	622
Duct Block Average Incremental Output (MW)	84
Annual Average Full Load Base Heat Rate (Btu/kWh)	6,844
Annual Average Base + Duct Heat Rate (Btu/kWh)	7,133
Emissions	
CO_2 (lb/MMBtu)	117
N_2O (lb/MMBtu)	0.00022

4 MODELING RESULTS

This section presents and discusses the results of ICF's analysis of the Base Case and Change Case for four discrete run years – 2025, 2030, 2040 and 2050. The first sub-section discusses New York's resource and generation mix as the CLCPA requirements and targets are implemented, and the subsequent sub-section discusses the impact of the Facility on direct and upstream greenhouse gas emissions in NYS.

4.1 CLCPA Consistent Resource Mix

ICF's assessment of New York's future resource mix was driven by the concurrent need to maintain adequate reserve margin in the NYISO electric system and meet the CLCPA's electricity supply targets. Thus, the optimal solution incorporates a mix of capacity resources required to maintain reliability, and energy resources required to fulfill the CLCPA targets. The most cost-effective resource mix relies on new offshore wind, onshore wind and solar PV capacity to produce non-emitting generation sufficient to meet the 70x30 and the 100x40 targets, while relying on existing thermal capacity reconfigured to burn RNG or hydrogen and new energy storage for reserve margin requirements. Thus, flexible, efficient, and biofuel-capable thermal resources such as the Facility play an important role in the projected resource mix to provide key load-following and reliability services.

Table 4-1 presents ICF's projected resource mix with the Facility online for 2025, 2030, 2040 and 2050. Between 2025 and 2050, a significant increase in offshore wind, solar PV and battery storage is expected to meet the resource-specific requirements of the CLCPA.

Table 4-1: Projected Resource Mix (in MW) in the Change Case

Capacity Type	2025	2030	2040	2050
Thermal	23,678	19,987	15,925	15,675
Nuclear	3,361	3,361	3,361	3,361
Hydro	6,624	6,624	6,624	6,624
Solar	5,448	9,503	13,672	13,672
Onshore Wind	5,250	5,250	5,250	5,250
Offshore Wind	1,696	6,098	10,471	17,839
Other Renewables	481	481	481	481
Battery Storage	1,500	3,000	8,211	12,740

Between 2025 and 2050, ICF projects the renewable capacity to increase to 17.8 GW of offshore wind, 5.2 GW of onshore wind, 13.7 GW of solar PV and 12.7 GW of battery storage in NYS. Prior to 2040, the renewable additions are driven by New York State mandates such as the 9 GW offshore wind target by 2035 as well as the 3 GW energy storage requirement by 2030. In addition, the requirement to meet 70% of the energy demand from renewable sources in 2030 drives incremental renewable builds in 2030.

In 2040, as NYS transitions to a 100% zero-emission electricity system, additional offshore wind and solar capacity is added between 2030 and 2040 to supply non-emitting generation. ICF projects offshore wind to reach over 10 GW and solar to reach almost 14 GW by 2040. However, ICF does not project new onshore wind additions as higher installed costs (see Appendix A-2) and a lack of sites with high wind resource potential make it less competitive relative to offshore wind and solar. An incremental 5.2 GW of battery storage is also projected beyond the firmly planned 3 GW, reaching a total installed capacity of 8.2 GW. The incremental storage capacity is added to maintain resource adequacy as thermal units, especially old, large and inflexible oil/gas steam units, are projected to retire. These retirements prior to 2040 are balanced through additions of offshore wind capacity in particular, and, as additional thermal facilities retire in 2040, 8-hour battery storage. While thermal generating capacity is projected to retire prior to 2040, substantial amounts of capacity are also projected to retrofit to burn RNG or hydrogen, maintaining over 15 GW of capacity in the system in 2040.

Post-2040, ICF projects additions of offshore wind and battery storage to be the most cost-effective solution to help meet demand growth and reliability requirements. New solar capacity is not projected after 2040 as additions of offshore wind, that provide greater reliability value than solar, are more cost-effective.

The need to retain existing natural gas capacity by converting it to burn RNG or hydrogen in 2040 is three-fold. First, there is a need for overall capacity levels (or resource adequacy) that can be reliably committed to satisfy demand at any time, including in periods of low renewable

generation. According to the NYISO, "as intermittent resources like wind and solar expand across the bulk power system, the Installed Reserve Margin (IRM) percentage will increase because intermittent resources do not contribute an equivalent amount of capacity to reliably meet peak demand as dispatchable resources. Policymakers will need to be cognizant that the intermittency of renewable resources requires that flexible and controllable capacity be available to meet load in the absence of sufficient energy production."[23] Further, it is noted that since individual wind and solar may be simultaneously affected by regional weather conditions, such as extended periods of low wind, maintaining resource adequacy would pose a challenge in the absence of dispatchable generation.[24] Indeed, a study prepared for the NYISO stakeholders found that the marginal capacity value of offshore wind, solar PV and 8-hour battery storage declines as penetration increases.[25] Thus, for every incremental MW of thermal capacity retirement, more than one MW of renewable and storage capacity would be required to maintain the same IRM. ICF's analysis suggests that it is more economical to retain some gas-fired generation by converting it to use RNG than to continue building renewable and battery capacity.

Second, there is a need for resources that are flexible enough to perform load-following of more variable net load (total load less renewable generation) patterns, respond to short-term fluctuations, insure against forecast uncertainty associated with renewables, and provide grid services such as voltage support. The Facility is a quick-start, fast-ramping, and efficient CCGT, that, along with other efficient CCGTs and CTs, provides more flexible load-following capability and grid services such as frequency regulation and voltage support.

Finally, RNG or hydrogen-fired thermal generation is projected to provide zero-emission electricity supply to New York's grid in 2040 and beyond. In both the Base and Change cases, gas-fired capacity running on RNG generates approximately 11 TWh in 2040 and 17 TWh in 2050, or 7% and 10% respectively of the state's annual energy use (see Table 4-2 and Table 4-3). Due to the higher costs of hydrogen versus RNG, thermal resources running on hydrogen generate 9 TWh in 2040 and 11 TWh in 2050 (see Table 4-4 and Table 4-5).

---

[23] NYISO 2019 Power Trends, pg. 23.
[24] NYISO 2020 Power Trends, pg. 26
[25] *NYISO Grid in Transition Study,* The Brattle Group. March 30, 2020.

Table 4-2: Generation Mix (in GWh) in the Base Case using RNG in 2040 and 2050

Capacity Type	2025	2030	2040	2050
Thermal	39,073	20,502	10,824	16,993
Nuclear	27,757	26,376	26,872	28,129
Hydro	27,626	27,626	27,627	27,626
Solar	10,058	17,712	24,394	23,212
Onshore Wind	13,407	13,266	13,008	12,311
Offshore Wind	6,981	24,742	40,768	62,226
Other Renewables (biomass, etc.)	2,948	2,948	2,956	2,948
Scheduled Hydro Imports	9,993	9,993	9,993	9,993
Energy Storage	2,165	3,760	11,931	21,361
Total (excl. energy storage)	137,843	143,166	156,442	183,438

Table 4-3: Generation Mix (in GWh) in the Change Case using RNG in 2040 and 2050

Capacity Type	2025	2030	2040	2050
Thermal	40,348	20,957	10,893	17,324
Nuclear	27,757	26,376	26,872	28,129
Hydro	27,626	27,626	27,627	27,626
Solar	10,058	17,720	24,423	23,269
Onshore Wind	13,405	13,258	13,002	12,311
Offshore Wind	6,981	24,742	40,733	62,299
Other Renewables	2,948	2,948	2,956	2,948
Scheduled Hydro Imports	9993	9993	9993	9993
Energy Storage	2,021	3,702	11,770	21,103
Total (excl. energy storage)	139,116	143,621	156,499	183,899

Table 4-4: Generation Mix (in GWh) in the Base Case using Hydrogen in 2040 and 2050

Capacity Type	2025	2030	2040	2050
Thermal	39,073	20,502	8,921	11,204
Nuclear	27,757	26,376	26,872	28,129
Hydro	27,626	27,626	27,627	27,626
Solar	10,058	17,712	24,426	23,236
Onshore Wind	13,407	13,266	13,024	12,340
Offshore Wind	6,981	24,742	40,759	62,333
Other Renewables (biomass, etc.)	2,948	2,948	2,956	2,948
Scheduled Hydro Imports	9993	9993	9993	9993
Energy Storage	2,165	3,760	11,719	20,878
Total (excl. energy storage)	137,843	143,166	154,577	177,810

Table 4-5: Generation Mix (in GWh) in the Change Case using Hydrogen in 2040 and 2050

Capacity Type	2025	2030	2040	2050
Thermal	40,348	20,957	8,889	11,555
Nuclear	27,757	26,376	26,872	28,129
Hydro	27,626	27,626	27,627	27,626
Solar	10,058	17,720	24,448	23,275
Onshore Wind	13,405	13,258	13,019	12,340
Offshore Wind	6,981	24,742	40,722	62,384
Other Renewables	2,948	2,948	2,956	2,948
Scheduled Hydro Imports	9993	9993	9993	9993
Energy Storage	2,021	3,702	11,626	20,656
Total (excl. energy storage)	139,116	143,621	154,527	178,250

It is important to emphasize that this analysis does not examine the full extent to which electrification of New York's energy system may impact electricity demand. The load forecast utilized in this analysis assumes achievement of the energy efficiency mandates as well as the full resource targets of the CLCPA, such as the six GW distributed generation solar PV target in 2025. However, impacts of electric vehicles (EVs) and non-EV electrification are consistent with NYISO's 2020 Gold Book Baseline scenario, which assumes only moderate levels of

electrification and EV proliferation. Given the load forecast assumptions of this analysis, ICF's findings regarding the Facility's benefits are likely conservative. If the broader economy-wide CLCPA greenhouse gas reduction targets are to be realized, electricity demand will rise significantly as space heating, transportation, and other end-use energy needs transition to electricity. As a result, more zero-emissions generation and capacity will be required in NYS. This increase is also shown in other studies published by NYISO, such as the Climate Change Report published in December of 2019 and the Gold Book High Load case, both of which predict substantial demand increases compared to demand assumptions in this analysis.[26,27] With the potential for significant increases in electric load, efficient and flexible RNG or hydrogen-fired thermal units will be even more important to maintaining reliability in the grid.

4.2 Impact on Greenhouse Gas Emissions

ICF's assessment of the impact of the Facility on GHG emissions in NYS comprises impacts on both direct GHG emissions from the Facility and upstream emissions associated with the operation of the Facility. As mentioned earlier (see Section 2.2), the net impact of the Facility on statewide greenhouse gas emissions is calculated by the following equation:

$$\begin{aligned} &Net\ Impact\ of\ the\ Project\ on\ Statewide\ GHG\ Emissions \\ &= Increase\ in\ emissions\ from\ the\ Project\ in\ tons \\ &- \left[displacement\ of\ other\ NYS\ thermal\ generation\ in\ MWh \right. \\ &\left. * average\ emissions\ rate\ in \frac{tons}{MWh}\right] \end{aligned}$$

The total amount of other NYS thermal generation displaced by the Project is equal to the projected generation of the Facility itself and is summarized below.

Table 4-6: Projected Generation and Fuel Consumption of the Facility using RNG in 2040 and 2050

Impact	2025	2030	2040	2050
Projected Generation of the Facility (GWh)	4,395	2,365	1,142	1,661
Projected Fuel Consumption of the Facility (Thousand MMBtu)	32,592	17,850	8,862	12,695

[26] Itron Inc., New York ISO Climate Change Impact Study Phase 1: Long-Term Load Impact, December 2019
[27] NYISO 2020 Load & Capacity Data, April 2020

Table 4-7: Projected Generation and Fuel Consumption of the Facility using Hydrogen in 2040 and 2050

Impact	2025	2030	2040	2050
Projected Generation of the Facility (GWh)	4,395	2,365	797	1,100
Projected Fuel Consumption of the Facility (Thousand MMBtu)	32,592	17,850	6,253	8,423

The tables below present the impact of the Facility on Statewide GHG (CO_2, CH_4, N_2O) emissions. In 2040 and 2050, combustion emissions from RNG are shown for informational purposes even though this analysis assumes that RNG would be considered a CLCPA-compliant fuel by the NY PSC.[28] Direct and upstream emissions from hydrogen are zero.

Table 4-8: Amount of GHG Emissions from other NYS generators displaced by the Facility

Impact (thousand short tons)	2025	2030	2040 (RNG)	2050 (RNG)	2040 and 2050 (Hydrogen)
Reduction in direct GHG emissions through displacement of other generators	2,010	1,082	522	760	-
Reduction in upstream emissions due to reduced fuel consumption of displaced generators	1,589	874	-	-	-
Total [B]	**3,599**	**1,956**	**522**	**760**	**-**

Table 4-9: Impact of the Facility on GHG Emissions in NYS

Impact (thousand short tons)	2025	2030	2040 (RNG)	2050 (RNG)	2040 and 2050 (Hydrogen)
Increase in direct GHG emissions in NYS from generation by the Facility	1,840	1,008	500	717	-
Increase in upstream GHG emissions from operation of the Facility	1,588	870	-	-	-
Total [A]	**3,428**	**1,877**	**500**	**717**	**-**

[28] NY DEC staff suggested that ICF may include an assumption that RNG will be considered zero emissions by the NY PSC. [Source: Binder, Jonathan A. "RE: ICF CPV Valley Title V Analysis Assumptions Documents." E-mail message to ICF, Valley and Harris Beach, LLC. February 10, 2021]

Table 4-10: Net Impact on Statewide GHG Emissions from operation of the Facility

Impact (thousand short tons)	2025	2030	2040 (RNG)	2050 (RNG)	2040 and 2050 (Hydrogen)
Net reduction in GHG emissions [C] = [A] - [B]	**(172)**	**(79)**	**(22)**	**(43)**	**-**

APPENDICES

A-1 Peak and Energy Use Assumptions

The tables below present the peak and energy demand assumptions used in this study.[29]

Net Coincident Summer Peak Demand (MW)												
Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2020	2,649	1,937	2,712	582	1,338	2,321	2,133	645	1,427	11,299	5,037	32,080
2021	2,614	1,919	2,686	611	1,310	2,272	2,097	642	1,422	11,269	4,963	31,805
2022	2,583	1,903	2,660	637	1,282	2,230	2,069	641	1,428	11,356	4,852	31,641
2023	2,547	1,882	2,630	657	1,249	2,181	2,039	638	1,419	11,298	4,699	31,239
2024	2,512	1,860	2,596	674	1,217	2,136	2,013	636	1,412	11,253	4,560	30,869
2025	2,478	1,838	2,562	684	1,185	2,091	1,986	631	1,399	11,163	4,450	30,467
2026	2,453	1,817	2,534	688	1,158	2,056	1,966	628	1,395	11,132	4,357	30,184
2027	2,435	1,806	2,514	688	1,138	2,031	1,948	625	1,397	11,134	4,305	30,021
2028	2,430	1,801	2,507	688	1,129	2,020	1,945	626	1,402	11,187	4,282	30,017
2029	2,436	1,802	2,508	684	1,128	2,019	1,946	627	1,413	11,269	4,269	30,101
2030	2,442	1,805	2,512	683	1,132	2,022	1,955	629	1,426	11,375	4,282	30,263
2031	2,454	1,812	2,520	679	1,139	2,029	1,964	631	1,439	11,497	4,312	30,476
2032	2,466	1,814	2,524	679	1,145	2,035	1,976	633	1,455	11,624	4,358	30,709
2033	2,476	1,819	2,528	678	1,149	2,042	1,990	634	1,465	11,716	4,395	30,892
2034	2,487	1,827	2,529	677	1,154	2,047	2,006	635	1,477	11,808	4,436	31,083
2035	2,500	1,831	2,532	677	1,160	2,059	2,021	637	1,488	11,909	4,483	31,297
2036	2,510	1,838	2,537	677	1,165	2,066	2,036	638	1,499	12,001	4,551	31,518
2037	2,519	1,846	2,540	676	1,172	2,076	2,053	638	1,508	12,082	4,608	31,718
2038	2,530	1,852	2,543	678	1,179	2,087	2,070	638	1,517	12,151	4,669	31,914
2039	2,541	1,860	2,546	676	1,185	2,097	2,087	638	1,524	12,212	4,738	32,104
2040	2,551	1,867	2,549	678	1,191	2,108	2,104	638	1,527	12,238	4,759	32,210
2041	2,558	1,870	2,550	678	1,197	2,118	2,120	636	1,530	12,264	4,785	32,306
2042	2,566	1,877	2,552	677	1,202	2,124	2,134	635	1,534	12,287	4,793	32,381
2043	2,571	1,878	2,553	677	1,204	2,128	2,147	633	1,536	12,307	4,807	32,441
2044	2,575	1,880	2,551	676	1,209	2,132	2,159	631	1,538	12,323	4,818	32,492
2045	2,579	1,883	2,549	675	1,210	2,135	2,170	628	1,540	12,336	4,822	32,527
2046	2,582	1,885	2,544	675	1,213	2,137	2,180	627	1,542	12,340	4,836	32,561
2047	2,585	1,884	2,544	675	1,215	2,137	2,191	624	1,541	12,338	4,840	32,574
2048	2,586	1,884	2,540	674	1,217	2,138	2,202	623	1,540	12,329	4,859	32,592
2049	2,589	1,885	2,538	675	1,219	2,136	2,212	620	1,539	12,316	4,878	32,607
2050	2,591	1,884	2,534	675	1,221	2,135	2,222	619	1,536	12,295	4,890	32,602

[29] 2020 Load & Capacity Data Report (Gold Book), NYISO, April 10, 2020.

Net Coincident Winter Peak Demand (MW)												
Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2020	2,213	1,551	2,513	750	1,323	1,887	1,551	492	857	7,540	3,271	23,948
2021	2,201	1,542	2,507	780	1,317	1,874	1,535	492	864	7,609	3,220	23,941
2022	2,196	1,534	2,509	807	1,314	1,868	1,520	495	884	7,817	3,133	24,077
2023	2,187	1,524	2,502	831	1,310	1,858	1,504	495	894	7,927	3,058	24,090
2024	2,179	1,515	2,495	851	1,305	1,851	1,489	495	905	8,055	2,958	24,098
2025	2,172	1,508	2,485	865	1,301	1,844	1,474	494	919	8,185	2,900	24,147
2026	2,171	1,504	2,478	873	1,298	1,843	1,464	495	940	8,374	2,869	24,309
2027	2,173	1,506	2,474	878	1,298	1,845	1,462	496	962	8,557	2,872	24,523
2028	2,186	1,511	2,479	881	1,303	1,853	1,466	500	990	8,815	2,891	24,875
2029	2,206	1,523	2,490	886	1,312	1,868	1,481	506	1,026	9,142	2,918	25,358
2030	2,226	1,535	2,504	891	1,321	1,885	1,500	513	1,068	9,507	2,934	25,884
2031	2,256	1,553	2,523	897	1,335	1,906	1,524	521	1,107	9,869	2,992	26,483
2032	2,289	1,570	2,549	904	1,350	1,931	1,554	530	1,150	10,244	3,061	27,132
2033	2,325	1,591	2,576	914	1,367	1,959	1,588	538	1,193	10,628	3,154	27,833
2034	2,368	1,615	2,607	925	1,387	1,990	1,627	548	1,234	11,007	3,260	28,568
2035	2,417	1,643	2,644	937	1,411	2,026	1,666	558	1,277	11,382	3,393	29,354
2036	2,467	1,672	2,682	951	1,433	2,061	1,710	569	1,305	11,746	3,539	30,135
2037	2,517	1,705	2,724	965	1,458	2,100	1,757	581	1,331	12,096	3,683	30,917
2038	2,572	1,738	2,769	981	1,485	2,140	1,805	594	1,354	12,427	3,847	31,712
2039	2,631	1,772	2,817	996	1,513	2,180	1,854	605	1,371	12,731	3,963	32,433
2040	2,689	1,809	2,864	1,012	1,541	2,222	1,903	615	1,386	13,009	4,083	33,133
2041	2,747	1,845	2,915	1,028	1,569	2,263	1,954	625	1,400	13,271	4,221	33,838
2042	2,803	1,881	2,963	1,044	1,595	2,300	2,000	634	1,410	13,506	4,337	34,473
2043	2,855	1,913	3,009	1,059	1,621	2,335	2,045	642	1,417	13,711	4,438	35,045
2044	2,905	1,946	3,050	1,075	1,643	2,369	2,088	648	1,423	13,885	4,522	35,554
2045	2,950	1,976	3,090	1,089	1,665	2,396	2,129	653	1,426	14,028	4,608	36,010
2046	2,990	2,002	3,127	1,102	1,684	2,418	2,166	658	1,427	14,127	4,686	36,387
2047	3,027	2,028	3,158	1,115	1,699	2,440	2,199	662	1,428	14,187	4,770	36,713
2048	3,061	2,052	3,189	1,129	1,714	2,458	2,230	665	1,428	14,216	4,846	36,988
2049	3,094	2,077	3,220	1,140	1,731	2,475	2,260	667	1,427	14,224	4,917	37,232
2050	3,122	2,098	3,245	1,151	1,742	2,489	2,287	669	1,427	14,216	4,968	37,414

Net Energy Projections (GWh)												
Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2020	14,182	9,396	15,078	4,810	7,462	11,272	8,994	2,657	5,589	48,857	19,584	147,881
2021	14,247	9,456	15,187	5,139	7,458	11,214	8,942	2,754	5,560	49,049	19,524	148,530
2022	14,233	9,460	15,236	5,407	7,404	11,117	8,837	2,819	5,564	49,455	19,336	148,868
2023	13,993	9,311	15,049	5,586	7,226	10,837	8,601	2,835	5,443	48,400	18,625	145,906
2024	13,764	9,161	14,865	5,728	7,042	10,572	8,380	2,831	5,352	47,602	17,931	143,228
2025	13,522	8,999	14,650	5,813	6,847	10,296	8,159	2,823	5,262	46,758	17,326	140,455
2026	13,322	8,863	14,466	5,858	6,680	10,065	7,981	2,812	5,191	46,123	16,861	138,222
2027	13,159	8,756	14,325	5,872	6,544	9,882	7,851	2,807	5,155	45,809	16,644	136,804
2028	13,064	8,698	14,249	5,868	6,455	9,773	7,794	2,817	5,159	45,813	16,694	136,384
2029	13,024	8,686	14,225	5,851	6,413	9,720	7,795	2,836	5,196	46,124	16,761	136,631
2030	12,997	8,688	14,218	5,843	6,387	9,690	7,837	2,861	5,250	46,602	17,004	137,377
2031	13,010	8,724	14,244	5,838	6,380	9,689	7,890	2,890	5,315	47,201	17,337	138,518
2032	13,040	8,750	14,283	5,840	6,383	9,698	7,965	2,923	5,394	47,889	17,806	139,971
2033	13,074	8,790	14,313	5,841	6,389	9,713	8,055	2,952	5,476	48,629	18,219	141,451
2034	13,122	8,846	14,357	5,852	6,402	9,735	8,158	2,985	5,562	49,399	18,769	143,187
2035	13,185	8,904	14,410	5,865	6,422	9,771	8,254	3,017	5,653	50,198	19,383	145,062
2036	13,236	8,973	14,472	5,884	6,444	9,805	8,368	3,049	5,745	51,014	20,122	147,112
2037	13,294	9,040	14,533	5,902	6,469	9,845	8,484	3,081	5,836	51,829	20,806	149,119
2038	13,361	9,117	14,601	5,924	6,502	9,892	8,605	3,111	5,929	52,660	21,473	151,175
2039	13,443	9,194	14,678	5,942	6,537	9,947	8,736	3,141	6,023	53,477	22,265	153,383
2040	13,528	9,281	14,759	5,963	6,580	10,006	8,875	3,170	6,113	54,276	22,644	155,195
2041	13,620	9,367	14,844	5,982	6,623	10,071	9,013	3,193	6,200	55,045	22,948	156,906
2042	13,718	9,453	14,933	6,000	6,669	10,135	9,157	3,216	6,281	55,764	23,238	158,564
2043	13,818	9,539	15,017	6,017	6,716	10,204	9,298	3,234	6,357	56,425	23,522	160,147
2044	13,919	9,624	15,101	6,036	6,766	10,267	9,440	3,250	6,424	57,020	23,821	161,668
2045	14,017	9,704	15,178	6,052	6,812	10,328	9,577	3,260	6,482	57,542	24,013	162,965
2046	14,115	9,780	15,254	6,068	6,860	10,386	9,713	3,269	6,532	57,977	24,272	164,226
2047	14,213	9,858	15,327	6,083	6,906	10,442	9,849	3,277	6,572	58,321	24,504	165,352
2048	14,308	9,927	15,392	6,097	6,951	10,493	9,979	3,284	6,602	58,587	24,799	166,419
2049	14,401	10,000	15,458	6,110	6,996	10,545	10,108	3,287	6,627	58,802	24,984	167,318
2050	14,488	10,062	15,510	6,121	7,036	10,587	10,230	3,291	6,645	58,947	25,175	168,092

A-2 Capital Cost Assumptions

The tables below provide ICF's capital cost assumptions for new renewable and CCGT with CCS resources. The values below represent the base numbers and do not show regionalization factors.

NREL ATB 2019 Build Costs (2018$)			
Utility Solar PV	**Overnight Capital Cost ($/kW)**	**FOM ($/kW-yr)**	
2020	$1,407	$17	
2025	$1,268	$15	
2030	$1,128	$14	
2035	$1,066	$13	
2040	$1,003	$12	
Onshore Wind	**Overnight Capital Cost ($/kW)**	**FOM ($/kW-yr)**	
2020	$1,526	$43	
2025	$1,388	$42	
2030	$1,251	$40	
2035	$1,190	$38	
2040	$1,129	$37	
Offshore Wind	**Overnight Capital Cost ($/kW)**	**FOM ($/kW-yr)**	
2020	$2,927	$113	
2025	$2,487	$96	
2030	$2,112	$81	
2035	$1,795	$69	
2040	$1,525	$58	
Battery Storage	**4-Hour Capex ($/kW)**	**8-Hour Capex ($/kW)**	**FOM ($/kW-yr)**
2020	$1,186	$1,990	$30
2025	$733	$1,500	$18
2030	$496	$1,256	$12
2035	$448	$1,178	$11
2040	$399	$1,099	$10

Combined Cycle with CCS	**EPA v6 Reference Case Assumptions (2018$)**			
	Overnight Capital Cost ($/kW)	**FOM ($/kW-yr)**	**VOM ($/MWh)**	**Heat Rate (MMBtu/MWh)**
2020	$2,201	$34.73	$7	7.514
2025	$2,096	$34.73	$7	7.493
2030	$1,918	$34.73	$7	7.493
2035	$1,776	$34.73	$7	7.493
2040	$1,672	$34.73	$7	7.493

A-3 RNG Cost Curve Development

To model RNG as a potential future fuel source for power plants, ICF analyzed resource availability and developed a cost curve. The objective of the RNG resource assessment was to characterize the technical and economic potential of RNG as a greenhouse gas emission reduction strategy, with a focus on local and regional resources deliverable to New York State. The assessment was based on an inventory of RNG feedstocks and production volumes accessible to NYS on existing transmission pipeline infrastructure. Biomass-based feedstocks were grouped into eight categories:

- Agricultural residues
- Animal manure
- Energy crops
- Food waste
- Forestry and forest product residues
- Landfill gas (LFG)
- Municipal solid waste (MSW)
- Wastewater treatment gas (WWT) from water resource recovery facilities (WWRFs)

ICF relied on existing studies, government data and industry resources to estimate the current and future supply of the feedstocks. The table below summarizes the resources that ICF drew from in its RNG resource assessment, broken down by RNG feedstock. The data sources and assessment approach were consistent with other RNG assessments ICF has conducted, notably its national assessment of RNG potential for the American Gas Foundation (AGF).[30]

Feedstock for RNG	Resources for assessment	
Agricultural residue	• US DOE 2016 Billion Ton Report	• Bioenergy Knowledge Discovery Framework
Animal manure	• AgStar Project Database	• USDA Livestock Inventory (Cattle, Swine, etc)
Energy crops	• US DOE 2016 Billion Ton Report	• Bioenergy Knowledge Discovery Framework
Food waste	• US DOE 2016 Billion Ton Report	• Bioenergy Knowledge Discovery Framework
Forestry and forest product residue	• US DOE 2016 Billion Ton Report	• Bioenergy Knowledge Discovery Framework
LFG	• US EPA Landfill Methane Outreach Program	
MSW	• US EPA	• Waste Business Journal
WRRF	• US EPA	• Water Environment Federation

[30] ICF, Renewable Sources of Natural Gas, December 2019.
[Source:https://gasfoundation.org/2019/12/18/renewable-sources-of-natural-gas/]

Based on these sources, ICF then developed RNG production potential estimates incorporating constraints on accessibility to feedstocks, the time it would take to deploy projects, the development of technology to achieve higher levels of RNG production, and the consideration of likely Facility economics—with the assumption that the most economic projects will come online first. The RNG production estimates differentiate between the two biomass-based RNG production technologies currently available: anaerobic digestion and thermal gasification.

RNG Feedstock	Supply Assumptions
Agricultural residue	50% of the agricultural residue biomass available at $50/dry ton.[31]
Animal manure	60% of technically available animal manure.
Energy crops	50% of the energy crop biomass available at $70/dry ton.
Food waste	70% of the food waste available at $10/dry ton.
Forestry and forest product residue	60% of the forest and forestry product residue biomass available at $460/dry ton.
Landfill gas[32]	RNG production at 65% of the LFG facilities that have collection systems in place; 60% of the LFG facilities that do not have collections systems in place; and 80% of EPA's candidate landfills.
MSW	60% of the non-biogenic fraction of MSW available at $100/dry ton.
WRRF	50% of WRRFs with a capacity greater than 3.3 million gallons per day.

The RNG resource scenario also includes constraints based on geography and further limited by the current share of regional natural gas consumption. The scenario includes only RNG feedstocks from the U.S. eastern seaboard region, based on the EIA's census regions of New England, Mid-Atlantic, South Atlantic, East North Central and East South Central. Available RNG resources are further limited by NYS's share of regional non-electric generation natural gas consumption, which is equivalent to roughly 10% of the region.

The potential availability of biomass in the region far exceeds the usage for power generation in ICF's RNG scenario. ICF's RNG scenario assumes up to 185 TBtu of available RNG in 2040, which represents roughly 2% of the total biomass available in the U.S. eastern seaboard region.

Infrastructure build out and technology development are constrained, and these constraints are reflected temporally. In the near term, RNG is sourced from feedstocks that use commercially

[31] Feedstock availability for agricultural residue, energy crops, forestry and forest product residue, and MSW are based on specified-price simulations for biomass used in the DOE Billion Ton Report. These price simulations introduce markets for biomass at specific farmgate or tipping fee prices, with the price driving the available volume of biomass. The higher the price, the greater the volume of economically viable biomass is available.

[32] ICF considered only landfills that are either open or were closed post-2000. This constraint was imposed to account for the fact that the phase during which the decomposition of waste in a landfill produces sufficient methane concentrations lasts about 20-25 years, and this is the period during which waste-to-energy projects are most viable.

available anaerobic digestion technology (landfill gas, WRRFs and animal manure). To allow time for technology and infrastructure development, RNG feedstocks that use thermal gasification do not make a significant contribution until post-2030, including agricultural residues, forestry residues and energy crops.

RNG production will require new interconnections to pipelines, but RNG supply does not necessarily require additional natural gas system infrastructure, such as transmission and distribution pipes. The assumptions that limit the potential for each feedstock are designed to reflect that not all of the feedstocks that could technically produce RNG are viable or feasible. For some feedstocks this lack of viability could be due to geography or other physical restrictions. For example, only 60% of the technically available animal manure feedstock is considered for RNG production, reflecting that the animal manure feedstock is located in rural or regional areas, and some of these locations are a long distance from existing pipelines.

Overall natural gas infrastructure is not explicitly addressed in the RNG resource assessment. ICF's general assumption is that with a steady decline in natural gas consumption over the long term, RNG coming into the pipeline system (particularly at larger volumes post-2035) will not constrain pipeline capacity or be impactful to the gas system.

ICF developed assumptions for the capital expenditures and operational costs for RNG production from the various feedstock and technology pairings. ICF characterizes costs based on a series of assumptions regarding feedstock type, production facility size, gas upgrading and conditioning costs (depending on the type of technology used, the contaminant loadings, etc.), compression, and interconnection for pipeline injection. ICF also includes operational costs for each technology type.

In relation to pipeline interconnection, ICF understands developers have experienced a wide range of costs. Costs will vary for individual projects, including particularly for those that use anaerobic digestion and thermal gasification technologies. ICF's supply-cost curves are meant to be estimates of the potential costs that may occur in the future, rather than exact values. This is especially true in the long term, because ICF does not include significant cost reductions that might occur from RNG utilization scaling in time. The table below outlines ICF's baseline assumptions employed in its RNG costing model.

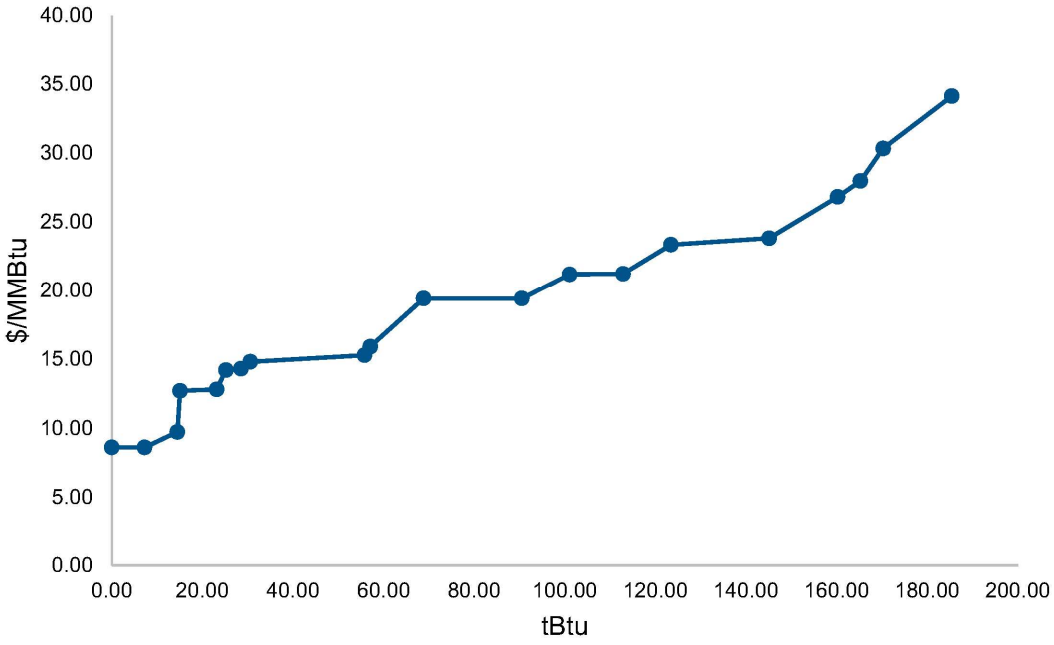
Cost Parameter	ICF Cost Assumptions
Facility Sizing	▪ Differentiate by feedstock and technology type: anaerobic digestion and thermal gasification. ▪ Prioritize larger facilities to the extent feasible, but driven by resource estimate.
Gas Conditioning and Upgradation	▪ Vary by feedstock type and technology required.
Compression	▪ Capital costs for compressing the conditioned/upgraded gas for pipeline injection.

Cost Parameter	ICF Cost Assumptions
Operational Costs	▪ Costs for each equipment type—digesters, conditioning equipment, collection equipment, and compressors—as well as utility charges for estimated electricity consumption.
Feedstock	▪ Feedstock costs (for thermal gasification), ranging from $30 to $100 per dry ton.
Financing	▪ Financing costs, including carrying costs of capital (assuming a 60/40 debt/equity ratio and an interest rate of 7%), an expected rate of return on investment (set at 10%), and a 15-year repayment period.
Delivery	▪ Cost of delivering the biogas in line with financing, constructing, and maintaining a pipeline of about 1 mile in length. The costs of delivering the same volumes of biogas that require pipeline construction greater than 1 mile will increase, depending on feedstock/technology type, with a typical range of $1-$5/MMBtu.
Facility Lifetimes	▪ 20 years. The levelized cost of gas was calculated based on the initial capital costs in Year 1, annual operational costs discounted at an annual rate of 5% over 20 years, and biogas production discounted at an annual rate of 5% for 20 years.

These cost assumptions are further refined by region, including average utility costs for the electricity and natural gas used in RNG production. However, the variation of costs between regions is modest. Tipping fees are based on state-level data, and relevant for estimating costs associated with LFG and WRRFs. The table below provides a summary of the different cost ranges for each RNG feedstock and technology.

	Feedstock	Cost Range ($/MMBtu)
Anaerobic Digestion	Landfill Gas	$7.10 – $19.00
	Animal Manure	$18.40 – $32.60
	Water Resource Recovery Facilities	$7.40 – $26.10
	Food Waste	$19.40 – $28.30
Thermal Gasification	Agricultural Residues	$18.30 – $27.40
	Forestry and Forest Residues	$17.30 – $29.20
	Energy Crops	$18.30 – $31.20
	Municipal Solid Waste	$17.30 – $44.20

The chart below shows ICF's price versus quantity curve for RNG in 2040 and beyond.



A-4 Hydrogen Cost Curve Development

Power-to-gas (P2G) is a form of energy technology that converts electricity to a gaseous fuel, such as hydrogen. Electricity is used to split water molecules into hydrogen and oxygen, and the hydrogen can be further processed to produce methane when combined with a source of carbon dioxide. If the electricity is sourced from renewable resources, such as wind and solar, then the resulting fuels are carbon neutral.

The key process in P2G is the production of hydrogen from renewable sources of electricity by means of electrolysis. This hydrogen conversion method is not new, and there are three electrolysis technologies with different efficiencies and in different stages of development and implementation:

- Alkaline electrolysis,
- Proton exchange membrane electrolysis, and
- Solid oxide electrolysis.

The hydrogen produced from P2G is a highly flexible energy product that can be used in multiple ways. It can be:

- Stored as hydrogen and used to generate electricity at a later time using fuel cells or conventional combustion turbine generating technologies.
- Injected as hydrogen into the natural gas system, where it augments the natural gas supply.
- Converted to methane and injected into the natural gas system.

The flexibility of hydrogen provides advantages beyond as an input to methanation for RNG. Hydrogen can be used in place of natural gas in many industrial applications, and hydrogen can be mixed directly with natural gas in pipeline systems, although there are physical limits to the level of hydrogen blending in natural gas pipeline systems. In addition, currently most commercially produced hydrogen is derived from conventional natural gas and does not have the environmental benefits of carbon neutral hydrogen produced from P2G.

Whether hydrogen or methane is the final product, P2G offers the potential to produce carbon neutral fuels from sustainable resources and leverage existing natural gas infrastructure for long-term and large-scale storage. Competing electric energy storage options, including batteries and pumped hydro storage, are expensive as a long-term energy storage option, and can be more expensive than hydrogen storage.

The quantity of carbon-neutral hydrogen available from P2G is technically unlimited as long as enough water and renewable electricity is available. ICF estimates that hydrogen would be available at an expected cost of $30/MMBtu in 2019 dollars, which equates to $45/MMBtu in nominal 2040 dollars. However, as the amount of renewable electricity increases, the cost to produce hydrogen will decline.

A-5 Upstream Emissions Factors

Consistent with the suggestion of NY DEC staff, ICF excluded upstream emissions from RNG and used upstream emission factors shown in the table below.[33]

GHG Emission Rate (g/MMBtu)				
Fuel Type	CO_2	CH_4	N_2O	CO_2e (20-year GWP)
Natural Gas	11,913	384	0.136	44,205
Coal	3,279	397	0.103	36,650
Distillate Fuel/Oil	15,164	121	0.258	25,375

[33] Leddy, Maureen A. “RE: ICF CPV Valley Title V Analysis Assumptions Documents.” Email message to ICF, Valley and Harris Beach. February 4, 2021.

APPENDIX 2

Supplement to March 8, 2021 Report - Greenhouse Gas Analysis for CPV Valley Energy Center Title V Application (ICF, Oct. 7, 2021)

Supplement to March 8, 2021 Report –

Greenhouse Gas Analysis for CPV Valley Energy Center Title V Permit Application

October 7, 2021

Prepared for:
Competitive Power Ventures

Prepared by:
ICF

Supplemental Table 4-8: Amount of GHG Emissions from other NYS generators displaced by the Facility

Impact (thousand short tons) (CO2e)	Effluent	2025	2030	2040 (RNG)	2050 (RNG)	2040 and 2050 (Hydrogen)
Reduction in direct GHG emissions through displacement of other generators	CO2	2,008	1,081	522	759	0
	N2O	2	1	1	1	0
Reduction in upstream emissions due to reduced fuel consumption of displaced generators	CO2	428	235	0	0	0
	CH4	1,160	638	0	0	0
	N2O	1	1	0	0	0
Total [B]		**3,599**	**1,956**	**522**	**760**	**0**

Supplemental Table 4-9: Impact of the Facility on GHG Emissions in NYS

Impact (thousand short tons) (CO2e)	Effluent	2025	2030	2040 (RNG)	2050 (RNG)	2040 and 2050 (Hydrogen)
Increase in direct GHG emissions in NYS from generation by the Facility	CO2	1,839	1,007	500	716	0
	N2O	1	1	0	0	0
Increase in upstream GHG emissions from operation of the Facility	CO2	428	234	0	0	0
	CH4	1,159	635	0	0	0
	N2O	1	1	0	0	0
Total [A]		**3,428**	**1,877**	**500**	**717**	**0**

Supplemental Table 4-10: Net Impact on Statewide GHG Emissions from operation of the Facility

Impact (thousand short tons) (CO2e)	Effluent	2025	2030	2040 (RNG)	2050 (RNG)	2040 and 2050 (Hydrogen)
Net reduction in GHG emissions [C] = [A] - [B]	CO2	-170	-75	-22	-43	0
	CH4	-1	-3	0	0	0
	N2O	-1	-1	0	0	0
	Total	**-172**	**-79**	**-22**	**-43**	**0**

APPENDIX 3

Additional Reliability Study: CPV Valley (NYISO, Mar. 09, 2022)

New York ISO
Independent System Operator

R008 Additional Reliability Study: CPV Valley

A Report by the
New York Independent System Operator

March 9, 2022

Table of Contents

Background

The purpose of this Additional Reliability Study is for the New York Independent System Operator, Inc. ("NYISO") to conduct a reliability planning study to determine whether a hypothetical change, as specified by CPV Valley, LLC ("Requestor") below, may result in certain Reliability Needs arising on the New York Bulk Power Transmission System ("BPTF"), as defined pursuant to the scope of work.

This Study is being performed by the NYISO, at the request of CPV Valley, LLC, and in accordance with the NYISO Procedures. The Study will determine whether the hypothetical unavailability of the CPV Valley Generator as of January 1, 2023, may result in certain Reliability Needs as defined in Section 31.1 of the NYISO Open Access Transmission Tariff ("OATT") or a Generator Deactivation Reliability Need as defined in Section 38.1 of the OATT, in accordance with the applicable Reliability Criteria[1], and in accordance with applicable NYISO study guidelines, procedures, and practices.

Scope

A limited scope was defined in collaboration with the Requestor, as described below.

1. Resource adequacy: the NYISO, using the latest available resource adequacy planning models from the 2021 Q4 Short Term Assessment of Reliability ("STAR") extended through 2031, provides the impact of the unavailability of the CPV Valley Generator as of January 1, 2023, on the New York Control Area (NYCA) loss of load expectation ("LOLE") for the Study Period of 2023 through 2031.
2. Transmission security: the NYISO, using the "tipping points" tables from the 2021 Q4 STAR, extended through 2031, provides a "tipping point" evaluation, similar to those evaluations performed in the 2021 Q4 STAR, by removing the CPV Valley Generator as of January 1, 2023. This will be provided for the Study Period of 2023 through 2031.

1. Section 31.1 of the OATT defines "Reliability Criteria" as "The electric power system planning and operating policies, standards, criteria, guidelines, procedures, and rules promulgated by the North American Reliability Corporation ("NERC"), the Northeast Power Coordinating Council ("NPCC"), and the New York State Reliability Council ("NYSRC"), as they may be amended from time to time.

CPV Valley Description

CPV Valley is a 770 MW (nameplate) 2-unit combined cycle dual-fuel (natural gas and oil) plant with a summer capacity of 680 MW, located in NYISO Zone G in the Town of Wawayanda within the Lower Hudson Valley locality. The plant entered service in March 2018.

Resource Adequacy

Modeling Background

The NYISO conducts its resource adequacy analysis using the GE-MARS software package, which performs probabilistic simulations of outages of capacity and select transmission resources. The program employs a sequential Monte Carlo simulation method and calculates expected values of reliability indices such as loss of load expectation (LOLE in days/year) and includes load models, generation, and a simplified transmission representation. In determining the reliability of a system, several types of randomly occurring events are taken into consideration. Among these are the forced outages of generation and transmission, and deviations from the forecasted loads.

Generation Model

The NYISO models the generation system in GE-MARS using several types of units. Thermal unit considerations include random forced outages as determined by Generator Availability Data System (GADS), which is reflected in form of a calculated EFORd in the Monte Carlo draw, and scheduled and unplanned maintenance, and thermal derates. Renewable resource units (*i.e.,* solar PV, wind, run-of-river hydro, and landfill gas) are modeled using five years of historical production data. Co-generation units are also modeled using a capacity and load profile for each unit.

Load Model

The load model in the NYISO GE-MARS model consists of historical load shapes and load forecast uncertainty (LFU). The NYISO currently uses three historical load shapes in the GE-MARS model (2002, 2006 and 2007) in seven different load levels using a normal distribution. LFU is applied to every hour of these historical shapes and each of the seven load levels are run through the GE-MARS model.

External Areas Model

The NYISO models the four external Control Areas interconnected to the NYCA: (ISO-New England, PJM, Ontario, and Quebec). The transfer limits between the NYCA and the external areas are set in collaboration

with the NPCC CP-8 Working Group. Additionally, the probabilistic model employs a number of methods aimed at preventing overreliance on support from the external systems. These include imposing a limit of 3,500 MW to the total emergency assistance from all neighbors, modeling simultaneous peak days, and modeling the long-term purchases and sales with neighboring control areas.

System Topology

The NYISO models the amount of power that could be transferred across the system in GE-MARS using interface transfer limits applied to the connections between the GE-MARS areas[2] ("bubble-and-pipe" model).

Under this type of probabilistic simulation, the NYCA loss of load expectation (LOLE in days/year) through the ten-year planning horizon is compared with the NYSRC and NPCC LOLE criterion to not exceed one event-day in 10 years, or LOLE < 0.1 event-days/year.

Resource Adequacy Results

The GE-MARS models from the 2021 Q4 STAR[3] were used as the "base case", from which CPV Valley was removed starting January 1, 2023, as defined in the scope. NYCA LOLE was then calculated for both models for impact comparison. The study years simulated were 2023 through 2031. The NYCA LOLE results are summarized in the **Figure 1** below.

Figure 1: NYCA LOLE with and without CPV Valley

	LOLE (days/year)		
Study Year	CPV On	CPV Off	Delta
2023	0.033	0.050	0.02
2024	0.041	0.059	0.02
2025	0.044	0.067	0.02
2026	0.046	0.069	0.02
2027	0.052	0.079	0.03
2028	0.044	0.085	0.04
2029	0.058	0.091	0.03
2030	0.059	0.098	0.04
2031	0.069	0.113	0.04

[2] No generation pockets in Zone J and Zone K are modeled in detail in MARS.

[3] https://www.nyiso.com/documents/20142/16004172/2021-Q4-STAR-Report-vFinal.pdf

Key resource adequacy observations:

1. If the 680 MW CPV Valley plant is unavailable, the loss of load expectation increases significantly and would exceed the resource adequacy criterion of 0.1 days/year starting in 2030 or 2031 based on the current load forecasts, system assumptions, and planning procedures. If the NYISO identified a LOLE greater than 0.1 in one of its reliability studies (e.g., Reliability Needs Assessment, Short-Term Assessment of Reliability) this would be considered a Reliability Need, as defined in Section 31.1. of the NYISO Open Access Transmission Tariff.

2. When the loss of load expectation is within the 0.1 days/year criterion, the already small system resource margin will significantly decrease without CPV Valley.

   As described in the 2021 Q4 STAR[4], and as an example focused on Zone G: the 2021-2030 Comprehensive Reliability Plan[5] (CRP) indicated that the zonal resource adequacy margin (ZRAM) as measured in "perfect capacity[6]" in Zone G was approximately 1,800 MW away from violating the NYCA LOLE criterion of 0.1 event-days/year under the study assumptions for study year 2024. Lower margins were identified in the outer study years in the CRP, e.g., 800 MW for study year 2030. If CPV Valley were "perfect capacity", the margin would further decrease to approximately 1,100 MW in 2024 (for a 1 to 1 impact assumption in Zone G), and would further decrease to 100 MW in 2030. The margin would become negative in 2031 when the LOLE is above its criterion.

[4] https://www.nyiso.com/documents/20142/16004172/2021-Q4-STAR-Report-vFinal.pdf

[5] https://www.nyiso.com/documents/20142/2248481/2021-2030-Comprehensive-Reliability-Plan.pdf

[6] "Perfect capacity" is capacity that is not derated (e.g., due to ambient temperature or unit unavailability), not subject to energy durations limitations (i.e., available at maximum capacity every hour of the study year), and not tested for transmission security or interface impacts.

Transmission Security Margins ("Tipping Points")

The purpose of this assessment is to identify plausible changes in conditions or assumptions that might adversely impact the reliability of the Bulk Power Transmission Facilities (BPTF) or "tip" the system into violation of a transmission security criterion. This assessment is performed using a deterministic approach through spreadsheet-based methods based on input from the 2021 Load and Capacity Data Report (Gold Book) and 2021 Quarter 4 STAR base case updates. For this assessment, "tipping points" are evaluated for the NYCA as well as the Lower Hudson Valley (G-J) locality. For this evaluation the system "tips" when the transmission security margin is negative (i.e., demand exceeds available resources and transmission capability).

New York Control Area (NYCA) Tipping Points

The tipping points for the NYCA are evaluated under summer peak conditions, which are expected to be the most stressed system conditions. A tipping point occurs when the transmission security margin is a negative value. The transmission security margin is the ability to meet load plus losses and system reserve (*i.e.,* total capacity requirement) against the NYCA generation, interchanges, and temperature-based generation de-rates (total resources). The NYCA generation (from line-item A) is comprised of the existing generation plus additions of future generation resources that meet the reliability planning process base case inclusion rules as well as the removals of deactivating generation and peaker units. Consistent with current transmission planning practices for transmission security, (1) wind generation is assumed at a 0 MW output, (2) run-of-river hydro is reduced consistent with its average capacity factor, and (3) solar is dispatched based on the ratio of its nameplate capacity and solar PV peak reductions stated in the 2021 Gold Book. Additionally, the NYCA generation includes the Oswego export limit for all lines in-service.

Figure 2 provides a summary of the statewide system margin with CPV in-service as well as with CPV out-of-service. Under current applicable reliability rules and procedures, the system would be unable to maintain operating reserves and meet forecasted demand when the transmission security margin is negative for the base case assumptions (e.g., baseline normal weather load forecast, no pre-contingency unscheduled forced outages, etc.). With CPV in-service the system has sufficient margin through 2031. However, with CPV out-of-service the system margin is insufficient starting in 2030. As shown in **Figure 2**, under baseline normal weather conditions the statewide system margin with CPV in-service (line-item H) ranges between 1,151 MW in 2023 to 508 MW in 2031. With CPV out-of-service the statewide system margin (line-item H) ranges from 489 MW in 2023 to -154 MW in 2031. The annual fluctuations are driven by the decreases in NYCA generation (line-item A) and in the load forecast (line-item E).

It is feasible for other combinations of events to tip the system over its margin, such as increased load or a combination of reductions in total resources and load. An additional evaluation shown in **Figure 2** is the impact of the historical forced outage rate of NYCA thermal generation (line-item I) on the transmission security margin. The statewide system margin with forced outages shows insufficient margins for all years with either CPV in-service or out-of-service (line-item J).

Figure 3 shows the statewide system margin for heatwave conditions (also known as 90/10 or 90th percentile load) under the assumption that the system is in an emergency condition, accounting for Special Case Resources (SCRs). Although the transmission security of the system is not currently designed for the 90th percentile forecast, **Figure 3** shows a risk to grid reliability with insufficient margin throughout the study period (Line-item I). When considering historical forced outage rates of thermal generation (line-item J), the system deficiency is amplified for all study years (line-item K).

Under transmission security for an extreme heatwave (1-in-100-year forecast), **Figure 4** shows that there is insufficient statewide system margin for all years (line-item I). This deficiency is exacerbated with the consideration of forced outages (line-item K). The adjusted statewide system margin is deficient beyond the point of meeting the total capability requirement without reserves.

Figure 5 provides a summary of the statewide system margins under the baseline normal weather conditions. **Figure 6** provides a summary of the statewide system margins under heatwave conditions. **Figure 7** provides a summary of the statewide system margins under the 1-in-100-year extreme heatwave conditions.

Figure 2: Statewide System Margin (Summer Peak - Baseline Normal Weather, Normal Transfer Criteria)

Line	Item	Summer Peak - Baseline Normal Weather, Normal Transfer Criteria with CPV In-Service								
		2023	2024	2025	2026	2027	2028	2029	2030	2031
A	NYCA Generation (1)	34,307	34,297	33,684	33,679	33,679	33,674	33,669	33,664	33,659
B	External Area Interchanges (2)	1,844	1,844	1,844	1,844	1,844	1,844	1,844	1,844	1,844
C	Temperature Based Generation Derates	0	0	0	0	0	0	0	0	0
D	**Total Resources (A+B+C) (3)**	36,151	36,141	35,528	35,523	35,523	35,518	35,513	35,508	35,503
E	Load Forecast	(32,380)	(32,211)	(32,140)	(32,076)	(32,088)	(32,094)	(32,158)	(32,263)	(32,375)
F	Operating Reserve Requirement	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)
G	**Total Capability Requirement (E+F)**	(35,000)	(34,831)	(34,760)	(34,696)	(34,708)	(34,714)	(34,778)	(34,883)	(34,995)
H	**Statewide System Margin (D+G)**	1,151	1,310	768	827	815	804	735	625	508
I	Forced Outages (3)	(1,806)	(1,806)	(1,744)	(1,744)	(1,744)	(1,744)	(1,744)	(1,744)	(1,744)
J	**Statewide System Margin with Forced Outages (H+I)**	(655)	(496)	(976)	(917)	(929)	(940)	(1,009)	(1,119)	(1,236)

Line	Item	Summer Peak - Baseline Normal Weather, Normal Transfer Criteria with CPV Out-of-Service								
		2023	2024	2025	2026	2027	2028	2029	2030	2031
A	NYCA Generation (1)	33,645	33,635	33,022	33,017	33,017	33,012	33,007	33,002	32,997
B	External Area Interchanges (2)	1,844	1,844	1,844	1,844	1,844	1,844	1,844	1,844	1,844
C	Temperature Based Generation Derates	0	0	0	0	0	0	0	0	0
D	**Total Resources (A+B+C) (3)**	35,489	35,479	34,866	34,861	34,861	34,856	34,851	34,846	34,841
E	Load Forecast	(32,380)	(32,211)	(32,140)	(32,076)	(32,088)	(32,094)	(32,158)	(32,263)	(32,375)
F	Operating Reserve Requirement	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)
G	**Total Capability Requirement (E+F)**	(35,000)	(34,831)	(34,760)	(34,696)	(34,708)	(34,714)	(34,778)	(34,883)	(34,995)
H	**Statewide System Margin (D+G)**	489	648	106	165	153	142	73	(37)	(154)
I	Forced Outages (3)	(1,781)	(1,781)	(1,718)	(1,718)	(1,718)	(1,718)	(1,718)	(1,718)	(1,718)
J	**Statewide System Margin with Forced Outages (H+I)**	(1,292)	(1,133)	(1,612)	(1,553)	(1,565)	(1,576)	(1,645)	(1,755)	(1,872)

Notes:

1. Reflects the 2021 Gold Book existing summer capacity plus projected additions, deactivations, and de-rates. For this evaluation wind generation is assumed to have 0 MW output, solar generation is based on the ratio of solar PV nameplate capacity (2021 Gold Book Table I-9a) and solar PV peak reductions (2021 Gold Book Table I-9c). De-rates for run-of-river hydro are included as well as the Oswego Export limit for all lines in-service.
2. Interchanges are based on ERAG MMWG values.
3. Includes de-rates for thermal resources based on NERC class average EFORd data (https://www.nerc.com/pa/RAPA/gads/Pages/Reports.aspx)

Figure 3: Statewide System Margin (Summer Peak – Heatwave, Emergency Transfer Criteria)

Line	Item	Summer Peak - Heatwave, Emergency Transfer Criteria with CPV In-Service								
		2023	2024	2025	2026	2027	2028	2029	2030	2031
A	NYCA Generation (1)	34,307	34,297	33,684	33,679	33,679	33,674	33,669	33,664	33,659
B	External Area Interchanges (2)	1,844	1,844	1,844	1,844	1,844	1,844	1,844	1,844	1,844
C	SCRs (4), (5)	822	822	822	822	822	822	822	822	822
D	Temperature Based Generation Derates	(195)	(195)	(185)	(185)	(185)	(185)	(185)	(185)	(185)
E	**Total Resources (A+B+C+D)**	36,778	36,768	36,164	36,159	36,159	36,154	36,149	36,144	36,139
F	Load Forecast	(34,341)	(34,152)	(34,069)	(33,996)	(34,001)	(34,005)	(34,072)	(34,183)	(34,300)
G	Operating Reserve Requirement	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)
H	**Total Capability Requirement (F+G)**	(36,961)	(36,772)	(36,689)	(36,616)	(36,621)	(36,625)	(36,692)	(36,803)	(36,920)
I	**Statewide System Margin (E+H)**	(183)	(4)	(525)	(457)	(462)	(471)	(543)	(659)	(781)
J	Forced Outages (3)	(1,806)	(1,806)	(1,744)	(1,744)	(1,744)	(1,744)	(1,744)	(1,744)	(1,744)
K	**Adjusted Statewide System Margin (I+J)**	(1,989)	(1,810)	(2,269)	(2,201)	(2,206)	(2,215)	(2,287)	(2,403)	(2,525)

Line	Item	Summer Peak - Heatwave, Emergency Transfer Criteria with CPV Out-of-Service								
		2023	2024	2025	2026	2027	2028	2029	2030	2031
A	NYCA Generation (1)	33,645	33,635	33,022	33,017	33,017	33,012	33,007	33,002	32,997
B	External Area Interchanges (2)	1,844	1,844	1,844	1,844	1,844	1,844	1,844	1,844	1,844
C	SCRs (4), (5)	822	822	822	822	822	822	822	822	822
D	Temperature Based Generation Derates	(195)	(195)	(185)	(185)	(185)	(185)	(185)	(185)	(185)
E	**Total Resources (A+B+C+D)**	36,116	36,107	35,503	35,498	35,498	35,493	35,488	35,483	35,478
F	Load Forecast	(34,341)	(34,152)	(34,069)	(33,996)	(34,001)	(34,005)	(34,072)	(34,183)	(34,300)
G	Operating Reserve Requirement	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)
H	**Total Capability Requirement (F+G)**	(36,961)	(36,772)	(36,689)	(36,616)	(36,621)	(36,625)	(36,692)	(36,803)	(36,920)
I	**Statewide System Margin (E+H)**	(845)	(665)	(1,186)	(1,118)	(1,123)	(1,132)	(1,204)	(1,320)	(1,442)
J	Forced Outages (3)	(1,781)	(1,781)	(1,718)	(1,718)	(1,718)	(1,718)	(1,718)	(1,718)	(1,718)
K	**Adjusted Statewide System Margin (I+J)**	(2,626)	(2,446)	(2,904)	(2,836)	(2,841)	(2,850)	(2,922)	(3,038)	(3,160)

Notes:

1. Reflects the 2021 Gold Book existing summer capacity plus projected additions, deactivations, and de-rates. For this evaluation wind generation is assumed to have 0 MW output, solar generation is based on the ratio of solar PV nameplate capacity (2021 Gold Book Table I-9a) and solar PV peak reductions (2021 Gold Book Table I-9c). De-rates for run-of-river hydro are included as well as the Oswego Export limit for all lines in-service.
2. Interchanges are based on ERAG MMWG values.
3. Includes de-rates for thermal resources based on NERC class average EFORd data (https://www.nerc.com/pa/RAPA/gads/Pages/Reports.aspx)
4. SCRs are not applied for transmission security analysis of normal operations, but are included for emergency operations.
5. Includes a de-rate of 373 MW for SCRs.

Figure 4: Statewide System Margin (Summer Peak – 1-in-100-Year Extreme Heatwave, Emergency Transfer Criteria)

Line	Item	Summer Peak - 1-in-100-Year Extreme Heatwave, Emergency Transfer Criteria with CPV In-Service								
		2023	2024	2025	2026	2027	2028	2029	2030	2031
A	NYCA Generation (1)	34,307	34,297	33,684	33,679	33,679	33,674	33,669	33,664	33,659
B	External Area Interchanges (2)	1,844	1,844	1,844	1,844	1,844	1,844	1,844	1,844	1,844
C	SCRs (4), (5)	822	822	822	822	822	822	822	822	822
D	Temperature Based Generation Derates	(410)	(410)	(390)	(390)	(390)	(390)	(390)	(390)	(390)
E	**Total Resources (A+B+C+D)**	36,563	36,553	35,959	35,954	35,954	35,949	35,944	35,939	35,934
F	Load Forecast	(36,039)	(35,834)	(35,743)	(35,659)	(35,662)	(35,666)	(35,734)	(35,849)	(35,974)
G	Operating Reserve Requirement	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)
H	**Total Capability Requirement (F+G)**	(38,659)	(38,454)	(38,363)	(38,279)	(38,282)	(38,286)	(38,354)	(38,469)	(38,594)
I	**Statewide System Margin (E+H)**	(2,096)	(1,901)	(2,404)	(2,325)	(2,328)	(2,337)	(2,410)	(2,530)	(2,660)
J	Forced Outages (3)	(1,806)	(1,806)	(1,744)	(1,744)	(1,744)	(1,744)	(1,744)	(1,744)	(1,744)
K	**Adjusted Statewide System Margin (I+J)**	(3,902)	(3,707)	(4,148)	(4,069)	(4,072)	(4,081)	(4,154)	(4,274)	(4,404)

Line	Item	Summer Peak - 1-in-100-Year Extreme Heatwave, Emergency Transfer Criteria with CPV Out-of-Service								
		2023	2024	2025	2026	2027	2028	2029	2030	2031
A	NYCA Generation (1)	33,645	33,635	33,022	33,017	33,017	33,012	33,007	33,002	32,997
B	External Area Interchanges (2)	1,844	1,844	1,844	1,844	1,844	1,844	1,844	1,844	1,844
C	SCRs (4), (5)	822	822	822	822	822	822	822	822	822
D	Temperature Based Generation Derates	(410)	(410)	(390)	(390)	(390)	(390)	(390)	(390)	(390)
E	**Total Resources (A+B+C+D)**	35,901	35,891	35,297	35,292	35,292	35,287	35,282	35,278	35,273
F	Load Forecast	(36,039)	(35,834)	(35,743)	(35,659)	(35,662)	(35,666)	(35,734)	(35,849)	(35,974)
G	Operating Reserve Requirement	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)	(2,620)
H	**Total Capability Requirement (F+G)**	(38,659)	(38,454)	(38,363)	(38,279)	(38,282)	(38,286)	(38,354)	(38,469)	(38,594)
I	**Statewide System Margin (E+H)**	(2,758)	(2,563)	(3,066)	(2,987)	(2,990)	(2,999)	(3,072)	(3,191)	(3,321)
J	Forced Outages (3)	(1,781)	(1,781)	(1,718)	(1,718)	(1,718)	(1,718)	(1,718)	(1,718)	(1,718)
K	**Adjusted Statewide System Margin (I+J)**	(4,539)	(4,344)	(4,784)	(4,705)	(4,708)	(4,717)	(4,790)	(4,909)	(5,039)

Notes:

1. Reflects the 2021 Gold Book existing summer capacity plus projected additions, deactivations, and de-rates. For this evaluation wind generation is assumed to have 0 MW output, solar generation is based on the ratio of solar PV nameplate capacity (2021 Gold Book Table I-9a) and solar PV peak reductions (2021 Gold Book Table I-9c). De-rates for run-of-river hydro are included as well as the Oswego Export limit for all lines in-service.
2. Interchanges are based on ERAG MMWG values.
3. Includes de-rates for thermal resources based on NERC class average EFORd data (https://www.nerc.com/pa/RAPA/gads/Pages/Reports.aspx)
4. SCRs are not applied for transmission security analysis of normal operations, but are included for emergency operations.
5. Includes a de-rate of 373 MW for SCRs.

Figure 5: Summary of Statewide System Margin - Baseline Normal Weather

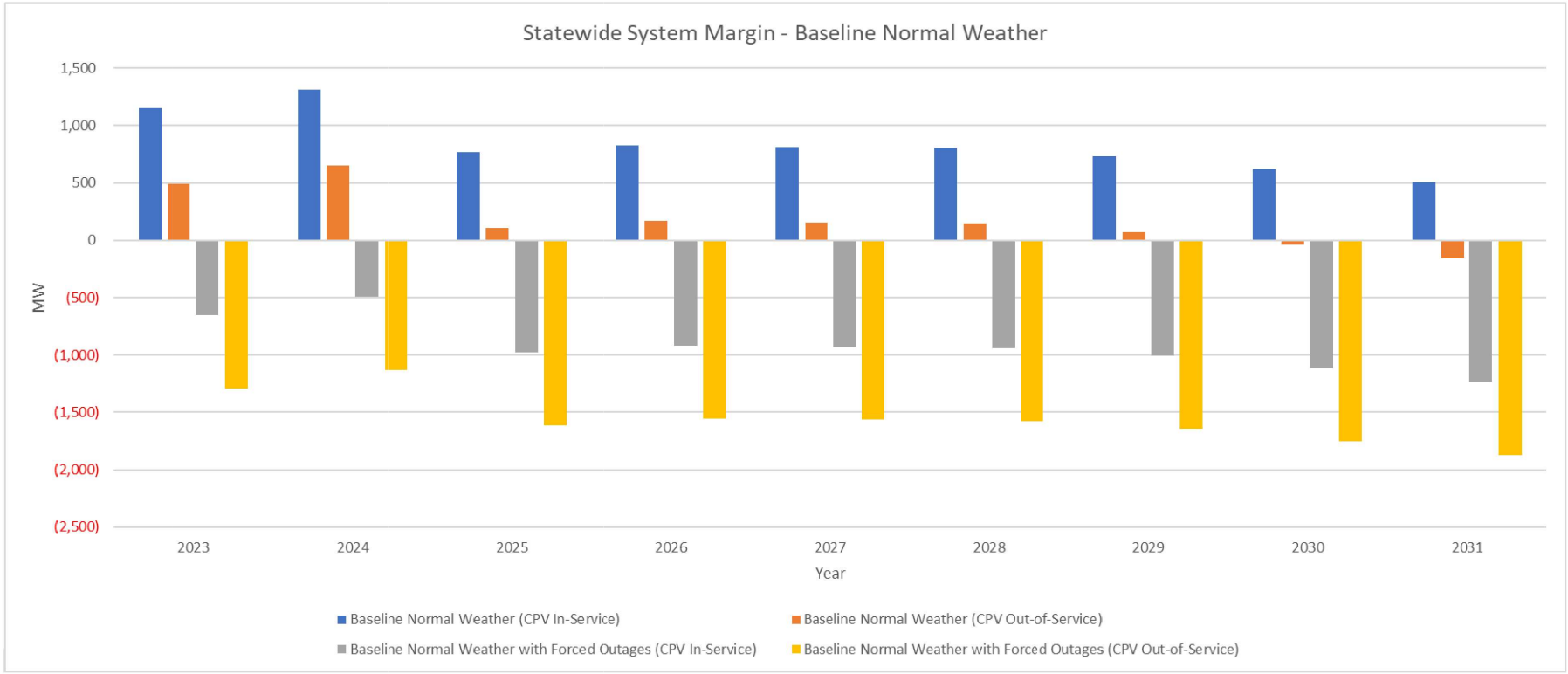


Figure 6: Summary of Statewide System Margin – Heatwave (90/10)

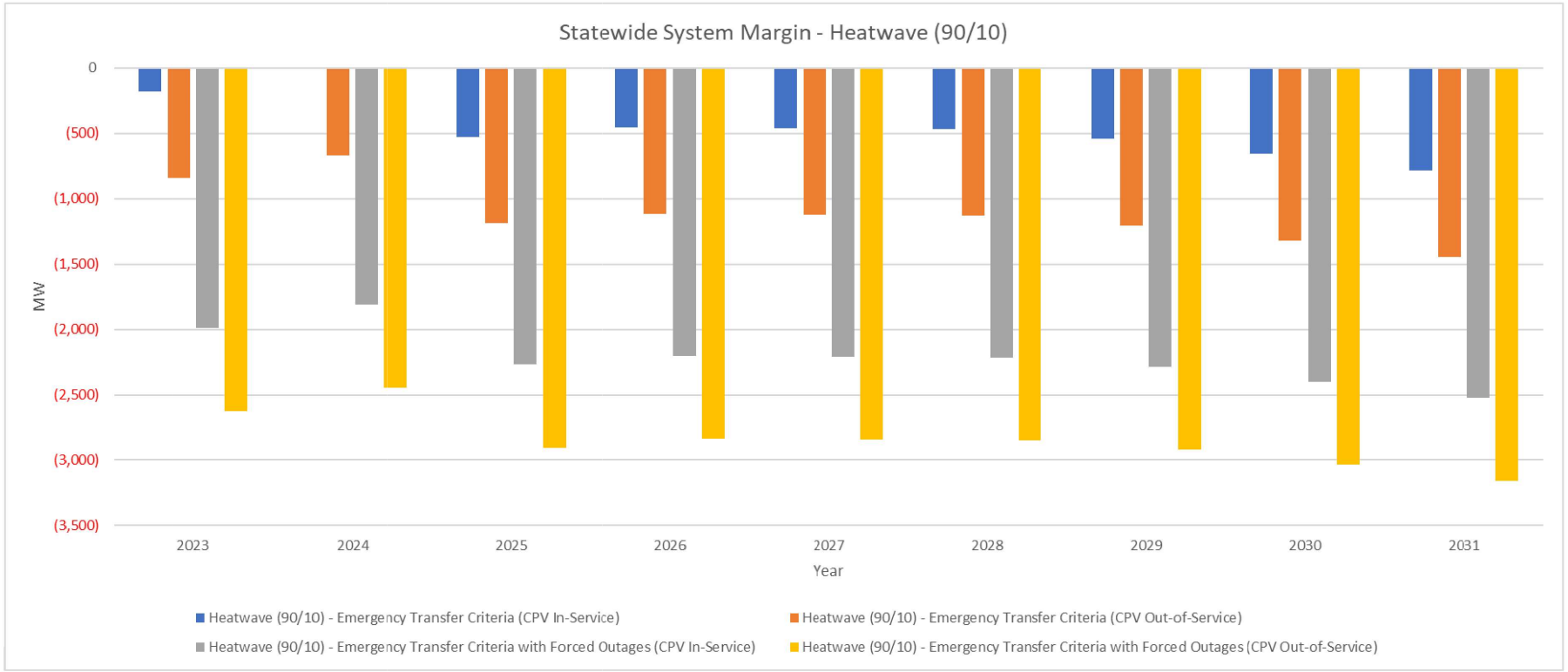
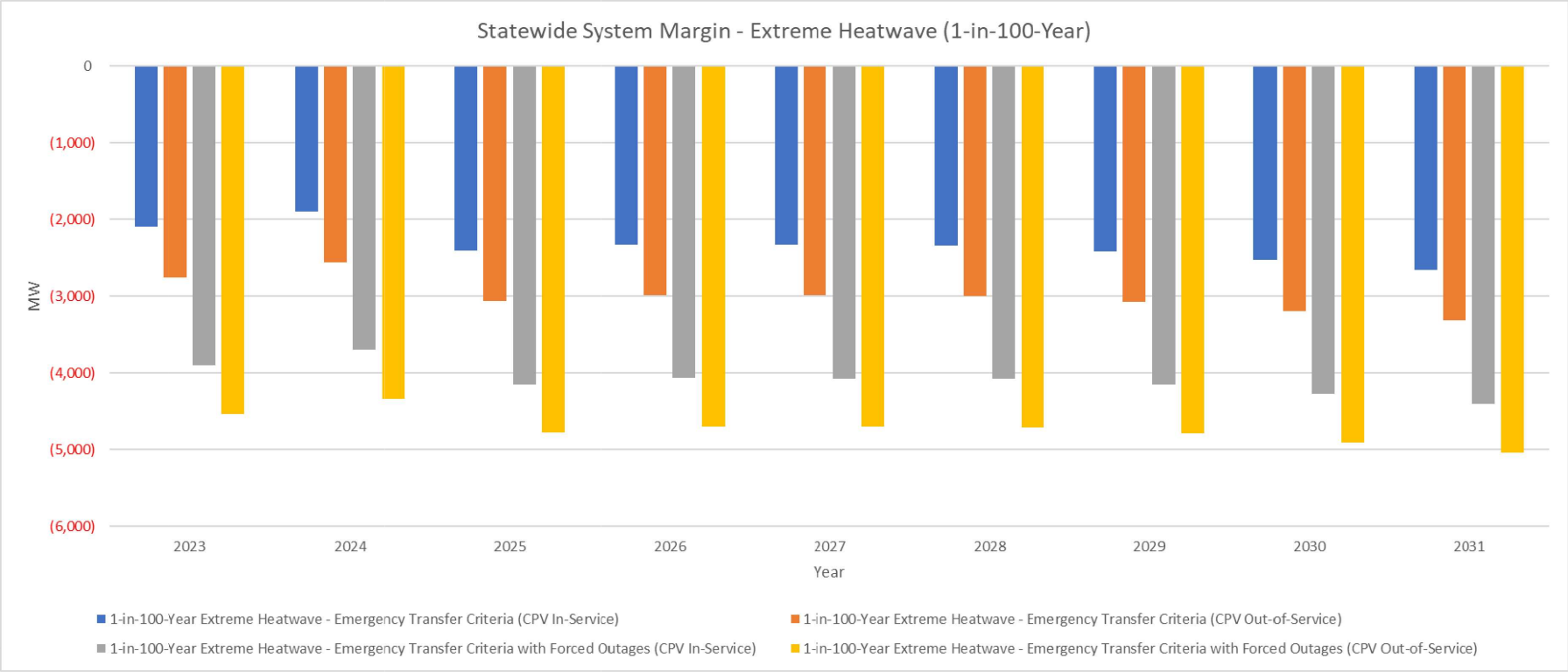


Figure 7: Summary of Statewide System Margin – 1-in-100-Year Extreme Heatwave



Lower Hudson Valley (Zones G-J) Tipping Points

The Lower Hudson Valley, or southeastern New York (SENY) region, is comprised of Zones G-J and includes the electrical connections to the Rockland Electric (RECO) load in PJM. To determine the tipping point for this area, the NYISO determined the combination of two non-simultaneous contingency events (N-1-1) that is most limiting to the transmission security margin. Design criteria N-1-1 combinations include various combinations of losses of generation and transmission. As the system changes, the limiting contingency combination may also change. Moreover, the UPNY-SENY limits included in this assessment are estimates of the transfer limits as they do not consider the impact of the CPV dispatch. The actual transfer limits may be different with CPV out-of-service.

Figure 8 shows how the transmissions security margin changes through time in consideration of the most limiting contingency combination for the year being evaluated. In years 2022 and 2023 (prior to the completion of the Segment B public policy project) the most limiting contingency combination to the transmission security margin under peak load conditions is the loss of Leeds-Pleasant Valley (92) 345 kV followed by the loss of Dolson — Rock Tavern (DART44) 345 kV and Coopers Corners – Rock Tavern (CCRT34). For the remainder of the years the contingency combination changes to the loss of Ravenswood 3 followed by the loss of Pleasant Valley-Wood St. 345 kV (F30/F31).

Figure 8: Lower Hudson Valley Transmission Security Margin (Summer Baseline Peak Forecast - Normal)

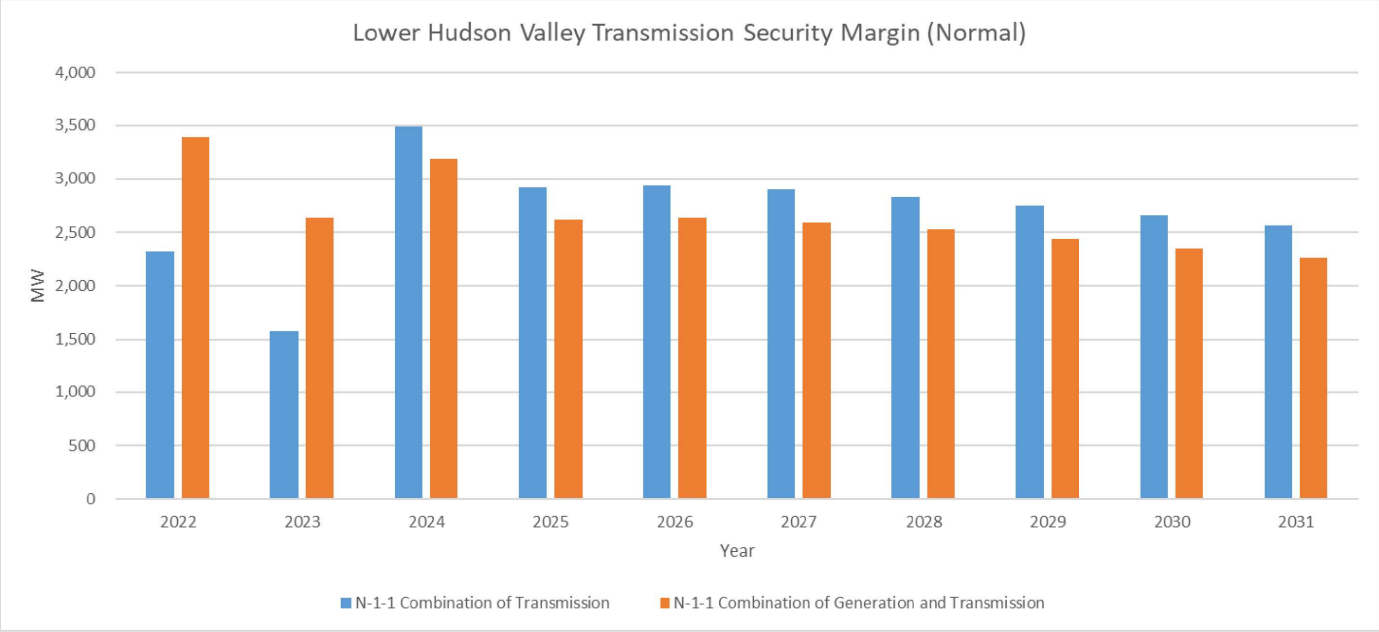


Figure 9 shows the calculation of the Lower Hudson Valley transmission security margin for summer baseline normal weather peak load conditions. Under current applicable reliability rules and procedures, a

violation would be identified when the transmission security margin is negative for the base case assumptions (e.g., baseline load forecast, no pre-contingency unscheduled forced outages, etc.). With CPV in-service under the baseline conditions applicable to the current reliability rules and procedures (line-item P), the transmission security margin ranges from 1,574 MW (2023) to 2,260 MW (2031) (line-item P). With CPV out-of-service the transmission security margin ranges from 912 MW (2023) to 1,598 MW (2031).

An additional evaluation shown in **Figure 9** is the impact of the historical forced outage rate of thermal generation on the transmission security margin (line-item R). This figure shows that generation outages consistent with the historical forced outage rates would result in a system deficiency upon the hypothetical CPV Valley unavailability in 2023. However, starting in 2024 there is a significant increase to the transmission security margin with the completion of the AC Transmission Segment B Public Policy Transmission Project such that no transmission security deficiencies are projected for normal weather through the study period.

Figure 10 and **Figure 11** show the transmission security margins for heatwave conditions (also known as 90/10 or 90th percentile load) and extreme heatwave conditions (1-in-100-year load), respectively, under the assumption that the system is in an emergency condition, and accounting for Special Case Resources (SCRs). An additional evaluation shown in each figure is the impact of the historical forced outage rate of thermal generation on the transmission security margin. Under heatwave conditions the adjusted transmission security margin (line-item S) shows that generation outages consistent with the historical forced outage rates would not result in "tipping" beyond transmission security limits. Under the extreme heatwave conditions shown in **Figure 11** with both CPV in-service and out-of-service, the system is deficient in 2023, and again in 2031.

Figure 12 provides a summary of the Lower Hudson Valley transmission security margins under the baseline load level. **Figure 13** provides a summary of the Lower Hudson Valley transmission security margins under the heatwave conditions. **Figure 14** provides a summary of the Lower Hudson Valley transmission security margins under the extreme heatwave conditions.

Key transmission security observations:

If the 680 MW CPV Valley plant is unavailable, transmission security could be at risk during heatwave conditions until the AC Transmission Segment B Public Policy Transmission Project is completed, scheduled for December 2023. Following completion of Segment B, Lower Hudson Valley transmission security margins would be positive for current forecasted system conditions.

Figure 9: Lower Hudson Valley Transmission Security Margin (Summer Peak – Baseline Normal Weather, Normal Transfer Criteria)

Summer Peak - Baseline Normal Weather, Normal Transfer Criteria with CPV In-Service										
Line	**Item**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
A	G-J Load Forecast	(15,231)	(15,163)	(15,120)	(15,100)	(15,142)	(15,210)	(15,294)	(15,381)	(15,474)
B	RECO Load	(397)	(397)	(397)	(397)	(397)	(397)	(397)	(397)	(397)
C	**Total Load (A+B)**	(15,628)	(15,560)	(15,517)	(15,497)	(15,539)	(15,607)	(15,691)	(15,778)	(15,871)
D	UPNY-SENY Limit (3)	3,200	5,725	5,725	5,725	5,725	5,725	5,725	5,725	5,725
E	ABC PARs to J	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)
F	K - SENY	95	95	95	95	95	95	95	95	95
G	**Total SENY AC Import (D+E+F)**	3,284	5,809	5,809	5,809	5,809	5,809	5,809	5,809	5,809
H	Loss of Source Contingency	0	(980)	(980)	(980)	(980)	(980)	(980)	(980)	(980)
I	**Resource Need (C+G+H)**	(12,344)	(10,731)	(10,688)	(10,668)	(10,710)	(10,778)	(10,862)	(10,949)	(11,042)
J	*Resources needed after N-1-1 (C+G)*	(12,344)	(9,751)	(9,708)	(9,688)	(9,730)	(9,798)	(9,882)	(9,969)	(10,062)
K	G-J Generation (1)	13,603	13,602	12,988	12,988	12,988	12,988	12,988	12,987	12,987
L	Temperature Based Generation Derates	0	0	0	0	0	0	0	0	0
M	Net ICAP External Imports	315	315	315	315	315	315	315	315	315
N	**Total Resources Available (K+L+M)**	13,918	13,917	13,303	13,303	13,303	13,303	13,303	13,302	13,302
O	*Resources available after N-1-1 (H+N)*	13,918	12,937	12,323	12,323	12,323	12,323	12,323	12,322	12,322
P	**Transmission Security Margin (I+N)**	1,574	3,186	2,615	2,635	2,593	2,525	2,441	2,353	2,260
Q	Forced Outages (2)	(991)	(991)	(928)	(928)	(928)	(928)	(928)	(928)	(928)
R	**Transmission Security Margin with Forced Outages (P+Q)**	583	2,195	1,687	1,707	1,665	1,597	1,513	1,425	1,332

Summer Peak - Baseline Normal Weather, Normal Transfer Criteria with CPV Out-of-Service										
Line	**Item**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
A	G-J Load Forecast	(15,231)	(15,163)	(15,120)	(15,100)	(15,142)	(15,210)	(15,294)	(15,381)	(15,474)
B	RECO Load	(397)	(397)	(397)	(397)	(397)	(397)	(397)	(397)	(397)
C	**Total Load (A+B)**	(15,628)	(15,560)	(15,517)	(15,497)	(15,539)	(15,607)	(15,691)	(15,778)	(15,871)
D	UPNY-SENY Limit (3)	3,200	5,725	5,725	5,725	5,725	5,725	5,725	5,725	5,725
E	ABC PARs to J	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)
F	K - SENY	95	95	95	95	95	95	95	95	95
G	**Total SENY AC Import (D+E+F)**	3,284	5,809	5,809	5,809	5,809	5,809	5,809	5,809	5,809
H	Loss of Source Contingency	0	(980)	(980)	(980)	(980)	(980)	(980)	(980)	(980)
I	**Resource Need (C+G+H)**	(12,344)	(10,731)	(10,688)	(10,668)	(10,710)	(10,778)	(10,862)	(10,949)	(11,042)
J	*Resources needed after N-1-1 (C+G)*	(12,344)	(9,751)	(9,708)	(9,688)	(9,730)	(9,798)	(9,882)	(9,969)	(10,062)
K	G-J Generation (1)	12,941	12,940	12,327	12,326	12,326	12,326	12,326	12,325	12,325
L	Temperature Based Generation Derates	0	0	0	0	0	0	0	0	0
M	Net ICAP External Imports	315	315	315	315	315	315	315	315	315
N	**Total Resources Available (K+L+M)**	13,256	13,255	12,642	12,641	12,641	12,641	12,641	12,640	12,640
O	*Resources available after N-1-1 (H+N)*	13,256	12,275	11,662	11,661	11,661	11,661	11,661	11,660	11,660
P	**Transmission Security Margin (I+N)**	912	2,524	1,954	1,973	1,931	1,863	1,779	1,691	1,598
Q	Forced Outages (2)	(966)	(966)	(903)	(903)	(903)	(903)	(903)	(903)	(903)
R	**Transmission Security Margin with Forced Outages (P+Q)**	(54)	1,558	1,051	1,070	1,028	960	876	788	695

Notes:

1. Reflects the 2021 Gold Book existing summer capacity plus projected additions, deactivations, and de-rates. For this evaluation wind generation is assumed to have 0 MW output, solar generation is based on the ratio of solar PV nameplate capacity (2021 Gold Book Table I-9a) and solar PV peak reductions (2021 Gold Book Table I-9c). De-rates for run-of-river hydro is included as well as the Oswego Export limit for all lines in-service.
2. Includes de-rates for thermal resources based on NERC class average EFORd data (https://www.nerc.com/pa/RAPA/gads/Pages/Reports.aspx)
3. Limits in 2022 and 2023 are based on limits from the summer peak 2023 representations. Limits for 2024 through 2031 are based on the summer peak 2025 representations.

Figure 10: Lower Hudson Valley Transmission Security Margin (Summer Peak – Heatwave, Emergency Transfer Criteria)

Summer Peak - Heatwave, Emergency Transfer Criteria with CPV In-Service										
Line	**Item**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
A	G-J Load Forecast	(15,961)	(15,888)	(15,843)	(15,822)	(15,865)	(15,935)	(16,023)	(16,115)	(16,212)
B	RECO Load	(397)	(397)	(397)	(397)	(397)	(397)	(397)	(397)	(397)
C	**Total Load (A+B)**	(16,358)	(16,285)	(16,240)	(16,219)	(16,262)	(16,332)	(16,420)	(16,512)	(16,609)
D	UPNY-SENY Limit (5)	3,925	5,450	5,450	5,450	5,450	5,450	5,450	5,450	5,450
E	ABC PARs to J	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)
F	K - SENY	155	155	155	155	155	155	155	155	155
G	**Total SENY AC Import (D+E+F)**	4,069	5,594	5,594	5,594	5,594	5,594	5,594	5,594	5,594
H	Loss of Source Contingency	0	0	0	0	0	0	0	0	0
I	**Resource Need (C+G+H)**	(12,289)	(10,691)	(10,646)	(10,625)	(10,668)	(10,738)	(10,826)	(10,918)	(11,015)
J	*Resources needed after N-1-1 (C+G)*	(12,289)	(10,691)	(10,646)	(10,625)	(10,668)	(10,738)	(10,826)	(10,918)	(11,015)
K	G-J Generation (1)	13,603	13,602	12,988	12,988	12,988	12,988	12,988	12,987	12,987
L	Temperature Based Generation Derates	(85)	(85)	(75)	(75)	(75)	(75)	(75)	(75)	(75)
M	Net ICAP External Imports	315	315	315	315	315	315	315	315	315
N	SCRs (3), (4)	288	288	288	288	288	288	288	288	288
O	**Total Resources Available (K+L+M+N)**	14,121	14,120	13,516	13,516	13,516	13,516	13,515	13,515	13,515
P	*Resources available after N-1-1 (H+O)*	14,121	14,120	12,225	12,225	12,225	12,224	12,224	12,224	12,224
Q	**Transmission Security Margin (I+O)**	1,832	3,429	2,870	2,891	2,848	2,778	2,689	2,597	2,500
R	Forced Outages (2)	(991)	(991)	(928)	(928)	(928)	(928)	(928)	(928)	(928)
S	**Adjusted Transmission Security Margin (Q+R)**	841	2,438	1,942	1,963	1,920	1,850	1,761	1,669	1,572

Summer Peak - Heatwave, Emergency Transfer Criteria with CPV Out-of-Service										
Line	**Item**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
A	G-J Load Forecast	(15,961)	(15,888)	(15,843)	(15,822)	(15,865)	(15,935)	(16,023)	(16,115)	(16,212)
B	RECO Load	(397)	(397)	(397)	(397)	(397)	(397)	(397)	(397)	(397)
C	**Total Load (A+B)**	(16,358)	(16,285)	(16,240)	(16,219)	(16,262)	(16,332)	(16,420)	(16,512)	(16,609)
D	UPNY-SENY Limit (5)	3,925	5,450	5,450	5,450	5,450	5,450	5,450	5,450	5,450
E	ABC PARs to J	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)
F	K - SENY	155	155	155	155	155	155	155	155	155
G	**Total SENY AC Import (D+E+F)**	4,069	5,594	5,594	5,594	5,594	5,594	5,594	5,594	5,594
H	Loss of Source Contingency	0	0	0	0	0	0	0	0	0
I	**Resource Need (C+G+H)**	(12,289)	(10,691)	(10,646)	(10,625)	(10,668)	(10,738)	(10,826)	(10,918)	(11,015)
J	*Resources needed after N-1-1 (C+G)*	(12,289)	(10,691)	(10,646)	(10,625)	(10,668)	(10,738)	(10,826)	(10,918)	(11,015)
K	G-J Generation (1)	12,941	12,940	12,327	12,326	12,326	12,326	12,326	12,325	12,325
L	Temperature Based Generation Derates	(85)	(85)	(75)	(75)	(75)	(75)	(75)	(75)	(75)
M	Net ICAP External Imports	315	315	315	315	315	315	315	315	315
N	SCRs (3), (4)	288	288	288	288	288	288	288	288	288
O	**Total Resources Available (K+L+M+N)**	13,459	13,458	12,854	12,854	12,854	12,854	12,854	12,853	12,853
P	*Resources available after N-1-1 (H+O)*	13,459	13,458	12,225	12,225	12,225	12,224	12,224	12,224	12,224
Q	**Transmission Security Margin (I+O)**	1,170	2,767	2,208	2,229	2,186	2,116	2,028	1,935	1,838
R	Forced Outages (2)	(966)	(966)	(903)	(903)	(903)	(903)	(903)	(903)	(903)
S	**Adjusted Transmission Security Margin (Q+R)**	204	1,801	1,305	1,326	1,283	1,213	1,125	1,032	935

Notes:

1. Reflects the 2021 Gold Book existing summer capacity plus projected additions, deactivations, and de-rates. For this evaluation wind generation is assumed to have 0 MW output, solar generation is based on the ratio of solar PV nameplate capacity (2021 Gold Book Table I-9a) and solar PV peak reductions (2021 Gold Book Table I-9c). De-rates for run-of-river hydro is included as well as the Oswego Export limit for all lines in-service.
2. Includes de-rates for thermal resources based on NERC class average EFORd data (https://www.nerc.com/pa/RAPA/gads/Pages/Reports.aspx)
3. SCRs are not applied for transmission security analysis of normal operations, but are included for emergency operations.
4. Includes a de-rate of 242 MW for SCRs.
5. Limits in 2022 and 2023 are based on limits from the summer peak 2023 representations. Limits for 2024 through 2031 are based on the summer peak 2025 representations.

Figure 11: Lower Hudson Valley Transmission Security Margin (Summer Peak – 1-in-100-Year Extreme Heatwave, Emergency Transfer Criteria)

Summer Peak - 1-in-100-Year Extreme Heatwave, Emergency Transfer Criteria with CPV In-Service										
Line	**Item**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
A	G-J Load Forecast	(16,690)	(16,614)	(16,568)	(16,545)	(16,590)	(16,663)	(16,754)	(16,849)	(16,951)
B	RECO Load	(443)	(443)	(443)	(443)	(443)	(443)	(443)	(443)	(443)
C	**Total Load (A+B)**	(17,133)	(17,057)	(17,011)	(16,988)	(17,033)	(17,106)	(17,197)	(17,292)	(17,394)
D	UPNY-SENY Limit (5)	3,925	5,450	5,450	5,450	5,450	5,450	5,450	5,450	5,450
E	ABC PARs to J	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)
F	K - SENY	155	155	155	155	155	155	155	155	155
G	**Total SENY AC Import (D+E+F)**	4,069	5,594	5,594	5,594	5,594	5,594	5,594	5,594	5,594
H	Loss of Source Contingency	0	0	0	0	0	0	0	0	0
I	**Resource Need (C+G+H)**	(13,064)	(11,463)	(11,417)	(11,394)	(11,439)	(11,512)	(11,603)	(11,698)	(11,800)
J	*Resources needed after N-1-1 (C+G)*	(13,064)	(11,463)	(11,417)	(11,394)	(11,439)	(11,512)	(11,603)	(11,698)	(11,800)
K	G-J Generation (1)	13,603	13,602	12,988	12,988	12,988	12,988	12,988	12,987	12,987
L	Temperature Based Generation Derates	(179)	(179)	(159)	(159)	(159)	(159)	(159)	(159)	(159)
M	Net ICAP External Imports	315	315	315	315	315	315	315	315	315
N	SCRs (3), (4)	288	288	288	288	288	288	288	288	288
O	**Total Resources Available (K+L+M+N)**	14,027	14,026	13,432	13,432	13,432	13,432	13,431	13,431	13,431
P	*Resources available after N-1-1 (H+O)*	14,027	14,026	13,432	13,432	13,432	13,432	13,431	13,431	13,431
Q	**Transmission Security Margin (I+O)**	963	2,564	2,016	2,038	1,993	1,920	1,829	1,733	1,631
R	Forced Outages (2)	(991)	(991)	(928)	(928)	(928)	(928)	(928)	(928)	(928)
S	**Adjusted Transmission Security Margin (Q+R)**	(28)	1,573	1,088	1,110	1,065	992	901	805	703

Summer Peak - 1-in-100-Year Extreme Heatwave, Emergency Transfer Criteria with CPV Out-of-Service										
Line	**Item**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
A	G-J Load Forecast	(16,690)	(16,614)	(16,568)	(16,545)	(16,590)	(16,663)	(16,754)	(16,849)	(16,951)
B	RECO Load	(443)	(443)	(443)	(443)	(443)	(443)	(443)	(443)	(443)
C	**Total Load (A+B)**	(17,133)	(17,057)	(17,011)	(16,988)	(17,033)	(17,106)	(17,197)	(17,292)	(17,394)
D	UPNY-SENY Limit (5)	3,925	5,450	5,450	5,450	5,450	5,450	5,450	5,450	5,450
E	ABC PARs to J	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)
F	K - SENY	155	155	155	155	155	155	155	155	155
G	**Total SENY AC Import (D+E+F)**	4,069	5,594	5,594	5,594	5,594	5,594	5,594	5,594	5,594
H	Loss of Source Contingency	0	0	0	0	0	0	0	0	0
I	**Resource Need (C+G+H)**	(13,064)	(11,463)	(11,417)	(11,394)	(11,439)	(11,512)	(11,603)	(11,698)	(11,800)
J	*Resources needed after N-1-1 (C+G)*	(13,064)	(11,463)	(11,417)	(11,394)	(11,439)	(11,512)	(11,603)	(11,698)	(11,800)
K	G-J Generation (1)	12,941	12,940	12,327	12,326	12,326	12,326	12,326	12,325	12,325
L	Temperature Based Generation Derates	(179)	(179)	(159)	(159)	(159)	(159)	(159)	(159)	(159)
M	Net ICAP External Imports	315	315	315	315	315	315	315	315	315
N	SCRs (3), (4)	288	288	288	288	288	288	288	288	288
O	**Total Resources Available (K+L+M+N)**	13,365	13,365	12,771	12,770	12,770	12,770	12,770	12,769	12,769
P	*Resources available after N-1-1 (H+O)*	13,365	13,365	12,771	12,770	12,770	12,770	12,770	12,769	12,769
Q	**Transmission Security Margin (I+O)**	302	1,902	1,354	1,377	1,332	1,258	1,167	1,072	969
R	Forced Outages (2)	(966)	(966)	(903)	(903)	(903)	(903)	(903)	(903)	(903)
S	**Adjusted Transmission Security Margin (Q+R)**	(664)	936	451	474	429	355	264	169	66

Notes:

1. Reflects the 2021 Gold Book existing summer capacity plus projected additions, deactivations, and de-rates. For this evaluation wind generation is assumed to have 0 MW output, solar generation is based on the ratio of solar PV nameplate capacity (2021 Gold Book Table I-9a) and solar PV peak reductions (2021 Gold Book Table I-9c). De-rates for run-of-river hydro is included as well as the Oswego Export limit for all lines in-service.
2. Includes de-rates for thermal resources based on NERC class average EFORd data (https://www.nerc.com/pa/RAPA/gads/Pages/Reports.aspx)
3. SCRs are not applied for transmission security analysis of normal operations, but are included for emergency operations.
4. Includes a de-rate of 242 MW for SCRs.
5. Limits in 2022 and 2023 are based on limits from the summer peak 2023 representations. Limits for 2024 through 2031 are based on the summer peak 2025 representations.

Figure 12: Summary of Lower Hudson Valley Summer Transmission Security Margin – Normal Weather

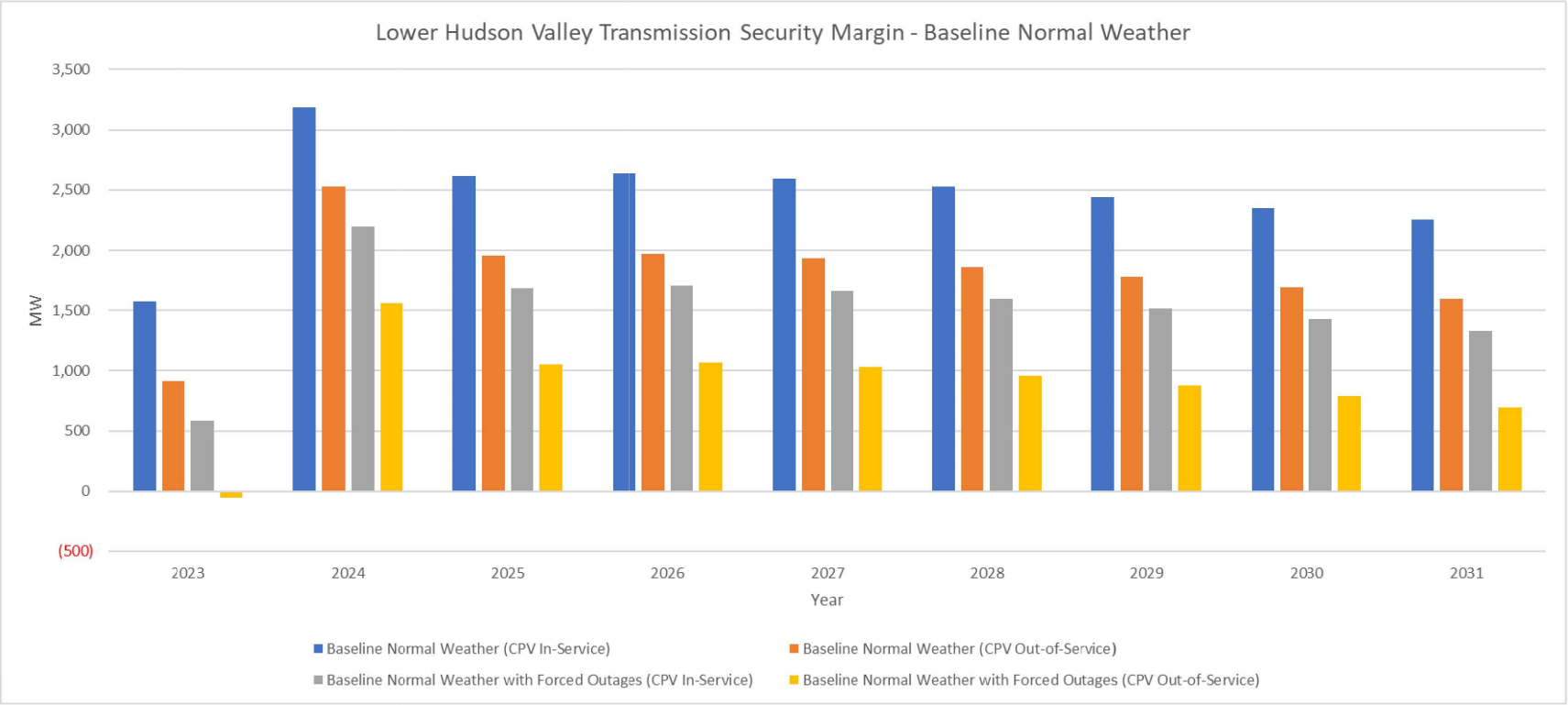


Figure 13: Summary of Lower Hudson Valley Summer Transmission Security Margin – Heatwave (90/10)

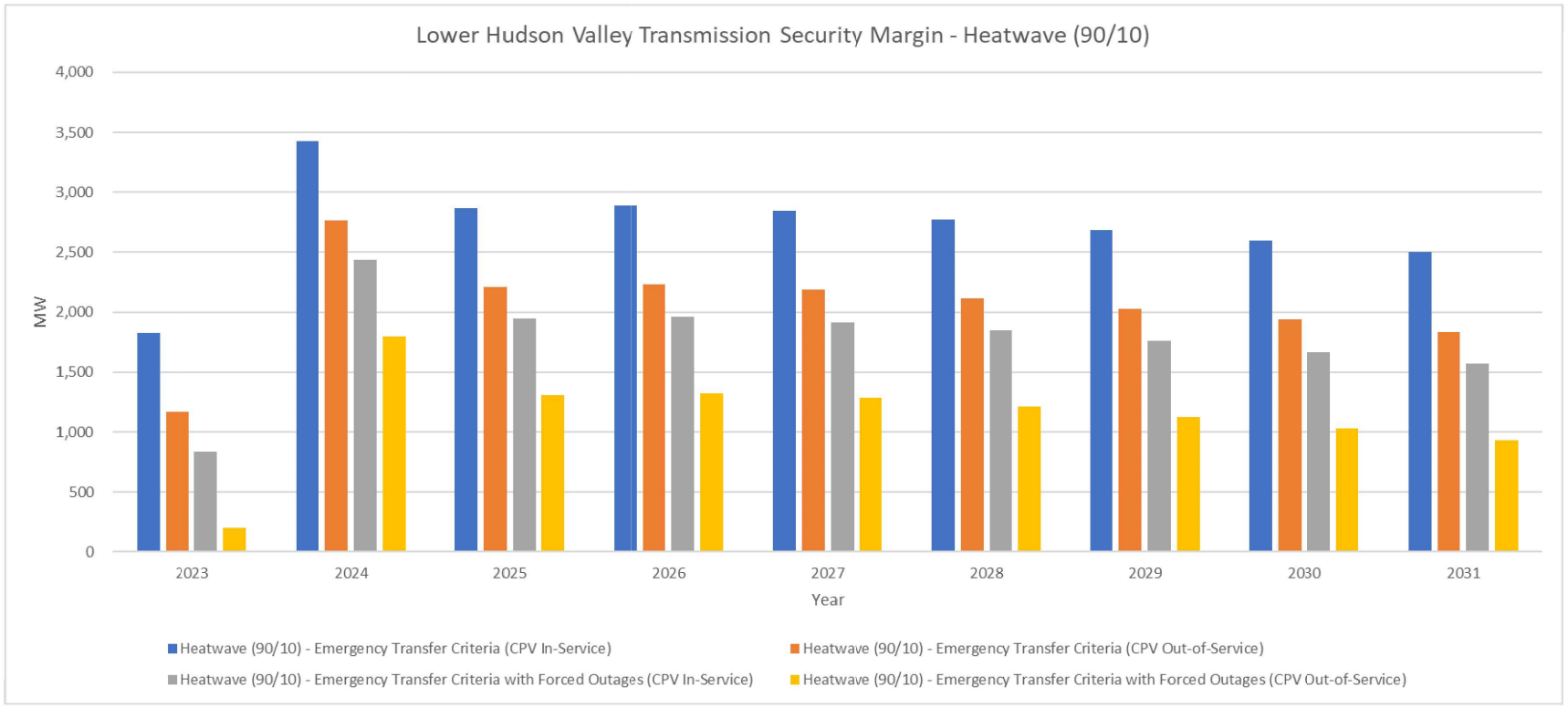
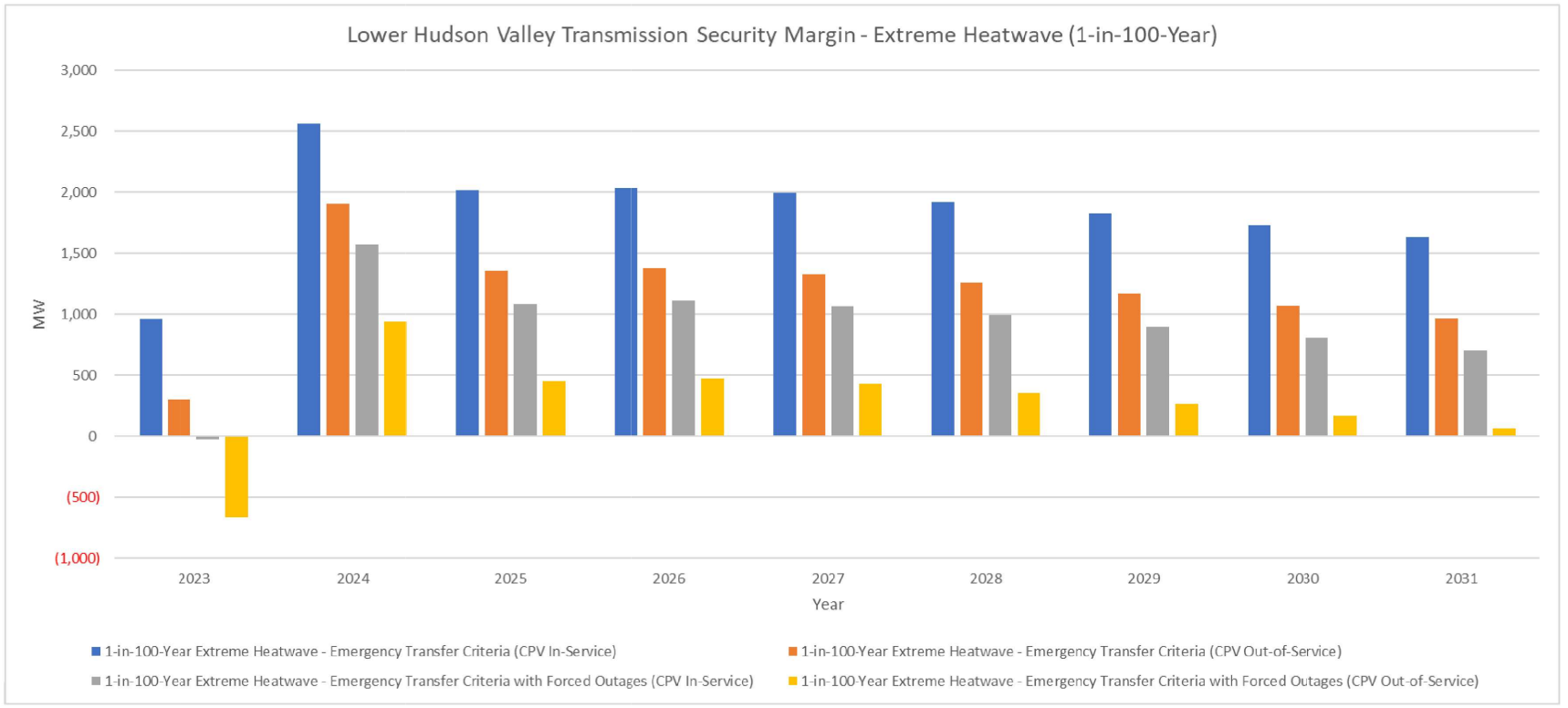


Figure 14: Summary of Lower Hudson Valley Summer Transmission Security Margin – Extreme Heatwave (1-in-100)



APPENDIX 4

CLCPA Project Justification - Grid Reliability (Hudson Energy Economics, LLC, Apr. 21, 2022)

Hudson Energy Economics, LLC
480 Pond View Road, Petersburgh, New York 12138
Phone (518) 527-1036
mdy@hudson-ee.com

April 21, 2022

VIA US AND ELECTRONIC MAIL: chris.hogan@dec.ny.gov

Mr. Christopher M. Hogan
Chief, Major Project Management Unit
Department of Environmental Conservation
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, NY 12233-1750

RE: ***CPV Valley, LLC –Title V and Title IV Permit Applications***
DEC ID 3-3356-00136/000010 & 00009
CLCPA Project Justification - Grid Reliability

Dear Mr. Hogan,

CPV Valley, LLC ("Valley" or "Applicant") has retained Hudson Energy Economics, LLC as a consultant to review and analyze the reliability planning study the New York Independent System Operator, Inc. ("NYISO") performed regarding CPV Valley Energy Center ("CPV Valley" or "Facility").[1] As discussed below and detailed in the Study, without CPV Valley: (1) the loss of load expectation increases significantly and would exceed the resource adequacy criterion in 2031 and barely meet targets in 2030; (2) a Transmission Security Analysis assuming all no forced outages on generating units shows insufficient resources to meet the peak load plus operating reserve requirement in 2030. (3) recoginizing the risk of historic unit outage rates the NYISO will have insufficient resources to meet peak load plus reserves in every year from 2023 through 2031; (4) assuming no forced outages on units the system will be 845 MW short of meeting 90/10 heatwave peak plus reserves in 2023 and more than 1,400 MW short in 2031; and (5) assuming historic unit outage rates the system would have insufficient resources to meet the 90/10 peak load alone in almost beginning in 2025 and would fail to meet the peak load by 540 MW in 2031.

Qualifications

I am employed as President of Hudson Energy Economics, LLC, an energy consulting company specializing in electric market design and market operations with a focus on the NYISO controlled market. My entire professional career has been devoted

---

[1] New York Independent System Operator, *R008 Additional Reliability Study: CPV Valley* (March 9, 2022) ("Study").

to matters relating to electric generation and the development of competitive electricity markets. Since moving to New York in 1992 my consulting practice has focused on the operation of the New York Control Area. Since 1999, I have been an active participant in the stakeholder processes defining the NYISO initial market structure, subsequently identifying tariff revisions to correct, improve and enhance market design and developing the detailed rule changes, known as ISO Procedures in its tariffs, to implement tariff revisions, including all aspects of its energy, ancillary services, and installed capacity ("ICAP") markets. I have also participated in the NYISO's economic and reliability planning processes.

Finally, I have participated in the New York State Reliability Council ("NYSRC") Installed Capacity Subcommittee ("ICS") meetings since 2008. The NYSRC is responsible for setting the reliability rules for planning and running the New York Control Area ("NYCA"). The NYSRC ICS work focuses on the continuous improvement of modeling to most accurately capture the resource adequacy risks faced by the NYISO electric system and ultimately to ensure resource adequacy through the State's annually updated installed reserve margin ("IRM") requirements.

Since moving to New York in 1992 I have testified in numerous New York Public Service Commission ("NYPSC") Proceedings. Since the formation of the NYISO in the late 1990s, I have also testified in numerous Federal Energy Regulatory Commission ("FERC") proceedings relating to many aspects of the overall NYISO market design. My resume is attached herewith.

Resource Adequacy

Before a generating unit is allowed to retire from the NYCA, the NYISO performs a series of evaluations to determine whether the retirement would create reliability needs. Valley requested that the NYISO perform a retirement evaluation to determine whether CPV Valley's forced retirement[2] would result in reliability needs on the NYISO system over the next ten years.

The first evaluation that the NYISO performed was to determine whether there would be a resource adequacy violation on the NYISO system without CPV Valley. Resource adequacy is analyzed using a probabilistic model to determine the risk of having unserved load due to cumulative generator outages. The required target for the NYCA system is that the Loss of Load Expectation ("LOLE") be no greater than 0.1 days/year. The analysis that was performed by the NYISO for the Study is the same analysis they use for the Reliability Needs assessments and in setting the required Installed Reserve Margin.

---

[2] For example, if the Facility were denied a Title V air permit by the New York State Department of Environmental Conservation (the "Department").

The Study shows that without CPV Valley the system exceeds the target LOLE standard in 2031 and barely meets the target in 2030. As the NYISO identified in its Study of CPV Valley retirement impacts: "If the NYISO identified a LOLE greater than 0.1 in one of its reliability studies (e.g., Reliability Needs Assessment, Short-Term Assessment of Reliability) this would be considered a Reliability Need, as defined in Section 31.1. of the NYISO Open Access Transmission Tariff."[3]

Transmission Security

The other evaluation the NYISO performed is referred to as a Transmission Security Margin study. The Transmission Security Margin looks at whether the NYCA has sufficient resources to meet projected peak loads plus operating reserve requirements.

The NYCA wide Transmission Security Margin study describes the Transmission Security study and their findings as follows:

> The tipping points for the NYCA are evaluated under summer peak conditions, which are expected to be the most stressed system conditions. A tipping point occurs when the transmission security margin is a negative value. The transmission security margin is the ability to meet load plus losses and system reserve (*i.e.,* total capacity requirement) against the NYCA generation, interchanges, and temperature-based generation de-rates (total resources).
> …
> Under current applicable reliability rules and procedures, the system would be unable to maintain operating reserves and meet forecasted demand when the transmission security margin is negative for the base case assumptions (e.g., baseline normal weather load forecast, no pre-contingency unscheduled forced outages, etc.). With CPV in-service the system has sufficient margin through 2031. However, with CPV out-of-service the system margin is insufficient starting in 2030.[4]

The Transmission Security Analysis that the NYISO presented above assumes that there are no outages on traditional generating facilities. This is highly unlikely since traditional units have a forced outage rate of approximately 5%.[5] To address the significance of assuming that the generating units would have no forced outages the NYISO looked at the margin assuming the system had average forced outages. They found that even with CPV Valley in service the NYISO had insufficient resources to meet peak load plus reserves in every year from 2023 through 2031. With CPV Valley removed the shortage became even more dire with it falling short of meeting peak plus

---

3 CPV Valley Reliability Study, p. 6.

4 Ibid, p. 7

5 Unit outage rates are generally higher on the older units that were previously owned by the Investor Owned Utilities. The NYISO system has more than 6,000 MW of steam boiler based units that are at least 50 years old.

operating reserve requirements by more than 1,600 MW in 2025 and the shortfall rising to almost 1,900 MW by 2031.[6]

The NYISO also looked at their margin in comparison to a peak that would be expected to occur in 10% of the years (referred to as a 90/10 peak). This type of peak is consistent with much hotter weather conditions. However, it could also be seen as a proxy, at least in the outer years, for the states beneficial electrification efforts accelerating faster than the NYISO's base case assumptions.

The 90/10 peak case also showed that with CPV Valley the system is unable to meet peak load plus reserve and that it gets much worse without CPV Valley. Without CPV Valley the system is 845 MW short of meeting 90/10 peak plus reserves in 2023 and more than 1,400 MW short in 2031. The preceding assume no unit outages. If 90/10 conditions were combined with historic outage rates then without CPV Valley the system would have insufficient resources to meet the peak load from 2025 onward and would fail to meet the peak load by 540 MW in 2031.[7]

There are other factors that the Department should consider in determining whether Valley should be granted its Title V air permit. CPV Valley is a state of the art generating unit with state-of-the-art pollution abatement equipment. Moreover, the unit is very flexible with a startup time of as little as 2 hours. This means that CPV Valley is ideally suited to compensate for the variability of wind and solar generation that New York is planning to rapidly add to the system to meet the requirements of the Climate Leadership and Community Protection Act ("CLCPA").

NYISO planning analysis shows that to achieve the CLCPA requirements and run the electric system reliably there will need to be substantial dispatchable resources. Until New York can determine a form of highly dispatchable emission free resources, this reliability service will be required to come from existing dispatchable resources such as CPV Valley.

The Facility's short start up time and low emission rates makes it an ideal source for this reliability service.

The NYISO's resource adequacy and transmission security evaluations show that if CPV Valley were to be retired then essentially no other significant sized generating units could be taken out of service without violating reliability requirements. This is readily shown in the results of the Transmission Security Margin study which showed that without CPV Valley the margin does not exceed 165 MW in any year after 2024.[8]

Consequently, failing to approve Valley's Title V air permit will mean that other, less flexible, less efficient, and higher emitting units would have to remain operating in the NYCA.

---

6 CPV Valley Reliability Study, Figure 2, p. 11.
7 CPV Valley Reliability Study, Figure 3, p. 12.
8 CPV Valley Reliability Study, Figure 2, p. 11.

Sincerely,

Mark D. Younger
President
Hudson Energy Economics, LLC

cc: J. Afzali, Esq. (*via email*)

Hudson Energy Economics, LLC, 480 Pond View Road, Petersburgh, NY 12138
(518) 527-1036, e-mail: mdy@hudson-ee.com

APPENDIX 5

Supplemental Greenhouse Gas Analysis for CPV Valley Energy Center Title V Application (ICF, Jan. 6, 2023)

Supplemental Greenhouse Gas Analysis for CPV Valley Energy Center Title V Permit Application

Submitted to:
Competitive Power Ventures

Submitted by:
ICF Resources, L.L.C.
1902 Reston Metro Plaza
Reston, VA 20190
703-934-3000

January 6, 2023

Table of Contents

1 Background

Competitive Power Ventures ("CPV") operates the Valley Energy Center ("Valley" or the "Facility"), a combined cycle gas turbine (CCGT) facility in Lower Hudson Valley in NYISO Load Zone G. It is currently going through the Clean Air Act Title V operating permit application after the NYSDEC issued a Notice of Incomplete Application on November 29, 2020, having initially issued a Notice of Complete Application on May 29, 2019. Specifically, the NYSDEC required CPV to demonstrate in its Title V application how the Facility would be consistent with the State's greenhouse gas emissions limits and the CLCPA's electric sector targets. In support of this requirement, ICF submitted a report titled "Greenhouse Gas Analysis for CPV Valley Energy Center Title V Permit Application" on March 8, 2021 ("March 2021 Report"). ICF then delivered two supplements to the report on October 7, 2021 ("October 2021 Supplement") and September 26, 2022 ("September 2022 Supplement").

The impact of the operation of the Facility on upstream emissions was calculated using the DEC's 2021 Statewide GHG Emissions Report which includes upstream emissions factors in Appendix A.[1] This supplemental report updates the data presented in ICF's September 2022 Supplement to utilize both the 2021 emission factors and the DEC's revised upstream emissions factors in the 2022 Statewide GHG Emissions Report.[2]

[1] NYSDEC, *2021 Statewide GHG Emissions Report*. Sourced from: https://www.dec.ny.gov/docs/administration_pdf/ghgsumrpt21.pdf
[2] NYSDEC, *2022 Statewide GHG Emissions Report*. Sourced from: https://www.dec.ny.gov/docs/administration_pdf/ghgsumrpt22.pdf

2 Analysis Results

Table 2-1 compares the preliminary DEC-provided upstream emissions factors that were utilized in the analysis presented in ICF's March 2021 Report and October 2021 Supplement, the emission factors from Appendix A of the 2021 Statewide GHG Emissions Report utilized in the September 2022 Supplement, and the emission factors from Appendix A of the 2022 Statewide GHG Emissions Report utilized in this supplemental report.

Table 2-1: Upstream Greenhouse Gas Emission Rates for Natural Gas Fuel

Emission Rate (g/MMBtu)	Effluent	
Preliminary Interim Draft Emission Factors, February 2021	CO2	11,913
	CH4	384
	N2O	0.136
	CO2e (GWP20)	44,205
2021 Statewide GHG Emissions Report	CO2	12,131
	CH4	357
	N2O	0.14
	CO2e (GWP20)	42,147
2022 Statewide GHG Emissions Report	CO2	12,206
	CH4	350
	N2O	0.14
	CO2e (GWP20)	41,671

Utilizing the revised upstream emissions factors, ICF recalculated the impact of the operation of the Facility on upstream GHG emissions. Tables 4-8 through 4-10 present the impact of the Facility on Statewide GHG emissions (CO_2, CH_4, N_2O) using both 2021 and 2022 upstream emission factors. These tables are intended to be a direct replacement for Supplemental Tables 4-8 through 4-10 provided in the October 2021 Supplement.

Table 4-8a: Amount of GHG Emissions from Other NYS Generators Displaced by the Facility (2021 Upstream Emission Factors)

Impact (thousand short tons) (CO2e)	Effluent	2025	2030	2040 (RNG)	2050 (RNG)	2040 and 2050 (Hydrogen)
Reduction in direct GHG emissions through displacement of other generators	CO_2	2,008	1,081	522	759	0
	N_2O	2	1	1	1	0
Reduction in upstream emissions due to reduced fuel consumption of displaced generators	CO_2	436	240	0	0	0
	CH_4	1,078	593	0	0	0
	N_2O	1	1	0	0	0
Total [B]		**3,525**	**1,915**	**522**	**760**	**0**

Table 4-8b: Amount of GHG Emissions from Other NYS Generators Displaced by the Facility (2022 Upstream Emission Factors)

Impact (thousand short tons) (CO2e)	Effluent	2025	2030	2040 (RNG)	2050 (RNG)	2040 and 2050 (Hydrogen)
Reduction in direct GHG emissions through displacement of other generators	CO_2	2,008	1,081	522	759	0
	N_2O	2	1	1	1	0
Reduction in upstream emissions due to reduced fuel consumption of displaced generators	CO_2	439	242	0	0	0
	CH_4	1,058	582	0	0	0
	N_2O	1	1	0	0	0
Total [B]		**3,508**	**1,906**	**522**	**760**	**0**

Table 4-9a: Impact of the Facility on GHG Emissions in NYS (2021 Upstream Emission Factors)

Impact (thousand short tons) (CO2e)	Effluent	2025	2030	2040 (RNG)	2050 (RNG)	2040 and 2050 (Hydrogen)
Increase in direct GHG emissions in NYS from generation by the Facility	CO_2	1,839	1,007	500	716	0
	N_2O	1	1	0	0	0
Increase in upstream GHG emissions from operation of the Facility	CO_2	436	239	0	0	0
	CH_4	1,077	590	0	0	0
	N_2O	1	1	0	0	0
Total [A]		**3,354**	**1,837**	**500**	**717**	**0**

Table 4-9b: Impact of the Facility on GHG Emissions in NYS (2022 Upstream Emission Factors)

Impact (thousand short tons) (CO2e)	Effluent	2025	2030	2040 (RNG)	2050 (RNG)	2040 and 2050 (Hydrogen)
Increase in direct GHG emissions in NYS from generation by the Facility	CO_2	1,839	1,007	500	716	0
	N_2O	1	1	0	0	0
Increase in upstream GHG emissions from operation of the Facility	CO_2	439	240	0	0	0
	CH_4	1,057	579	0	0	0
	N_2O	1	1	0	0	0
Total [A]		**3,337**	**1,827**	**500**	**717**	**0**

Table 4-10a: Net Impact on Statewide GHG Emissions from Operation of the Facility (2021 Upstream Emission Factors)

Impact (thousand short tons) (CO2e)	Effluent	2025	2030	2040 (RNG)	2050 (RNG)	2040 and 2050 (Hydrogen)
Net reduction in GHG emissions [C] = [A] – [B]	CO2	-170	-75	-22	-43	0
	CH4	-1	-3	0	0	0
	N2O	-1	-1	0	0	0
	Total	**-172**	**-78**	**-22**	**-43**	**0**

Table 4-10b: Net Impact on Statewide GHG Emissions from Operation of the Facility (2022 Upstream Emission Factors)

Impact (thousand short tons) (CO2e)	Effluent	2025	2030	2040 (RNG)	2050 (RNG)	2040 and 2050 (Hydrogen)
Net reduction in GHG emissions [C] = [A] – [B]	CO2	-170	-75	-22	-43	0
	CH4	-1	-3	0	0	0
	N2O	-1	-1	0	0	0
	Total	**-172**	**-78**	**-22**	**-43**	**0**

APPENDIX 6

Supplemental Emissions Analysis for CPV Valley Energy Center Title V Application (ICF, Jan. 6, 2023)

Supplemental Emissions Analysis for CPV Valley Energy Center Title V Permit Application

Submitted to:
Competitive Power Ventures

Submitted by:
ICF Resources, L.L.C.
1902 Reston Metro Plaza
Reston, VA 20190
703-934-3000

January 6, 2023

Table of Contents

Table of Figures

1. Background

Competitive Power Ventures (CPV) operates the Valley Energy Center (Valley, or the Facility), a nominal net 680-megawatt (MW) combined cycle gas turbine (CCGT) facility in Lower Hudson Valley in NYISO Load Zone G. It is currently going through the Clean Air Act Title V operating permit application after the New York State Department of Environmental Conservation (NYSDEC) issued a Notice of Incomplete Application on November 29, 2020, having initially issued a Notice of Complete Application on May 29, 2019. Specifically, the NYSDEC required CPV to demonstrate in its Title V application how the Facility would be consistent with the State's greenhouse gas emissions limits and the electric sector clean energy targets. In support of this requirement, ICF submitted a report titled "Greenhouse Gas Analysis for CPV Valley Energy Center Title V Permit Application" on March 8, 2021 (March 2021 Report). ICF then delivered two supplements to the report on October 7, 2021 (October 2021 Supplement) and September 26, 2022 (September 2022 Supplement).

ICF submits this report as part of CPV's response to NYSDEC's second Request for Additional Information (RFAI) that seeks to enforce operational limits on Valley as a potential mitigation measure for consistency with the requirements of the Climate Leadership and Community Protection Act (CLCPA). Through a review of historical data and recent New York ISO (NYISO) studies, this report addresses whether placing operational limits on Valley will result in a reduction in Statewide GHG emissions and support the electric sector targets enshrined in the CLCPA.[1]

[1] The New York ISO, or Independent System Operator, is a nonprofit quasi-governmental agency charged by New York to administer and operate its power system.

2. Executive Summary

ICF finds that enforcing operational limits on Valley over the next five years will lead to an increase, not decrease, in Statewide GHG emissions, and continued operation of Valley will be required to support the clean energy transition in New York. ICF's key findings are summarized below:

- Using historical generation statistics for generators in northeastern United States, Valley is found to be one of the lowest emitters of CO_2 per MWh (Megawatt-hour).
- The average CO_2 emission rate (or CO_2 intensity) of the thermal generation fleet in downstate NY (Zone G-K) is 1,143 lb/MWh, and the average CO_2 emission rate in upstate NY (Zone A-F) is 958 lb/MWh. The combined CO_2 emission rate of NYISO's entire thermal fleet is 1,089 lb/MWh. In the NYISO's neighboring regions, PJM and ISO-NE, average CO_2 emission rates of the thermal generation fleet are 1,326 lb/MWh and 887 lb/MWh, respectively.
- Valley generated nearly 4.5 million MWh annually on an average between 2019 and 2022 (Valley was only partly operational in 2018), serving 3% of annual energy load in NYISO. During this period, it emitted CO_2 at an average intensity of 815 lb/MWh and was the least emitting fossil resource in New York.
- Curtailment of Valley will result in generation from other thermal resources filling in to meet the shortfall in serving load. As Valley is one of the least emitting generators, its curtailment will lead to an increase in CO_2 emissions through increased generation from higher-emitting resources.
- ICF estimates that total Statewide CO_2 emissions will rise by 0.2-0.5 million ton/year over the next five years. The rise in emissions is dependent on the degree of curtailment of Valley. The lower bound estimate represents a less restrictive scenario with Valley limited to 50% annual capacity factor, while the upper bound estimate represents a more restrictive scenario with Valley limited to 10% annual capacity factor.
- Operation of Valley, even at full capacity, will not curtail renewable generators as the NYISO always dispatches them first before calling upon thermal generators to meet load. Thus, as their penetration grows, generation from renewables will displace generation from Valley, rather than Valley inhibiting renewables.
- Continued operation of Valley is required for a successful energy transition. The NYISO's 2021-2040 System & Resource Outlook (The Outlook) report finds that there will be a greater need for resources that can operate flexibly to compensate for the increased supply variability arising from new wind and solar resources. It further concludes that until new dispatchable, on-demand and emissions-free generating technologies are developed, "continued operation of fossil will be required in some manner during the

grid transition."[2] With the lowest CO_2 emissions rate among thermal generators in New York, and a quick ramping rate of 13 MW/min, Valley is the cleanest flexible fossil resource in the state capable of supporting its clean energy transition.

3. Key Findings

3.1. Curtailment of Valley will lead to higher, not lower, Statewide CO_2 emissions

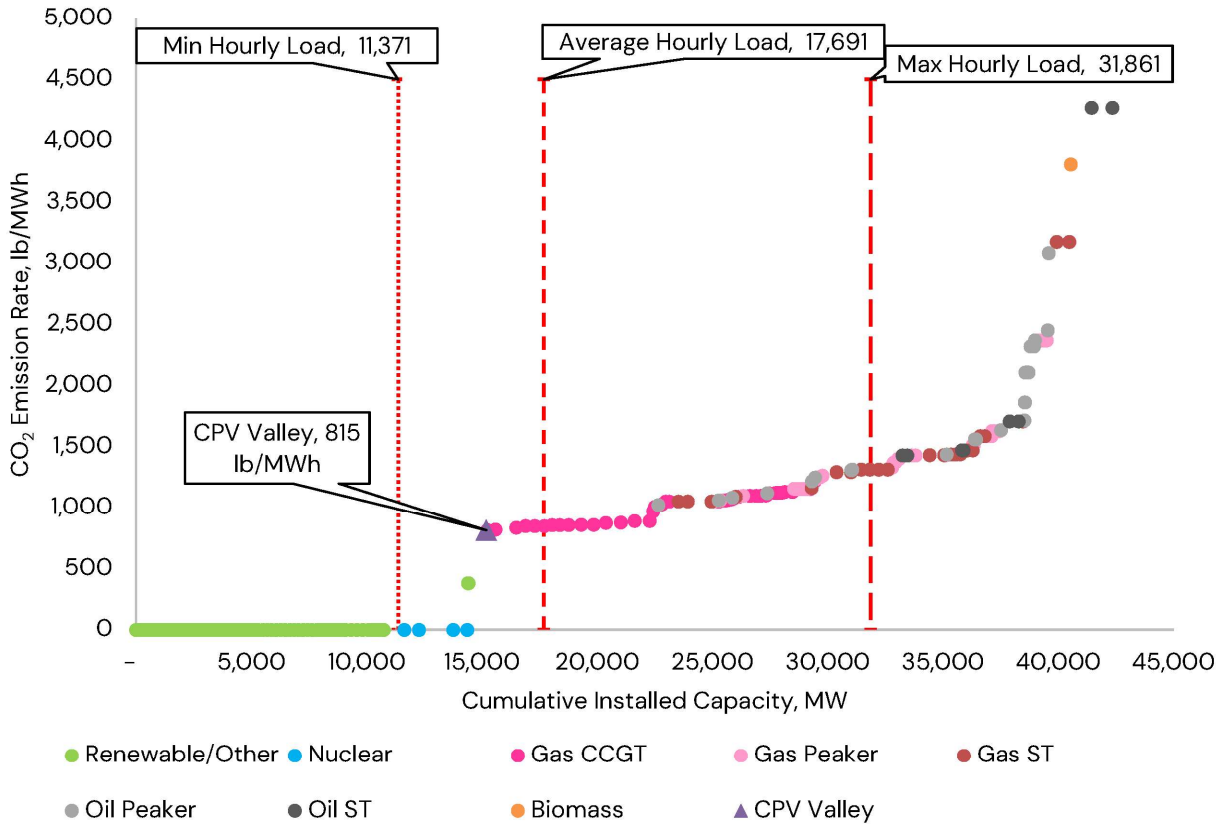
CLCPA Section 7(2) requires all state agencies to consider whether their permit approval decisions are inconsistent with or will interfere with the attainment of the statewide GHG emission limits established in ECL section 75-0107 and promulgated at 6 NYCRR Part 496 (eff. December 30, 2020). Part 496 requires reductions of statewide GHG emissions to 60% of 1990 levels by 2030 and to 15% of 1990 levels by 2050, but the rule does not impose compliance obligations on individual sources. Further, the CLCPA amends the Public Service Law (PSL) to require the New York State Public Service Commission (PSC) to implement a program to achieve the following targets: 1) 70% of statewide electric generation from renewable energy systems by 2030; and 2) zero emissions from the statewide electric system by 2040.

As part of its review process, the NYSDEC is evaluating whether granting a Title V permit to Valley would interfere with the attainment of the GHG targets of the CLCPA. Specifically, it is considering enforcing operational limits on Valley with the aim of reducing Statewide GHG emissions through direct curtailment of the Facility, a major point source of emissions. However, ICF finds that while curtailment of Valley will lead to a reduction in emissions in the Facility's immediate vicinity, it will cause a net increase in Statewide CO_2 emissions.

To evaluate the impact of Valley's curtailment on Statewide CO_2 emissions, ICF estimated the CO_2 footprint of generators that may be expected to fill in for Valley. To this end ICF relied upon historical generation and emissions data sourced from EIA 923 and EPA Clean Air Markets Program Data (CAMPD) for January 2018 through September 2022.[3] During this period, Valley emitted 7.4 million tons of CO_2 at an average emission rate of 815 lb/MWh. In comparison, NYISO's thermal generation fleet emitted a combined 155 million tons of CO_2 at an average emission rate of 1,089 lb/MWh. Figure 1 shows the NYISO's installed generation fleet arranged in increasing order of CO_2 emission rate and demonstrates Valley's emissions benefits over other generators. Figure 1 also shows the minimum, average, and maximum hourly load seen between 2018 and September 2022.

[2] NYISO, 2021-2040 System & Resource Outlook (The Outlook), September 22, 2022. pg. 8.
[3] EIA 923: https://www.eia.gov/electricity/data/eia923/; EPA CAMPD: https://campd.epa.gov/

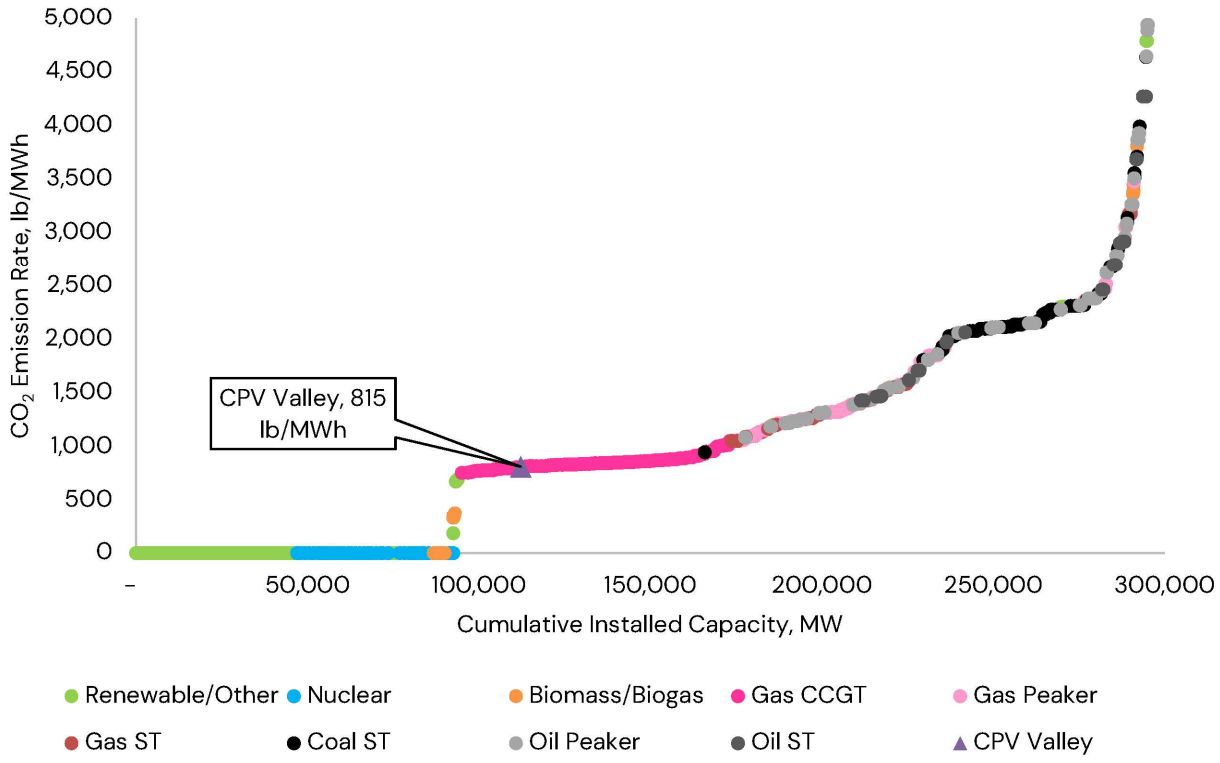
Figure 1: New York generators arranged in increasing order of CO_2 emission rate



Source: ICF analysis of EPA CAMPD and EIA 923 data

Similarly, Figure 2 shows the installed generation fleet in NYISO, ISO-NE, and PJM arranged in increasing order of CO_2 intensity and demonstrates Valley's superior emission rate in the broader region.

Figure 2: NYISO, ISO-NE, and PJM generators arranged in increasing order of CO_2 emission rate



Source: ICF analysis of EPA CAMPD and EIA 923 data

ICF finds that Valley is the lowest emitting thermal generator in NYISO and is a crucial resource for meeting energy load. From its first full year of operation in 2019 through September 2022, Valley operated at an average 75% net capacity factor and delivered nearly 4.5 million MWh annually, or 3% of the NYISO's annual energy load. If output from Valley is curtailed, generation from other thermal generators will increase to meet the shortfall in serving load. However, as demonstrated in Figure 1, all other generators in New York are more CO_2 intensive than Valley. Thus, net Statewide CO_2 emissions will rise if Valley, a low-emitting resource, is curtailed, and higher-emitting resources are dispatched instead.

For every MWh curtailed from Valley, ICF estimates that Statewide CO_2 emissions will rise by 274 lb. Net change in CO_2 emissions is calculated as the difference between the emissions saved by curtailing Valley and the emissions produced by replacement generation. For each MWh curtailed from Valley, the amount of emissions saved is equal to its CO_2 emission rate, 815 lb/MWh. Likewise, the amount of emissions produced by replacement generation is equal to its CO_2 emission rate. Due to the interconnected nature of the grid, generation curtailed from Valley may be filled in by several generators across New York. ICF projects CO_2 from Valley's replacement generation will be emitted at a rate close to the NYCA-wide average of 1,089 lb/MWh. Consequently, ICF estimates Statewide CO_2 emissions will rise by 274 lb per MWh curtailed (equal to the difference between the emission rates of Valley and Valley's replacement generation).

ICF estimated the net increase in CO_2 emissions at four hypothetical levels of curtailment of Valley. 90% curtailment implies Valley is restricted to an annual capacity factor of 10%, representing a 65% drop in generation from its 2019-2022 average net output of 75%. This equates to a reduction of nearly 3.8 million MWh. At this curtailment level, total Statewide CO_2 emissions will increase by 0.5 million tons annually. At a lower curtailment level of 50%, increase in Statewide CO_2 emissions is restricted to about 0.2 million tons annually. ICF's findings are summarized in Table 1 below.

Table 1: Impact of curtailment of Valley on CO_2 emissions in New York at different curtailment levels

Scenario	Attribute	Units	Value
	Emission rate of Valley [A]	lb/MWh	815
	Emission rate of replacement generation [B]	lb/MWh	1,089
	Net increase in emissions per MWh curtailed from Valley [C] = [B] - [A]	**lb**	**274**
90% Curtailment: Valley is restricted to 10% annual capacity factor	Estimated MWh curtailed from Valley [D]	MWh	3,876,111
	Total increase in emissions [E] = [C] * [D] / 2000	**tons**	**530,785**
75% Curtailment: Valley is restricted to 25% annual capacity factor	Estimated MWh curtailed from Valley [D]	MWh	2,982,591
	Total increase in emissions [E] = [C] * [D] / 2000	**tons**	**408,429**
60% Curtailment: Valley is restricted to 40% annual capacity factor	Estimated MWh curtailed from Valley [D]	MWh	2,089,071
	Total increase in emissions [E] = [C] * [D] / 2000	**tons**	**286,072**
50% Curtailment: Valley is restricted to 50% annual capacity factor	Estimated MWh curtailed from Valley [D]	MWh	1,493,391
	Total increase in emissions [E] = [C] * [D] / 2000	**tons**	**204,501**

Source: ICF analysis of EPA CAMPD and EIA 923 data

3.2. Continued operation of Valley will support, not inhibit, the clean energy transition in New York

The NYISO grid is expected to undergo a rapid transformation in the next five years. 9.5 GW of contracted renewable resources are scheduled to come online, and nearly 2 GW of on-demand, peaking resources in downstate New York are slated for retirement in response to the NYSDEC's Peaker Rule.[4] At the same time, the retirement or refurbishment of 10 GW of nuclear capacity between 2021 and 2025 in Ontario will greatly reduce its energy flows to the NYISO.[5] The inherent variability associated with wind and solar generation and the reduced availability of on-demand resources and imports will increase operational demands on the NYISO's existing fossil fleet. There will be a greater need for resources that can operate flexibly to meet the increased variability of renewable generation. Indeed, the NYISO's 2021-2040 System & Resource Outlook (The Outlook) report states: "This Outlook demonstrates that the flexible units will be dispatched more frequently but will operate for less hours with the year as the

[4] NYISO, 2021-2040 System & Resource Outlook (The Outlook), September 22, 2022. pg. 33-34.
[5] Ibid, pg. 8.

transition unfolds. Until new technologies emerge, continued operation of fossil will be required in some manner during the grid transition."[6] Another NYISO report, the 2022 Reliability Needs Assessment (RNA), finds: "With increased renewable intermittent generation for achievement of the CLCPA goal of 70% renewable energy by 2030, at least 17,000 MW of existing fossil must be retained to continue to reliably serve forecasted demand."[7] The NYISO's recent findings reiterate the conclusion from ICF's March 2021 Report that flexible resources, including CCGTs like Valley, will be needed to supplement intermittent renewable generation and serve load reliably. With a fast ramp rate of up to 13 MW/min, short start-up lead time, and low CO_2 emission rate, Valley is one the prime fossil candidates to be retained to support New York's clean energy transition.[8]

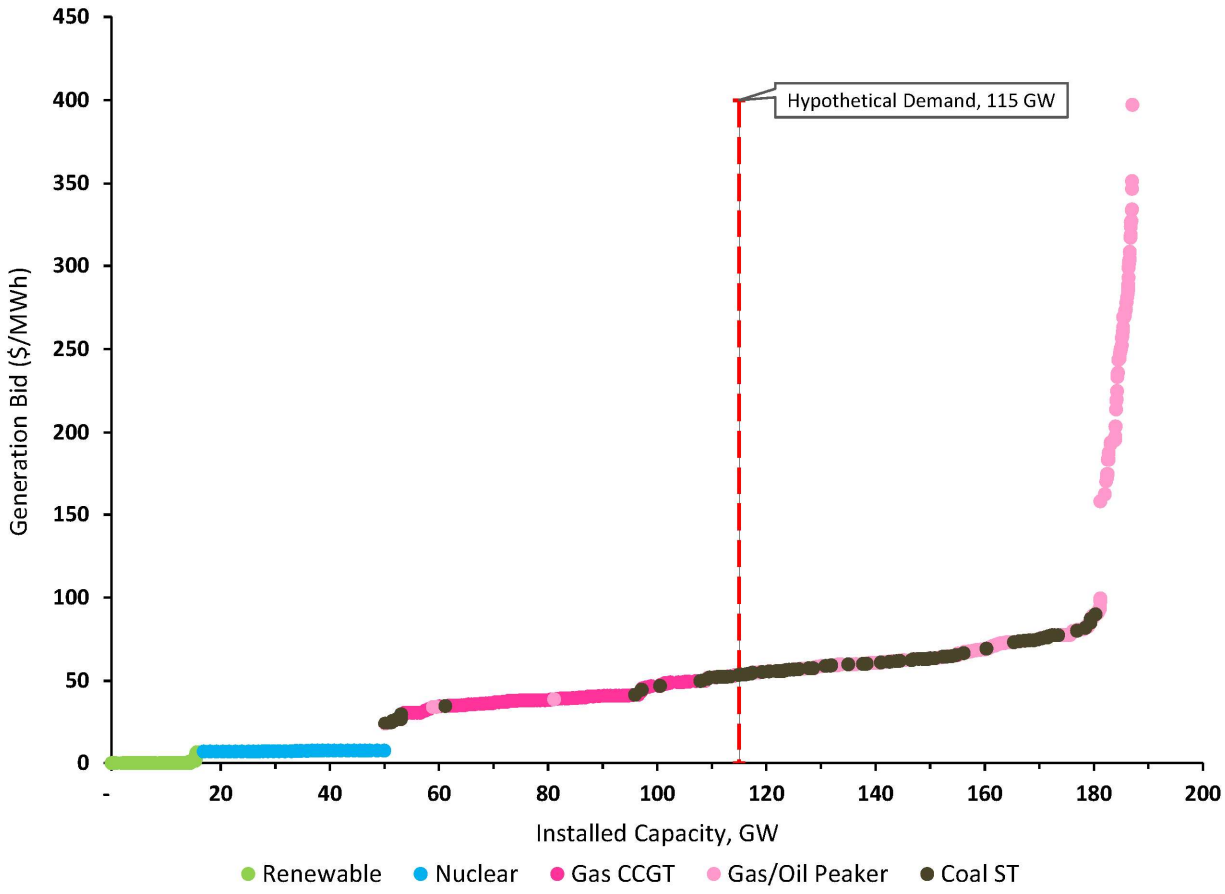
While reliance on Valley and other flexible generators will be required to balance renewable generation variability, operation of Valley, even at full capacity, will never curtail emissions-free generation. Power markets are designed such that demand is satisfied at all times by the least cost generation available, subject to transmission and operational constraints. Figure 3 shows a hypothetical generation bid stack, with available generation capacity on the x-axis, and generation costs (or bids) on the y-axis. Renewable resources, including solar, wind, and hydro, have near-zero generation costs and are given priority for dispatch. Nuclear resources also have low generation costs due to the high energy density of nuclear fuel and are dispatched next. Finally, thermal resources are dispatched until supply matches demand (115 GW in the illustrative example below). As generation from low-cost renewable resources grows, higher-cost thermal resources (such as Valley) will get priced out in the bid stack more frequently, and hence, dispatch less.

[6] Ibid, pg. 8.

[7] NYISO, 2022 Reliability Needs Assessment (RNA), November 15, 2022, pg. 12.

[8] Ramp rate means the rate at which a generator is able to change its output level. CCGTs and combustion turbines (CT) are able to ramp up or down at up to 13 MW/min, but steam turbines (ST) can only change their outputs at less than 0.5 MW/min.

Figure 3: Illustrative generation bid stack (supply stack)



Source: ICF

Appendix

Table A 1: Supplementary CO_2 emissions rate calculations for NYISO, ISO-NE and PJM for the period January 2018 through September 2022

Region	Year	Net Generation, MWh			Total CO_2 Emissions, tons [B]	CO_2 Emission Rate of Thermal, lb/MWh [C] = [B] * 2000/[A]	Average CO_2 Emission Rate of Thermal, lb/MWh	
		Renewable /Other[9]	Nuclear	Thermal [A]				
NYISO (A-F)	2018	35,337,766	26,600,051	20,611,442	9,761,291	947	958	1,089
	2019	36,651,290	28,170,175	17,656,774	8,303,331	941		
	2020	35,821,139	26,562,172	16,472,001	7,619,029	925		
	2021	34,805,041	28,355,182	16,594,546	7,640,730	921		
	2022	19,422,318	19,816,761	12,382,722	6,773,180	1,094		
NYISO (G-K)	2018	1,055,113	16,318,960	39,571,479	22,072,121	1,116	1,143	
	2019	1,081,343	16,694,843	37,812,342	21,576,601	1,141		
	2020	1,137,266	11,867,904	43,383,298	23,752,893	1,095		
	2021	1,164,237	2,821,401	46,600,068	26,102,590	1,120		
	2022	501,905	0	34,554,586	21,866,868	1,266		
ISO-NE	2018	17,204,143	31,384,751	57,240,545	25,821,413	902	887	
	2019	17,341,367	29,817,525	53,180,652	22,433,568	844		
	2020	16,533,127	25,580,051	54,906,839	23,224,041	846		
	2021	16,415,225	27,072,626	59,809,615	25,621,310	857		
	2022	4,556,104	19,980,357	40,415,921	20,628,219	1,021		
PJM	2018	60,320,193	250,451,471	527,918,262	373,101,125	1,413	1,326	
	2019	60,435,965	244,683,105	525,873,959	343,676,806	1,307		
	2020	63,060,557	243,804,056	508,657,300	320,108,328	1,259		
	2021	68,046,142	237,258,819	532,812,621	344,324,937	1,292		
	2022	37,230,128	179,166,380	388,892,023	265,618,775	1,366		

[9] "Other" refers to generators burning renewable fuels such as landfill gas, sludge waste, municipal solid waste, wood waste solids, etc.

Source: ICF analysis of EPA CAMPD and EIA 923 data

APPENDIX 7

Measures and Alternatives to Mitigate the Impacts of Co-Pollutant Emissions from Greenhouse Gas Emission Sources, (TRC Companies, Dec. 2022)

CPV Valley Energy Center
Measures and Alternatives to Mitigate the Impacts of Co-Pollutant Emissions from Greenhouse Gas Emission Sources

Prepared for:

Competitive Power Ventures, Inc.

Prepared by:

TRC
21 Griffin Road North
Windsor, CT 06095

December 2022

1. Introduction

1.1. Legislative Background

Climate Leadership and Community Protection Act of 2019 (CLCPA)[1] sets goals for New York State to achieve 100 percent zero-emissions electricity generation by 2040 and anthropogenic greenhouse gas (GHG) emissions reductions (relative to the 1990-levels) of 40 percent by 2030 and 85 percent by 2050. Section 7(3) of CLCPA directs the New York State Department of Environmental Conservation (NYSDEC) to prioritize net reductions of GHG emissions and co-pollutants in disadvantaged communities (DAC).

The CLCPA defines co-pollutants as hazardous air pollutants (HAPs) that are emitted by a piece of equipment that emits GHG. For this report, carbon monoxide (CO), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), sulfur dioxide (SO_2), nitrogen oxides (NO_x), ozone (O_3), and its precursors[2] are considered to be co-pollutants.

1.2. Purpose

The purposes of this report are to:

- Provide co-pollutant emission calculations for the Valley Energy Center (Project).
- Describe the measures and alternatives to reduce the Project's co-pollutant emissions and it impact on DAC.

2. Project Description

2.1. Co-Pollutant Emission Sources

Competitive Power Ventures, Inc. (CPV) owns and operates the Project, a 680-megawatt electric generation facility. The Project commenced operation during 2018 and operates under Air State Facility Permit ID: 3-3356-00136/00001 (Permit). The Project includes the following GHG emission sources:

- Emission Units U-00001 and U-00002: Two combined-cycle Siemens F-class combustion turbines, which are both equipped with duct-burners. They are capable of firing natural gas or No. 2 fuel oil.
- Emission Unit U-00003: One 46.7 million British thermal units per hour (MMBtu/hr) auxiliary boiler that fires natural gas. This boiler is used to heat the steam power plant to facilitate startup of the combined-cycle units. The boiler's operation is limited by the Permit to no more than 2,000 hours per year (hr/yr).

[1] https://www.nysenate.gov/legislation/bills/2019/S6599, accessed December 2022

[2] The Project does not directly emit O_3, but it does emit volatile organic compounds (VOC) and NO_x, which are O_3 precursors.

- Emission Unit U-00004: One 1,495 horsepower (hp) emergency diesel generator engine. This engine is operated for emergencies, maintenance, and testing only. Its operation is limited by the Permit to no more than 500 hr/yr.
- Emission Unit U-00005: One 282 hp firewater pump engine. This engine is operated for emergencies, maintenance, and testing only. Its operation is limited by the Permit to no more than 500 hr/yr.
- Emission Unit U-00006: Two 6.28 MMBtu/hr fuel gas heaters that fire natural gas.

2.2. Potential to Impact Disadvantaged Communities

The Project is located at 3330 Route 6, Middletown, New York, 10940 (Census Tract 36071011801). It is identified as a potential DAC in the CLCPA Climate Council's Climate Justice Working Group (CJWG) draft DAC list[3].

3. Co-pollutant Emission Calculations

Tables 1 through 5 provide calculations of the potential co-pollutant to emit (PTE) for each GHG emission source. PTE is the maximum capacity of a stationary source to emit under its physical and operational design. Any physical or operational limitation on the source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation, or on the type or amount of material combusted, stored, or processed, is treated as part of its design if the limitation is enforceable by the Administrator of the Environmental Protection Agency (EPA). Tables 1 through 6 provide the following:

- Table 1: Co-pollutant PTE calculations for the two combustion turbines and their associated duct-burners. Each combined-cycle unit is assumed to operate at its maximum capacity (based on data provided by the equipment vendor) for 8,760 hr/yr. Two cases (each turbine firing natural gas 8,760 hr/yr and each turbine firing natural gas and No. 2 fuel oil 8,040 hr/yr and 720 hr/yr, respectively) are evaluated, and the largest co-pollutant emission rate selected as the co-pollutant PTE. Most of the co-pollutant emitted by the combined-cycle units are hydrocarbon products of incomplete combustion (PIC), such as formaldehyde and acetaldehyde, or uncombusted constituents of natural gas such as benzene. Each combined-cycle unit is equipped with an oxidation catalyst that will oxidize these PIC. Nevertheless, the calculations in Table 1 take credit for the emission rate reduction for only formaldehyde.
- Table 2: Co-pollutant PTE calculations for the auxiliary boiler. It is assumed to operate at its rated capacity for 2,000 hr/yr.

[3] CJWG Draft List of Disadvantaged Communities, at pg. 30, *available at: https://climate.ny.gov/-/media/Project/Climate/Files/Draft-List-of-Disadvantaged-Communities.pdf* accessed December 2022).

- Tables 3 and 4: Co-pollutant PTE calculations for the emergency diesel generator and firewater pump engines. Each is assumed to operate at its rated capacity for 500 hr/yr.
- Table 5: Co-pollutant PTE calculations for the two fuel gas heaters. Each is assumed to operate at its rated capacity for 8,760 hr/yr.
- Table 6: A Summary of the Project's co-pollutant PTE.

The Project's Draft Environmental Impact Statement[4] describe a variety of air dispersion modeling analyses that demonstrated the following:

- The Project's emissions of nitrogen dioxide, CO, $PM_{2.5}$, and SO_2 would not cause or significantly contribute to violations of the National Ambient Air Quality Standards then applicable.
- The Project's emissions would not adversely impact vegetation in the site area.
- The Project's emissions of $PM_{2.5}$ precursors complied with the Federal and State requirements then applicable.
- The predicted impacts of the Project's non-criteria pollutant complied with the NYSDEC Guideline Concentrations then applicable.

4. Co-pollutant Emission Impact Mitigation Measures and Alternatives

4.1. Mitigation Measures

The impact of the Project's co-pollutant emissions on its neighbors are mitigated by the Project's design features and operational practices. The design features include the following:

- The Project's combined-cycle units are thermally efficient and minimize the amount of fuel burned (and amount of co-pollutants emitted) per unit of electricity generated. Table 7 compares the Project's heat rate [British thermal units of fuel burned to generate one kilowatt-hour of electricity (Btu/kWh)[5]] to electrical generators in the region and to Permit limits.
    - For calendar year 2020, EPA eGRID[6] reports that the Project's heat rate was 6,912 Btu/kWh, versus a heat rate of 7,599 Btu/kWh for all Northeast Power Coordinating Council (NPCC) upstate New York subregion combustion generation plants.

[4] Draft Environmental Impact Statement - CPV Valley Energy Center, Volume I, February 2009, Revision 2
[5] All heat rate data are expressed at fuel higher heating value (HHV).
[6] Emissions & Generation Resource Integrated Database (eGRID), https://www.epa.gov/egrid/download-data accessed December 2022.

- Project heat rates equal to 6,659; 6,938; 6,934; and 6,917 Btu/kWh were measured in 2019, 2020, 2021, and 2022, respectively. The Permit limit is 7,605 Btu/kWh[7].

- The Project's GHG emissions per unit of electricity generated are low. Table 8 compares the Project's GHG emissions [pounds of carbon dioxide equivalents released to generate one megawatt-hour of electricity (lb CO_2e/MWh)] to electrical generators in the region and to Permit limits.
  - For calendar year 2020, EPA eGRID reports that the Project emitted 822 lb CO_2e/MWh. The Permit limit is 925 lb CO_2e/MWh.
  - For calendar year 2020, EPA eGRID reports that combustion generation plants, fossil fuel generation plants, and non-baseload generation plants located in the NPCC upstate New York subregion emitted, respectively, 836, 852, and 881 lb CO_2e/MWh.
- The HAPs emitted by the Project's combined-cycle units are hydrocarbon PIC and trace metals contained in liquid fuels (No. 2 fuel oil and diesel fuel). CO and VOC are also PIC. Each combined-cycle unit is equipped with an oxidation catalyst that oxidizes the PIC and uncombusted natural gas constituents such as benzene.
- Each combined-cycle unit is equipped with dry low emission (DLE) combustors and a selective catalytic reduction (SCR) system. The DLE combustors decrease NO_x formation, and the SCR system reduces NO_x emissions to nitrogen and water.
- The Project's combined-cycle units are less efficient when they are starting up. The steam plant must be heated prior to bringing the combustion turbines to full load. To minimize startup duration, the Project's auxiliary boiler operates to heat the steam plant as needed prior to and during startup.

The impact of the Project's co-pollutant emissions on its neighbors are also mitigated by the Project's operational practices, including the following:

- The Project's combined-cycle units actual annual operating hours are less than the theoretical maximum potential hours of operation. Table 9 presents each combined-cycle unit's actual and maximum potential annual operating hours.
- The emergency generator firewater pump engines are operated only during emergencies, testing, and maintenance.

[7] Measured and permit limit heat rates are corrected to reference conditions per ASME PTC 46-1996 https://www.asme.org/codes-standards/find-codes-standards/ptc-46-overall-plant-performance, accessed December 2022.

- The Project's combined-cycle units are less efficient during startup and shutdown events. The oxidation catalyst is less effective in oxidizing organic co-pollutants during startup events. CPV operating practices minimize the frequency and duration of the combined-cycle units' startup and shutdown events. These are summarized in Table 10.

- The Project's combined-cycle turbines are each permitted to combust distillate oil for up to 720 hr/yr. Co-pollutant emissions are greater when firing distillate oil than when firing an equivalent amount of natural gas. Distillate oil is fired in the Project's combined-cycle turbines only when natural gas is unavailable or for testing.

- The Project's GHG emission sources are operated and maintained in accordance with manufacturer specifications and industry standards.

4.2. Alternatives

4.2.1. Green Hydrogen

Electrolysis is the process of using electricity to split water into hydrogen and oxygen. Green hydrogen produced by electrolysis using electricity generated using renewable energy. Green hydrogen can then be stored and combusted by dispatchable energy resources to generate electricity when it is needed without emitting GHG or co-pollutants.

The Project's combined-cycle turbines use DLE combustion technology. Siemens Energy reports that, using currently available technologies, the Project's combined-cycle turbines could burn up to 15 percent hydrogen with the minor modifications, or up to 30 percent hydrogen with more extensive retrofits. By 2030, Siemens anticipates that technologies will be commercially available which will enable large turbine DLE systems to combust 100 percent hydrogen fuel. Combusting green hydrogen in the Project's combined-cycle units is not now feasible because utility-scale green hydrogen infrastructure does not exist in the vicinity of the Project. CPV continues to monitor the feasibility of this alternative.

4.2.2. Renewable Natural Gas

Renewable natural gas (RNG) is a pipeline-quality gas derived from biomass or other renewable sources that is fully interchangeable with conventional natural gas. RNG is essentially the gaseous product of the decomposition of organic matter that has been processed to a high degree of purity. Producing and combusting RNG does not create new carbon emissions. Instead, RNG recycles carbon that was already in circulation, and which would have resulted in the emission of GHGs absent conversion. Like conventional natural gas, RNG is mostly methane. Therefore, the amount of co-pollutant emissions produced by burning RNG is similar to the amount of co-pollutant emissions produced by burning an equivalent amount conventional natural gas. Conventional natural gas also contains small amounts of heavier hydrocarbons (e.g., C2 - C6).

Therefore, burning conventional natural gas also produces small amounts of co-pollutants which are the PIC of the heavier hydrocarbons.

While RNG production may require new interconnections to pipelines, RNG supply does not necessarily require additional natural gas system infrastructure, such as transmission and distribution pipes. RNG can be transported in existing natural gas pipelines and used by conventional natural gas consumers. CPV continues to monitor the availability of RNG and the feasibility of combusting RNG in the Project's combined-cycle units.

5. Summary and Conclusion

The Project uses state-of-the art design features and operating practices to minimize and mitigate its co-pollutant emissions and its potential to impact disadvantaged communities. These include the following:

- Thermally efficient combined-cycle units.
- Catalyst systems which oxidize the combined-cycle units' CO and hydrocarbon co-pollutant emission.
- DLE combustors and SCR systems which decrease the combined-cycle units' NO_x emissions.
- Auxiliary boiler to minimize startup duration.
- Operating GHG sources fewer hours than allowed.
- Minimizing the frequency and duration of combined-cycle unit startup and shut down.
- Combusting distillate oil in the combined-cycle units only during testing or when natural gas is unavailable.
- Operating and maintaining GHG emission sources in accordance with manufacturers' specifications and industry standards.

These measures are consistent with the goals of the CLCPA. CPV continues to monitor the feasibility of alternative fuels to further mitigate its co-pollutant emissions and its potential to impact DAC.

Table 1: Potential to Emit
Two Combustion Turbines w/ Duct Burners
Emission Units U-00001 and U-00002

	Extreme Cold (-5 °F)	Moderate (51 °F)	Extreme Heat (90 °F)	Annual Total	
Combustion Turbine					
Operation (hr/yr)					
Case 1 - Natural Gas	1,440	14,640	1,440	17,520	(2 units)
Case 2a - Natural Gas	0	14,640	1,440	16,080	(2 units)
Case 2b - Distillate	1,440	0	0	1,440	(2 units)
Fuel Usage (MMBtu/hr)					
Case 1 - Natural Gas	2,238	2,002	1,859		
Case 2a - Natural Gas	2,238	2,002	1,859		
Case 2b - Distillate	2,140	1,889	1,752		
Duct Burners					
Operation (hr/yr)					
Case 1 - Natural Gas	0	14,640	1,440	16,080	(2 units)
Case 2a - Natural Gas	0	14,640	1,440	16,080	(2 units)
Case 2b - Distillate	0	0	0	0	(2 units)
Fuel Usage (MMBtu/hr)					
Case 1 - Natural Gas	0	186	457		
Case 2a - Natural Gas	0	186	457		
Case 2b - Distillate	0	0	0		

Co-pollutant	Emission Factor (lb/MMBtu)	Ref.	Hourly Emissions (lb/hr)			Annual Emissions (ton/yr)
			Winter	Spring/Fall	Summer	
Case 1 - Natural gas firing in combustion turbine for 8,760 hours per year per unit						
Criteria Pollutants						
NO_x		7	16.80	15.04	13.92	132.21
CO		7	10.20	9.20	8.40	80.74
VOC		7	2.03	1.82	1.68	15.99
SO_2		7	4.87	4.36	4.04	38.31
$PM_{2.5}/PM_{10}$		7	11.11	10.10	9.67	88.87
Hazardous Air Pollutants						
1,3 Butadiene	4.30E-07	1	9.62E-04	8.61E-04	7.99E-04	0.01
Acetaldehyde	4.00E-05	1	8.95E-02	8.01E-02	7.44E-02	0.70
Acrolein	6.40E-06	1	1.43E-02	1.28E-02	1.19E-02	0.11
Benzene	1.20E-05	1	2.69E-02	2.40E-02	2.23E-02	0.21
Ethylbenzene	3.20E-05	1	7.16E-02	6.41E-02	5.95E-02	0.56
Formaldehyde	1.10E-04	2	2.46E-01	2.20E-01	2.04E-01	1.94
Naphthalene (included in PAH)	1.30E-06	1	2.91E-03	2.60E-03	2.42E-03	0.02
Total PAH	2.20E-06	1	4.92E-03	4.40E-03	4.09E-03	0.04
Toluene	1.30E-04	1	2.91E-01	2.60E-01	2.42E-01	2.29
Xylenes	6.40E-05	1	1.43E-01	1.28E-01	1.19E-01	1.13
Total HAP						7.01

Case 2a - Natural gas firing in combustion turbine for 8,040 hours per year per unit						
Criteria Pollutants						
NO_x		7	16.80	15.04	13.92	120.12
CO		7	10.20	9.20	8.40	73.39
VOC		7	2.03	1.82	1.68	14.53
SO_2		7	4.87	4.36	4.04	34.80
$PM_{2.5}/PM_{10}$		7	11.11	10.10	9.67	80.87
Hazardous Air Pollutants						
1,3 Butadiene	4.30E-07	1	9.62E-04	8.61E-04	7.99E-04	0.01
Acetaldehyde	4.00E-05	1	8.95E-02	8.01E-02	7.44E-02	0.64
Acrolein	6.40E-06	1	1.43E-02	1.28E-02	1.19E-02	0.10
Benzene	1.20E-05	1	2.69E-02	2.40E-02	2.23E-02	0.19
Ethylbenzene	3.20E-05	1	7.16E-02	6.41E-02	5.95E-02	0.51
Formaldehyde	1.10E-04	2	2.46E-01	2.20E-01	2.04E-01	1.76
Naphthalene (included in PAH)	1.30E-06	1	2.91E-03	2.60E-03	2.42E-03	0.02
Total PAH	2.20E-06	1	4.92E-03	4.40E-03	4.09E-03	0.04
Toluene	1.30E-04	1	2.91E-01	2.60E-01	2.42E-01	2.08
Xylenes	6.40E-05	1	1.43E-01	1.28E-01	1.19E-01	1.02
Total HAP						6.37
Case 2b - Distillate oil firing in combustion turbine for 720 hours per year per unit						
Criteria Pollutants						
NO_x		7	51.43	45.43	42.14	37.03
CO		7	7.43	9.20	8.60	5.35
VOC		7	2.10	1.82	1.68	1.51
SO_2		7	3.27	2.89	2.68	2.35
$PM_{2.5}/PM_{10}$		7	51.35	46.19	42.10	36.97
Hazardous Air Pollutants						
1,3 Butadiene	1.60E-05	3	3.42E-02	3.02E-02	2.80E-02	0.02
Benzene	5.50E-05	3	1.18E-01	1.04E-01	9.64E-02	0.08
Formaldehyde	2.80E-04	3	5.99E-01	5.29E-01	4.91E-01	0.43
Naphthalene (included in PAH)	3.50E-05	3	7.49E-02	6.61E-02	6.13E-02	0.05
Total PAH	4.00E-05	3	8.56E-02	7.56E-02	7.01E-02	0.06
Arsenic	1.10E-05	4	2.35E-02	2.08E-02	1.93E-02	0.02
Beryllium	3.10E-07	4	6.63E-04	5.86E-04	5.43E-04	4.78E-04
Cadmium	4.80E-06	4	1.03E-02	9.07E-03	8.41E-03	0.01
Chromium	1.10E-05	4	2.35E-02	2.08E-02	1.93E-02	0.02
Lead	1.40E-05	4	3.00E-02	2.64E-02	2.45E-02	0.02
Manganese	7.90E-04	4	1.69E+00	1.49E+00	1.38E+00	1.22
Mercury	1.20E-06	4	2.57E-03	2.27E-03	2.10E-03	1.85E-03
Nickel	4.60E-06	4	9.84E-03	8.69E-03	8.06E-03	0.01
Selenium	2.50E-05	4	5.35E-02	4.72E-02	4.38E-02	0.04
Total HAP						1.98

Cases 1 & 2a - Natural gas firing in duct burners for 8,040 hours per year per unit						
Criteria Pollutants						
NO_x		7		1.48	4.00	13.74
CO		7		3.71	10.00	34.34
VOC		7		1.30	3.50	12.02
SO_2		7		0.40	1.09	3.74
$PM_{2.5}/PM_{10}$		7		2.02	5.45	18.71
Hazardous Air Pollutants						
2-Methylnaphthalene	2.35E-08	5		4.37E-06	1.07E-05	3.97E-05
3-Methylchloranthrene	1.76E-09	5		3.27E-07	8.06E-07	2.98E-06
7,12-Dimethylbenz(a) anthracene	1.57E-08	5		2.91E-06	7.16E-06	2.65E-05
Acenaphthene	1.76E-09	5		3.27E-07	8.06E-07	2.98E-06
Acenaphthylene	1.76E-09	5		3.27E-07	8.06E-07	2.98E-06
Anthracene	2.35E-09	5		4.37E-07	1.07E-06	3.97E-06
Arsenic	1.96E-07	6		3.64E-05	8.95E-05	3.31E-04
Benzo(a)anthracene	1.76E-09	5		3.27E-07	8.06E-07	2.98E-06
Benzene	2.06E-06	5		3.82E-04	9.40E-04	3.47E-03
Benzo(a)pyrene	1.18E-09	5		2.18E-07	5.37E-07	1.98E-06
Benzo(b)fluoranthene	1.76E-09	5		3.27E-07	8.06E-07	2.98E-06
Benzo(g,h,i)perylene	1.18E-09	5		2.18E-07	5.37E-07	1.98E-06
Benzo(k)fluoranthene	1.76E-09	5		3.27E-07	8.06E-07	2.98E-06
Beryllium	1.18E-08	6		2.18E-06	5.37E-06	1.98E-05
Cadmium	1.08E-06	6		2.00E-04	4.92E-04	1.82E-03
Chromium	1.37E-06	6		2.55E-04	6.27E-04	2.32E-03
Chrysene	1.76E-09	5		3.27E-07	8.06E-07	2.98E-06
Cobalt	8.24E-08	6		1.53E-05	3.76E-05	1.39E-04
Dibenzo(a,h)anthracene	1.18E-09	5		2.18E-07	5.37E-07	1.98E-06
Dichlorobenzene	2.06E-06	5		3.82E-04	9.40E-04	3.47E-03
Fluoranthene	2.94E-09	5		5.46E-07	1.34E-06	4.96E-06
Fluorene	2.75E-09	5		5.09E-07	1.25E-06	4.63E-06
Formaldehyde	7.35E-05	5		1.36E-02	3.36E-02	0.12
Hexane	1.76E-03	5		3.27E-01	8.06E-01	2.98
Indeno(1,2,3-cd)pyrene	1.76E-09	5		3.27E-07	8.06E-07	2.98E-06
Lead	4.90E-07	6		9.10E-05	2.24E-04	8.27E-04
Manganese	3.73E-07	6		6.91E-05	1.70E-04	6.29E-04
Mercury	2.55E-07	6		4.73E-05	1.16E-04	4.30E-04
Naphthalene	5.98E-07	5		1.11E-04	2.73E-04	1.01E-03
Nickel	2.06E-06	6		3.82E-04	9.40E-04	3.47E-03
Phenanthrene	1.67E-08	5		3.09E-06	7.61E-06	2.81E-05
Pyrene	4.90E-09	5		9.10E-07	2.24E-06	8.27E-06
Selenium	2.35E-08	6		4.37E-06	1.07E-05	3.97E-05
Toluene	3.33E-06	5		6.19E-04	1.52E-03	5.62E-03
Total HAP						3.12

Co-pollutant	Emissions for Two Units (ton/yr)		
	Case 1 8,760 hr/yr Nat Gas	Case 2 8,040 hr/yr Nat Gas 720 hr/yr Distillate	Maximum of Cases 1 & 2
Criteria Pollutants			
NO_x	146	171	171
CO	115	113	115
VOC	28.0	28.1	28.1
SO_2	42.1	40.9	42.1
$PM_{2.5}/PM_{10}$	108	137	137
Hazardous Air Pollutants			
2-Methylnaphthalene	3.97E-5	3.97E-5	3.97E-5
3-Methylchloranthrene	2.98E-6	2.98E-6	2.98E-6
7,12-Dimethylbenz(a) anthracene	2.65E-5	2.65E-5	2.65E-5
Acenaphthene	2.98E-6	2.98E-6	2.98E-6
Acenaphthylene	2.98E-6	2.98E-6	2.98E-6
Anthracene	3.97E-6	3.97E-6	3.97E-6
Benzo(a)anthracene	2.98E-6	2.98E-6	2.98E-6
Benzo(a)pyrene	1.98E-6	1.98E-6	1.98E-6
Benzo(b)fluoranthene	2.98E-6	2.98E-6	2.98E-6
Benzo(g,h,i)perylene	1.98E-6	1.98E-6	1.98E-6
Benzo(k)fluoranthene	2.98E-6	2.98E-6	2.98E-6
Chrysene	2.98E-6	2.98E-6	2.98E-6
Cobalt	1.39E-4	1.39E-4	1.39E-4
Dibenzo(a,h)anthracene	1.98E-6	1.98E-6	1.98E-6
Dichlorobenzene	3.47E-3	3.47E-3	3.47E-3
Fluoranthene	4.96E-6	4.96E-6	4.96E-6
Fluorene	4.63E-6	4.63E-6	4.63E-6
Hexane	2.98	2.98	2.98
Indeno(1,2,3-cd)pyrene	2.98E-6	2.98E-6	2.98E-6
Naphthalene	1.01E-3	1.01E-3	1.01E-3
Phenanthrene	2.81E-5	2.81E-5	2.81E-5
Pyrene	8.27E-6	8.27E-6	8.27E-6
Toluene	5.62E-3	5.62E-3	5.62E-3
1,3 Butadiene	7.57E-3	0.03	0.03
Acetaldehyde	0.70	0.64	0.70
Acrolein	0.11	0.10	0.11
Benzene	0.21	0.28	0.28
Ethylbenzene	0.56	0.51	0.56
Formaldehyde	2.06	2.31	2.31
Naphthalene	0.02	0.07	0.07
Toluene	2.29	2.08	2.29
Xylenes	1.13	1.02	1.13
Arsenic	3.31E-4	0.02	0.02
Beryllium	1.98E-5	4.97E-4	4.97E-4
Cadmium	1.82E-3	9.21E-3	9.21E-3
Chromium	2.32E-3	0.02	0.02
Lead	8.27E-4	0.02	0.02
Manganese	6.29E-4	1.22	1.22
Mercury	4.30E-4	2.28E-3	2.28E-3
Nickel	3.47E-3	0.01	0.01
Selenium	3.97E-5	0.04	0.04
Total HAP	10.1	11.4	11.4

Reference:

1. AP-42, 5th Edition Tables 3.1-3
2. CATEF factor for natural gas-fired combustion turbines with SCR and oxidation catalyst median value, rounded to two significant figures. https://ww2.arb.ca.gov/california-air-toxics-emission-factor
3. AP-42, 5th Edition Tables 3.1-4
4. AP-42, 5th Edition Tables 3.1-5
5. AP-42, 5th Edition Tables 1.4-3
6. AP-42, 5th Edition Tables 1.4-4
7. Vendor data

Table 2: Potential to Emit
Auxiliary Boiler
Emission Unit U-00003

Annual Operating Schedule (hr) 2,000 Fuel Consumption (MMBtu/hr) 46.7

Co-pollutant	Emission Factor (lb/MMBtu)	Reference	Hourly Emission (lb/hr)	Annual Emission (ton/yr)	Note
Criteria Pollutants					
NO_x	0.05	1	2.29	2.29	
CO	0.08	1	3.85	3.85	
VOC	5.39E-3	2	0.25	0.25	
SO_2	5.88E-4	2	0.03	0.03	
$PM_{2.5}/PM_{10}$	7.45E-3	2	0.35	0.35	
Hazardous Air Pollutants					
2-Methylnaphthalene	2.35E-8	3	1.10E-6	1.10E-6	PAH
3-Methylchloranthrene	1.76E-9	3	8.24E-8	8.24E-8	PAH
7,12-Dimethylbenz(a) anthracene	1.57E-8	3	7.33E-7	7.33E-7	PAH
Acenaphthene	1.76E-9	3	8.24E-8	8.24E-8	PAH
Acenaphthylene	1.76E-9	3	8.24E-8	8.24E-8	PAH
Anthracene	2.35E-9	3	1.10E-7	1.10E-7	PAH
Arsenic	1.96E-7	4	9.16E-6	9.16E-6	
Benzo(a)anthracene	1.76E-9	3	8.24E-8	8.24E-8	PAH
Benzene	2.06E-6	3	9.61E-5	9.61E-5	
Benzo(a)pyrene	1.18E-9	3	5.49E-8	5.49E-8	PAH
Benzo(b)fluoranthene	1.76E-9	3	8.24E-8	8.24E-8	PAH
Benzo(g,h,i)perylene	1.18E-9	3	5.49E-8	5.49E-8	PAH
Benzo(k)fluoranthene	1.76E-9	3	8.24E-8	8.24E-8	PAH
Beryllium	1.18E-8	4	5.49E-7	5.49E-7	
Cadmium	1.08E-6	4	5.04E-5	5.04E-5	
Chromium	1.37E-6	4	6.41E-5	6.41E-5	
Chrysene	1.76E-9	3	8.24E-8	8.24E-8	PAH
Cobalt	8.24E-8	4	3.85E-6	3.85E-6	
Dibenzo(a,h)anthracene	1.18E-9	3	5.49E-8	5.49E-8	PAH
Dichlorobenzene	2.06E-6	3	9.61E-5	9.61E-5	
Fluoranthene	2.94E-9	3	1.37E-7	1.37E-7	PAH
Fluorene	2.75E-9	3	1.28E-7	1.28E-7	PAH
Formaldehyde	7.35E-5	3	3.43E-3	3.43E-3	
Hexane	1.76E-3	3	0.08	0.08	
Indeno(1,2,3-cd)pyrene	1.76E-9	3	8.24E-8	8.24E-8	PAH
Lead	4.90E-7	4	2.29E-5	2.29E-5	
Manganese	3.73E-7	4	1.74E-5	1.74E-5	
Mercury	2.55E-7	4	1.19E-5	1.19E-5	
Naphthalene	5.98E-7	3	2.79E-5	2.79E-5	PAH
Nickel	2.06E-6	4	9.61E-5	9.61E-5	
Phenanthrene	1.67E-8	3	7.78E-7	7.78E-7	PAH
Pyrene	4.90E-9	3	2.29E-7	2.29E-7	PAH
Selenium	2.35E-8	4	1.10E-6	1.10E-6	PAH
Toluene	3.33E-6	3	1.56E-4	1.56E-4	PAH
Total PAH	4.04E-6		1.89E-4	1.89E-4	
Total HAP				0.09	

Reference:

1. AP-42 Table 1.4-1
2. AP-42 Table 1.4-2
3. AP-42 Table 1.4-3
4. AP-42 Table 1.4-4

Table 3: Potential to Emit
Emergency Generator
Emission Unit U-00003

Annual Operating Schedule (hr) 500 Power Output (bkW) 1,115 [1]

Fuel Consumption (MMBtu/hr) 15.4 [1]

Co-pollutant	CAS No.	Emission Factor		Reference	Hourly Emission (lb/hr)	Annual Emission (ton/yr)
		(lb/MMBtu)	(g/kWh)			
Criteria Pollutants						
NO_x			5.42	1	13.3	3.33
CO			0.80	1	1.97	0.49
VOC			0.23	1	0.57	0.14
SO_2		1.53E-03		2	2.36E-02	5.90E-03
$PM_{2.5}/PM_{10}$			0.80	1	1.97	0.49
Hazardous Air Pollutants						
Acetaldehyde	75-07-0	2.52E-05		3	3.89E-04	9.72E-05
Acrolein	107-02-8	7.88E-06		3	1.22E-04	3.04E-05
Benzene	71-43-2	7.76E-04		3	1.20E-02	2.99E-03
Formaldehyde	50-00-0	7.89E-05		3	1.22E-03	3.04E-04
Total PAH		2.12E-04		4	3.26E-03	8.16E-04
Acenaphthene	83-32-9	4.68E-06		4	7.22E-05	1.81E-05
Acenaphthylene	208-96-8	9.23E-06		4	1.42E-04	3.56E-05
Anthracene	120-12-7	1.23E-06		4	1.90E-05	4.74E-06
Benzo(a)anthracene	56-55-3	6.22E-07		4	9.60E-06	2.40E-06
Benzo(b)fluoranthene	205-99-2	1.11E-06		4	1.71E-05	4.28E-06
Benzo(g,h,i)perylene	191-24-2	5.56E-07		4	8.58E-06	2.14E-06
Benzo(k)fluoranthene	207-08-9	2.18E-07		4	3.36E-06	8.41E-07
Benzo(a)pyrene	50-32-8	2.57E-07		4	3.97E-06	9.91E-07
Chrysene	218-01-9	1.53E-06		4	2.36E-05	5.90E-06
Dibenzo(a,h)anthracene	53-70-3	3.46E-07		4	5.34E-06	1.33E-06
Fluoranthene	206-44-0	4.03E-06		4	6.22E-05	1.55E-05
Fluorene	86-73-7	1.28E-05		4	1.98E-04	4.94E-05
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07		4	6.39E-06	1.60E-06
Naphthalene	91-20-3	1.30E-04		4	2.01E-03	5.01E-04
Phenanthrene	85-01-8	4.08E-05		4	6.30E-04	1.57E-04
Pyrene	129-00-0	3.71E-06		4	5.72E-05	1.43E-05
Toluene	108-88-3	2.81E-04		3	4.34E-03	1.08E-03
Xylenes	1330-20-7	1.93E-04		3	2.98E-03	7.44E-04
Total HAP						5.34E-03

Reference:

1. Vendor data (Caterpillar C175-20 Standby)
   https://s7d2.scene7.com/is/content/Caterpillar/CM20190430-aca82-c4a9f
2. Diesel fuel (15 ppm sulfur, 7 lb/gal, 0.137381 MMBtu/gal)
2. AP 42 Table 3.4-3.
3. AP 42 Table 3.4-4.

Table 4: Potential to Emit
Firewater Pump
Emission Unit U-00005

Annual Operating Schedule (hr) 500 Fuel Consumption (MMBtu/hr) 2.02 [1]

Co-Pollutant	CAS No.	Emission Factor (lb/MMBtu)	Reference	Hourly Emission (lb/hr)	Annual Emission (ton/yr)
Criteria Pollutants					
NO_x		0.6763	1	1.37	0.34
CO		0.4356	1	0.88	0.22
VOC		0.0378	1	0.08	0.02
SO_2		1.53E-03	2	3.09E-3	7.72E-4
$PM_{2.5}/PM_{10}$		0.0362	1	0.07	0.02
Hazardous Air Pollutants					
Acetaldehyde	75-07-0	7.67E-04	3	1.55E-03	3.87E-04
Acrolein	107-02-8	9.25E-05	3	1.87E-04	4.67E-05
Benzene	71-43-2	9.33E-04	3	1.88E-03	4.71E-04
Formaldehyde	50-00-0	1.18E-03	3	2.38E-03	5.96E-04
Total PAH		1.68E-04	3	3.39E-04	8.49E-05
Acenaphthene	83-32-9	1.42E-06	3	2.87E-06	7.17E-07
Acenaphthylene	208-96-8	5.06E-06	3	1.02E-05	2.56E-06
Anthracene	120-12-7	1.87E-06	3	3.78E-06	9.44E-07
Benzo(a)anthracene	56-55-3	1.68E-06	3	3.39E-06	8.48E-07
Benzo(b)fluoranthene	205-99-2	1.88E-07	3	3.80E-07	9.49E-08
Benzo(g,h,i)perylene	191-24-2	9.91E-08	3	2.00E-07	5.00E-08
Benzo(k)fluoranthene	207-08-9	4.89E-07	3	9.88E-07	2.47E-07
Benzo(a)pyrene	50-32-8	1.55E-07	3	3.13E-07	7.83E-08
Chrysene	218-01-9	3.53E-07	3	7.13E-07	1.78E-07
Dibenzo(a,h)anthracene	53-70-3	5.83E-07	3	1.18E-06	2.94E-07
Fluoranthene	206-44-0	7.61E-06	3	1.54E-05	3.84E-06
Fluorene	86-73-7	2.92E-05	3	5.90E-05	1.47E-05
Indeno(1,2,3-cd)pyrene	193-39-5	3.75E-07	3	7.58E-07	1.89E-07
Naphthalene	91-20-3	8.48E-05	3	1.71E-04	4.28E-05
Phenanthrene	85-01-8	2.94E-05	3	5.94E-05	1.48E-05
Pyrene	129-00-0	4.78E-06	3	9.66E-06	2.41E-06
Toluene	108-88-3	4.09E-04	3	8.26E-04	2.07E-04
Xylenes	1330-20-7	2.85E-04	3	5.76E-04	1.44E-04
Total HAP					1.94E-03

Reference:

1. Vendor data (Cummins CFP23E-F50)
2. Diesel fuel (15 ppm sulfur, 7 lb/gal, 0.137381 MMBtu/gal)
3. AP 42 Table 3.3-2.

Table 5: Potential to Emit
Two Fuel Gas Heaters
Emission Unit U-00006

Operating Schedule (hr/yr) 8,760 Firing Rate (MMBtu/hr) 12.56 [1]

Co-Pollutant	Emission Factor (lb/MMBtu)	Reference	Hourly Emission (lb/hr)	Annual Emission (ton/yr)	Notes
Criteria Pollutants					
NO_x	0.0364	1	0.46	2.00	
CO	0.073	1	0.92	4.02	
VOC	0.005	1	0.06	0.28	
SO	5.88E-4	2	7.39E-3	0.03	
$PM_{2.5}/PM_{10}$	7.45E-3	2	0.09	0.41	
Hazardous Air Pollutants					
2-Methylnaphthalene	2.35E-08	3	2.96E-07	1.29E-06	PAH
3-Methylchloranthrene	1.76E-09	3	2.22E-08	9.71E-08	PAH
7,12-Dimethylbenz(a) anthracene	1.57E-08	3	1.97E-07	8.63E-07	PAH
Acenaphthene	1.76E-09	3	2.22E-08	9.71E-08	PAH
Acenaphthylene	1.76E-09	3	2.22E-08	9.71E-08	PAH
Anthracene	2.35E-09	3	2.96E-08	1.29E-07	PAH
Arsenic	1.96E-07	4	2.46E-06	1.08E-05	
Benzo(a)anthracene	1.76E-09	3	2.22E-08	9.71E-08	PAH
Benzene	2.10E-03	3	2.64E-02	1.16E-01	
Benzo(a)pyrene	1.18E-09	3	1.48E-08	6.47E-08	PAH
Benzo(b)fluoranthene	1.76E-09	3	2.22E-08	9.71E-08	PAH
Benzo(g,h,i)perylene	1.18E-09	3	1.48E-08	6.47E-08	PAH
Benzo(k)fluoranthene	1.76E-09	3	2.22E-08	9.71E-08	PAH
Beryllium	1.18E-08	4	1.48E-07	6.47E-07	
Cadmium	1.08E-06	4	1.35E-05	5.93E-05	
Chromium	1.37E-06	4	1.72E-05	7.55E-05	
Chrysene	1.76E-09	3	2.22E-08	9.71E-08	PAH
Cobalt	8.24E-08	4	1.03E-06	4.53E-06	
Dibenzo(a,h)anthracene	1.18E-09	3	1.48E-08	6.47E-08	PAH
Dichlorobenzene	2.06E-06	3	2.59E-05	1.13E-04	
Fluoranthene	2.94E-09	3	3.69E-08	1.62E-07	PAH
Fluorene	2.75E-09	3	3.45E-08	1.51E-07	PAH
Formaldehyde	7.35E-05	3	9.24E-04	4.05E-03	
Hexane	1.76E-03	3	2.22E-02	9.71E-02	
Indeno(1,2,3-cd)pyrene	1.76E-09	3	2.22E-08	9.71E-08	PAH
Lead	4.90E-07	4	6.16E-06	2.70E-05	
Manganese	3.73E-07	4	4.68E-06	2.05E-05	
Mercury	2.55E-07	4	3.20E-06	1.40E-05	
Naphthalene	5.98E-07	3	7.51E-06	3.29E-05	PAH
Nickel	2.06E-06	4	2.59E-05	1.13E-04	
Phenanthrene	1.67E-08	3	2.09E-07	9.17E-07	PAH
Pyrene	4.90E-09	3	6.16E-08	2.70E-07	PAH
Selenium	2.35E-08	4	2.96E-07	1.29E-06	PAH
Toluene	3.33E-06	3	4.19E-05	1.83E-04	PAH
Total PAH	4.04E-06		5.08E-05	2.22E-04	
Total HAP				2.17E-01	

Reference:

1. Vendor data (2 heaters)
2. AP-42 Table 1.4-2
3. AP-42 Table 1.4-3
4. AP-42 Table 1.4-4

Table 6: Potential to Emit
CPV Valley Energy Center

Co-pollutant	Potential to Emit (lb/yr)					
	Two Combustion Turbines w/ Duct Burners	Auxiliary Boiler	Emergency Generator	Firewater Pump Engine	Two Fuel Gas Heaters	Total
Criteria Pollutants						
NO_x	341,758	4,578	6,662	683	4,008	357,689
CO	230,148	7,692	983	440	8,032	247,295
VOC	56,125	504	283	38.2	550	57,499
SO_2	84,104	54.9	11.8	1.54	64.7	84,237
$PM_{2.5}/PM_{10}$	273,114	696	983	36.6	820	275,649
Hazardous Air Pollutants						
1,3 Butadiene	63.1					63.1
2-Methylnaphthalene	7.94E-02	2.20E-03			2.59E-03	0.08
3-Methylchloranthrene	5.95E-03	1.65E-04			1.94E-04	6.31E-3
7,12-Dimethylbenz(a) anthracene	5.29E-02	1.47E-03			1.73E-03	0.06
Acenaphthene	5.95E-03	1.65E-04	3.61E-02	1.43E-03	1.94E-04	0.04
Acenaphthylene	5.95E-03	1.65E-04	7.12E-02	5.11E-03	1.94E-04	0.08
Acetaldehyde	1,408		1.94E-01	7.75E-01		1,409
Acrolein	225		6.08E-02	9.34E-02		226
Anthracene	7.94E-3	2.20E-04	9.49E-03	1.89E-03	2.59E-04	0.02
Arsenic	34.6	1.83E-02			2.16E-02	34.6
Benzo(a)anthracene	5.95E-3	1.65E-04	4.80E-03	1.70E-03	1.94E-04	0.01
Benzene	560	1.92E-01	5.99E+00	9.42E-01	2.31E+02	798
Benzo(a)pyrene	3.97E-03	1.10E-04	1.98E-03	1.57E-04	1.29E-04	6.35E-3
Benzo(b)fluoranthene	5.95E-03	1.65E-04	8.56E-03	1.90E-04	1.94E-04	0.02
Benzo(g,h,i)perylene	3.97E-03	1.10E-04	4.29E-03	1.00E-04	1.29E-04	8.60E-3
Benzo(k)fluoranthene	5.95E-03	1.65E-04	1.68E-03	4.94E-04	1.94E-04	8.49E-3
Beryllium	0.99	1.10E-03			1.29E-03	1.00
Cadmium	18.4	1.01E-01			1.19E-01	18.6
Chromium	38.5	1.28E-01			1.51E-01	38.8
Chrysene	5.95E-03	1.65E-04	1.18E-02	3.57E-04	1.94E-04	0.02
Cobalt	2.78E-01	7.69E-03			9.06E-03	0.29
Dibenzo(a,h)anthracene	3.97E-3	1.10E-4	2.67E-3	5.89E-4	1.29E-4	7.47E-3
Dichlorobenzene	6.95	0.19			0.23	7.37
Ethylbenzene	1,127					1,127
Fluoranthene	9.92E-3	2.75E-4	0.03	7.69E-3	3.24E-4	0.05
Fluorene	9.26E-3	2.56E-4	0.10	0.03	3.02E-4	0.14
Formaldehyde	4,630	6.87	0.61	1.19	8.09	4,646
Hexane	5,954	165			194	6,313
Indeno(1,2,3-cd)pyrene	5.95E-3	1.65E-4	3.19E-3	3.79E-4	1.94E-4	9.89E-3
Lead	44.8	0.05			0.05	44.9
Manganese	2,436	0.03			0.04	2,436
Mercury	4.56	0.02			0.03	4.61
Naphthalene	151	0.06	1.00	0.09	0.07	153
Nickel	21.1	0.19			0.23	21.5
Phenanthrene	0.06	1.56E-3	0.31	0.03	1.83E-3	0.40
Pyrene	0.02	4.58E-4	0.03	4.83E-3	5.39E-4	0.05
Selenium	77.1	2.20E-3			2.59E-3	77.1
Toluene	4,589	0.31	2.17	0.41	0.37	4,592
Xylenes	2,254		1.49	0.29		2,255
Total HAP	22,767	173	10.7	3.87	435	23,389

Note that total HAP emissions does not equal the sum of the pollutant emissions values listed above. Speciated PAH and total PAH are both listed . The pollutant emissions values listed for the combustion turbines are the worse case of to emissions values with and without duct burner firing.

Table 7: Heat Rate Comparison
CPV Valley Energy Center

Project, Power Plant Category, or Requirement	Heat Rate (Btu/kWh, HHV)	Notes
CPV Valley Energy Project	6,912[(1)]	eGRID calendar year 2020 operation
CPV Valley Energy Project	6,650[(2)]	April 9, 2019 heat rate test
CPV Valley Energy Project	6,938[(2)]	May 27, 2020 heat rate test
CPV Valley Energy Project	6,934[(2)]	May 26, 2021 heat rate test
CPV Valley Energy Project	6,917[(2)]	June 7, 2022 heat rate test
All NPCC[3] Upstate NY Combustion Generation Plants	7,599[(1)]	eGRID calendar year 2020 operation
NYSDEC Maximum Allowable Heat Rate	7,605[(2)]	State Facility Permit 3-3356-00136/ 00001 Condition 19

1. EPA eGRID https://www.epa.gov/egrid/download-data
2. Corrected to reference conditions per, ASME PTC 46-1996 https://www.asme.org/codes-standards/find-codes-standards/ptc-46-overall-plant-performance
3. Northeast Power Coordinating Council

Table 8: Greenhouse Gas Emission Rate Comparison
CPV Valley Energy Center

Project, Power Plant Category, or Requirement	CO_2e Emission Rate (lb/MWh)	Notes
CPV Valley Energy Project	822[(1)]	eGRID calendar year 2020 operation
All NPCC Upstate NY Combustion Generation Plants	836[(1)]	eGRID calendar year 2020 operation
All NPCC Upstate NY Fossil Fuel Plants	852[(1)]	eGRID calendar year 2020 operation
All NPCC Upstate NY Non-baseload Plants	881[(1)]	eGRID calendar year 2020 operation
Maximum Allowable Emission Rate	925[(2)]	Measured on a 12-month rolling average basis

1. EPA eGRID https://www.epa.gov/egrid/download-data
2. State Facility Permit 3-3356-00136/ 00001 Condition 100

Table 9: Combined-Cycle Turbine Operating Hours
CPV Valley Energy Center

Year	Operating Hours[1]		
	Emission Unit U-00001	Emission Unit U-00002	Maximum Potential
2018	2,480	2,310	8,208 / 8,352[2]
2019	6,802	6,855	8,760
2020	7,814	7,421	8,784
2021	7,133	6,926	8,760
2022 (Q1 & Q2)	3,675	3,839	4,344

1. From EPA Clean Air Markets https://campd.epa.gov/data accessed October 2022.

2. U-00001 and U-00002 commenced operation on January 24, 2018 and January 18, 2018, respectively.

Table 10: Startup and Shutdown Event Frequency and Duration
CPV Valley Energy Center

Event Type	Extended Startup	Cold Startup	Warm Startup	Hot Startup	Shutdown
Unit Downtime Prior to Event	>96 hours	>48 hours ≤96 hours	>8 hours ≤48 hours	≤ 8 hours	Not Applicable
Year	Event Frequency (Events/Year)				
2018	3	0	9	4	2
2019	11	5	17	23	41
2020	7	6	20	31	53
2018 - 2020 Total	21	11	49	59	96
Year	Average Event Duration (Hours/Event)				
2018	1.71		2.43	0.88	0.13
2019	3.35	2.66	1.98	1.24	0.38
2020	2.52	1.65	1.77	1.27	0.28
2018 - 2020 Average	2.84	2.11	1.97	1.23	0.35

Table 11: Annueal Fuel Consumption
CPV Valley Energy Center

Year	Amount of Fuel Burned	
	No. 2 Fuel Oil / Diesel Fuel (gallon/year)	Natural Gas (standard cubic feet/ year)
2020	5,371	31,504,950,000
2021	1,541	28,887,150,000

APPENDIX 8

Draft Environmental Impact Statement § 7.5

Draft
Environmental Impact Statement

CPV Valley Energy Center

VOLUME I
Sections 1-19

November 17, 2008, REV. 1

Submitted to:

Town of Wawayanda Planning Board
80 Ridgebury Hill Road
PO Box 296
Slate Hill, New York 10973

Prepared by:

TRC
Wannalancit Mills
650 Suffolk Street
Lowell, Massachusetts 01854

Submitted by:
CPV Valley, LLC
50 Braintree Hill Office Park, Suite 300
Braintree, MA 02184

ALPINE
P.O. Box 145
Montgomery, New York 12549

7.4.7 Funding for Decommissioning

The typical operating life span for a new electric generating facility ranges from 30 to 40 years. With respect to funding for decommissioning, it is expected that the aboveground portion of the Facility's components would be offered for sale, for salvage or at least scrap value in the event of decommissioning. Even if there were no market for purchasing the Project's components for salvage purposes, the scrap value of the equipment, buildings, and structures on the Project site would be anticipated to be more than sufficient to offset the complete cost of demolition of the Facility.

It should be noted that decommissioning is unlikely to occur under any reasonable scenario during either construction or any period when the Facility is economically viable. During Project construction, there are contractual requirements for the Project to reach commercial operation, and several levels of remedies in place to cure a potential default. During Project operation, as long as the facility remains economically viable, continuing operations would negate any need to pursue decommissioning. Once operational, the Project would be the cleanest, most efficient, and reliable baseload electric generation facility in the region. Thus, one would expect older less efficient plants in the current fleet to be retired well before the CPV Valley Project.

7.5 ENVIRONMENTAL JUSTICE

7.5.1 Introduction

The intent of this environmental justice (EJ) analysis is to determine whether the construction and operation of the proposed Project would have a significant adverse and disproportionate affect on an "environmental justice community." The concept of performing an EJ analysis for the Project is related to the issuance of Executive Order 12898, entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations" (February 11, 1994). The order requires Federal agencies to consider disproportionate adverse human health and environmental impacts on minority and low-income populations. The methodology used in preparing this analysis is based upon the New York State Department of Environmental Conservation (NYSDEC) EJ Policy (CP-29, Environmental Justice and Permitting, Mar. 19. 2003) and Federal guidance documents prepared by the United States Environmental Protection Agency (USEPA) for use in preparing a National Environmental Policy Act (NEPA) environmental justice analysis.

The NYSDEC EJ Policy was issued on March 19, 2003. This report sets forth guidelines for how environmental justice consideration can be incorporated into permit review, SEQRA procedures, and some components of the NYSDEC's enforcement and public participation programs.

The NYSDEC EJ Policy applies to permits administered under Article 70 of the Environmental Conservation Law (ECL) and Title 6 of the New York Code of Rules and Regulations (NYCRR) Part 621. Any application for a new permit that is classified as a major project (as defined by 6 NYCRR Part 621.4) from applicable programs or an application for a major modification of an

existing permit from the same applicable programs are subject to the EJ screening process. The NYSDEC programs that would be the subject of a review for EJ impact, as they relate to the Project include:

- Air Pollution Control-6 NYCRR Parts 201
- SPDES-6 NYCRR Parts 750 through 758

The NYSDEC EJ Policy prescribes a two-step methodology for conducting the preliminary screening analysis. These steps consist of:

- Determine whether the proposed action is in or near a minority or low-income community and identify potential environmental impacts.
- Determine whether impacts are likely to adversely affect a potential EJ community.

The focus of an EJ analysis is the determination of whether the construction and operation of a proposed Project would have both adverse and disproportionate impacts on an environmental justice community.

Notwithstanding the fact that this EIS demonstrates that the impacts of the CPV Valley would not be considered to be "adverse" under any Federal, state, or local guideline or standard, an environmental impact analysis was conducted to determine whether there would be an adverse and disproportionate environmental burdens on minority or low-income populations as defined in the NYSDEC EJ Policy.

7.5.2 Determination of Environmental Justice Communities

The NYSDEC EJ Policy establishes state-specific thresholds in order to identify areas, typically census tracts or block groups, where the representation of low-income and/or minority populations qualifies the area as a "potential environmental justice area." The NYSDEC EJ Policy establishes the New York State urban EJ threshold for minority population at 51.1 percent. For purposes of this policy, an urban threshold applies because the area in question is located within a Census-designated place with a population of 2,500 people or more. The Town of Wawayanda proper has a small minority population of 10.6 percent.

The NYSDEC EJ Policy establishes the New York State EJ threshold for low-income population at 23.59 percent. Income data are part of the US Census "long form" questionnaire and are based on a partial, sample count. For the year 2000 Census, low-income population is defined as the percentage of individuals whose 1999 income was less than 100 percent of the poverty level. Block groups in which more than 23.59 percent of individuals fit this description are potential EJ communities. In the Town of Wawayanda, only 3.7 percent of the population was living below the poverty threshold. Table 7-15 provides a summary of percent minority, poverty rate, and household income data for each Census block group within a two mile radius of the Project site, as well as six Census block groups outside the 2-mile radius that have been identified by NYSDEC as potential EJ sites. Figure 7-4 shows the location of the each Census Block relative to the Project site.

Table 7-15
Environmental Justice Data by Census Block Group

Area	Minority Population Percentage	Poverty Rate	Median Household Income
New York State	39.5	14.6	$43,393
Orange County	28.6	10.5	$52,058
Wawayanda	10.6	3.7	$61,885
Tract 11, BG 4*	**53.1**	21.9	$27,548
Tract 14, BG 2*	49.0	**39.3**	$14,500
Tract 14, BG 3*	**60.1**	**34.7**	$18,424
Tract 14, BG 6*	**55.4**	**31.7**	$26,786
Tract 15, BG 1*	**57.6**	22.0	$32,292
Tract 15, BG 3	**62.29**	**26.76**	$22,768
Tract 16, BG 1	36.63	12.31	$43,403
Tract 16, BG 2	36.42	6.95	$51,139
Tract 16, BG 3	31.10	5.92	$43,750
Tract 16, BG 4	39.70	6.09	$50,714
Tract 17, BG 1*	**56.7**	**31.4**	$15,341
Tract 112, BG 3	35.00	4.13	$49,450
Tract 114, BG 3	15.37	1.33	$60,536
Tract 118, BG 1	12.12	1.16	$67,417
Tract 118, BG 2	12.43	3.04	$61,250
Tract 118, BG 3	10.89	2.41	$68,942
Tract 118, BG 4	11.40	5.51	$53,021
Tract 118, BG 5	7.25	6.13	$55,809

Notes: BG: Block Group
The NYSDEC minority population percentage threshold in urban areas is 51.1 percent
The NYSDEC poverty rate threshold is 23.59 percent
Bold values indicate percentage above the NYSDEC threshold
* DEC-identified potential EJ area outside 2-mile radius
Sources: U.S. Census, 2000 and Empire State Development Website

The Town of Wawayanda's minority population, 10.6 percent, and poverty rate, 3.7, are well below the NYSDEC's population percentage threshold for minority populations and the population percentage threshold for low income[1]. As shown in Table 7-15, one out of the twelve census block groups within a two-mile radius of the Project is a potential Environmental Justice Area. This Census Block (Tract 15, BG 3) is primarily located in the City of Middletown; a small portion is located in Walkill. The southwestern most point of the census block is 0.94 miles northeast from the Facility Site. Based on the data land use mapping for Middletown and Walkill, the block has the following land use types: Utilities, Industrial, Light Industrial, Commercial, Professional Office, Mixed Use, Single Family Residential, Two-Family Residential, Multi-Family Residential, Parks/Open Space, Community Services, Public/Government, and Vacant.

[1] Minority and income data were obtained from the 2000 Census.

In addition, the NYSDEC identified six potential EJ areas outside the 2-mile radius (Tract 11, BG 4; Tract 14, BG 2; Tract 14, BG 3; Tract 14, BG 6; Tract 15, BG 1; and Tract 17, BG 1.)

Tract 11, BG 4 is located entirely in Middletown. The block group is 2.7 miles northeast from the Project. Based on the data land use mapping from the Middletown Comprehensive Plan, the block has the following landuse types: Single Family Residential, Two-Family Residential, Multi-Family Residential, Commercial, Professional/Office, Mixed Use, Light Industrial, Industrial, Community Services, Public/Government, Transportation, and Vacant.

Tract 14, BG 2 is located entirely in Middletown. The block group is 2.5 miles northeast from the Project. Based on the data land use mapping from the Middletown Comprehensive Plan, the block has the following landuse types: Single Family Residential, Two-Family Residential, Multi-Family Residential, Commercial, Professional/Office, Mixed Use, Light Industrial, Industrial, Parks/Open Space, Community Services, Public/Government, Transportation, Utilities, and Vacant.

Tract 14, BG 3 is located entirely in Middletown. The block group is 2.1 miles northeast from the Project. Based on the data land use mapping from the Middletown Comprehensive Plan, the block has the following landuse types: Single Family Residential, Two-Family Residential, Multi-Family Residential, Commercial, Professional/Office, Mixed Use, Light Industrial, Industrial, Parks/Open Space, Community Services, Public/Government, Transportation, Utilities, and Vacant.

Tract 14, BG 6 is located entirely in Middletown. The block group is 2.5 miles north from the Project. Based on the data land use mapping from the Middletown Comprehensive Plan, the block has the following landuse types: Single Family Residential, Two-Family Residential, Multi-Family Residential, Commercial, Mixed Use, Industrial, Community Services, Public/Government, Transportation, Utilities, and Vacant.

Tract 15, BG 1 is located entirely in Middletown. The block group is 2.2 miles northeast from the Project. Based on the data land use mapping from the Middletown Comprehensive Plan, the block has the following landuse types: Single Family Residential, Two-Family Residential, Multi-Family Residential, Commercial, Professional/Office, Mixed Use, Light Industrial, Industrial, Community Services, Public/Government, Transportation, and Vacant.

Tract 17, BG 1 is located in Middletown and Walkill. The block group is 2.4 miles north from the Project. Based on the data land use mapping from the Middletown Comprehensive Plan and the Walkill Comprehensive Plan, the block has the following landuse types: Agriculture, Commercial, Mixed Use, Light Industrial, Community Services, Transportation, and Vacant.

In addition, a workforce housing project called “Horizons at Wawayanda” is located adjacent to Project site to the northwest of the Project site. Horizons at Wawayanda consists of 106 dwelling units, and is approximately 0.40 miles from where the facility will sit on the site. Construction at this site is nearing completion and applications are being accepted for fall 2008 occupancy. Horizons at Wawayanda is a project built with a combination of private and public funding to develop affordable housing for Orange County’s working families at below market

rates. Horizons at Wawayanda was constructed on a formerly vacant parcel adjacent to a cemetery, commercial, and industrial properties and directly bordering the MI Zoning District

7.5.3 Enhanced Public Participation Plan

Public participation in the NYSDEC environmental permit review process encompasses a program of activities that provides opportunities for citizens to be informed about and involved in the review of a proposed action. To ensure meaningful and effective public participation, this policy requires applicants for permits covered by this policy to actively seek public participation throughout the permit review process. CPV is implementing an Enhanced Public Participation Plan in accordance with NYSDEC's EJ Policy. The Plan is provided as Appendix 1-B of this DEIS, and includes the following elements as recommended in NYSDEC's EJ Policy.

- Identify stakeholders to the proposed action, including residents adjacent to the proposed action site, local elected officials, community-based organizations and community residents located in a potential environmental justice area;
- Distribute and post written information on the proposed action and permit review process.
- Hold public information meetings to keep the public informed about the proposed action and permit review status.
- Establish easily accessible document repositories in or near the potential environmental justice area to make available pertinent project information.

7.5.4 Environmental Justice Area Impact Assessment

To evaluate the existing environmental load profile and determine the potential impacts of the proposed facility within the potential environmental justice area, analyses related to air quality, contaminated materials, noise, and transportation impacts were undertaken. These analyses are summarized below.

7.5.4.1 Air Quality

The Project was modeled in accordance with the procedures documented in the revised Air Quality Modeling Protocol, and maximum predicted Project impacts were determined for various pollutants and averaging periods.

Table 7-16 presents the maximum predicted impacts of CO, SO_2, PM-10, and NO_2 for comparison with significant impact levels (SILs) that have been established by EPA. Table 7-16 also presents the sum of maximum Project impacts and conservative background air quality levels so that total predicted concentrations can be compared to the corresponding National Ambient Air Quality Standards (NAAQS).

All predicted Project impacts, except for 24-hour average PM-10 impacts, are below SILs. The sum of maximum predicted impacts and conservative background levels is below the

corresponding NAAQS for all pollutants and averaging periods. Therefore, the Project is not considered to have any adverse air quality impacts

Figures 7-5 through 7-12 provide isopleths of maximum predicted Project impacts for each pollutant and averaging period. The outlines of identified EJ areas are also depicted on the plots.

The maximum predicted Project impacts for short-term averaging periods are generally predicted to occur in elevated terrain located to the northwest of the Project in a direction away from identified EJ areas. Therefore, the identified EJ areas will not receive a disproportionate share of the maximum short-term Project impacts.

The maximum predicted annual Project impacts exhibit a pattern that reflects the general southwest/northeast orientation of the surrounding terrain and the corresponding prevailing winds. Although some of the maximum annual Project impacts are predicted to occur near some of the nearest EJ areas or, in some cases, near the Project fence line, the maximum predicted annual impacts are always below the corresponding SIL, so there will be no adverse impact from the Project.

Table 7-16
CPV Valley Energy Center - Maximum Modeled Concentrations a/

Pollutant	Averaging Period	SIL ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Background Concentration b/ ($\mu g/m^3$)	Maximum Ground-Level Project Impact ($\mu g/m^3$)	Total Ground-Level Concentration c/ ($\mu g/m^3$)
CO	1-Hour	2,000	40,000	3,893	563	4,456
	8-Hour	500	10,000	3,206	182	3,382
SO_2	3-Hour	25	1,300	55.0	3.3	58
	24-Hour	5	365	28.8	0.6	29
	Annual	1	80	5.2	0.04	5.2
PM_{10}	24-Hour	5	150	78	9.9	88
	Annual	1	50	35	0.2	35
NO_2	Annual	1	100	41.4	0.8	42

Notes:
a/ Maximum modeled ground-level concentration due to the worst case overall facility operating scenario (i.e., the facility operating scenario that resulted in the maximum modeled air quality impact) for each pollutant.
b/ Background concentrations are the highest second highest short term (1-, 3-, 8-, and 24-hour) and maximum annual concentrations.
c/ Total concentration = background concentration + maximum modeled (i.e., ground-level) concentration.
Source: TRC Environmental Corp.

7.5.4.2 Traffic and Transportation

Operation of the proposed Facility would not adversely impact traffic conditions in the project study area or within the environmental justice area. The proposed facility would contribute a small number of vehicle trips to the local roadway network. The facility would have, at most, 8 to 10 persons on duty during any one shift. It is anticipated that there would be a maximum of 30 vehicle trips during the morning and evening peak hour periods. The addition of these vehicle trips would not impact traffic flow conditions throughout the environmental justice area.

7.5.4.3 Noise

The proposed Facility would not result in adverse or disproportionate noise impacts within the environmental justice area. The environmental justice area is more than one mile away from the proposed Facility. Operation of the Facility will not result in any increase in noise levels at all locations within the environmental justice area. The Project's projected increase in noise levels at the Horizon complex is well within NYSDEC and the Town noise ordinance standards.

7.5.4.4 Visual

The proposed Facility would not result in disproportionate or adverse visual impacts within the EJ environmental justice area. A detailed visual impact assessment for the Project is presented in Section 5.0, Visual Resources and Aesthetics. The results of the visual impact analysis indicate that views from within the environmental justice area are likely to be intermittent, and to the extent they exist at all, would be limited to the tip of the Project stack in the distant horizon. Due to the distance away from the Project and limited views in the environmental justice area, externality costs associated with possible declines in property values are not expected. Most views from the environmental justice area toward the Project, to the extent they exist, already contain many manmade features (i.e., roads, houses, stores, telephone poles, automobiles, etc.) and thus the new visual element of a portion of the Facility's stacks would not result in a significantly new modification to the landscape. As views of the stack would not be limited to those from within the environmental justice area, visual impacts within the environmental justice area are not considered disproportionate.

7.5.4.5 Water

With respect to impacts on water, the Project will minimize water use by using treated effluent from the City of Middletown Sewage Treatment Plant. The Project will not discharge to groundwater and will have a SWPPP and a SPCC plan in place to prevent impacts to surface and groundwater quality. Thus, no disproportionate impacts are expected to EJ communities of concern related to water, and the Project is not expected to result in any externality costs associated with water impacts in or outside of the EJ area.

7.5.5 Conclusion with Respect to Environmental Justice

The above analysis shows that one census block exceeds the NYSDEC thresholds for minority and/or low-income representation within the 2-mile study radius. In addition, the NYSDEC identified six potential EJ areas outside the 2-mile radius (Tract 11, BG 4; Tract 14, BG 2; Tract 14, BG 3; Tract 14, BG 6; Tract 15, BG 1; and Tract 17, BG 1.)

The analysis demonstrates that the Project's potential air emission concentrations do not cause violations of the NAAQS within the EJ study area, and therefore are not adverse. Furthermore, the maximum modeled air quality impact locations do not fall within the potential environmental justice areas and thus are not considered disproportionate.

Regarding hazardous materials and chemical use, the introduction of oil, aqueous ammonia, and other chemicals at the Project site would also not result in a disproportionate or adverse impact to the identified potential environmental justice area as the use and/or presence of fuel oil, chemicals, and other materials is currently occurring throughout the two-mile Project study area and is not concentrated within the environmental justice area. The storage of fuel oil or use of aqueous ammonia or other chemicals at the Project site would also not jeopardize public health or impact groundwater quality.

The proposed Facility would comply with NYSDEC and Town of Wawayanda noise standards at all locations within the Project study area, and therefore, would not cause any adverse impact to any environmental justice area.

Facility views from within the environmental justice area are likely to be intermittent and minimal, limited to the tip of the Project stack along the horizon, set behind the existing development within and north of the environmental justice area. However, views of the stack would not be limited to those from within the environmental justice area. Therefore, visual impacts within the environmental justice area are not considered adverse or disproportionate. Finally, operation of the Facility would not result in disproportionate or adverse impacts related to Project-related traffic.

7.6 REFERENCES

American Hospital Directory (AHD). 2008. www.ahd.com/freesearch.php3. Site accessed June, 2008.

Capitol Impact. 2008. www.capitolimpact.com/gw. Site accessed August 19, 2008.

Creative Strategies and Communications, Inc. 2007. Real Estate Value Impact Report – Prepared for Twin River Energy, LLC.

Empire State Development (ESD). 2002. Empire State Development Website. http://www.empire.state.ny.us/nysdc/download_intro.asp. Site accessed June, 2008.

J.A. Cowen and Associates, Inc. Consulting Report, Proposed Electrical Generating Plan. Spagnoli Road. Melville, NY.

Middletown School District. 2008. www.middletowncityschools.org. Site accessed August 19, 2008.

New York State Department of Environmental Conservation (NY DEC). 2003. *CP-29: Environmental Justice and Permitting*.

New York State Department of Labor. 2008. www.labor.state.ny.us. Site accessed June, 2008.

Rowe, R.D., C.M., Lang., L.G. Chestnut., D.A. Latimer., D.A. Rae., S.M. Bernow., and D.E. White.. The New York Electricity Externality Study. 1995.

APPENDIX 9

Final Environmental Impact Statement § 4.1.16

State Environmental Quality Review
Notice of Completion of Final EIS

Date: February 8, 2012

This notice is issued pursuant to Part 617 of the implementing regulations pertaining to Article 8 (State Environmental Quality Review Act) of the Environmental Conservation Law.

A Final Environmental Impact Statement has been completed and accepted by the Town of Wawayanda Planning Board, as lead agency, for the proposed action described below.

Name of Action:

CPV Valley Energy Center

Description of Action:

The CPV Valley Energy Center (Project or Facility) is proposed to consist of a combined cycle natural gas powered electric generating facility nominally rated at 630 megawatts (MW) and an interconnection substation. The proposed Facility would generate nominally 630 MW of electricity, fueled primarily by natural gas. The Facility would use ultra-low sulfur distillate oil for back-up for reliability purposes. The Project is proposed to utilize "combined cycle" generation technology, one of the most efficient technologies for producing electricity. The Project is proposed to consist of two combined-cycle units, each consisting of a combustion turbine generator, a Heat Recovery Steam Generator (HRSG) with supplemental duct firing, and a steam turbine generator. Auxiliary equipment would include a low nitrogen oxide (NOx) natural gas-fired auxiliary boiler, needed to keep the HRSGs warm during periods of turbine shutdown and to provide sealing steam during startups. The Project is proposed to be equipped with dry low NOx burners and selective catalytic reduction (SCR) technology to control emissions of NOx, and an oxidation catalyst to control carbon monoxide (CO) and volatile organic compounds (VOC) emissions. The Facility would be limited to operating on the back-up fuel for the equivalent of 720 hours per year, per turbine. Water use will be minimized by the use of air cooled condensers. Process water supply is proposed to be treated wastewater supplied from the City of Middletown's Sewage Treatment Plant (STP). Wastewater generated by the CPV facility would be returned to the City of Middletown STP.

Location:

Route 6, Wawayanda, Orange County, New York.

The project site is located at the intersection of state Route 6 and 17M, and interstate Route 84. The project site is bounded to the north by Route 6, to the south by interstate Route 84 and to the east by Route 17M.

The underground trench would cross the unnamed tributary to Carpenter Creek, south of where it joins Carpenter Creek, requiring 600 square feet (0.01 acre) of temporary impact to the stream and its banks. Open cut construction methods will be used. Following construction, the trench area and the disturbed corridor will be re-graded, stabilized, and revegetated. The stream bed and banks will also require restoration to pre-existing grades, with bank stabilization measures and monitoring to prevent soil erosion. Wetland and stream restoration monitoring will be implemented according to permit conditions.

The riser poles at the GIS building site location in Middletown would permanently impact approximately 0.05 acres of wetlands. Given the pre-existing disturbed conditions of the wetland area and the developed nature of the area, the impacts associated with the pole installation are insignificant. The process water supply/return lines will be routed to avoid impact wetlands.

A wetland mitigation plan has been prepared in accordance with the NYSDEC and ACOE Joint Application review process and associated mitigation standards, in which both the permanent "fill" impacts and "forest conversion" impacts associated with the project will be compensated on the site. Wetland fill impacts will be compensated for on the site by creating a wetland replacement area. The wetlands will be replaced on site on a >2:1 areas basis, totaling 0.80 acres. Conversion of forested wetlands to non-forested wetlands within the electrical interconnect will be compensated by creating a permanent forested buffer along Carpenter Creek where there are currently fields in agricultural use.

The NYSDEC SPDES Discharge Permit for Stormwater will contain conditions that will further protect wetland resources. The SPDES permit will include provision of a Stormwater Pollution Prevention Plan. The additional field studies for the site included study of the resource value of the existing vernal pools. Construction of the Facility will not have direct impacts on the vernal pools, which were found to have low overall biological quality.

4.1.15 Ecology

In response to ecological comments received on the DEIS, supplemental studies were conducted for plant species of conservation concern, summer roosting habitat for the Indiana bat, and potential turtle habitat complexes. Appendix 2A of the FEIS presents the results of the field studies conducted. As summarized in Section 3.2, Ecology, no significant impacts on ecological resources have been identified for either Facility construction or operation.

4.1.16 Environmental Justice

A comment letter was received from the Middletown Chapter of the National Association for the Advancement of Colored People (NAACP) on November 17, 2009, voicing concerns regarding air quality, greenhouse gas emissions, hazardous chemical storage, and the impact on the environmental safety of all Americans and particularly African Americans currently living in direct proximity of the proposed Project. The David Moore Heights and its surrounding residential complexes in Middletown were noted as being a low income and minority community of particular concern. Section 7.5 of the DEIS provided a thorough analysis of Project-related impacts to the areas identified as minority and low income (Environmental Justice areas). The analysis was completed in accordance with NYSDEC Environmental Justice policies and guidance.

The analysis in the DEIS demonstrated that the Project's potential air emission concentrations do not cause violations of the NAAQS within the indentified environmental justice areas, which include the David Moore Heights and surrounding residential housing complexes. Furthermore, the maximum

modeled air quality impact locations do not fall within the potential environmental justice areas and, thus, do not create disproportionate impacts in such areas.

Regarding hazardous materials, the use of oil, aqueous ammonia, and other chemicals at the Project site would not result in a disproportionate or adverse impact to the identified potential environmental justice areas. The storage of fuel oil or use of aqueous ammonia or other chemicals at the Project site would comply with all local, state, and federal requirements and would not jeopardize public health or impact groundwater quality. The use and/or presence of fuel oil, chemicals, and other materials is currently occurring throughout the 2-mile Project study area and is not concentrated within the environmental justice areas.

Specific responses to the National Association for the Advancement of Colored People (NAACP) comment letter are provided in Section 4.2 of the FEIS (Response to Comments on Section 7.0 – Socioeconomics and Environmental Justice).

4.1.17 Decommissioning

As described in Section 7.4.9 of the DEIS, the typical operating life span for a new electric generating facility ranges from 30 to 40 years. With respect to funding for decommissioning, it is expected that the aboveground portion of the Facility's components would be offered for sale, for salvage or at least scrap value in the event of decommissioning. Even if there were no market for purchasing the Project's components for salvage purposes, the scrap value of the equipment, buildings, and structures on the Project site would be anticipated to be more than sufficient to offset the complete cost of demolition of the Facility.

Once operational, the Project would be one of the cleanest, most efficient, and reliable baseload electric generation facilities in the region. Thus, one would expect older less efficient plants in the current fleet to be retired well before the CPV Valley Project.

4.2 RESPONSE TO COMMENTS ON THE DEIS

This section presents responses to comments received on the DEIS, including written comments and comments made during the Public Hearing. The comment letters received on the DEIS and the public hearing transcript are included in Appendices 1A and 1B of the FEIS. The comment letters and comments provided at the Public Hearing were thoroughly reviewed, and responses were prepared to address each substantive comment.

Each comment letter and public hearing speaker comment was given a unique identification code as summarized in Table 1-3. Individual issues or comments within each comment letter and public speaker comment were then denoted by appending a sequential number to the comment identification code. For example, the first three comments in the GREENPLAN comment memorandum (PB1) were denoted by PB1-1, PB1-2, and PB1-3. The comments were then compiled and organized according to the applicable section in the DEIS as follows:

1.0 Executive Summary
2.0 Project Description
3.0 Land Use and Zoning
4.0 Cultural Resources
5.0 Visual Resources and Aesthetics
6.0 Community Facilities
7.0 Socioeconomics and Environmental Justice

APPENDIX 10

SEQRA Findings Statement

A RESOLUTION OF THE PLANNING BOARD OF THE TOWN OF WAWAYANDA ORANGE COUNTY, NEW YORK, ACCEPTING AND ADOPTING THE FINDINGS STATEMENT IN THE APPLICATION OF THE CPV VALLEY ENERGY CENTER

WHEREAS, the Town of Wawayanda Planning Board is Lead Agency for the SEQRA Review of the CPV Valley Energy Center application; and

WHEREAS, the Town of Wawayanda Planning Board has given due consideration to the DEIS and FEIS, and information derived from other documents, public hearings and meetings during the course of the SEQRA review process; and

WHEREAS, a Findings Statement has been prepared pursuant to and as required by 6 NYC44 Part 617; and

WHEREAS, the Planning Board has reviewed the Findings Statement and the Planning Board and its consultants have determined that the Findings Statement is ready for acceptance and adoption; and

WHEREAS, the Planning Board, upon its independent examination and consultation with its consultants and counsel, has concluded that the Findings Statement is consistent with the social, economic and other essential considerations of the proposed action; considers reasonable alternatives; considers mitigation measures specified in the DEIS and FEIS seeking to avoid or minimize adverse environmental impacts to the maximum extent practicable.

NOW, THEREFORE, BE IT RESOLVED that the Planning Board of the Town of Wawayanda accepts and adopts the Findings Statement of CPV

Valley Energy Center in accordance with the requirements of 6 NYCRR Part 617 and hereby authorizes the filing of same.

DATED: May 23, 2012

Motion by: Barbara Parsons

Seconded by: Daniel Long

Ayes: 7

Nays: 0

Abstentions: 0

Town of Wawayanda Planning Board
State Environmental Quality Review
Findings Statement

This Findings Statement is based on the information contained in the Draft Environmental Impact Statement (DEIS), the Additional Studies, and Final Environmental Impact Statement (FEIS) prepared for the CPV Valley Energy Center Project (Project) (collectively, the EIS Documents) and as set forth below, the independent review of the EIS Documents conducted by the Planning Board and its consultants and advisors. The Project applicant is CPV Valley, LLC (CPV Valley).

The Town of Wawayanda Planning Board (Planning Board) has relied upon the advice, technical review, and counsel of its outside environmental and engineering consultants, McGoey, Hauser & Edsall Consulting Engineers, C.T. Male, ARC Engineering and Construction, George M Janes & Associates, Greenplan and The Hudson Group, and of its outside legal counsel, Bavoso, Plotsky & Onofry. These consultants and counsel have reviewed the EIS Documents and the associated record developed with respect to those documents, and have advised the Planning Board with respect to the identification of environmental and other impacts of the Project, the potential significance of such impacts, and the availability and sufficiency of potential measures to avoid, minimize, and mitigate such impacts to the maximum extent practicable. The Planning Board has conducted its own thorough review of the EIS Documents, the public comments received on the EIS Documents, the record created with respect to the EIS Documents and the results of the consultants' and counsel's review of that record. These Findings are based upon the review of the entire record by the Board, its consultants and its counsel. The Planning Board paid

particular attention to the comments on the DEIS, and placed an emphasis on assuring that substantive comments were addressed in the FEIS and in these Findings.

These Findings are made by the Town of Wawayanda Planning Board acting as Lead Agency pursuant to Article 8 of the Environmental Conservation Law, The State Environmental Quality Review Act and 6 New York Code of Rules and Regulations Part 617.

Lead Agency: Town of Wawayanda Planning Board

Address: Town of Wawayanda

80 Ridgebury Hill Road

Slate Hill, NY 10973

Name of Action: CPV Valley Energy Center Project

Applicant: CPV Valley, LLC

Description of Action: The proposed CPV Valley Energy Center will be located on an approximate 21.25 acre portion of a total 122 acre site parcel of open land in the northeast portion of the Town of Wawayanda. The broader 122 acre site parcel is bounded by Interstate-84 (I-84) to the south, Route 17M on the east, and Route 6 to the north and west. The approximate 21.25 acre development footprint is located in the southwest quadrant of the broader site. The development site parcel is currently undeveloped land used previously for agricultural purposes, including the growing of hay and corn, and wooded areas. There is a private cemetery (Cooley Cemetery) located

on the far northwestern corner of the Project site, which will not be impacted by the Project.

The Project consists of a combined-cycle facility (Facility) capable of generating a peak of approximately 630[1] megawatts (MW) of electricity, although the output of the Facility will vary depending on actual ambient conditions. Approximately 365 MW of this power will be produced using two F Class combustion turbine generator sets. Exhaust heat from the combustion turbines will be sent to heat recovery steam generators (HRSGs) to produce steam to drive a steam turbine generator. The HRSGs will include a natural gas-fired "duct burner" (supplemental firing system). The duct burners will allow for additional electrical production during select periods. Exhaust steam from the steam turbine will be cooled (i.e., condensed) and then returned to the HRSG using an air-cooled condenser. Air-cooled condensing will be employed to minimize water use and eliminate potential cooling tower plume impacts.

For environmental purposes, the Project will be equipped with state-of-the-art emissions control technology; including selective catalytic reduction (SCR) technology to control oxides of nitrogen (NO_x) and an oxidation catalyst to control carbon monoxide (CO) and volatile organic compound (VOC)

[1] CPV Valley, LLC is listed as queue position 251 in the NYISO Interconnection Queue and has a maximum summer output ("SP (MW)") rating of 678 MW. The output of the facility varies depending on weather conditions. The 678 MW output represents the facility's maximum summer net output @ 85°F.

emissions. To control the NO_x emissions from the Facility, the combustion turbines also will be equipped with an advanced dry low NO_x combustion system. The dry low NO_x combustion system will limit NO_x formation by controlling the combustion process through optimization of the air and fuel mixture. When the combustion turbines are operating on ultra-low sulfur light distillate oil, water injection will also be used to control NO_x emissions. The CO emissions from the combustion turbines (and duct burners) will be reduced using an oxidation catalyst (also referred to as a CO catalyst). Exhaust gases from the turbines will be passed over a catalyst bed where excess air oxidizes the CO to carbon dioxide (CO_2).

Natural gas will be used as the primary fuel with ultra-low sulfur distillate oil serving as a back-up fuel for reliability purposes. Use of the back-up fuel will be limited to the equivalent of 720 hours per year, per turbine, so that the Facility can reliably support the electrical system in the event that natural gas supplies are needed to meet residential heating or other demands. To accommodate short-term operation on ultra-low sulfur distillate oil, the proposed Project will include a 965,000 gallon fuel oil storage tank and associated off-loading facilities.

The Project will interconnect with the New York Power Authority's (NYPA) 345-kilovolt (kV) transmission system, which is located less than 1 mile north of the Project site. The Facility's new 345 kV gas insulated switchgear (GIS)

switchyard will be located adjacent to the NYPA transmission lines. In addition to the electrical substation facilities to be located adjacent to the NYPA transmission lines, the electrical interconnection will include underground transmission lines that will extend easterly along the Project site parallel to I-84 towards Route 17M. At the eastern portion of the site, the underground transmission line route will turn and extend north paralleling Route 17M in the New York State Department of Transportation (NYSDOT) Route 17M right-of-way.

Process water requirements for the Facility will be met through use of treated effluent from the City of Middletown Sewage Treatment Plant. Treated effluent currently discharged to the Wallkill River will be filtered and chlorinated for reuse as process makeup water. Process water discharge will be conveyed back to the City of Middletown Sewage Treatment Plant. Potable water will be obtained through an interconnection to the municipal system along Route 6.

Location: Town of Wawayanda, Orange County, NY

Jurisdiction: Special Use Permit and Site Plan Review

Contact: Barbara Parsons, Planning Board Chairperson

80 Ridgebury Hill Road

Slate Hill, NY 10973

Date FEIS Filed: February 8, 2012

Procedural Summary

On March 10, 2008 a Full Environmental Assessment Form (EAF) addressing the proposed power generation Project was submitted by CPV Valley, LLC to the Planning Board. The formal submittal of the EAF initiated the SEQRA process for the subject action. A solicitation of Lead Agency status was forwarded to involved agencies by the Wawayanda Planning Board on May 8, 2009. On June 11, 2008, the Planning Board formally assumed the role of Lead Agency, and, in that role, issued a positive declaration on June 25, 2008 requiring the preparation of a DEIS.

On October 8, 2008, the EIS Scope was approved by the Planning Board. The DEIS was submitted to the Planning Board on November 18, 2008. After review by the Planning Board and its consultants, any revision to address their comments, the DEIS was accepted as complete on February 23, 2009. Upon acceptance of the DEIS, copies of that document (along with a copy of the public notice) were distributed to all interested and involved agencies and made available to the public at the Town of Wawayanda Town Hall, Goshen Library and Historical Society, City of Middletown, Middletown Thrall Library and the Wallkill Town Hall. The entire DEIS was posted to the Project website (www.cpvvalley.com) and a link provided on the Town of Wawayanda's website (www.townofwawayanda.com) to facilitate public review and comment on the document. The public comment period ran from February 23, 2009 to April 22, 2009, and was subsequently extended through May 14, 2009. A public hearing was held by the Planning Board in its capacity as Lead Agency at the Wawayanda Town Hall on April 8, 2009.

To provide greater detail regarding specific aspects of the Project, some additional studies were performed at the request of the Planning Board. The studies included seasonally dependent ecological field surveys, a more detailed visual impact assessment of the above ground electric transmission lines, and preparation of a technical memorandum on the visible plume analysis and secondary formation of fine particulate matter ($PM_{2.5}$), which responded to specific comments on the DEIS (Additional Studies). The Additional Studies were documented in the following reports:

- *Spring and Summer 2009 Ecological Field Survey Report*, which provides the results and assessment of the seasonally dependent ecological surveys;

- Technical Memoranda regarding comments on the Visible Plume and Secondary Formation of Fine Particulate Matter ($PM_{2.5}$); and

- Technical Memorandum regarding the visual assessment further analyzing the impacts of the above ground electric transmission line.

The Additional Studies were submitted to the Planning Board, and the Planning Board held a public comment period on the Additional Studies from March 8, 2010 through March 22, 2010. A Responsiveness Summary was subsequently prepared as part of the FEIS to address all substantive comments received on the DEIS (Section 4 of the FEIS) and the Additional Studies (Section 5 of the FEIS).

A proposed FEIS was prepared initially by CPV Valley. The proposed FEIS was reviewed by the Planning Board and its consultants. The FEIS was revised and ultimately accepted as

complete by the Planning Board on February 8, 2012, and thereafter noticed, filed and distributed as required under 6 NYCRR Section 617.12.

Facts and Conclusions Relied Upon To Support Decision

The EIS Documents fully describe the Project, its environmental setting, and its potential environmental impacts, including a summary of permits and approvals, as presented in Section 1.5 of the DEIS. The EIS Documents also demonstrate the public need for the Project and the socioeconomic benefits that it will provide, which benefits include, among others approximately 660 construction jobs, 25-30 direct jobs during operation, and a new source of revenue for the community and state through the construction and operation of the Project. The Planning board believes that the benefits to the Town serve to balance the identified adverse environmental impacts associated with the Project, all of which have been minimized to the maximum extent practicable.

The EIS Documents identify both significant and minor adverse environmental impacts resulting from the Project. They also comprehensively discuss alternatives to the Project and measures that could avoid, minimize, or mitigate identified significant adverse environmental impacts. The Planning Board has identified measures that will ensure that environmental impacts of the Project are minimized to the maximum extent practicable. The measures are detailed in this Findings Statement, consistent with the requirements of Part 617.11 (Findings Statement).

The Planning Board recognizes the subjective nature of individual perspectives regarding potential impacts from the Project. The Planning Board and its consultants have given careful consideration to these perspectives, and spent many hours reviewing the potential impacts of the Project. The Planning Board has done so with an open mind, consistent with its obligations to assure compliance with applicable laws and regulations and to protect the interests of residents of Wawayanda, and with its broader responsibility as SEQRA lead agency.

The potential environmental impacts reviewed in the SEQRA process are summarized by topic herein. Each section presents a summary of potential significant environmental impacts, the required mitigation, and the Planning Board's related findings. As appropriate, potential environmental impacts both from the construction and operation of the Facility are addressed separately, as are the associated mitigation measures.

Purpose & Need

The Project is consistent with several of the policy objectives set forth in the 2009 New York State Energy Plan. This Plan, which is the most recent State Energy Plan, states the following five (5) policy objectives:

1. Assure that New York has reliable energy and transportation systems;

2. Support energy and transportation systems that enable the State to significantly reduce greenhouse gas emissions;

3. Address affordability concerns of residents and business caused by rising energy bills, and improve the State's economic competitiveness;

4. Reduce health and environmental risks associated with the production of energy; and

5. Improve the State's energy independence by developing in-state energy supply resources.[2]

The Energy Plan further states *"[p]roduction and use of in-state energy resources – renewable resources and natural gas – can increase the reliability and security of our energy systems, reduce energy costs and contribute to meeting climate change, public health and environmental objectives."*[3]

The addition of the Project to the generation resources of New York will enhance electric system reliability as well as increase the fuel diversity in the region. As a combined-cycle facility, the Project will be one of the most efficient methods of generating dispatchable electricity. The high efficiency of combined-cycle technology equates to less fuel consumed to produce electricity, and therefore, less emissions. The efficiency of combined-cycle technology along with the clean burning nature of natural gas provides significant reductions in greenhouse gas emissions[4] when compared to existing alternative generation

[2] 2009 New York State Energy Plan, p. *xiii*

[3] *Id.*at p. *xiv*

[4] On April 21, 2009, the NY ISO issued a press release entitled *"Power Plant Emission Rates Improve: Double-Digit Decline in Past Decade"* This document, describes the increased efficiency of power plants as the root of the significant reductions in greenhouse gas and other pollutant emission rates in New York State. Over the ten

(Footnote continued on next page)

resources in the state, and more specifically, in the NYISO's Zone G. The Project's combined-cycle technology along with the clean burning natural gas fuel is another step towards improving New York's health and reducing environmental impacts associated with power generation.

The NYISO has confirmed that the expansion of natural gas combined-cycle power generation facilities has improved New York's air quality while reducing overall costs for the consumer[5]. The CPV Valley Energy Center will continue this trend of improved air quality and benefits to the public.

The location of the proposed Project is consistent with the State's Energy Plan to increase in-state generation and energy independence. Further, the NYISO's CARIS[6] process

year period from 1999 to 2008, SO_2 rates have dropped 77%, CO_2 rates 28%, and NO_X rates 61%. Combined cycle, natural gas facilities are by far the most efficient of the fossil fuels at generating power, and as the press release points out, "...the lower the heat rate the less fuel is required to produce the same amount of electricity.", resulting in lower emissions.
http://www.nyiso.com/public/webdocs/newsroom/press_releases/2009/Power_Plant_Emission_Rates_Improve_04212009.pdf

[5] On May 12, 2009, the NY ISO issued a press release entitled *"Wholesale Electricity Prices Drop Again: Wholesale energy price in April at a level not seen since 2002"*This document credits the more efficient natural gas facilities that have been added to the fleet for driving down wholesale energy prices. "The prices of wholesale electric energy in New York State have dropped to their lowest level since 2002..." Over a ten year period, 1999 to 2008, the system-wide heat rate has improved 21% due to the addition of the efficient fossil-fueled facilities. NYISO President and CEO Stephen G. Whitley was quoted as saying "While the latest drop in energy prices is largely attributable to lower natural gas costs, New York also has a much more efficient fleet of power plants today. Natural gas prices may go back up, but the efficiency improvements will not disappear." The economic, environmental, and reliability benefits for a natural gas facility are unlike any other power generation technology.http://www.nyiso.com/public/webdocs/newsroom/press_releases/2009/NYISO_Wholesale_Electricity_Prices_Drop_Again_05122009.pdf

[6] The NYISO released the *"2009 Congestion Assessment and Relief Integration Study, CARIS-Phase 1"*. This study evaluated the impacts of adding various resource types on the projected congestion costs from 2009 to 2018. In the study, the congestion costs for three regions of the transmission system were calculated for the ten years period. Then, the additions of generic resources were added to those regions to determine the impact on congestion costs. The analysis concluded that the addition of a generic 500MW combined-cycle in the Hudson Valley region, which includes Zone G, would provide significant congestion cost benefits. Of the three regions evaluated, the Hudson Valley region was projected to experience the greatest amount of congestion costs

(Footnote continued on next page)

concluded that the addition of new resources located in the Hudson Valley region, which includes Zone G, would provide congestion relief and could provide economic benefits to the consumers[7]. The Project is located in Zone G.

The Project represents a significant capital investment in New York that will stimulate the local economy through construction and operational job creation. As more fully described in Section 7.4 of the DEIS, the economic stimulus provided by the Project once in operation is in excess of $23 million annually. In addition, the Project is estimated to provide an average of $2.35 million annually in additional revenues to the Town of Wawayanda, the local school district, the local fire district and Orange County through payments in lieu of taxes and other host community payments.

A. Land Use and Zoning

The CPV Valley Energy Center would be located on an approximate 21.25 acre portion of the total 122 acres of site parcel in the northeast portion of the Town of Wawayanda and approximately 0.4 miles to the boundary with the City of Middletown. The land is currently vacant and bounded by an interstate highway (I-84) and New York State roadways (Route 6 and Route 17M). It is also adjacent to a clover-leaf exit off I-84 with Route 17M. Approximately 7.0 additional acres of land within the 122 acre site parcel would be temporarily used during construction for materials lay down, equipment storage and

(estimated at $1.3 billion) over the 10-year study period. The study estimated that the location of 500 MW of combined-cycle generation in this region would create $346 million (net present value) of production cost savings.

[7] Subsequent to the FEIS being accepted as complete, the NYISO released the "*2011 Congestion Assessment and Resource Integration Study, CARIS-Phase 1*". Although analysis of this document is not included in the SEQRA record, the conclusions in the new report are consistent with those provided in the 2009 version of the report.

construction parking. The primary land use management law applicable to the Project is the Town of Wawayanda's Zoning Code. Other applicable laws and regulations include the State's Agricultural Districts Law and the Environmental Quality Review Act (SEQRA) regulations governing the designation of the Critical Environmental Areas. In addition, the City of Middletown's Zoning Ordinance will apply to the portions of the Project's electrical, process water supply, and water discharge interconnection that are located within the City.

From a land use development perspective, the CPV Valley Energy Center will occupy approximately 21.25 acres within the large 122 acre parcel. The majority of the tract on the site currently used for agricultural purposes is located within the 21.25 acre development footprint. As a result, the agricultural use will be displaced by the Project development.

The 21.25 acre development footprint is located in the southwest quadrant of the 122 acre site area. The I-84 limited access highway forms a boundary edge between the Project and open space to the south. The two lane Route 6 arterial roadway forms a similar boundary edge to the north and west. In an easterly and northeasterly direction, the areas of the site that are outside the development footprint serve as a physical buffer providing a degree of separation between the proposed physical plant from off-site land uses. Route 17-M, a four lane arterial roadway, forms the easterly edge of the broader Facility site. Highway commercial oriented land uses dominate development along Route 17M. The Facility as an industrial activity will not have any adverse impact to the highway commercial land uses.

Horizons at Wawayanda abuts the Project site to the northeast. The location of the Facility physical development in the southwest portion of the 122 acre site provides a significant

physical separation from the Horizons complex consisting of primarily tree cover along with some open crop land. Four single-family residences are located on the section of Route 6 that forms the northern boundary of the 122 acre site. One of the residences is located on the south side of Route 6. The land use setting of this residence to the south currently consists of agricultural use and open space. This setting will change with development of the energy facility. Through selective tree plantings, development of a landscaped buffer area will be incorporated.

Single-family residences located on Kirbytown Road to the north of the site have areas of tree buffer of varying density and linear thickness leading to Route 6. This tree cover and the Route 6 arterial roadway physically separate the energy facility from the Kirbytown residences. As a result of the physical separation and tree cover, the energy facility does not represent a direct physical disruption to the neighborhood appearance or functioning.

The CPV Valley Energy Facility will require construction of an electrical interconnection to the NYPA transmission lines, located less than one mile north of the site. The transmission line will be underground from the Project to the NYPA transmission lines. From the western edge of the site to the NYPA lines, the transmission lines will be underground within the unpaved portion of the Route 17M right-of-way. No permanent impacts to existing highways or commercial land uses will result from operation of the underground line.

Off site construction trenching activities of the underground electrical conduit will be relatively short in duration and would not be expected to result in significant adverse impacts to nearby land uses due to their temporary nature.

Construction of the electrical interconnect would result in some currently vacant land on-site and commercial land off-site being converted to industrial/utility use. Impacts associated with the construction of the approximate 0.9 mile utility interconnect easement would include conversion of undeveloped and forested land to a cleared 20 foot wide permanent right-of-way, although the existing ecological communities will be maintained. A total of approximately 1,450 feet of underground electrical interconnect would be installed offsite mainly in the roadway shoulder of Route 17M, with a portion south of and then north of its intersection with Route 6.

Operation of the Project would be compatible with the existing and proposed land uses within the 1-mile radius study area. Given the agricultural and open space use of the 122 acre site, no displacement of current physical land use development will result from development of the CPV Valley Energy Center.

Operation of the electrical interconnect also would be compatible with existing and proposed land uses within the 1-mile radius study area, as well as the broader region. Once constructed, the underground electrical transmission line and the water supply/wastewater pipelines will have no impacts to off-site land use development.

Through selective tree plantings on the Project site, a landscaped buffer will be constructed to minimize visual impacts of the Project on viewpoints north of the Site, along Route 6. Due to the minimal nature of impacts to nearby land uses, no specific mitigation measures are suggested for the electrical interconnect and water supply/wastewater pipelines.

B. Cultural Resources

The potential impacts on cultural resources from the construction and operation of the Project are analyzed and discussed in the EIS Documents. The impact analysis was carried out in accordance with the standards and methods contained in *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State*, published by the New York Archaeological Council in 1994. The New York Office of Parks, Recreation and Historic Preservation (OPRHP), which acts as the State Historic Preservation Office (SHPO) for the State of New York, was consulted throughout the process for both guidance and concurrence.

A Phase IA and IB archaeological survey was conducted on the proposed construction impact areas of the Project site in an effort to determine if there would be a potential impact to any cultural resources eligible for inclusion in the National Register of Historic Places (NRHP).

In addition, an architectural survey, consisting of a literature search and field verification of historic resources—buildings, structures, objects, districts, and sites—50 years or older was conducted within a 1/2-mile radius, defined as the Area of Potential Effect (APE) of the Project site. The objective of these surveys was to identify historic resources listed in, determined eligible for listing, or potentially eligible for listing in the NRHP; to provide evaluations of NRHP eligibility for the surveyed resources based on the NRHP Criteria for historic significance and integrity; and to provide assessments of direct and indirect (primarily noise and visual) effects to historic resources from the Facility.

A Phase IA/IB Cultural Resource Report was submitted to the OPRHP on October 31, 2008. The Report concluded that the archaeological deposits encountered are not eligible for the National Register of Historic Places. The OPRHP responded in a letter dated December 23, 2008 concurring with the Report's findings, but recommended additional Phase 2 testing at two sites. Upon further discussion with the OPRHP reviewer, Mr. Doug Mackey, it was agreed that Phase 2 testing on the two sites would not be needed if additional shovel tests were conducted in and around the clusters of artifacts at the sites that could confirm no concentrations of subsurface artifacts in those areas.

As recommended by the OPRHP, additional field shovel testing was conducted in September, 2009 at two small areas on the Project site (A07119.000197 and A07119.000198). Consistent with the previous conclusions, these additional investigations did not identify any significant archeological resources on the Project site. The results of the September 2009 field work were submitted to the OPRHP for concurrence with the findings and determination of No Adverse Impact upon properties eligible for inclusion in the State or National Register of Historic Places. The OPRHP concurred with the conclusion, and has determined that the Project will have No Adverse Impact upon properties (historic and archeological) listed in or eligible for inclusion in the State or National Register of Historic Places as stated in their letter dated November 5, 2009.

By letter dated November 4, 2011, CPV provided the OPRHP a summary of Project refinements that evolved as a result of the SEQRA and permitting processes. These include the electric interconnection (addition of the GIS building) and process water supply/return

routing alternatives (see Appendix 7B of the FEIS). The OPRHP's response dated December 13, 2011 requested more detailed information along the proposed water supply/return routing alternatives that are proposed to be located within roadway right-of-way corridors to document existing conditions and assess the potential for intact deposits to remain along these road right-of-way corridors. For any areas where the full depth of disturbance cannot be verified, additional testing may be required to help verify disturbance.

By letter dated January 9, 2012, CPV committed to provide additional information and to carry out supplemental cultural resources investigation of the routing options (or if selected the preferred options) along the Route 17M right-of-way and Dolsontown Road right-of-way. The objective will be to ascertain the extent of previous ground disturbance in the areas proposed to be utilized for the routing alternatives to determine whether installation of the water line has the potential to impact archeological resources. The work will consist of a walk-over of each route alternative, collection of street-view photographs to document disturbance along the routes, and, in areas where disturbance is not apparent, manual shovel tests to document soil profiles. Field observations will be reported in a letter to OPRHP, with a copy of the results also provided to the Town of Wawayanda. CPV Valley will complete this supplemental investigation prior to commencing construction of the water lines.

By letter dated February 1, 2012 the OPRHP stated that they have no objections to this approach or to the SEQRA process being allowed to proceed with the understanding that

such testing in advance of any actual construction be made a condition of any SEQRA finding or New York State Department of Environmental Conservation (NYSDEC) permit.

Based on prior reports and contingent upon the specific results of the supplemental investigation, it is not anticipated that there will be any impacts to NRHP-listed or eligible cultural resources as a result of construction and operation of the Project; therefore, no additional mitigation is necessary. If any changes are made to the Project, additional consultations with OPRHP may be necessary.

C. Visual Resources and Aesthetics

The most prominent features of the overall appearance of the CPV Valley Energy Center are the two exhaust stacks, air cooled condenser, and the generation building. The generation building would house the combustion turbine generators and the Heat Recovery Steam Generators (HRSG). The tallest structure will be the two exhaust stacks with a height of approximately 275 feet above grade. The highest portion of the generation building will be 113 feet above grade. The air-cooled condenser will have a height of approximately 115 feet above grade. The Project will also incorporate a 1,000,000 gallon combination raw water/fire water storage tank, a 400,000 gallon demineralized water storage tank, and a 965,000-gallon fuel storage tank and associated off-loading facilities, transfer piping, and pump systems. The Facility's combined raw and fire water storage tank will be 40 feet tall and the fuel storage tank will be 48 feet tall. The demineralized water storage tank will be 22 feet tall. Ancillary facilities, such as fuel gas compressor, maintenance building, and a

combustion turbine inlet filter would be smaller and less prominent than the aforementioned structures.

Neutral coloring will be used for project building structures. Landscaping is proposed for key vantage points on the development parcel. The Facility lighting plan is designed to meet operational requirements while minimizing to the extent possible offsite visibility. The two exhaust stacks will be lighted to meet Federal Aviation Administration (FAA) requirements. Considerations such as color, landscaping and lighting will be addressed in detail during the site plan review conducted by the Planning Board.

Visual impacts of the Project's electrical interconnect to the 345 kilovolt (kV) NYPA Marcy South system, located less than 1 mile from the site to the northeast have been avoided by placing the electric transmission lines underground from the Facility, to the point of interconnection. The GIS building will be an enclosed structure, similar in character to existing nearby structures. With a height of approximately 55 feet, the GIS building does represent a new element in the area viewshed, however, the NYPA Marcy South transmission structures represent the dominate viewshed feature.

The visual impact assessment (VIA) performed for the Project identified potential viewpoints within a 5 mile radius of the Project site for which viewshed analyses were performed, along with impact assessments and mitigation analyses. In addition, an analysis of potential stack plume visibility was also performed. Visual impact was assessed in terms of the anticipated change in visual resources, including whether there would be a change in character or quality of the view.

The analysis performed for this Project used the technical concepts and methods contained in the NYSDEC program policy entitled "Assessing and Mitigating Visual Impacts" for evaluating visual and aesthetic impacts generated from proposed facilities.

The visual impact assessment for this Project was performed using two methodologies: 1) viewshed analysis and 2) realistic photo-renderings (photosimulations). A viewshed analysis is a Geographic Information System analytical technique that allows one to determine if and where an object, such as a generating facility, is potentially visible within the visual study area. The results of the viewshed analyses are typically displayed over a USGS topographic quadrangle or aerial photograph. Photosimulations are prepared to obtain the best possible visual representation of the proposed Project in terms of size and scale within the landscape, and assist in evaluating the potential visual impact from a given vantage point. These assessments are contained in the EIS Documents.

Representative viewpoints were selected for photosimulations. The process for selecting the viewpoints for photosimulations included: 1) identification of existing visual resources within the 5-mile study area surrounding the Project site (as described in Section 5.2.3 of the DEIS); 2) determination of potential project visibility from each location identified; and 3) evaluation of potential project visibility for sensitive viewing areas and locations of representative viewer groups in the Project vicinity in accordance with the NYSDEC visual policy.

Existing visual resources and potential viewpoints identified within the Project study area included historic sites, recreational resources, residential communities, major roadways, and other areas identified by the Planning Board.

The CPV Valley Energy Center has been designed in such a way to minimize visual impacts. However, the Project will create a new visual element to the existing landscape. As previously stated, the most prominent structures associated with the Project are the two exhaust stacks; air cooled condenser, and the generation building. The tallest structure will be the two exhaust stacks with a height of approximately 275 feet above grade.

The Project will interconnect to the 345 kilovolt (kV) NYPA Marcy South system, located less than 1 mile from the site to the northeast. The interconnection would be made via a newly constructed, enclosed 345 kV GIS substation located adjacent to the existing NYPA transmission lines. The transmission line connecting the Project to the new substation will be located underground within the right-of-way of Route 17M.

The results of the viewshed analysis and field survey show that the areas with the greatest potential for views of the Project will be open areas in low lying locations and those at higher elevations where views of the site are not obscured by hills and vegetation. Views from parks, schools, and other sensitive receptors considered in the study would be very limited as a result of dense tree cover and intervening topography.

The CPV Valley Energy Center will create a new visual element in the landscape from certain viewpoints. Places where the Facility will appear large in relation to the landscape are

limited to those located very close to the site along major roadways (i.e., I-84 and Route 6) where motorists would view the Project for short periods of time while traveling. Due to the short term nature of this view by motorists, this impact is not considered to be significant.

The vapor plume from the two exhaust stacks will add to the vertical visual impact of the Facility during limited periods when temperature, relative humidity and wind speed are conducive to plume formation. The vapor plume will be a wispy light cloudy type of visual element occurring approximately 13.2 percent of the daylight hours (See Section 3.4 and appendix 3A of the FEIS). At all other times there would be no visible plume seen from the stacks. When the plume is visible, it can increase the Project's impact on visual resources, since the acuity of the human eye will notice the plume's movement and draw attention to the Project.

The Project has implemented a number of techniques to avoid and minimize off-site visual impacts. The techniques are consistent with the visual impact avoidance and mitigation tools recommended for consideration under NYSDEC's visual resources policy. These include design and siting; alternative cooling technologies; changes to the profile or size of the Facility; on-site screening and landscaping; coloring and texture of materials; maintenance during operation. In addition, the Project design also includes enclosing much of the Facility components inside buildings; minimizing stack height based on air discharge analysis; preserving the natural vegetation to the extent practicable and implementing a lighting plan that complies with Dark Sky standards and incorporates red lighting on the stacks to minimize impacts to the surrounding communities and roadways.

The CPV Valley Energy Center is sited and designed in such a way to minimize visual impacts to the maximum extent practicable. Locating the Facility at the southern center portion of the Project site was preferred as it placed the proposed Facility proximate to nearby Route 6 and I-84 and proposed and existing commercial properties along the Route 6 corridor, thereby providing for a continuation of the orderly development of the Project area by avoiding a fragmented development condition, and also providing maximum buffer from nearby visual receptors, thereby mitigating potential impacts. The air-cooling design was chosen over a wet-cooling design for a number of reasons, including its elimination of cooling tower plumes. The air-cooled condenser (ACC) height was minimized so as not to increase the height of the stacks. Preliminary modeling considered stack heights of up to 325 feet based on Good Engineering Practice stack height associated with an initial Facility design. Project design changes, including the reduction in the height of the air cooled condenser to 115 feet, reduced the Good Engineering Practice stack height to 287.5 feet. The final stack height of 275 feet for the combustion turbines was selected based on dispersion modeling that showed that this height was adequate to largely avoid increases in predicted air quality impacts that can result from the effects of building induced downwash on stacks that are below Good Engineering Practice stack height.

The electric transmission lines required to connect the Project to the existing transmission infrastructure were originally proposed to be above ground within the Project site, but based on the Planning Board's evaluation of underground alternatives, those lines are being placed underground to avoid the visual impacts associated with towers and wires of an

aboveground electrical interconnection. This change to the Project after acceptance of the DEIS responds to and resolves a number of comments on the DEIS.

The proposed Landscaping Plan is intended to enhance the appearance and natural beauty of the property, and to provide visual buffering for the surrounding areas. Various small sections of the entrance to the Project site will be graded and seeded after construction. Approximately 7.0 acres of land will be temporarily used as equipment and construction materials laydown and parking during construction. This land, as well as other land to be left as buffer outside the Facility fence line after construction will be restored to its current open space use after construction.

The existing natural vegetation, which provides large buffer areas surrounding the Facility, and proposed landscaping will help shield full views of the Facility from off site locations. Other landscaping plans include adding trees and shrubs at select areas on the site. These landscaping areas will be protected by protective barriers, curbs, or other damage control measures and from storm water runoff. The Project will incorporate measures to protect landscaping and vegetation adjacent to parking areas, loading areas and driveways. To the maximum practical extent and where applicable, mature shade trees, vegetation, and unique site features such as stone walls will be preserved. The applicant will be required to implement the final landscaping plan, and this requirement will be incorporated as an enforceable permit condition as part of the Site Plan and Special Use Permit Approval.

The buildings (i.e., doors, siding, etc.) will be painted a neutral beige color to mitigate visibility. The steel stack will be painted a neutral gray tone to complement the generation

building. Non-reflective materials will be specified, to further soften the Facility appearance and minimize the potential for glare.

Normal lighting and emergency temporary lighting customary for these types of installations will be provided throughout the Facility. The Project's proposed lighting design will minimize off-site impacts, while providing sufficient lighting to ensure worker safety during routine operations and maintenance. The site lighting will be designed according to the latest edition of the Illuminating Engineering Society (IES) Lighting Handbook and the International Dark Sky guidelines.

An FAA Determination of No Hazard to Air Navigation is required for the CPV Valley Energy Center because the stack height would be greater than 200 feet. Stack lighting will be in accordance with FAA advisory circular No. 70/7460-2 called Obstruction Marking and Lighting, a med-duel system – Chapters 4, 8 (M-Duel), &12. The FAA allows several options for the type of lighting and stack marking. The options include for example: Red Obstruction Lights, Medium Intensity Flashing White Obstruction Lights, High Intensity Flashing White Lights, Dual Lighting (red lighting for nighttime and high or medium intensity white lighting for day time and twilight). Red lighting will be used at night to mark the stacks, so as to reduce any potential impacts associated with white lights shining into homes during nighttime hours. Based on communication with FAA representatives, the red lighting for night time is typically preferred by surrounding residents and the public in general (compared to white lighting).

D. Community Services

This section discusses the Project's potential impacts to local community services, such as the school systems, transportation and emergency response services. Each community function was examined for possible impact on service and capital outlay demands. Particular attention and focus was paid to transportation/highway and emergency services, including police protection, fire, and emergency medical services. The primary service providers of community services were contacted in an effort to determine their capacity to serve and respond to the proposed Project. For each relevant community service, when necessary, an analysis was performed to assess potential impacts of the Project including any suitable mitigation measures.

Police services are provided by New York State Troopers, Troop F.

The closest fire departments to the Project are the New Hampton Fire Company (1 mile east of the Project, in Wawayanda), the Slate Hill Fire Department (2.6 miles southwest of the Project, in Slate Hill), and the City of Middletown Fire Department (2.7 miles northeast of the Project, in Middletown).

The Project's primary structures are located within the New Hampton Fire Company district, which is the closest fire department to the Project. The New Hampton Fire company is located at 5024 Route 17M in New Hampton, NY and provides fire and rescue type calls. The New Hampton Fire Company has three cars, two engines and one 3,500 gallon tanker.

The Facility is proposed to be located in the Minisink Valley Central School District. The Minisink Valley Central District has five public schools including: one high school, one middle school, one intermediate school, and two elementary schools (Town of Wawayanda, 2008). The district comprises approximately 4,700 students. The nearest school to the Project is a private school, Our Lady of Mount Carmel Elementary School. It is located on Wawayanda Avenue in Wallkill, approximately 1.3 miles north of the Project. Our Lady of Mount Carmel Elementary covers pre-kindergarten to eighth grade and has a total of 216 students. The nearest public school is the Truman Moon Elementary School, located at 53 Bedford Avenue in Middletown, approximately 1.9 miles northeast of the Project. The Truman Moon Elementary School is a primary center of approximately 400 students in kindergarten and first grade and is part of the Middletown City School District.

Hospital services in Orange County, and specifically in the vicinity of the Project, are provided by the Orange Regional Medical Center, located on East Main Street in the Town of Wallkill. Other hospitals include Saint Luke's Cornwall Hospital with campuses in Cornwall and Newburgh for a combined 183 staffed beds; Bon Secours Community Hospital in Port Jervis with 183 staffed beds; and Saint Anthony Community Hospital in Warwick with 73 staffed beds (AHD, 2008). Currently, the nearest hospital to the Project is the Orange Regional Medical Center's Horton Campus, approximately 2.7 miles northeast of the Project site.

There are no houses of worship within 1 mile of the Project site. The nearest houses of worship are the Middletown Islamic Center; located 1.1 miles East of the site, Our Lady of

Mount Carmel Catholic Church; located 1.3 miles directly north of the Project site, at 90 Eculid Avenue in Middletown, and Middletown Alliance, also located about 1.3 miles from the site to the North. Both facilities are located in Wallkill.

The construction of the CPV Valley Energy Center is expected to generate approximately 660 temporary construction jobs and 25 permanent operations jobs. Considering a worst case in which the total of 660 temporary positions were filled by workers from outside the current service area of New York State Police Troop F, the influx of project workers would represent a less than 0.07 percent increase in the population currently served by Troop F. In addition, the Project will have private security during construction, thereby requiring minimal to no police services.

Once constructed, the perimeter of the Project site will be secured with a chain link fence, sliding gates and surveillance equipment so as to permit only authorized access to the facility's service drive, structures and operations. One gate would provide access into the Project site, thereby restricting access to this area. The gate will be locked at all times with access provided by Facility personnel. The Facility security will be controlled by the Facility's operators in the control room 24 hours per day, 7 days per week, 365 days per year. All site security personnel would be equipped with communication equipment to maintain contact with construction and operations management personnel and/or the New York State Police Troop F and the New Hampton Fire, Rescue, and Emergency Services. Accordingly, any increase in the demand for police services resulting from construction and operation of the Project would be negligible.

The Facility would be equipped with fire supression systems as well as emergency fire protection backup pumping capacity. The 1,000,000 gallon raw water/fire water storage tank, of which 500,000 gallons are dedicated solely for fire protection purposes, would provide additional capacity for emergency fire fighting use. The remaining balance (up to 500,000 gallons) will be used for Facility process water, and if required, can be used for fire protection. The fire supression systems would be used only during emergencies or during periodic testing of emergency systems, as required. The use of the raw water tank would allow the Project to avoid impacting the local water distribution system for fire protection.

It is not anticipated that the Project would result in significant impacts related to fire and emergency services as the Project has been designed to provide a high level of safety and redundancy and to meet all National Fire Protection Association (NFPA), state, and local requirements. CPV Valley intends to have its Facility personnel trained as an on-site fire brigade, working cooperatively with the fire department, to function as the first line of defense in the event of a fire at the Facility. As part of this training effort, a safety orientation program and fire response plan will be in place during Project construction and operation. A Preliminary Emergency Response Plan has been established, and prior to the commencement of Project construction and operation, CPV Valley will be required, as part of the Site Plan and Special Use Permit approval, to finalize the Emergency Response Plan in consultation with the Town. Based on operational experience of similar type facilities, incidence of fire is remote due to the combination of fire protection systems incorporated in the design of the facility and operator training. The trained operating personnel on site familiar with fire safety and the on-site dedicated fire water storage help mitigate potential

cost impacts to fire and emergency services in the area. Emergency medical services are available via the hospitals and any costs of such ambulance or hospital services would be addressed by the individual users and therefore would not result in added costs to the municipality.

Consultation with the New Hampton Fire Company will continue throughout the Site Plan process and the design of the facility's fire protection system so as to address and mitigate potential impacts that may be identified. In addition, this consultation with the New Hampton Fire Company will continue through the operation phase to facilitate communication of emergency protocols, coordination of safety programs, review material storage locations on site, etc.

Due to the limited number of operational employees (approximately 25), the proposed Facility will not result in the placement of a significant number of additional students in local schools or impact the ability of local religious institutions to serve their community.

The number of construction workers and employees do not represent a significant increase in the population served by the closest hospital; therefore, the Project is not expected to impact the hospital's resources.

Although construction and operation of the Project is not expected to bring a measurable number of additional school-age children into the districts, when completed the CPV Valley Energy Center will represent a long-term source of incremental revenue for the Town of

Wawayanda and the Minisink Valley Central School District through a Payment in Lieu of Taxes (PILOT) agreement with the Orange County Industrial Development Agency (IDA).

Distributions of a percentage of the PILOT payments to the Minisink Valley Central School District will not impact school aid that the school district receives from the state. The PILOT arrangement through the IDA will allow the school district to realize its percentage distribution of the PILOT payments in addition to the school aid the district currently receives. This financial benefit without any significant increase in students resulting from the Project provides a positive economic impact for the school district. In addition, the Town of Wawayanda will also receive a percentage distribution of the PILOT payments.

E. Socioeconomics and Environmental Justice

This section assesses direct and indirect social and economic effects associated with the construction and operation of the Project, including an evaluation of the local and regional socioeconomic impacts and benefits of the construction and operation of the Project. An Environmental Justice (EJ) Analysis, which addresses potential impacts to low-income and minority populations, is contained in the EIS Documents. Based on the EIS Documents, the Planning Board's findings are that positive socioeconomic impacts will result from the project with no adverse EJ impacts.

The Project will have both direct and indirect positive economic effects on the state, town, county, and school district. These effects will commence during construction and continue throughout the operating life of the Project. The Project will result in an estimated capital

investment of approximately $900 million for the development and construction of the Facility. In the short term, benefits will include additional employment and expenditures associated with construction of the Project. It is expected that the Project would require approximately 660 employees during the peak construction months, and approximately 300 construction employees on average. Construction is expected to be completed within an estimated 26 to 29-month timeframe. It is expected that the peak construction period would last approximately four to five months. It is anticipated that the required construction labor force for the Project would be readily met with the available trades and union workforce in Orange County. In the long term, the operating Project will represent a source of additional revenue or local jurisdictions through a Payment in Lieu of Taxes (PILOT) agreement, purchases of goods and services, and the Host Community Agreement (HCA). The Project will also provide about 25 fulltime permanent jobs once the Facility is completed. All of these results should have a beneficial effect on local community and businesses.

In addition to the jobs created during construction and the wages paid to the work force, this Project is expected to have an indirect impact on the local economy through the purchase of goods and services, which will support local businesses and perhaps result in the creation of additional new jobs. An input-output (I/O) methodology model was used to determine the economic and fiscal impacts of the Project on the regional economy. The analysis was included in the DEIS and estimated that the Project's direct positive impact on Orange County and New York will result in total output of $466.5 million in the state of New York, of which $393.9 million will occur within Orange County, based on

the then current project costs, which have increased since that time. This means that these values would be greater when the project is financed and built.

The job impacts from construction activity will be large, and with indirect and induced (multiplier) impacts occurring across many industries. The construction of the Facility will result in a total job impact of 1,797 across the State of New York during each year of the construction phase of the Project. The total increase in labor incomes from construction in the State is estimated at $182.4 million.

The operation of the Facility is expected to create approximately 25 new full-time jobs. In addition, another 49 indirect and induced jobs will be created in the region as a result of the operation of the Facility and the income earned from the direct and indirect employment impacts for a total annual impact of 74 jobs in the region. Finally, 20 jobs will be created or "leak" from the region into other areas of New York as a result of CPV Valley Energy Center annual operations. The total job impacts in New York resulting from the annual Facility operations are estimated to be 94.

The total annual direct, indirect and induced income impacts (including all non-wage salary and benefits) in the region are estimated to be $5.24 million with another $940,000 of labor income increases occurring in other New York counties, for a total impact on labor income of $6.18 million. The direct and indirect labor income impacts suggest that the average annual wages resulting from Facility operations will be significantly higher than the current average annual wages in the region.

As noted in the previous section, the economic impacts to the Minisink School District and the Town are expected to be positive.

The PILOT payments will increase the revenues of the local taxing jurisdictions, and will represent a significant portion of their total tax levy. The PILOT payments will serve to offset any minor increases in community service costs that may be associated with long-term operation and maintenance of the Project (e.g., small number of additional school children.)

An EJ analysis of the Project was conducted consistent with the principles set forth in Executive Order 12898, entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations" and NYSDEC Policy CP-29.

The intent of this EJ analysis was to determine whether the construction and operation of the proposed Project would have a significant adverse and disproportionate affect on an "environmental justice community."

An EJ area located in the City of Middletown, with a small portion located in Wallkill, was identified. The southwestern most point of the census block is 0.94 miles northeast from the Facility Site. The analysis demonstrates that the Project's potential air emission concentrations do not cause violations of the National Ambient Air Quality Standards (NAAQS) within the EJ study area, and therefore are not adverse. Furthermore, the maximum modeled air quality impact locations do not fall within the potential EJ areas and thus are not considered disproportionate.

Regarding hazardous materials, the use of oil, aqueous ammonia, and other chemicals at the Project site would not result in a disproportionate or adverse impact to the identified potential EJ area. The storage of fuel oil or use of aqueous ammonia or other chemicals at the Project site would comply with all local, state and federal requirements and would not jeopardize public health or impact groundwater quality. The use and/or presence of fuel oil, chemicals, and other materials is currently occurring throughout the two-mile Project study area and is not concentrated within the EJ area. The Facility would also be required to comply with NYSDEC and Town of Wawayanda noise standards at all locations within the Project study area, and therefore, would not cause any adverse impact to any EJ area.

Facility views from within the EJ area are likely to be intermittent and minimal, and limited to the top of the Project stack. Any views that do exist will be within a commercial/industrial context and visual impacts will be minimal. In addition, views of the stack would not be limited to those from within the EJ area. Therefore, visual impacts within the EJ area are not considered adverse or disproportionate.

Because of the socioeconomic benefits arising from the Project, and the avoidance of impacts to any identified EJ areas, no specific mitigation measures are warranted. Although, the PILOT and HCA are outside of the Planning Board's jurisdiction; they will provide significant socioeconomic benefits to the area.

F. Traffic and Transportation

Based on the EIS Documents, the Planning Board had determined that impacts to traffic and transportation would be minimal subject to the mitigation discussed herein

Impacts

The Project site is bounded on the north and west by U.S. Route 6, on the east by N.Y. Route 17M and on the south by Interstate 84 (I-84).

A traffic analysis of the Project is contained in the EIS Documents. The initial stage of the traffic analysis consisted of a detailed review of existing land-use, roadway, and traffic conditions near the proposed site. Existing traffic volumes were recorded in November 2007. Next, in order to identify potential Project impacts, the study estimated and analyzed future conditions and then compared them to existing conditions.

During the construction of the proposed Project, additional vehicle trips would be generated by the construction workforce, and by the delivery of equipment and materials to the Project site. Construction of the facility is expected to take approximately 26-29 months.

It is expected that the highest level of potential traffic impact would occur during the middle 4 to 5 months of the construction period, when the highest level of workers will be on-site. Any traffic impacts associated with Project construction would be temporary in nature limited to the duration of construction.

The traffic impact analysis conducted was conservative in its approach because it included 30 percent of the construction worker trips within the peak hours. As described in the EIS Documents, based on experience with other projects, most construction related trips would arrive and depart before the respective AM and PM peak commuter roadway hours. In this case, 70 percent of the workforce are expected to arrive by 7:00 AM – a full half-hour before the peak hour of the adjacent street, which was determined to be 7:30 to 8:30 AM. Similarly, most of the construction workers would have left the site by 4:00 PM – in advance of the 4:30 to 5:30 PM peak hour.

There are a few instances when construction-related traffic would cause deterioration in Level of Service (LOS) at a study location. The drop in LOS is generally moderate and will be temporary in nature, lasting only during the 4 to 5 months of peak construction activity. Thereafter, conditions will return to pre-construction levels.

Construction involving crossing of Route 6 or Route 17M will utilize directional drilling to minimize the potential for traffic disruption. Construction involving use of roadway right-of-way will be conducted generally during off-peak hour periods with associated informational signing, safety barriers, and police officer control. With construction utilizing the unpaved portion of the roadway rights-of-way, no rerouting of traffic is anticipated. CPV will provide the necessary Maintenance and Protection of Traffic plans for work in the public roadway right-of-way associated with construction of the off-site utility work and obtain necessary permits. Requirements of the NYSDOT will be met. If required by NYSDOT, State Police

traffic officer control, paid by the Project applicant, will be utilized at the intersection of Route 6 and Kirbytown Road, and the Facility site access drive.

Operation

Under full time, post construction operating conditions, at all locations and under both AM and PM peak hour traffic conditions, the impacts from the proposed Project will be negligible in that no LOS would change as a result of the traffic generated by the proposed Facility, compared to the "no build" scenario. The Project site entrance has been located so as to provide sight distances that meet or exceed applicable standards to ensure safe ingress and egress to and from the Project site. Therefore, no additional mitigation measures are necessary.

G. Air Quality

The CPV Valley Energy Center will not result in any significant adverse impacts to air quality. The Project will not only be required to comply with a variety of state and federally issued regulations and guidelines, but it is also designed to be one of the most efficient and clean power generation facilities in New York. The Project is designed to utilize natural gas, as well as state of the art, highly efficient gas turbines in a combined cycle configuration. It will also employ highly effective emission control equipment, including an SCR to control NO_x and an oxidation catalyst to control CO and VOC emissions, at the Facility. These design characteristics play an important role in minimizing and avoiding potential adverse impacts.

The dispersion modeling and other analyses that have been performed demonstrate that not only will the Project comply with all of the various air permitting requirements, but its maximum air quality impacts, both alone and in combination with those of other existing source emissions, will be substantially smaller than the federal and State ambient air quality standards that were established to:

- Protect both public health, with an adequate margin of safety for sensitive individuals such as those with respiratory illnesses, the elderly and children, and public welfare (e.g. flora, flauna and property), and

- Prohibit air pollutant concentration increases that are excessive, which effectively keeps cleaner air clean.

The CPV Valley Energy Center is considered a major stationary source that will be located in an attainment area for a regulated air pollutant, and therefore it is subject to the Clean Air Act's requirement for a Prevention of Significant Deterioration (PSD) permit review. The Project is subject to PSD review for NO_x, CO, particulate matter sized 10 and 2.5 microns or smaller (PM_{10} and $PM_{2.5}$, respectively), and sulfur dioxide (SO_2). The Project is subject to Best Available Control Technology (BACT) and ambient air quality impact compliance demonstration requirements for these applicable PSD pollutants. The Project will also be located in an area that is non-attainment for ozone and $PM_{2.5}$, which means that it is subject to the Clean Air Act's non-attainment new source review program if certain of its potential emissions (of precursor pollutants) exceed a designated yearly threshold. Since the Project's potential emissions exceed the yearly threshold for NO_x and VOC, the Project is required to

meet Lowest Achievable Emission Reduction Rate (LAER) limits and acquire emission offsets at a ratio of 1.15 to 1 for those pollutants. This means the Facility will offset 1.15 times more than what it will actually emit, resulting in a net air quality benefit.

The Project has submitted an application for regulatory agency review in conjunction with the federal and State PSD and non-attainment new source review requirements and process.

The Project will utilize natural gas as the main fuel for generating electricity, and will incorporate an SCR system to limit NO_x emissions. The combustion turbines will also be equipped with an advanced dry low NO_x combustion system. The dry low NO_x combustion system will limit NO_x formation by controlling the combustion process through optimization of the air and fuel mixture. Water injection will be used to control NO_x emissions when the combustion turbines are operating on ultra-low sulfur light distillate oil. The CO emissions from the combustion turbines (and duct burners) will be reduced using an oxidation catalyst (also referred to as a CO catalyst). Exhaust gases from the turbines will be passed over a catalyst bed where excess air will oxidizes the CO. The oxidation catalyst system will greatly decrease CO concentrations. The Facility will incorporate oil as a backup fuel for situations when natural gas use may be curtailed, but under those circumstances the Facility will use ultra-low sulfur distillate to further reduce any emissions associated with the Project.

Maximum predicted Project impacts at identified sensitive receptors within a radius of 5 miles from the Project were determined using typical modeling procedures, with impacts based on the results of a single year of meteorological data. For each combination of

pollutant and averaging period, the year for which the Project had overall predicted maximum impacts was used for the modeling to predict impacts at the sensitive receptors. Receptors representing historic parks, other parks, golf courses, public nature preserves, conservation easements, cemeteries, churches, fire stations, hospitals, nursing homes, police stations, schools, pre-schools, and other recreational areas within 5 miles were identified and included as receptors for the modeling. Maximum Project impacts were predicted for nitrogen dioxide (NO_2), CO, PM_{10}, and SO_2. All predicted impacts were well below the concentration levels that were established by EPA to protect public health and welfare, and to prevent excessive air pollutant concentration increases, respectively.

New (or revised) NAAQS and PSD increments became applicable to the Project after November 2008. The new (or revised) NAAQS pertain to NO_2, SO_2 and lead (Pb). The new PSD increments pertain to $PM_{2.5}$. The new standards are much more stringent than the ones that applied to those air pollutants in 2008. Supplemental dispersion modeling analyses performed in 2012 and included in the FEIS (Section 3.3.2 and Appendix 3B) demonstrate that the Project and its state-of-the-art air pollutant emission controls are more than adequate to ensure compliance with the new NAAQS and PSD increments.

The Project will not result in any significant adverse impacts to air quality, therefore no mitigation is necessary. The Project will provide an annual summary of fuel use and emissions data to the Town.

H. Noise

A detailed noise assessment of the proposed Project was conducted. The assessment included an ambient noise monitoring program, conducted during the leaf-off season when no insect noise was present (January 28-29, 2008) and a computer noise modeling study. The ambient program was conducted in order to quantify the existing noise environment, including during winter late night hours when ambient noise levels are typically lowest. The computer modeling study included Project source specific noise emission data, as provided by the proposed equipment manufacturers. The modeling conducted included topographic features, and was conservative in that no credit was taken for tree cover or any intervening off site structures that would act to reduce noise levels. Design noise control measures, including enclosing most major sources inside buildings, acoustical specifications for building walls, and noise limits for the air cooled condensers, were included in the model.

The resulting calculated Facility noise levels were compared to minimum late night ambient noise levels from each noise monitoring location in order to determine if any increases in noise would occur, and if so, whether those increases would be below NYSDEC's noise impact screening criterion. The criterion establishes increases in noise of 6 dBA and greater to have the potential for an adverse impact. The Town of Wawayanda noise requirement that noise generated is no greater than 65 dBA at a distance of 100 feet from the Project lot line was also analyzed. The EIS Documents demonstrate the Project noise levels would be in compliance with both the NYSDEC criterion and the Town of Wawayanda noise ordinance,

and that no additional mitigation measures are necessary beyond those proposed in the EIS Documents.

Noise Impacts of Project Operation

Based on the EIS Documents, the noise analysis revealed that no increases in noise from operation of the Project would be expected at any of the noise monitoring locations, with the lone exception being at the Uhlig Road location, where an increase of 4 dBA was projected, which is below the NYSDEC impact criterion. The Town of Wawayanda noise standard will be complied with. A review of this analysis reveals that Project noise levels would be below 65 dBA even within the Project lot line, and are well below 65 dBA 100 feet from the lot line. Accordingly, no significant noise impacts are anticipated due to Project operation, and the Project noise levels would be in compliance with the Town of Wawayanda noise ordinance.

The design of the Facility includes the following noise attenuation features:

- Locating major Facility sources, including the combustion turbines, Heat Recovery Steam Generators (HRSGs), steam turbine and ancillary sources within buildings;
- Building walls will be designed to provide a nominal 20 dBA attenuation of interior noise;
- HRSG exhaust stack silencers;
- Acoustically treated building ventilation louvers; and

- An air cooled condenser (ACC) with a noise specification not to exceed 59 dBA at a distance of 100 meters from the edge of the ACC.

- No additional measures are necessary to mitigate operational noise.

Noise Impacts of Project Construction

Construction equipment utilized will differ from phase to phase. In general, heavy equipment (bulldozers, dump trucks, cement mixers) will be used during excavation and concrete pouring activities. Noise is generated during construction primarily from diesel engines, which power the equipment. Exhaust noise usually is the predominant source of diesel engine noise.

Construction equipment is not generally operated continuously, nor is the equipment always operated simultaneously. There will therefore be times when no equipment is operating and noise will be at ambient levels. Also, it should be noted that the construction noise levels modeled are those, which would be experienced for people outdoors. A building (house) will provide significant attenuation for those who are indoors. Sound levels can be expected to be up to 27 dBA lower indoors with the windows closed. Even in homes with the windows open, indoor sound levels can be reduced by up to 17 dBA (USEPA, 1978). Construction noise will also be temporary in nature. As such, no adverse or long term noise impacts from construction noise are anticipated.

Calculated construction noise levels were shown to be below measured average noise levels at all locations. Therefore no additional mitigation measures are required. However, the

Project will nonetheless make use of functional mufflers on all equipment engine exhausts. Further, construction activities are currently scheduled to occur primarily during daytime hours. In addition, noise compliance monitoring will be done during construction and operation subject to final "Noise Compliance Testing Protocol" that is subject to the review and finalization by the Planning Board during the Site Plan approval process.

I. Soil, Geology and Seismology

The topography of the Project Site is nearly flat, with a gentle slope decreasing from west to east. The elevation change is approximately 10 feet.

Based on the preliminary geotechnical analysis in the EIS Documents, the unconsolidated material at the Project Site is suitable to support the proposed Facility. Construction of the Project will require the excavation of soils and the reworking of the unconsolidated surficial material. Site preparation would require heavy equipment for grading and excavation. This would include excavators, bulldozers, graders, front-end loaders, concrete trucks, and dump trucks. This will not impact the geologic setting. Foundations will be shallow and deep, depending upon the requirements of the specific equipment building structure component. The surficial geology at the CPV Valley Energy Center consists of coarse to fine gravel and/or sand, and silts, clays, and oxidized fine sand and gravel. The depth to bedrock is 52 to 80 feet below ground surface. The soils are not contaminated chemically or physically and should be suitable for multiple uses on or offsite. Foundation construction will be completed with standard construction techniques and no blasting of bedrock is anticipated.

Prevention of contamination to soils due to operation of the Facility will be accomplished in part by development and implementation of the best management practices incorporated in the Storm Water Pollution Prevention Plan (SWPPP) that will be consistent with local and NYDEC permits.

Sediment and erosion of soils will be mitigated during construction with common engineering controls. Excavation and grading for the proposed facilities will include re-working to promote good site drainage and runoff control. Given the flat topography that exists at the Project Site, some excavation and fill activity will likely be needed to achieve a site level suitable for construction. Where necessary soils unsuitable as structural fill will be removed from the Project Site. It is anticipated that unsuitable soils will be recycled offsite for landscaping or non-engineering grade fill.

Due to the relatively shallow groundwater at the Project Site, dewatering will likely be required to support foundation construction at select locations. Groundwater will be brought down approximately 1 foot below the proposed sub-grade, prior to excavating to final subgrade. The groundwater will be maintained at that level until the subgrade is prepared and concrete placed in order to minimize disturbance of the ground. This will be temporary and will only be a localized condition. Erosion and sediment control will be installed to prevent impacts to soil and exposed surficial materials.

Guidelines established for agricultural soil removal and restoration will be followed as the site is developed. NYS Department of Agriculture and Markets farm land reclamation notes will be added to the site plan, making these procedures a condition of the site plan approval

for the project. Implementation of the Agriculture and Markets guidelines is a mitigation measure that will be undertaken by the applicant to assure conservation of the agricultural soil resource.

The methods proposed for stripping, stockpiling and stabilizing the agricultural soil profiles are in accordance with NYS Department of Agriculture and Markets and NYSDEC guidelines.

Soils and surface topography will be re-established to original conditions following the installation of the water/wastewater lines and electrical interconnect. Cut material not suitable for re-use as backfill will be recycled off-site.

A third party environmental inspector will be present during construction. The inspector will be trained to screen cut material for evidence of contamination. If contaminated soils are identified, they will be stockpiled separately and sampled for chemical parameters required by the licensed receiving facility permit. The environmental inspector will be paid for by CPV Valley.

Erosion and sediment controls will be maintained throughout construction and during post-construction restoration. Vehicle exits will be designed to prevent unconsolidated surface materials from being transported to offsite local roadways.

Given that soil nutrients and agricultural chemicals are bound on the soil colloid fraction, and that the exposure period will be shorter in duration than the agricultural tillage cycle, releases from the site related to this temporary use are expected to be less than those associated with the planting of row crops or re-seeding the hay crop.

Operation

During operation, commonly used oils (e.g., fuel oil, lube oil) and chemicals (e.g., aqueous ammonia, water treatment chemicals) will be utilized. The state of the art storage and containment facilities proposed will be operated with management plans to prevent a release to the environment. The mitigation measures to protect geologic resources, as well as other resources, are addressed as part of the *Spill Prevention and Contingency Plan*.

Based upon the above analysis, significant adverse impacts on soils and geology are not anticipated, and mitigation measures in addition to the avoidance, minimization and mitigation measures proposed in the EIS Documents are not required.

J. Water Resources & Infrastructure

Several advanced technologies and sound water resources management policies and practices have been incorporated into the Facility's overall design to minimize impacts to water resources during construction and operation. These include:

- Use of combined-cycle technology for power generation, thereby increasing the overall water and fuel efficiency of the Facility when compared to traditional steam electric generating plants;
- Selection of an air-cooled condenser to dissipate heat, thereby eliminating the need for large volumes of water for cooling purposes;

- Reuse of tertiary treated effluent from the City of Middletown's Sewage Treatment Plant to satisfy process makeup requirements for power generation, thereby minimizing water withdrawals from the municipal water supply systems or ground or surface waters;

- Use of inlet air cooling to enhance the overall performance characteristics of the combustion turbines during the peak summer electrical demand season, thereby decreasing reliance on older generating assets within the Lower Hudson River Basin that require large amounts of water for cooling purposes (i.e., existing facilities currently using surface waters of the State in once-through cooling systems);

- Development of best management practices (BMPs), including both structural and non-structural controls, to ensure the proper storage, handling and management of fuel oils, lubricants, transformer oils, water treatment additives and boiler additives; and

- Development of an erosion and sediment control plan to ensure that applicable site specific controls are in place and properly maintained throughout the construction process.

Potential impacts to groundwater resources, wetlands, and surface waters have each been analyzed. In order to reduce the energy of stormwater during construction, flow within temporary swales will be interrupted by a series of stone check dams. The effects of

stormwater runoff will also be controlled through the use of temporary filter fencing installed to protect areas downgradient of construction activity.

Sedimentation/detention basins, properly sized and located, have been included in the Project design. The purpose of the basins is threefold. In addition to providing a controlled location for sediment deposition and retention, the basins will provide storage volume to compensate for that lost through development of the site and will serve to limit peak flows of stormwater runoff to levels which do not exceed current or pre development peak discharge rates (for the 100 year design storm). As the basins are multi-functional (i.e., sedimentation and treatment as well as stormwater detention), they have been designed to control runoff during the 100 year storm event. Removal of accumulated sediments contained within the basins will be performed as needed. The SWPPP included in the EIS Documents details the pre and post developmental drainage conditions as well as the stormwater runoff model and calculations used in development of the basin design. In addition to limiting the peak rate of stormwater discharge, the stormwater management facilities provide the required Water Quality Volume (WQV) for stormwater treatment, as well as the regulatory Channel Protection volume, designed to protect receiving waters from high velocity discharges that would damage or overtop stream banks.

The impacts to water resources include those related to the construction of the Project and the respective interconnects, as well as the long term use of process water and discharge of treated stormwater. These impacts fall into three categories: Impacts attributed to construction of the Project, which will be minimized and mitigated by the design features,

including erosion and sediment control, wetland creation, etc., incorporated in the SWPPP, impacts attributed to operation of the Facility's stormwater management system, which will be minimized and mitigated through the maintenance and operation of a system that meets all regulatory guidelines at the time of construction, and impacts related to the long term use of process water for cooling are expected to be minimal. The use of process water from the City of Middletown Sewage Treatment Plant will have no impact on water resources in general, or on the operation of the Sewage Treatment Plant in particular.

Considering the resource evaluation and analyses prepared for the Project, it is anticipated that construction and operation of the proposed action will have a negligible cumulative impact on water resources. Additionally, the Project should not generate significant negative impacts to water supply or quality in the aquifer or surface waters.

Proper sequencing of construction activities represents a key element in the Project's Construction CSWPPP. BMPs for sediment and erosion control would be implemented early in the construction process and prior to the start of major earthwork activities. These include installation of stabilized construction entrances and installation of silt fencing. Temporary sedimentation basins and diversion swales would also be used as construction progresses. In addition, procedures for the stabilization of soil stockpiles and for protecting catch basins would be implemented on an as needed basis.

All stormwater management, treatment, erosion and sediment control measures proposed for the CPV Valley site have been designed in accordance with the April 2008 *New York State Stormwater Management Design Manual (SMDM)*, NYSDEC's Division of Water TOG

5.1.8 and 5.1.10 and NYSDEC's *Better Site Design, April 2008*[8]. Further, in accordance with Article 17 of the Environmental Conservation Law (which mandates SPDES permit authorization for stormwater discharges associated with construction activity), a comprehensive erosion and sediment control/stormwater management plan is required for the proposed development. The plan under development will detail the erosion and sediment control measures to be utilized on-site during the construction phase.

The project SWPPP has been developed in accordance with NYSDEC guidelines, and the site plans include design measures to minimize and mitigate the effects of these pollutants, given the increase in impervious area brought about by implementation of the proposed project. All stormwater generated by the completed project is treated for quality enhancement in accordance with prevailing guidelines. Current NYSDEC pond and outlet designs have been developed to mitigate impacts from paved areas, and, by definition, are the accepted method for controlling pollution from paved surfaces. These measures, depicted on the Site Plans, and detailed in the SWPPP to be maintained on-site during construction, conform to New York State's Guidelines for Urban Erosion and Sediment Control, particularly the 2008 New York State SMDM and the New York Standards and Specifications for Erosion and Sediment Controls. The stormwater management plan and all proposed control measures shall comply with the requirements of current NYSDEC regulations under ECL Article 17, Titles 7 and 8 as well as 6NYCRR Parts 700-705. All relevant

[8] Pursuant to NYSDEC DOW -1.2.5: *New York State Stormwater Design Manual 2010 Update Transition Policy*, the SWPPP for the Project may comply with the 2008 Design Manual because CPV Valley made applications to governmental entities prior to March 1, 2011, which included a preliminary SWPPP, developed using the 2008 version of the Design Manual.

conditions of the SPDES General Permit will be met, including the SMDM requirements for Runoff Reduction and Green Infrastructure, which provide for increased groundwater recharge in the vicinity around newly developed sites.

No significant impacts to surface waters and wetlands are anticipated from construction of the Project. The Facility has incorporated mitigation and avoidance measures into its construction plans, therefore, no additional mitigation is necessary.

Operation

The Project will use an air cooled condenser for heat dissipation to minimize both water supply and wastewater discharge requirements. The Facility's process makeup water requirements will be addressed using tertiary treated effluent from the City of Middletown Sewage Treatment Plant. Process wastewater will be discharged to the City of Middletown Sewage Treatment Plant. The City of Middletown Sewage Treatment Plant currently discharges treated effluent to the Wallkill River. Potable water for on-site staff and visitors would be obtained from the municipal water distribution system. Sanitary wastewater will be discharged to the City of Middletown Sewage Treatment Plant via the town sewer system. Stormwater runoff from construction and operation would discharge to on-site wetlands, which ultimately drain to Monhagen Brook.

The Project site area will be covered in gravel, except for designated roads, tanks, and buildings, and will be approximately 23 percent impervious (i.e., approximately 8 acres will

be impervious). The switchyard area and area beneath the air cooed condenser will be covered with crushed rock.

Potential groundwater impacts attributable to the proposed Project are related to the storage of fuel oil and ammonia, process water usage, and stormwater runoff from the Project site.

Mitigation measures proposed to reduce/eliminate potential water quantity and quality impacts include:

- Aboveground fuel storage to facilitate leak detection will be provided, with secondary containment capable of containing 110 percent of the tank contents. A leak detection system will be incorporated into this containment area.
- Ammonia tanks to be underlain and surrounded by a concrete dike for containment, maintenance and leak detection.
- The proposed detention ponds will incorporate measures to provide stormwater treatment in accordance with the 2003 NYSDEC Manual, revised in 2008 and 2010.
- Water quality inlets in heavily trafficked areas of the site will serve to remove sediments from the stormwater stream.
- No de-icing chemicals will be used on site roadways or parking areas.
- The site will not use pesticides or herbicides for site maintenance.

In order to mitigate the potential impacts, such as the increased surface water runoff, peak rate of discharge, and erosion and sedimentation, the preliminary site plan for the Facility includes a series of structural and non-structural stormwater management and erosion control measures. These measures, along with the other design features, adequately mitigate the potential impacts identified.

Facility operation requires the use and storage of oil and hazardous materials (OHM), such as natural gas, fuel oil, and aqueous ammonia. These are well known and have been safely used by commercial and industrial facilities throughout New York State in a wide range of applications, including electric power generation. The majority of the OHM required to support operations would be consumed in the electrical generation process or recycled offsite. The Facility design incorporates a number of features to mitigation potential impacts associated with the release of these materials, including locating major processing equipment indoors, installing indoor storage areas for water treatment chemicals in the water treatment buildings, stores chemicals, used oils and other lubricants in designated storage enclosures within the gas turbine building, the maintenance warehouse and the water demineralization building (the enclosures would be constructed with an impervious, chemically resistant pad on which to place portable containers), proper labeling and handling procedures, hazardous materials training programs for employee, and proper truck unloading procedures.

All piping, fittings and connections associated with the transfer of oil or hazardous materials would be fabricated, constructed and installed in a manner that would prevent the escape of any potentially toxic materials to the ground, ground water or surface waters.

As part of final design and in accordance with New York State regulations, a Spill Prevention, Control, and Countermeasures Plan (SPCC Plan) would be prepared for the Facility with as-built drawings. The SPCC Plan will be subject to the review and approval of NYSDEC.

An emergency response plan also will be developed to detail procedures to prevent a release of OHM to the environment and to direct response actions at the Facility in the event of an emergency. The plan will evolve as part of final design and construction, ultimately completed using as-built plans and implemented with Facility staff.

The Facility will acquire process water from the City of Middletown Sewage Treatment Plant (STP), and will return the discharge back to the headworks of the STP. Due to the minimal volumes of process water required for operation and relatively unchanged characteristics of the discharge water, no impacts associated with the Facility's process water are anticipated.

The impact avoidance, minimization, and mitigation measures proposed in the EIS Documents minimize adverse impacts to the maximum extent practicable; therefore, no additional mitigation measures are necessary.

K. Ecology

The NYSDEC list of Species of Greatest Conservation Need, NYS Comprehensive Wildlife Strategy (NYSDEC, 2008) was consulted and reviewed with respect to the potential

occurrence of these species or their habitat on-site and any potential impacts associated with project construction.

The CPV Valley Energy Center would be located on approximately a 21.25 acre portion of 122 acres of open land comprising the site, consisting primarily of agricultural cropland, hayfield, and small portions of adjacent federal jurisdictional wetlands. An additional 7 acres of land, primarily old field and hayfields, within the 122 acre parcel would be temporarily disturbed during construction for materials lay down, equipment storage, and construction parking.

As a result of the CPV Valley Energy Center project construction, permanent impacts will occur to 21.25 acres of cropland/row crop ecological community and permanent filling of 0.33 acres of Federal jurisdictional wetlands. The Facility has been designed to minimize and/or avoid impacts to wetlands to the maximum extent practicable. The layout and footprint of the Facility is focused on the upland portions of the site; however small fringe wetland areas within the fields, adjacent drainage ditches, and broad swale along I-84 containing invasive species common reed (*Phragmitis sp.*) could not be entirely avoided. Permanent wetland impacts of Federal jurisdictional wetlands, as a result of the main facility footprint are 0.246 acres. For construction laydown/parking areas, approximately 7 acres of Successional old field and hayfield will be temporarily impacted, and will be restored upon completion of construction. Approximately 0.09 acres[9] of wetland, including

[9] Although the amount of permanent wetland impacts may vary slightly during the Site Plan approval process, the identified mitigation area exceeds the required amount of mitigation and will sufficiently offset any additional

(Footnote continued on next page)

a temporary bridge across Carpenter Creek, will be temporarily impacted to provide access to the laydown areas.

The routing of the underground electric transmission line has also been optimized to avoid wetlands. The electrical transmission line extending east from the Facility will be placed underground, reducing the right-of-way clearing requirements to further reduce impacts to forested wetlands. Given siting constraints such as extensive wetlands around the site and the ability to site the transmission line in the roadway, the on-site underground electrical transmission line option will consist of an underground duct bank containing insulated, three phase conductors, and up to three precast concrete manholes approximately 20 feet long by 9 feet wide by 8.5 feet deep in dimension (540 square feet each, for a total of 1,620 square feet [0037 acres]).

The on-site underground electrical transmission route would follow the same general route as the originally proposed overhead route. The construction corridor will occur within approximately 2,077 linear feet of wetlands (240 linear feet of which are currently forested). Use of a 75 foot construction corridor would result in approximately 3.56 acres of temporary construction impacts. Approximately 0.46 acres of permanent impacts will occur to wetlands in the form of conversion of forested to non-forested vegetation. This arrangement results in a reduction from the above ground option that consisted of a 130 foot right-of-way width resulting in approximately 6.2 acres of temporary wetland impacts, and 0.92 acres of permanent impacts to wetlands in the form of conversion of forested to

impacts. To the extent the permanent wetland impacts are reduced, the mitigation amount will remain in excess of amounts required.

non-forested vegetation. A permanent corridor of 20 feet will be maintained for the electric transmission line within the site proper (i.e., from the switching station to the crossing of Carpenter Creek at Route 17M).

The underground duct bank for the electrical transmission line will cross the two streams; an unnamed tributary to Carpenter Creek (NYSDEC Class B, south of where it joins Carpenter Creek and Carpenter Creek itself where it crosses Route 17M. These crossings will result in 600 square feet (0.01 acre) of temporary impact to the stream and its banks. Open cut construction methods will be used. Following construction, the trenched areas and the disturbed corridor will be re-graded, stabilized, and re-vegetated. The stream bed and banks will also require restoration to pre-existing grades, with bank stabilization measures and monitoring to prevent soil erosion. The Freshwater Wetlands Permit issued by NYSDEC and the Nationwide Permit issued by the U.S. Army Corps of Engineers (ACOE) will address the construction of the underground electrical transmission line. Wetland and stream restoration monitoring will be implemented according to permit conditions.

The riser poles at the GIS building site location in Middletown would permanently impact approximately 0.05 acres of wetlands. Given the pre-existing disturbed conditions of the wetland area and the developed nature of the area, the impacts associated with the pole installation are considered to be insignificant. The process water supply/return lines will be routed to avoid impact wetlands.

A wetland mitigation plan has been prepared in accordance with the NYSDEC and ACOE Joint Application review process and associated mitigation standards, in which both the

permanent "fill" impacts and "forest conversion" impacts associated with the project will be compensated on the site. Wetland fill impacts will be compensated for on the site by creating a wetland replacement area, subject to the review and approval of NYSDEC and the ACOE. The wetlands will be replaced on site on a greater than 2:1 ratio, resulting in the creation of 0.80 replacement acres[10]. This wetland replication area will also provide enhanced wildlife habitat functions for the site. Conversion of forested wetlands to non-forested wetlands within the electrical interconnect will be compensated by creating a permanent forested buffer along Carpenter Creek where there are currently fields in agricultural use. The NYSDEC SPDES General Permit for Stormwater will contain conditions that will further protect wetland resources, including a provision for a Stormwater Pollution Prevention Plan. The additional field studies for the site included study of the resource value of the existing vernal pools. The vernal pools were found to have "low" (Tier III) overall biological quality according to the assessment manual, "Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States" (Calhoun and Klemens, 2002), which was recommended by the Town's DEIS consultant. Construction of the Facility and the transmission line will avoid and not have direct impacts on the vernal pools.

In response to ecological comments received on the DEIS, supplemental studies were conducted for plant species of conservation concern, summer roosting habitat for the

[10] Although the amount of permanent wetland impacts may vary slightly during the Site Plan approval process, the identified mitigation area exceeds the required amount of mitigation and will sufficiently offset any additional impacts. To the extent the permanent wetland impacts are reduced, the mitigation amount will remain in excess of amounts required

Indiana bat, and potential turtle habitat species complexes. As summarized in Section 3.2 of the FEIS no significant impacts on ecological resources have been identified for either Facility construction or operation.

Although the limited amount of wetlands impacts are unavoidable, the optimization of the Facility's design and layout have significantly minimized, the impacts, to the maximum extent practicable.

Impacts to wildlife habitat will be minimized due to utilization of agricultural fields for the majority of the proposed Facility. Losses of forested habitat will be minimized through the southern routing of the electrical interconnect, selection of an underground construction methodology, maintenance of only a 20 foot wide permanent electrical corridor, and the use of roadway shoulders where possible. No impacts to Federal or State listed Threatened or Endangered species are anticipated. By locating the electrical interconnect route in a corridor requiring the least amount of tree removal, losses of potential forested summer roosting habitat of the Indiana bat will be minimized. The water/wastewater line route will use existing roadways, non-forested areas, and existing overland utility corridors to minimize use of any new overland routes/corridors.

No significant impacts to Federal or State listed Threatened or Endangered species are anticipated; therefore no further mitigation is warranted. However, based on recommendations made during agency reviews, several large trees in the vicinity of the wetland mitigation area that are in continuum with the adjacent forested area, and that could potentially provide summer roosting habitat for Indiana bat, will be preserved and

integrated into the mitigation area. In addition, all tree clearings shall be conducted between the dates of November 15 and March 31 to further protect the federally listed endangered Indiana Bat.

L. Community Character

The EIS Documents evaluated the impacts on the community character of the area in the vicinity of the Project. Community character is defined as:

- The built environment which may include historic buildings, development and land-use patterns, architectural landscape, roads, sidewalks, and visual character. The natural, or "un-built" environment often encompasses stream corridors, open spaces, farms, geographical features, critical habitats, and air and water quality. The interaction between the built and un-built environment is also an element of community character.

- The social and cultural characteristics of a community can include those attributes that reflect its overall quality of life (i.e., quality of schools, poverty and crime rates, demographics, etc.) and represent its cultural resources (i.e., hospitals, museums, social gatherings, local arts, community activities, etc.).

- The community's economic environment may include the number and quality of jobs, unemployment rates, type of business, and presence and/or vitality of a downtown area.

The Town of Wawayanda is a rural-suburban community located in western Orange County, New York. The Town was incorporated in 1849, and its roots lie in agriculture due to its acres of fertile "black dirt" located in the floodplain around the Wallkill River. The Town encompasses a mix of small-town, suburban and rural settings and is home to several historic hamlets. According to the Town's Comprehensive Plan, Wawayanda has been experiencing significant growth pressures since before 2000 as neighboring areas to the east and south continued to accommodate the movement of populations outward from the New York City metropolitan area. Residential development has largely been incremental. There is a large amount of vacant land primarily due to environmental constraints such as poor soil conditions for development, wetlands, floodplains and steep slopes. Since 2000, the Town's population has continued to increase due to its proximity to transportation, highways and its affordability relative to other communities. (Saratoga, 2006).

The Town of Wawayanda's most recent Comprehensive Plan was adopted in August, 2006. It places emphasis on appropriate economic development together with preservation and protection of natural and community resources. The plan sets forth environmental, cultural, and agricultural priorities. The Town of Wawayanda's most recent Comprehensive Plan centers around four major themes: promoting economic development and diversity, maintaining and supporting Wawayanda's rural character, protecting natural resources and open space, and cultivating a sense of community.

With respect to industrial development, the Town's Comprehensive Plan seeks to channel commercial and industrial uses into designated zones. The Project site and surrounding area is proposed to be within a Mixed Commercial Zone. This targeted area was created based on a set of environmentally-based criteria, existing land use and zoning, current land use planning principles, and residents' preferences.

The area has seen some recent developments along this corridor, including a project directly northeast of the Project site, the Horizons at Wawayanda. This housing development consists of several large three story buildings. Across the street from the Project site, a large warehouse with building heights of 35-40 feet was recently built, the Pannatonni project. Just west of the Project site along Route 6 is the New York Department of Transportation (NYDOT) facility which has some large buildings, including a very tall shed and cell tower. North of Kirbytown Road runs an abandoned railroad bed and the NYPA right-of-way and electric transmission lines and towers that are as high as 130 feet.

The primary focus of the Route 17M corridor centers on automotive and commercial uses while the Route 6 corridor is more diversified and includes more industry and a large-scale dairy operation, Elvree Farms, with closely massed large scale buildings and several silos up to 85 feet in height. Other industrial uses that set the tone for this portion of Route 6 include the Thruway Authority/NYSDOT maintenance facility, which has several large buildings, salt sheds, and a 180 foot cell tower, Eason's Auto Body, Thermo King, and the Tetz facility which houses a concrete batch plant, a crushing and screening plant, and truck/equipment repair facilities.

The community character during construction of the Project would be affected only relatively close to the Project site as a result of traffic and noise. However, such impacts would be relatively minor and temporary, and will be mitigated (e.g., by offsetting construction work day hours from peak traffic periods on local roads, use of noise attenuation measures on construction equipment). The construction workforce is not expected to result in any required in-migration of workers, and thus no temporary impacts to community character are expected from the need to accommodate such workers in homes in the area or provide municipal services to these workers.

As the Project will not result in any discernible in-migration of workers, it will not have an effect on the character of the area in terms of changing the number or type of people living in the area, or affecting costs associated with additional school enrollment or other town services. As well, traffic impacts during operation will be negligible compared to existing traffic volumes. Other environmental factors such as changes in noise levels, air emissions, and water impacts will generally not be discernible, and will not affect community character. Visual impacts could result in minor changes to the character of the area in limited locations that are both very close to the Project and have a view of the Project, as the landscape at the Project site would change from open/agricultural land to industrial. However, the extent of visibility is limited due to topography, trees, and structures in the area, and due to the undergrounding of the electrical interconnection. Thus overall, the Project would not change the community character of the area except in limited locations very close to the Project site where views exist.

With respect to positive impacts, the significant revenues going to the Town of Wawayanda, and more specifically the Minisink Valley Central School District, will allow the Town to improve its services to residents, and the school district to improve the general quality and character of its school system. Additionally, 25 jobs will be created for operation of the Project. CPV expects all 25 positions to be filled locally.

As stated previously, the Project site is located within an area specifically targeted for mixed commercial use, and will be consistent with the uses currently authorized in that area, as well as futures use proposed under the Comprehensive Plan.

The Project would aid in economic development and diversity by broadening the community's revenue base and creating stable new jobs in the energy industry. The siting of the Project allows economic development without threatening the goals of the other themes in the Town's Comprehensive Plan. One of the recommendations in the Town's plan is to balance commercial and industrial growth in the town's three school districts.

Relative to scale and size, portions of the Facility will be higher than the existing structures in the area, including the generation building (113 feet), Air Cooled Condensers (115 feet), and the Facility stacks (275 feet). The Facility's placement at the southern center portion of the Parcel helps to mitigate visual effects of the Facility structures from residential areas to the north of the site.

The Facility's combustion turbine stacks are the most visually prominent feature. One way to minimize stack height is to limit the height of nearby structures that determine the Good

Engineering Practice stack height. Preliminary modeling considered stack heights of up to 325 feet based on Good Engineering Practice stack height associated with an initial Facility design. Project design changes, including the reduction in the height of the air cooled condenser to 115 feet, reduced the Good Engineering Practice stack height to 287.5 feet. The final stack height of 275 feet for the combustion turbines was selected based on modeling that showed that this height was adequate to largely avoid increases in predicted impacts that can result from the effects of building induced downwash on stacks that are below Good Engineering Practice stack height.

The proposed landscaping plan is intended to enhance the appearance and natural beauty of the historical agricultural use of the existing property, and to enhance property values in the surrounding areas. Various small sections of the entrance to the Project site will be graded and seeded after construction. Land outside the Facility fence line will be left as buffer after construction and will be restored to its current open space use.

Other landscaping plans include adding trees and shrubs in areas on the site. To the maximum practical extent and when applicable, mature shade trees, vegetation, and unique site features such as stone walls will be preserved. A buffer area will be placed along the Route 6 boundary; and one shade tree (minimum caliper of three inches at four feet) will be planted for each 40 feet of lot frontage.

The natural vegetation, large buffer areas surrounding the Facility, and proposed landscaping will help shield full views of the Facility from off site locations. The exterior architectural treatment of the buildings (i.e., windows, doors, siding, etc.) will be painted a

neutral beige color to reduce visibility. The steel stack will be painted a neutral gray tone to complement the generation building. Non-reflective materials will be specified, where feasible, to further soften the Facility appearance and minimize the potential for glare.

The proposed transmission line interconnect will consist of an underground duct bank configuration routing within a 20-foot wide right-of-way. The underground alignment will basically parallel I-84. It will then parallel Route 17M and cross Route 6, eventually connecting to NYPA's Marcy South 345 kV right-of-way electric transmission system. The transmission line was placed underground to mitigate visual impacts and to avoid any change to the character of the area.

The Project will not have significant adverse impacts on the character of the surrounding community because it will not generate significant operational traffic, it is a use consistent with the existing and planned future character of the surrounding area, its visual impacts will be small given the landscaping and screening features incorporated into the Project design, its noise impacts will comply with applicable criteria, and it will not burden community services. The following are some of the Project attributes that will allow the Facility to blend with the existing community character:

- The Facility's placement at the southern center portion of the Parcel helps to mitigate visual effects of the Facility structures from residential areas to the north of the site.

- Various small sections of the entrance to the Project site will be graded and seeded after construction. Land outside the Facility fence line will be left as buffer after construction and will be restored to its current open space use.

- To the maximum practical extent and when applicable, mature shade trees, vegetation, and unique site features such as stone walls will be preserved. A buffer area will be placed along the Route 6 boundary; and one shade tree (minimum caliper of three inches at four feet) will be planted for each 40 feet of lot frontage.

- The exterior architectural treatment of the buildings (i.e., windows, doors, siding, etc.) will be painted a neutral beige color to reduce visibility. The steel stack will be painted a neutral gray tone to complement the generation building. Non-reflective materials will be specified, where feasible, to further soften the Facility appearance and minimize the potential for glare.

Based upon the analysis above, no additional mitigation for impacts to community character are required.

Unavoidable Adverse Impacts

As discussed previously, the proposed Project will result in significant long-term economic and other benefits to the Town of Wawayanda, the local school districts, special districts, Orange County, as well as the state as whole. When fully operational, the Project is capable of

providing a peak of approximately 630[11] MW of highly efficient, low cost electric power generation. The development of the site is consistent with the Town's zoning and comprehensive plan.

Despite the positive effects anticipated as a result of the Project, its construction and operation will necessarily result in certain unavoidable adverse impacts to the environment. The majority of the adverse environmental impacts associated with the Project will be temporary, and will result from construction activities. Site preparation (e.g., clearing, grading), and construction of the facility (including the electrical interconnection and water and sewer connections) will have short-term and localized adverse impacts on the soil, water, agricultural, and ecological resources of the site. This construction will also have short-term impacts on the local transportation system, air quality, and noise levels. These impacts will largely result from the movement and operation of construction equipment and vehicles, which will occur during the construction of the Project. The level of impact to each of these resources has been described in the EIS Documents. They will generally be localized and/or of short duration.

Long-term unavoidable impacts associated with operation and maintenance of the Project include visibility of the stacks and air emissions from Project operation. While the presence of the stacks will result in a change in perceived land use from some viewpoints, their overall contrast with the landscape will likely be low to moderate in most locations. Although the project will be a source of new air emissions, the air impact analyses demonstrate that those

[11] CPV Valley, LLC is listed as queue position 251 in the NYISO Interconnection Queue and has a maximum summer output ("SP (MW)") rating of 678 MW. The output of the facility varies depending on weather conditions. The 678 MW output represents the facility's maximum summer net output @ 85°F.

emissions will not create any significant adverse impacts. Project development will also result in an increased level of sound at some receptor locations within the study area, a minor loss of cropland/row crop ecological community, the conversion of Red Maple-hardwood swamp to non-forested wetlands, and the conversion of upland Beech-maple mesic forest to non-forested upland. As described in the EIS Documents, these impacts are not considered significant.

Although adverse environmental impacts will occur, they will be minimized through the use of various general and site-specific avoidance and mitigation measures, as described in the herein. With the incorporation of these mitigation measures, the Project is expected to result in positive, long-term overall impacts that will offset the adverse effects that cannot otherwise be avoided.

Alternatives

The EIS Documents described and evaluated a range of alternatives to the proposed Project. These alternatives included alternate sites, fuels, electric and gas interconnect routing, air emission control technologies, condenser cooling technologies, designs, equipment selections, and water supply options. The discussion of alternatives was principally contained in Section 19 of the DEIS, and in the related sections of the FEIS and Responses to Comments. The no action alternative was also evaluated.

Alternative Project Sites

As a private applicant without the power of eminent domain, CPV Valley is only required to consider reasonable alternative sites that are under its control. Nonetheless, CPV Valley did

conduct an alternate site screening analysis which concluded that the proposed Project Site is the preferred site. Further, and in any event, there are no suitable alternative sites under the control of CPV Valley.

Based upon the discussion in the EIS Documents, the Planning Board finds that all practicable alternatives have been reviewed and analyzed in the EIS Documents and that, with the Project changes described in the FEIS, there are no practicable alternatives to the Project that would avoid or minimize adverse environmental impacts to a greater extent.

Alternative Electrical Interconnection Routing

Three alternate routings for the electrical interconnection were considered in the DEIS. For all of the alternatives, the first segment of the route, on the Project Site, would be the same up to the eastern Project Site boundary at Route 17M. Alternative 1 would continue north from that boundary along the western shoulder of Route 17M to the NYPA 345 kV line right-of-way. Alternative 2 follows the same route to the Project Site boundary, but would then continue east beneath Route 17M, cross beneath a culverted section of a stream flowing from the site, and then continue via underground conduits to the east, crossing Sunrise Park Drive and a second culverted section of the stream. From there, Alternative 2 would continue east across Monhagen Brook to a set of tie-in structures at the existing NYPA lines. Alternative 3 would share most of its route with Alternative 2, but would cross Sunrise Park Drive at more of an angle to the northeast, and then would immediately cross Monhagen Brook east of the Sunrise Park Drive. All of the alternatives included evaluation of both overhead and underground routing configurations.

After consultation with ACOE, NYSDEC and NYISO and the other involved transmission owners, and consideration of the comments on the DEIS, CPV proposed to utilize Alternative 1 with an underground arrangement that exits the site and travels along the west side of Route 17M, and terminates at the new 345 kV GIS substation adjacent to NYPA's Marcy South transmission right-of-way, just north of the intersection of NY Routes 6 and 17M. Based upon its consideration of the EIS Documents, the Board finds that this proposed alternative is the one best suited for the Project and the community, and will avoid and minimize adverse environmental impacts to the maximum extent practicable.

Alternative Gas Line Routing

The Project's natural gas fuel will transported to the Project via the Federal Energy Regulatory Commission (FERC) regulated Millennium Pipeline. The Project will interconnect to the existing Millennium Pipeline by a new 7 to 8 mile long gas transmission line, which would require approval from FERC. An alternative option of obtaining natural gas transportation service through Orange and Rockland Utilities, Inc. (O&R) was evaluated in the DEIS, which would have require the construction of a new 2 to 3 mile natural gas transmission line, which would require approval from the New York State Public Service Commission (PSC) under Public Service Law Article VII.

Section 17.5 of the DEIS provided a discussion of both alternatives. A map level and literature review of the potential environmental impacts to wildlife, wildlife habitats, wetlands, water bodies and resources, groundwater soils, vegetation, cultural resources and land use along the potential routing options was conducted. Details of the corridor level map and literature

review study are presented in Appendix 17-A of the DEIS. Routing options evaluated were anticipated to have relatively minimal environmental impacts and minimal cumulative environmental impacts with respect to the proposed Project.

CPV Valley has reached an agreement with Millennium Pipeline for the construction of the natural gas lateral connecting the Project to the pipeline. Millennium Pipeline has identified potential routes for the connecting pipe. The routes were evaluated based on utilization of existing rights-of-way and minimization of environmental impacts. The final routing will be the responsibility of Millennium Pipeline and will undergo its own separate environmental review and approval process.

Alternative Cooling Technologies

CPV Valley proposes to utilize air-cooled condensers to cool the exhaust from the steam turbine. Four alternatives to using an air-cooled condenser were evaluated in the EIS Documents: once-Through Cooling; mechanical draft (wet) cooling towers; hybrid (wet/dry) cooling towers; and natural draft cooling towers. For the reasons described in the EIS Documents, the Planning Board determines that use of an air-cooled condenser will avoid and minimize adverse environmental impacts to the maximum extent practicable.

Alternative Air Emissions Control Technologies

The proposed Facility design incorporates the use of SCR. SCR is an add-on NO_x control technique that is placed in the exhaust stream following the gas turbine/duct burner. SCR involves the injection of ammonia (NH3) into the exhaust gas stream upstream of a catalyst

bed. On the catalyst surface, NH3 reacts with NO_x contained within the flue gas to form nitrogen gas (N2) and water (H2O). Other air emissions control technologies evaluated in the EIS Documents included Selective Non-Catalytic Reduction (SNCR); XONON™; and SCONOX™. The Planning Board finds that, for the reasons described in the EIS Documents, use of SCR will avoid and minimize adverse environmental impacts to the maximum extent practicable.

Alternative Facility Designs

The EIS Documents evaluated a number of alternatives to the Project that would have resulted in a project of a smaller or larger generating capacity. The alternatives investigated included different turbine technologies, including "G" class turbines and a Siemens Westinghouse V84.3 steam turbine, and a project configuration without duct firing. The Planning Board agrees with the conclusions in the EIS Documents that use of the "F" technology with duct firing will provide the most cost-efficient facility, and will avoid and minimize adverse environmental impacts to the maximum extent practicable.

Alternate Site Layouts

The EIS Documents considered a number of potential site layouts on the 122 acre parcel. Locating the Facility at the south central portion of the 122 acre parcel was preferred for three reasons. First, it placed the proposed Facility proximate to nearby Route 6 and I-84 and proposed industrial properties; thereby providing for a continuation of the orderly development of the Project area by avoiding a fragmented development condition. Second, it placed the Project further away from nearby visual receptors in an effort to mitigate potential

visual impacts. Third, the location minimizes impacts to wetlands and vegetated habitats. The Planning Board concurs that the proposed layout will avoid and minimize adverse environmental impacts to the maximum extent practicable.

Alternate Stack Heights

The EIS Documents included evaluation of several ways to minimize the visibility of the proposed Facility, including changes to the Facility profile and size. The Facility's combustion turbine stacks are the most visually prominent feature. One way to minimize stack height is to limit the height of nearby structures that determine the Good Engineering Practice stack height. Preliminary modeling considered stack heights of up to 325 feet based on Good Engineering Practice stack height associated with an initial Facility design. Project design changes, including the reduction in the height of the air cooled condenser (ACC) to 115 feet, reduced the Good Engineering Practice stack height to 287.5 feet. The final stack height of 275 feet for the combustion turbines was selected based on modeling that showed that this height was adequate to largely avoid increases in predicted impacts that can result from the effects of building induced downwash on stacks that are below Good Engineering Practice stack height.

For the reasons described in the EIS Documents, the Planning Board finds that the 275 foot stacks will minimize adverse visual impacts, and enable the Project to blend with the surrounding area as much as possible.

Alternative Water Supply Option

CPV Valley proposes to utilize Treated Effluent from City of Middletown Sewage Treatment Plant for its process make-up water. The EIS Documents also considered the use of ground water, surface waters, and existing municipal potable water supplies for make-up water. Use of ground water and surface waters were found to be technically viable; however, existing municipal water supplies would not be able to meet the facilities make-up water needs. For the reasons described in the EIS Documents, the Planning Board determines that the proposed use of effluent from the City of Middletown Sewage Treatment Plant will avoid and minimize adverse environmental impacts to the maximum extent practicable.

Cumulative Impacts

Cumulative impacts potentially created by construction and operation of the Project are thoroughly evaluated in the EIS Documents. The evaluation focused on the projects for which sufficient location, layout, and design information was available to carry out a meaningful analysis. Based upon its review of the EIS Documents, and its knowledge of new land uses and developments proposed in the Town and the area near the Project Site, the Planning Board finds that the EIS Documents thoroughly analyzed the degree to which the impacts of the Project may have cumulative impacts with such other projects. Further, the Planning Board agrees with, and adopts the cumulative impact conclusions reached in, the EIS Documents, and finds that the Project will not cause or contribute to any significant adverse cumulative environmental impacts.

Certification of Findings To Approve

The Town of Wawayanda Planning Board has considered the relevant environmental impacts, facts and conclusions disclosed in the EIS Documents and other pertinent information, and has weighed and balanced relevant environmental impacts with social, economic and other considerations.

Having considered the information and the facts and conclusions relied upon to meet the requirements of 6 NYCRR 617.11, the Town of Wawayanda Planning Board certifies that:

1) The requirements of 6 NYCRR Part 617 have been met; and

2) Consistent with social, economic, and other essential considerations from among the reasonable alternatives available, the action is one that avoids or minimizes adverse environmental impacts to the maximum extent practicable, and that adverse environmental impacts will be avoided or minimized to the maximum extent practicable.

This Statement Is Not Complete Until Authorized As Follows:

Adopted By Resolution: May 23rd 2012

Chairperson: Barbara Paterson

APPENDIX 1-15

Due to file size limitations, Appendices are accessible at:

https://harrisbeach.sharefile.com/d-s09381937c3ba46f69294024878f5e1ad

CPV Valley Energy Center
Responsible Energy Starts With Us

Community Grant Program
Guidelines & Criteria

The Valley Energy Center Disadvantaged Community Benefits Grant Program (DAC Grant Program Fund) has been established to assist our host communities in providing direct and lasting benefits through various environmental initiatives, historic preservation efforts, and passive recreational opportunities, that prioritize reductions of GHG / co-pollutants emissions, improve the quality of life for residents, and provide direct benefits to the residents of the communities identified in Valley's Disadvantaged Communities Burden Report.

Who May Apply

- Local, state and county governments representing communities within Census Tract 36071011801 located in Town of Wawayanda, and Census Tracts 36071001500 and 36071001600 located in the City of Middletown (Identified Communities).
- Tax-exempt, not-for-profit environmental organizations and land trusts directly serving the Identified Communities.
- Private tax-exempt organizations under Section 501(c)(3) of the Internal Revenue Service Code directly serving the Identified Communities.

Types of Grants

The Valley Energy Center DAC Grant Program Fund is a competitive based program for funding requests not to exceed the total annual program budget of $200,000.00 per year for five years.

Valley will consider funding requests as follows:

- New, enhanced or phased projects based on a documented need, having a strong project plan, specific outcomes, feasible budget, and that demonstrate quantifiable reductions in GHG and its co-pollutants or that reduce or eliminate environmental burdens within the Identified Communities.
- Priority will be given to those that meet the criteria and have a high correlation with the grant program's intent.
- Preference is given to requests with visible community involvement and demonstrated additional fundraising opportunities.
- Startup or ongoing projects or programs that have proven specific benefits to the Identified Communities.
- Lower priority given to requests for capital and equipment.

- Requests from schools located withing the Identified Communities must have approval of the Superintendent.

Focus Areas

- **Primary Focus Areas:** Environmental initiatives (preservation, enhancement, education) and passive recreation (green spaces).

- **Secondary Focus Areas**: Historic Preservation, Civic & Community, Targeted Arts and Culture

Ineligible Requests

Requests from or for the following are not eligible:

- Individuals
- Organizations without 501(c)(3) status
- Political organizations, campaigns, causes or candidates
- Fraternal, veterans or social organizations
- Health and human service organizations
- Sectarian or religious organizations
- Athletics or youth sports organizations
- Capital campaigns, endowment funds and scholarship funds
- Municipal capital/public works projects
- Fundraising events such as dinners and golf tournaments
- Conferences, trips or tours
- Personnel positions
- Research projects
- Planning/Conceptual Stage of Projects
- Technology - computers, software or hardware
- Projects proposed outside an Identified Community

Application Process

Submit a cover letter with attachments of no more than 5 pages. Information should include:

- Project description
- Description of organization (include proof of 501(c)(3) status)
- Outcomes: expected long-term impact or results, including demonstrated and quantifiable reductions of greenhouse gas emissions and/or co-pollutants within the Identified Communities, or quantifiable reductions of environmental burdens within the Identified Communities
- Community Involvement
- Activities and Timeline: Principal steps with benchmark dates
- Amount of funding requested
- Additional funding secured and/or pending from other sources
- Detailed budget including copies of written contractor/vendor estimates

Decision Criteria

Grants will be awarded if an application meets all the above eligibility requirements, demonstrates quantifiable outcomes consistent with the intent of the DAC Grant Program, and funds are available in the annual program budget.

Submission

While applications may be submitted at any time, Valley reviews applications and grants awards on semi-annual basis follows: May 31, and November 30. Applications must be submitted in writing by U.S. mail or electronic mail at least 60 days prior to the quarterly funding date. Applications received less than 60 days prior to the quarterly funding date will be considered for the next quarter.

Submit applications to:

CPV Valley
50 Braintree Hill Office
Park Suite 300
Braintree, MA 02184
info@cpv.com