



ELECTRONICLY SUBMITTED

February 12, 2025

Evan H. Hogan
Section Chief, Bureau of Energy Project Management
NYSDEC, Division of Environmental Permits
625 Broadway, 4th Floor
Albany, NY 12233-1750

**Subject: Cricket Valley Energy Center LLC
NYSDEC Facility ID # 3132600275
Second Request for Additional Information (RFAI), Title V Permit Renewal**

Dear Mr. Hogan,

On May 21, 2024, we received NYSDEC's second request for additional information (RFAI) in support of our Title V Permit Renewal Application (note that the letter was dated May 2, 2024). Additionally, NYSDEC provided comments on our draft Public Participation Plan in a letter dated 12/11/2024.

In the attached documents, you will find our revised Public Participation Plan (Attachment 1a & 1b), and an updated CLCPA Analysis (Attachment 2) which includes administrative updates and additional mitigation information. Also included in the CLCPA Analysis as attachments, project justification information...

- NYISO Reliability Letter dated 10/17/24 (previously submitted to NYSDEC)
- Hudson Energy Economics, LLC letter dated 9/20/24 (previously submitted to NYSDEC)

Please contact me at (617)320-5219 or mduquette@advanced-power.com if you have any questions regarding this submission.

Sincerely,

A handwritten signature in black ink that reads "Marc J. Duquette".

Marc J. Duquette
Director EHS, Cricket Valley Energy Center

CC: Michael Higgins, NYSDEC
Michael Cronin, NYSDEC
Mark Lanzafame, NYSDEC
Denny Escarpeta, NYSDEC
Alyssa Arket, NYSDEC

Attachment 1a & 1b

Public Participation Plan (PPP)

- 1a Public Participation Plan
- 1b Stakeholder List (Excel Workbook)

PUBLIC PARTICIPATION PLAN

Applicant:

Cricket Valley Energy Center, LLC

Facility:

Cricket Valley Energy Center
2241 State Route 22
Dover Plains, NY 12522

NYSDEC Facility ID Number:

3132600275

As Required by:

NYSDEC Commissioner's Policy Guidance CP-29

Submitted to:

New York State Department of Environmental Conservation
21 South Putt Corners Road
New Paltz, NY 12561-1696

Date:

February 10, 2024

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List of Acronyms

Acronym	Definition
CP-29	Commissioner Policy 29, Environmental Justice and Permitting
NOCA	Notice of Complete Application
NYSDEC	New York State Department of Environmental Conservation
PEJA	Potential Environmental Justice Area
PPP	Public Participation Plan
CVEC	Cricket Valley Energy Center

I. INTRODUCTION AND OBJECTIVE

This Public Participation Plan (PPP) has been prepared by Cricket Valley Energy Center, LLC (hereinafter referred to as “applicant”) to fulfill and comply with the requirements of

New York State Department of Environmental Conservation **Commissioner Policy 29, Environmental Justice and Permitting (CP-29)** for the renewal of its Air Pollution Control -- Title V Permit.

No changes to the facility or related emissions are being proposed.

This PPP has been developed in accordance with the procedures established in CP-29 Section V.D and it aims to ensure meaningful and effective public participation throughout the NYSDEC environmental permit review process. Public participation in the NYSDEC environmental permit review process will be advanced through a program of activities that provides opportunities for stakeholders to be informed and involved during the review of the proposed action.

The objective of this PPP is to outline and describe the program of activities that the applicant will implement to actively seek and enhance public participation during the application review process.

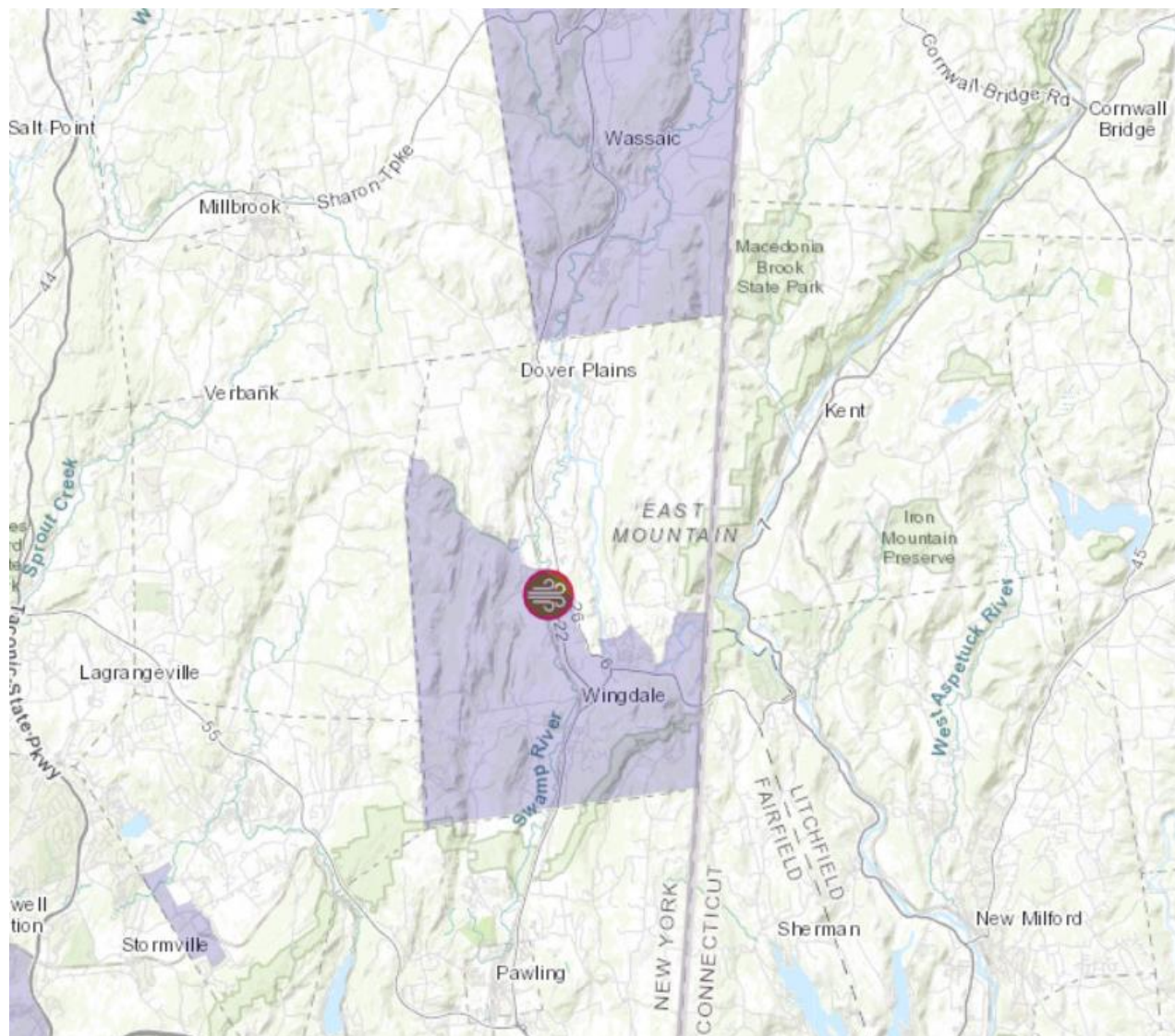


Figure 1. Project Location and Potential Environmental Justice Area(s)

II. PROJECT DESCRIPTION AND PROPOSED ACTION

Overview

Cricket Valley Energy Center, LLC (CVEC) is applying for the renewal of its existing Air Pollution Control – Title V Permit from the New York State Department of Environmental Conservation (NYSDEC). The facility, located at 2241 NY-22, Dover, Dutchess County, New York, is a combined-cycle natural gas power plant with a nominal net capacity of 1,000 megawatts (MW). The plant provides energy to nearly one million homes while adhering to strict environmental regulations that manage emissions of nitrogen oxides (NOx), volatile organic compounds (VOCs), and carbon monoxide (CO).

This renewal is a standard regulatory action to ensure continued compliance with air quality standards. No changes to the facility or related emissions are being proposed in

the renewal application: CVEC will maintain its current operations without any changes to the plant's structure, emissions profile, or environmental controls. The renewal is necessary to maintain operational compliance, allowing the facility to continue providing reliable electricity while meeting all regulatory requirements established by the NYSDEC.

Nature of Proposed Project/Action and Purpose

CVEC is seeking the renewal of its existing Title V permit to continue the operation of its nominal net 1,000 MW natural gas-fired power plant, located in Dover, Dutchess County, New York. This permit, originally issued by the NYSDEC on February 2, 2016, authorized both the construction and operation of the facility. The permit expired on February 2, 2021, and CVEC applied for renewal on July 23, 2020.

The facility generates electricity using three General Electric (GE) turbines, powered by natural gas. CVEC is currently in full compliance with its Title V permit and is not proposing any changes to the facility or its emissions profile. This application for permit renewal involves no expansion or modification but represents a continuation of the existing operations.

Nature of the Proposed Action

The proposed action involves the continued operation of an existing facility without any changes to the facility's structure or emissions profile. CVEC is seeking a renewal of its Title V Air Pollution Control Permit to maintain its current operations in compliance with regulatory standards. No expansions, modifications, or temporary operations are being proposed as part of this permit renewal. The facility will continue to generate power while adhering to established environmental regulations.

Purpose/Need for Project

CVEC is a critical part of New York State's energy infrastructure, supplying sustainable and reliable power to nearly one million homes. The facility plays a key role in meeting the state's energy demands, using a highly efficient combined-cycle process to convert clean-burning natural gas into electricity while minimizing environmental impact.

In addition to supporting regional energy needs, CVEC contributes to the local economy by creating jobs, generating tax revenue, and funding community projects. This permit renewal ensures that CVEC can continue to provide these benefits while maintaining full compliance with air quality standards. Detailed project justification has been submitted to the NYSDEC as part of this process.

Potential Impacts

CVEC is proposing no changes to the facility or its emissions profile; therefore, no potential impacts are expected beyond those associated with the normal operation of the plant. The facility will continue to operate under the stringent environmental controls and monitoring systems already in place, ensuring compliance with all regulatory requirements

and maintaining minimal environmental and community impact. Continued potential impacts include:

Economic Resources

During construction, CVEC created nearly 1,100 new jobs, providing a significant boost to the local economy. This influx of work and workers brought business to local suppliers, contractors, and small businesses, multiplying the economic benefits beyond just direct employment. Currently, the facility employs 25 full-time staff, with salaries totaling approximately \$3.4 million per year. In addition to plant employees, local service and maintenance contractors are also regularly engaged, further extending the economic benefits to the community. These jobs provide long-term opportunities to local families and contribute to household incomes that, in turn, support other businesses and services in the region.

Additionally, CVEC's contribution to local tax revenue ensures that essential public services, such as education, infrastructure, and emergency services, are well-funded. Starting at \$3.3 million and increasing to \$7.9 million annually, the facility's tax payments provide a reliable financial foundation for the town, county, and state. CVEC's 30-year Payment in lieu of taxes (PILOT) Agreement will continue to contribute an estimated total of \$157 million, enabling meaningful community planning and investment that will benefit residents for decades to come. Continued operation of CVEC will ensure long-term support for these community-strengthening public service and employment benefits.

Community Resources

Through its construction and continued operation, CVEC has made substantial contributions to the town of Dover, Dutchess County, and the State of New York, helping to fund essential projects in partnership with local communities. Key initiatives have included the installation of a new well and filtration system at Thomas J. Boyce Park, enhancements to J.H. Ketcham Memorial Park, and the purchase of municipal equipment such as a mini-excavator and a 10-wheel truck to support Dover's operational needs. In addition to financial contributions, CVEC employees actively participate in serving their community, including through monthly volunteering at the Center of Compassion Food Bank in Dover Plains.

CVEC also provides an annual \$5,000 scholarship for graduates of the Dover Union Free School District, over a total of 30 years, that the receiving student is eligible to renew for up to four years. Through its ongoing support of the Dover Educational Enrichment Program (DEEP), CVEC donates \$10,000 annually, which is allocated toward student enrichment activities such as guest speakers, advanced recess equipment, and field trips—programs that the school may otherwise be unable to afford. In addition, CVEC contributes to the Board of Education Discretionary Fund, enhancing learning opportunities for local students. Through the continued operation of the plant and close collaboration with community partners, these programs and partnerships will provide long-term benefits and ensure sustained support for local development and education.

Air Resources

CVEC employs advanced emissions control technologies to manage air quality and comply with stringent environmental regulations. The facility utilizes state-of-the-art systems for controlling NO_x, including NO₂, VOCs, and CO. This includes the use of dry low-NO_x burners and selective catalytic reduction (SCR) technology to control NO_x emissions, as well as an oxidation catalyst to manage VOC and CO emissions. These technologies were implemented as part of a rigorous air permitting process mandated by the NYSDEC.

In addition, CVEC maintains a continuous emissions monitoring system (CEMS) to ensure compliance with the emission limits set by the NYSDEC-issued air permit. This system continuously tracks emissions and verifies that the air emissions controls are operating as expected.

Furthermore, CVEC worked with local administrators to establish an ambient air quality and meteorological monitoring station on the Town of Dover High School/Middle School campus. This station has been operational since December 1, 2017, providing over six years of publicly available data, which exceeds the timeline required by NYSDEC and the Town of Dover. The data collected from this monitoring station indicates that CVEC's operations do not contribute detectable levels of NO₂ and PM_{2.5}, confirming that the facility's impact on local air quality is minimal.

Water Resources

CVEC has implemented advanced water conservation measures to minimize water demand and reduce associated resource impacts, making it one of the most water-efficient electrical generating facilities in the region. The facility utilizes highly efficient combined-cycle technology, which enhances the energy output per unit of water used. Air-cooled condensers are employed to significantly cut down the facility's reliance on water for cooling purposes. Additionally, CVEC operates a zero liquid discharge (ZLD) system that recycles and reuses all water within the facility, eliminating liquid waste. A rain capture system is also in place to utilize rainwater, further alleviating pressure on local water resources. The facility's stormwater management systems are designed to control runoff, prevent erosion, and protect local water bodies.

Land Use, Zoning and Community Character

CVEC was designed in alignment with the Town of Dover's Zoning Code and reflecting the community values, economic growth objectives, and preservation goals outlined in the Town's Master Plan. During construction, CVEC removed unsightly, partially destroyed buildings, solid waste, and other debris left on the property by previous occupants, significantly improving the site's appearance. CVEC limited its development to a previously disturbed industrial footprint, further respecting the area's land use and character.

Building on its commitment to culturally and environmentally sustainable development, CVEC undertook the restoration of wetlands that were damaged from prior industrial use and purchased and remediated a neighboring property, known locally as the Rasco site.

In recognition of these efforts, CVEC was honored with the Ducks Unlimited Wetlands Remediation Award in 2017 for revitalizing and conserving 79 acres of wetlands, demonstrating its long-term commitment to protecting these ecosystems for their natural benefits and the enjoyment of future generations.

Visual Resources

Before construction, the visual impact of CVEC was carefully assessed, considering a broad range of factors. These included the perspective of the viewers, the duration of the view, the level of discernible detail, the number of viewers, the degree of natural buffering, and the scenic value of the setting. The CVEC site was selected, in part, due to the natural tree buffer surrounding the area, which serves as an effective visual and sound barrier, helping to reduce the facility's impact on the surrounding community. To further minimize visual impact on the surrounding area, project features were deliberately designed within a compact footprint, with the three stacks co-located to further reduce their visibility. This thoughtful design approach has ensured that the facility integrates more harmoniously with the surrounding environment while maintaining its operational efficiency.

Noise

CVEC carefully considered noise impacts to the surrounding community during the development of the project layout, as well as in the selection and orientation of facility components. As a result, CVEC operates below the noise level guidelines established by NYSDEC, ensuring minimal disruption to the surrounding area. The design and operational measures implemented help maintain a quiet environment for the community while the facility continues its operations.

III. STAKEHOLDER IDENTIFICATION & CONTACT LIST

A contact list consisting of the names, addresses, phone numbers, or email addresses of stakeholders to the proposed action is provided in Appendix A. The contact list includes individuals and organizations with a direct stake in the proposed action and people and individuals and organizations that have expressed interest in the proposed project or similar projects affecting the same neighborhood or community.

To develop a draft contact list, the applicant reached out to residents/neighborhood groups who are near or adjacent to the project and that will be or potentially will be affected by the operation; community boards, community and elected leaders, local community, civic and recreational organizations, and environmental and business groups to help identify stakeholders and develop an initial contact list.

The current contact list has been developed in consultation with NYSDEC by identifying 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.

The applicant will utilize this contact list to communicate and disseminate information about the proposed project/action and permit application review process to the affected community and stakeholders. At minimum, this includes distribution of the written information and outreach materials described in Section V to inform the community about upcoming virtual public meetings and opportunities for public participation.

The contact list will be reviewed periodically and updated as appropriate throughout the permit application review process. The applicant will update the contact list with any new stakeholders identified during the virtual public meetings or execution of other PPP components. In addition, individuals and organizations will be added to the contact list upon request. Such requests should be submitted to the project liaison identified in Section IV. Other additions to the contact list may be made at the discretion of the applicant or, at the request of the NYSDEC project manager, in consultation with other NYSDEC staff, as appropriate.²

IV. PROJECT LIAISON

A representative from the applicant will be available during business hours at:

- Marc Duquette, Director, Environmental Health and Safety
 - 845-834-8035
 - muquette@cricketvalley.com
 - 2241 NY-22, Dover Plains, NY 12522

Affected residents and interested stakeholders can contact the liaison listed above to provide input, discuss any issues or concerns and/or to ask questions or request information. The liaison shall respond in a timely manner and in the manner appropriate to question or information request received. The liaison will be responsible for tracking and documenting public input, inquiries, questions, and information requests received, along with responses provided.

V. PUBLIC OUTREACH ACTIVITIES

The applicant will utilize a range of engagement strategies and conduct various public outreach activities to facilitate participation, involvement, and direct communication with the affected community during the permit renewal application review process. The applicant will implement the public outreach activities outlined below upon finalization and approval of this PPP by NYSDEC.

In compliance with the requirements of CP-29, the applicant will hold two public information meetings to keep the public informed about the proposed action (permit renewal) and the environmental permit review process. At minimum, the applicant will prepare, distribute and post written information and materials, including a meeting notice and fact sheet, to encourage dialogue and solicit input from interested stakeholders during the permit renewal application review process. Public information materials, including a Title V fact sheet, will be prepared and presented in an easy-to-read, understandable

format, using plain language free of legal terminology, and geared towards a non-technical audience.

The public information meeting notice and Title V fact sheet will be made available and disseminated in both English and Spanish. In addition, the public can contact the project liaison regarding the availability of language assistance and to request that the notice and fact sheet are translated into another language for comprehension by non-English speaking or limited English proficiency stakeholders.

Virtual Public Meetings

At the discretion of NYSDEC two virtual public meetings will be conducted to satisfy the intent of CP-29. The two meetings will be held at different times of day to ensure members of disadvantaged communities with varying work schedules have a chance to attend, participate, and comment on the proposed application.

A meeting is typically required near the end of the permit application renewal review process to inform the public about: the status of, or, if applicable, the availability of, final application materials and draft permits for review; the pending NYSDEC public comment period, and deadline to submit written comments to NYSDEC, if established; and eventual final decision.

Virtual Public Meeting: At or Near Completeness

Applicant will facilitate two virtual public meetings on date(s) contingent upon NYSDEC's review timeline. The meetings will be held roughly one month after the PPP is approved by NYSDEC to allow ample time for meeting promotion and public outreach. These final meeting date(s) and times will be proposed to NYSDEC for approval immediately following NYSDEC's review.

- Inform the public about the proposed project/action and permit application review status.
- Provide the opportunity for stakeholders to ask questions and express concerns about the project and identify how to obtain information or answers to questions after the meeting has concluded.
- Inform attendees how they may submit written comments on the permit application to the NYSDEC during the public comment period and, if available, identify any applicable deadlines.

Necessary Meeting Discussion Points and Requirements

All meetings will be facilitated by the applicant and/or representatives from their project team (project personnel) via Zoom. During the meeting, the applicant and/or representatives from their project team will present a brief overview of the project, including any relevant background information, details on the permitting action, scope of work, schedule, and community impacts. The second part of the meeting will include a question-and-answer –portion, enabling attendees to ask questions, provide comments, and/or express concerns. In addition, the following discussion points will be addressed:

- Provide an update on the permit application review process and identify outstanding application requirements and future milestones in the application review process.
- Make it clear that the meeting is being held prior to NYSDEC's permitting decision for the project/action.
- Identify the location of the online document repository and provide directions on how attendees may obtain and review materials relevant to the application, documents related to the meeting, and other public participation plan components.
- Identify and provide contact information for the project liaison and announce procedures for how attendees may obtain answers to questions after the meeting has concluded and interested stakeholders can submit questions, express concerns, or request additional information by telephone, email, and in writing.
- Announce any future outreach, opportunities for public participation, and /or required follow-up with attendees including, but not limited to additional meetings and future mailings, including, but not limited to the Notice of Complete Application.

Attendance will be recorded during the virtual meeting by using the participant list and chat log. The applicant will track the number of attendees for all meetings held during implementation of this PPP and, where feasible and applicable, identify any affiliation of participants and interests represented at the meeting. In addition, the applicant will be responsible for documenting meeting notes or minutes, along with a record of comments and questions raised in the meeting and respective responses and answers provided. Attendees not identified on the contact list will have the option to be added in the event of future meetings or information sharing.

Virtual Public Meeting Notice Preparation and Distribution

Information regarding the details of the virtual public meetings and how to participate via computer and/or telephone is contained in the reader-friendly meeting notice shown in Appendix B. The notice has been prepared in English and will be translated into Spanish by a certified translator. Through this notice, the public will be invited and encouraged to attend the virtual public meeting scheduled upon PPP review by NYSDEC.

Once the PPP has been approved by NYSDEC, the public meeting notice will be posted and available in the online document repository described in Section VI of this document. At least two weeks in advance of the public virtual meeting, the notice will be published in the Poughkeepsie Journal which is the local newspaper of record printed, published, and circulated daily in Dutchess County. In addition, the virtual public meeting notice will be delivered through first-class mail to the stakeholders identified in the contact list in Appendix A at least two weeks prior to the public virtual meeting. Email will be used only as a secondary option to invite stakeholders with unlisted addresses, and the confirmed receipt option will be used.

Fact Sheet Preparation and Distribution

Factual information on the proposed project/action, including an overview, purpose statement, and potential impacts, is outlined in the reader-friendly fact sheet shown in Appendix C. In addition, the fact sheet outlines how interested stakeholders can: participate in the permit application review process; access the online document repository to review relevant application materials prior to the virtual public meetings; and contact the project team to obtain additional information. The fact sheet has been prepared in English and will be translated into Spanish.

Once the PPP has been approved by NYSDEC, the fact sheet will be posted and available in the online document repository described in Section VI of this document. No later than 2 weeks prior to the virtual public meetings, the applicant will distribute the fact sheet to provide stakeholders with relevant background on the proposed project/action and facilitate meaningful participation during the meeting. The fact sheet will be distributed together with the virtual public meeting notice via first-class mail.

The fact sheet(s) will also be posted within the vicinity of the project site and visible to the public. For example, they may be posted on some streetlight lampposts or bulletin boards located in the lobby of residential complex buildings or public facilities such as town halls, libraries, schools, grocery stores, churches, or community centers within the project site.

Distribution of Notice of Complete Application

Once NYSDEC determines the application(s) for the proposed action/project is complete and provides the Notice of Complete Application (NOCA) to the applicant, the applicant will distribute the NOCA and draft permit, if applicable, to the meeting attendees and any identified interested parties, to provide notification regarding the start of the NYSDEC public comment period and to announce the deadline for submission of written comments to NYSDEC. If the NOCA is available at the time of the meeting, the applicant will digitally distribute the NOCA at the virtual public meetings. If the NOCA is not available at the time of the meeting, the applicant will provide explicit instructions on how to access the online repository and inform the attendees that, once available, the NOCA will be posted to the online document repository and will be distributed to attendees via email or mail as soon as possible, but no later than the date that the NOCA is published by the applicant in the print edition of a paid local newspaper that is circulated at least weekly and available in the municipality in which the project is located.

Additional Outreach and Materials

Meeting materials and outreach actions will be fully documented and made available to stakeholders and the public at cricketvalley.com. The use of a variety of additional communication methods will ensure that all stakeholders and the public are informed, and that outreach efforts are effectively tailored to meet the diverse informational needs of the stakeholder community, including groups such as:

Abutting Property Owners

Because affected property owners have specific interests and issues of concern, communication with them will extend beyond that which is conducted with other audiences in order to provide them with as much detail as possible to address their needs. Residents with property abutting the project will be contacted by first-class mail to provide them with detailed information on how the project will communicate with them, collect their input, and respond to their inquiries.

Elected Leadership and Policymakers

Elected leadership and policymakers are acutely aware of the concerns and needs of their constituents and consequently must be informed about project progress. Presentations will be conducted with local elected officials within the project area and will include an overview of project status, updates on requested information, and the collection of input from these key stakeholders.

Under-engaged communities

Additional efforts will be made to reach the elderly, individuals with physical disabilities, those with low median incomes, and Spanish-speaking and other minority and environmental justice populations. Public outreach information will be distributed to local libraries, offices of the aging, community centers, and other locations to ensure information and participation opportunities reach these populations.

Media

Media serving the project area will be kept apprised with regular press releases related to permit progress, briefings as needed, and distribution of fact sheets and other materials. A database of media contacts (print, radio, and electronic) will be developed for this project, and will include local and regional media, including any available special interest media directed specifically to ethnic populations, and those with limited English proficiency.

VI. DOCUMENT REPOSITORY

An online document repository has been established for the community and interested stakeholders to access and review information about the project. The online repository available at <https://www.cricketvalley.com/resources/> will provide information and documents relating to the project and permit application.

The repository will be updated throughout the application process with project-related information and written materials (i.e., application forms and supporting materials, draft permit, fact sheet, statement of basis (where applicable), the Notice of Complete Application provided by the NYSDEC, etc.).

VII. SUBMISSIONS

Progress Report

No later than two weeks following the engagement meeting described in Section V, the applicant will submit a progress report to NYSDEC in the form of a brief memorandum or cover letter. At minimum, the progress report shall:

- Describe progress-to-date in implementing the approved PPP, identify the components of the plan yet to be implemented, and the timeline for completion of the PPP.
- Summarize the virtual public meetings (identify the time and date, number, affiliation and diversity of attendees and interests represented) and include or append copies of the written materials (i.e. virtual public meeting notice, fact sheet) along with any documentation that supports implementation of public outreach activities described in Section V, such as: the meeting sign-in sheet, record of attendees/participants, meeting presentation, notes or minutes, and a summary of questions and answers, along with copies of newspaper notice and affidavits of publication.
- Identify any language or disability assistance requests received and document any considerations or accommodations made to-date.
- Summarize or include a table that documents:
 - all substantive concerns raised to-date, either during the virtual public meetings, or received by the project liaison, along with responses provided by the applicant
 - all resolved and outstanding issues
- Explain any project, design changes and/or measures to reduce potential impacts, either as result of community/public input or the NYSDEC permitting review process.

The progress report will become part of the application record and will be posted to the online document repository so that it is readily available to the public.

Final Summary Report and Written Certification

Upon completion of the enhanced public participation plan, the applicant will submit written certification to NYSDEC to certify that it has fully executed and complied with the approved PPP. The certification shall be signed by the applicant, or the applicant's agent, and submitted to NYSDEC prior to a final decision on the application.

As part of the certification, the applicant shall submit a final summary report documenting the implementation of this PPP. The report will summarize the activities that occurred in accordance with the PPP and will identify any substantive concerns raised by stakeholders during the virtual public meetings, or at any time throughout the permitting process and will detail the applicant's response(s) to any such concerns or questions. The applicant will include, or append, any documentation that supports the final summary report, such as: the meeting sign-in sheet(s), record of attendees/participants, meeting presentation, notes or minutes, summary of questions and answers, and copy of newspaper notice or other proof of publication. In addition, the report will identify any changes or modifications to the proposed project that were made or considered by the applicant to address or reduce concerns surrounding the permit application.

The final summary report and written certification will become part of the application record and will be posted to the online document repository so that it is readily available to the public.

APPENDIX A Contact List

Link to Excel: [2025_NYSDEC_StakeholderList_CricketValley.xlsx](#)

APPENDIX B

CLCPA Analysis and Mitigation Measures

Link to PDF: [2025_NYSDEC_CLCPA_and_Mitigation_CricketValley.pdf](#)

APPENDIX C
Virtual Public Meeting Notice
(English and Spanish)

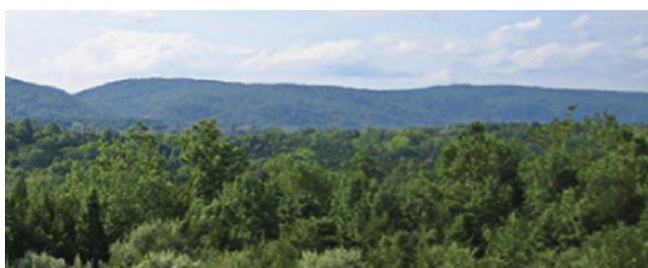


YOUR VOICE COUNTS!

Virtual Public Meeting

DATE AT X:00 PM, DATE AT X:00 PM

Title V Air Pollution Control Permit Renewal



Meeting Agenda

The agenda and presentations for both meetings will be identical.

1. Title V Air Pollution Control Permit Overview
2. CVEC Background
3. Community Impacts
4. Question and Answer

Cricket Valley Energy Center, LLC (CVEC) has submitted an application to the New York State Department of Environmental Conservation (NYSDEC) for renewal of its Title V Air Pollution Control Permit. No changes to the facility or to the related emissions are being proposed by CVEC; the application for renewal of the permit is a periodic requirement for energy facilities such as CVEC.

A Public Participation Plan has been developed in accordance with NYSDEC Commissioner Policy 29, Environmental Justice and Permitting (CP-29), and is available online at [insert document repository link].

The purpose of this public meeting is to inform the public about the permit renewal process and provide an opportunity for attendees to ask questions and make comments as part of an effort to engage and involve the Dover community.

To Join Online:

Visit www.zoom.us/join and type in the following meeting ID: XXXXX

To Call-in Using a Phone:

Dial in using the following number:
[INSERT NUMBER]

For more information:

Visit: www.cricketvalley.com

Contact: Marc Duquette, Project Liaison, mduquette@cricketvalley.com or by phone at (845) 834-8035.

Submit Comments: You can submit questions and comments at the public meeting; questions and comments can also be submitted at [\[insert link\]](#) or scan the QR code below.

 The XX-day public comment period will continue through XXXX, 2025.

QR
CODE

Please contact the project liaison to request accommodation for disability or interpretation services in a language other than English at the public meeting, and/or to request a translation of any of the event documents into a language other than English.

APPENDIX D
Fact Sheet
(English and Spanish)



FACT SHEET

Title V Air Pollution Control Permit Renewal Process



Cricket Valley Energy Center, LLC (CVEC) has submitted an application for a Title V Air Pollution Control Permit renewal to the New York State Department of Environmental Conservation (NYSDEC) to ensure compliance with state and federal air quality regulations. As part of a robust public participation process, CVEC has created this fact sheet to explain the permit renewal process and how the public can get involved.

Why does Cricket Valley Energy Center, LLC need to renew the Title V Air Pollution Control Permit?

This permit renewal is necessary to ensure that the facility maintains emissions standards, safeguards air quality, and continues to comply with the regulatory requirements set by the NYSDEC. The renewal process also allows for critical public input and ensures the facility's ongoing accountability to the community.

How might the project affect the surrounding community?

No changes to the facility or related emissions are proposed in the Title V application. As a result, there are no anticipated new impacts on the surrounding community. The facility will continue to operate within the same emissions limits, ensuring that air quality and other environmental factors remain consistent with regulations. Additionally, CVEC's permit renewal will allow the team to continue providing economic benefits to the community through job stability, local investments, and tax contributions.

Applicant: Cricket Valley Energy Center, LLC

Facility: Cricket Valley Energy Center (CVEC), 2241 State Route 22, Dover, NY 12522

NYSDEC Application Number:
[INSERT APPLICATION ID#]

A **Public Participation Plan (PPP)** has been developed in accordance with NYSDEC Commissioner Policy 29, Environmental Justice and Permitting (CP-29)



How can I participate in the permit renewal process?

There are several ways to participate:

1. Attend an upcoming virtual public meeting on XXX or XXXX to learn about the permit renewal process and ask questions about the project.
2. Submit written comments and questions by email at info@cricketvalley.com, or via postal mail at Cricket Valley Energy Center, 2241 NY Route 22, Dover Plains, NY 12522.
3. Call the Project Liaison, Marc Duquette, at (845) 834-8035
4. Visit the online document repository on the Cricket Valley website at www.cricketvalleyenergy.com to obtain application materials, relevant documents, and information about the status of the permit renewal process.

How long is the public comment period?

The public comment period begins DATE. Comments will be accepted in writing or by phone until DATE.

Who is responsible for reviewing the permit application?

NYSDEC Region 2 Headquarters, 47-40 21st St., Long Island City, NY 11101, is responsible for reviewing and issuing the required permits. Their phone is (718) 482-4997 and email is DEP.R2@dec.ny.gov



The CVEC team at Dover Schools celebrating Earth Day.



The CVEC team gifting supplies to the Dover Volunteer Fire Department.

**APPENDIX E
Cover Letter
(English and Spanish)**

2241 NY-22
Dover Plains, NY 12522

(Date)

(Abutter Address)

Dear [Name],

Please join the Cricket Valley Energy Center (CVEC) team for an online public meeting at [Time] on [Date] to learn more about its Title V Air Pollution Control Permit.

Cricket Valley Energy Center is a combined-cycle natural gas-fired power facility off Route 22. The facility has been in operation since 2020 and produces 1,100 megawatts of electricity—enough to power 1 million homes. CVEC is an active member of the Dover community and was recognized as one of the most efficient electricity producers in New York State.

As required by the New York State Department of Environmental Conservation (NYSDEC), energy facilities must renew their Title V Air Pollution Control Permits every five years. These permits ensure that energy facilities meet air pollution standards to protect their communities. NYSDEC is currently reviewing the CVEC team's permit renewal application, and we invite all community members to learn more about the process during our public meeting.

Enclosed in this letter you will find an official invitation to the meeting with key logistical information, along with a fact sheet regarding the Title V Air Pollution Control Permit Renewal process. For additional information, please visit CricketValley.com or contact info@cricketvalley.com or (845)-834-8035. Thank you.

Sincerely,
[Name], Cricket Valley Energy Center

Attachment 2
Updated CLCPA Analysis

Title V Permit Renewal

DEC Request for Additional Information

Cricket Valley Energy Center LLC

2241 Route 22

Dover, Dutchess County, NY 12522

NYSDEC Permit ID No. 3-1326-00275/00009

December 2022, updated February 2025

Submitted to:

New York State Department of Environmental Conservation

Division of Air Resources, Region 3

21 South Putt Corners Road

New Paltz, NY 12561-4659

Prepared by:

Berkshire Environmental Consultants, Inc.

1450 East Street, Suite 6-H

Pittsfield, MA 01201

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1 Introduction

On July 23, 2020, Cricket Valley Energy Center, LLC (CVEC) submitted an application to the New York State Department of Environmental Conservation (NYSDEC or “the Department”) for renewal of the Title V Operating Permit (Permit ID 3-1326-00275/00009) for the CVEC natural-gas fired, combined-cycle, electric generating facility in Dover, NY. In accordance with Title 6, Subpart 201-6 of the New York Codes, Rules, and Regulations (NYCRR), the renewal application was submitted at least 180 days, but not more than 18 months, prior to expiration date (February 2, 2021) of the current permit. The permit application did not include any new or modified sources or increases in greenhouse (GHG) gas emissions from existing sources.

On May 20, 2022, NYSDEC sent CVEC an initial Request for Additional Information (RFAI No. 1) to aid in the Department’s determination of whether the permit renewal is consistent with the statewide GHG emission limits established by the NY Climate Leadership and Community Protection ACT (CLCPA) in Article 75 of Environmental Conservation Law (ECL). CVEC submitted its response to this request on December 6, 2022.

On May 2, 2024, NYSDEC sent a 2nd RFAI (RFAI No. 2) requesting that CVEC prepare and submit an Enhanced Public Participation Plan (EPPP) and update its response to RFAI No. 1 to include a more detailed justification for the permit renewal and a more detailed suite of quantifiable, feasible mitigation options. Since then, CVEC has had ongoing communications and meetings concerning the RFAI. This report and the accompanying documentation provide CVEC’s updated response to the NYSDEC RFAI.

2 Background

2.1 Applicable CLCPA Requirements

The NY CLCPA became effective on January 1, 2020. Section 7(2) of the CLCPA directs state agencies to consider whether decisions by the agency, including permit approvals, are inconsistent or will interfere with the attainment of the statewide GHG greenhouse emissions limits in ECL Article 75. For decisions that are determined to be inconsistent with or that will interfere with the attainment of the limits, the agency must provide a detailed justification as to “why such limits/criteria may not be met” and identify required alternatives or mitigation measures. Additionally, Section 7(3) of the CLCPA requires that agencies, when considering approvals and decisions, must not disproportionately burden disadvantaged communities and must prioritize reductions of GHGs and co-pollutants in these communities.

The ECL Article 75 statewide GHG emission limits, as stated in Title 6, Part 496 of the New York Codes, Rules, and Regulations (6 NYCRR 496), are as follows:

- 245.87 million metric tons CO₂ equivalent¹ (CO₂e) by the year 2030, and
- 61.47 million metric tons CO₂e by the year 2050.

¹ CO₂ equivalents determined using the 20-year global warming potentials in 6 NYCRR 496.4.

These limits represent a 40% and 85% reduction, respectively, from estimated 1990 statewide GHG emissions. The CLCPA requires² that NYSDEC promulgate, by 1/1/2024, implementing regulations containing legally enforceable emissions limits, performance standards, or other measures to ensure the statewide GHG emission limits are met. These regulations must be developed after public workshops and hearings and in consultation with stakeholders and the “Climate Action Council” (CAC), “Climate Justice Working Group” (CJWG) and “Just Transition Working Group” (JTWG) established by the CLCPA and be based on the findings of the CAC Scoping Plan. As of the date of this submittal the CLCPA implementing regulations have not been proposed by NYSDEC.

The NYSDEC issued a revision to Commissioner’s Policy CP-49, *Climate Change and DEC Action*³, which addresses implementation of the CLCPA Section 7(2) requirement to evaluate the Department’s decisions for compatibility with the GHG emission limits and consideration of the impacts to disadvantaged communities required by CLCPA Section 7(3). The NYSDEC has also issued Division of Air Resources Policy DAR-21, *Climate Leadership and Community Protection Act and Air Permit Applications*⁴, which provides “guidance for applicants and DEC staff” when preparing and reviewing CLCPA analyses submitted in support of air permit applications.

A separate provision of the CLCPA modifies Section 66 of the NY Public Service Law (PSL) to require that the NYS Public Service Commission (PSC) establish “targets” for electrical power generation from renewable sources as follows:

- by the year 2030 at least 70% of the statewide electric generation will be generated by renewable energy systems; and
- by the year 2040 the statewide electrical demand system will be zero emissions.

2.2 NYSDEC Information Requests

In RFAI No. 1, NYSDEC asked that CVEC provide the following information to support NYSDEC’s review of the CVEC Title V Operating Permit renewal application pursuant to Section 7(2) and 7(3) of the CLCPA:

- Calculations showing the facility’s potential GHG emissions in CO2 equivalents, including upstream emissions and, if possible, the projected facility emissions for the years 2030 and 2050. [See Sections 3.3 & 3.4.]
- A discussion of how GHG emissions from the facility will be mitigated or reduced consistent with the CLCPA statewide emission limits in ECL Article 75 and the CLCPA requirement for zero-emissions from the electric generation sector by 2040. [See Section 6.]
- An explanation if there are no feasible ways to reduce GHG emissions. [See Section 6.]
- Calculations of co-pollutant emissions and a discussion of any alternatives or mitigation measures that will be used to reduce the impact of those emissions if the project is in or potentially impacts a Draft Disadvantaged Community identified by the CJWG. [See Section 7.]

² ECL §75-0109

³ NYSDEC Commissioner’s Policy CP-49 / *Climate Change and DEC Action*, Revised December 14, 2022.

⁴ NYSDEC Division of Air Resources Policy DAR-21, *The Climate Leadership and Community Protection Act and Air Permit Applications*, Issued December 14, 2022.

In RFAI No. 2, NYSDEC asked that CVEC “prepare and submit an updated and more detailed justification for the renewal of the Title V permit” including a discussion of any potential need for the facility as supported by independent third parties. Additionally, NYSDEC requested that CVEC provide a more detailed suite of quantifiable, feasible mitigation options for review. [See Sections 5 & 6.]

The information requested in the RFAs conflicts with the guidance in DAR-21 and the CLCPA requirements in that the DAR-21 requires an applicant to provide a description of proposed alternatives or mitigation measures *only if the project will result in an increase in actual or potential GHG emissions*⁵. Likewise, Section 7(2) of the CLCPA requires that DEC review its decisions for consistency with the statewide GHG emission limits in ECL Article 75 and identify alternatives or mitigation measures *if a decision is inconsistent*, but it does not require applicants to submit possible mitigation options projects that *have not* been determined to be inconsistent. Notwithstanding, CVEC has tried to provide as much of the requested information as possible to aid NYSDEC in its review and approval of the Title V Permit renewal application.

2.3 Facility Description

The CVEC facility consists of three General Electric (GE), Model 7FA.05, combined-cycle combustion turbine generator (CTG) units that commenced commercial operations in October and November 2019, and February 2020, respectively. It is one of the most efficient thermal generation sources in the state of New York. As a result, as discussed in Section 5 below, it often displaces older less efficient generation resources which reduces the state’s overall emissions profile.

Each combustion turbine exhausts via a heat recovery steam generator (HRSG) equipped with duct burners (DB) for supplemental firing and a separate stack. A 60 MMBTU/hr auxiliary boiler, used to assist with plant startup and to keep plant components warm during standby periods, exhausts via the CTG #1 stack.

The facility also includes a 1,500 kW emergency diesel generator and a 260-hp diesel powered emergency fire pump. In lieu of a cooling tower and non-contact cooling water system, the CVEC facility uses a dry cooling system and an air-cooled condenser which has no air emissions.

The CTGs, DBs, and auxiliary boiler fire pipeline natural gas. The auxiliary boiler is limited to 4,500 hours of operations per year, or less, which equates to a maximum of 270 million cubic feet of natural gas per year. The two emergency diesel engines use ultra-low sulfur diesel (ULSD) fuel with a sulfur content of less than or equal to 15 ppm by weight and are limited to 500 hours of operations or less per year.

The GE 7FA.05 combustion turbines use a dry low NOx (DLN) combustion system to reduce NOx emissions. The duct burners and auxiliary boiler are also equipped with low NOx burners. A selective catalytic reduction (SCR) system and oxidation catalyst in each HRSG further reduce NOx, CO, and VOC emissions from the CTGs and DBs.

The combined-cycle units are subject to 6 NYCRR 251.3(a), which limits CO2 emissions from new electric generating facilities. The current Title V Permit also contains “Best Available Control Technology” (BACT)

⁵ DAR-21, Section V.C.6.

limits on GHG emissions, in CO₂e, for the auxiliary boiler, the two diesel engines, and the facility as a whole.

3 Calculated Greenhouse Gas Emissions

The NYSDEC RFAI No. 1 requested that CVEC “calculate the project’s potential to emit GHG,” including any upstream emissions, and “include calculations showing the project’s projected GHG and CO₂e emissions in the years 2030 and 2050, if possible”. The DAR-21 policy states⁶ that calculations of actual direct GHG emissions from the project should also be included with the analysis.

The DAR-21 policy defines the “project scope” as “any new or modified emission sources that have the potential to emit GHGs” and excludes “existing equipment whose operations are not being changed unless deemed necessary to assess CLCPA consistency”. Although the CVEC Title V Renewal application does not include any new or modified emissions sources, the actual and potential GHG emissions from existing sources at the facility were calculated and included as described in the following paragraphs.

3.1 *Direct Emissions Calculations*

For the purpose of this analysis, direct GHG emissions were calculated based on potential and actual fuel consumption in the three combined-cycle units (GTGs and DBs), the auxiliary boiler and the two emergency diesel engines. Emissions from trivial and mobile sources at the facility were not included. Greenhouse gas emissions from the combustion sources at the facility include carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O).

For consistency with other applicable GHG reporting requirements, emission factors from the following sources were used in the calculations. As per the RFAI No. 1 and DAR-21, the 20-year global warming potentials (GWP₂₀) from 6 NYCRR 496.5 were used to calculate GHG emissions as CO₂ equivalents (CO₂e).

Table 1: Sources of GHG Emission Factors

	CO ₂	CH ₄ / N ₂ O	GWP ₂₀
GTGs & DB	40 CFR 75, App. G, Eqn. G-4	40 CFR 98, Table C-2	6 NYCRR 496.5
Auxiliary Boiler	40 CFR 98, Table C-1		
Emergency Diesel Engines			

3.2 *Upstream Emissions Calculations*

The NYSDEC RFAI No. 1 requested that CVEC include in its potential emissions calculations “upstream” GHG emissions associated with the generation of electricity imported into the State, or the extraction, transmission, and use of fossil fuels imported into the State. The maximum potential GHG emissions will occur when the combined-cycle units are continuously operating and generating electricity, in which case no imported electricity will be used at the facility. The calculated upstream GHG emissions, therefore, consist solely of emissions due to natural gas and ULSD⁷ imported into the State for use as fuel for the facility combustion units.

⁶ DAR-21, Section V.C.1.

⁷ The calculations conservatively assume that all the ULSD used at the facility is imported into the state.

RFAI No. 1 instructed CVEC to calculate upstream GHG emissions using emission factors from *Appendix A, Emission Factors for Use by State Agencies and Applicants*, of the 2021 NYSDEC Statewide GHG Emissions Report. For the response to RFAI No. 2, the upstream emissions calculations are updated, per DAR 21, Section V.C.3, to use the emission factors in *the most recent* (i.e., 2024) version of the *Emission Factors for Use by State Agencies and Applicants* from the Statewide GHG Emissions Report.

As noted in the Statewide GHG Emissions Reports, the upstream emission factors are “a work in progress” subject to future stakeholder comment and a continual improvement process “as additional information becomes available”. These emission factors were used to calculate potential GHG emissions, but CVEC does not possess information on GHG emissions from the extraction, production, or transmission of fuels used at the facility and cannot, therefore, verify that the resulting values correctly reflect upstream emissions attributable to the facility.

3.3 Potential GHG Emissions

The potential GHG emissions calculations for the CVEC facility are included in Appendix A and summarized in Table 2 below. Potential direct GHG emissions from the CTGs and DBs were calculated using 8760 hours of operation and the design heat input rate at ISO conditions (e.g., 59 deg. F ambient temperature). Potential GHG emissions from the auxiliary boiler and the diesel engines were calculated using the design heat input / fuel consumption rate and the maximum annual operating hours allowed by the Title V Permit for each emission source (4,500 hours/year for the auxiliary boiler and 500 hours/year for each emergency engine).

The CVEC facility Title V Permit contains an annual limit of 3,593,609 tons per year total direct GHG emissions (CO₂e, GWP100) from all combustion sources at the facility. This limit is more restrictive than the sum of the calculated potential emissions for the individual sources and, therefore, represents the maximum potential GHG emissions for the facility. The equivalent facility-wide GHG Potential to Emit (PTE), using 20-year GWPs, is 3,597,312 tons/year.

Potential upstream GHG emissions attributable to CVEC facility operations were calculated using emission factors from the *NYSDEC 2024 Statewide GHG Emissions Report* and the maximum potential natural gas and ULSD that could be used annually at the facility. The maximum potential annual fuel use was determined by summing the maximum amount of fuel that could be used in each emission unit without exceeding an annual operating hour or GHG emissions limit in the Title V Permit. These calculations are detailed in Appendix A.

Table 2: Maximum Potential GHG Emissions (tons/year)

Potential Direct GHG Emissions from Combustion Sources (tons/year)	CVEC Maximum Potential Annual GHG Emissions				Permit Limits
	CO ₂	CH ₄	N ₂ O	CO ₂ e, GWP20	CO ₂ e, GWP100
Total for three CTG-DB	3,931,007	73	7	3,939,057	---
Auxiliary Boiler	15,792	0.3	0.03	15,825	---
Emergency Diesel Generator	608	0.02	0.005	611	595
Diesel Fire Pump	73.4	0.003	0.0006	74	74
Facility Total	3,947,480	73	7	3,955,567	3,593,609*

Potential Upstream GHG Emissions from Fuels Used (tons/year)					
Natural Gas	835,503	22,437	9	2,722,902	
ULSD	122	1.1	0.002	211	
Total Upstream Potential Emissions	835,626	22,438	9	2,722,902	
Facility-wide Direct Plus Upstream Potential GHG Emissions (tons/year)					
Direct Emissions				3,597,312*	
Upstream Emissions				2,722,902	
Facility-Wide Total Potential Emissions				6,320,214	
Facility-wide Direct plus Upstream Actual Annual GHG Emissions (see Table 3) – for comparison					
Facility-Wide Total Actual Emissions (tons/year)				3,665,245	

* The facility-wide Permit limit on GHG emissions (3,593,609 tons/year, CO2e) is based on 100-year Global Warming Potentials. The equivalent facility-wide limit using 20-year Global Warming Potentials is 3,597,312 tons/year.

3.4 Actual and Projected Actual GHG Emissions

3.4.1 Actual GHG Emissions

In addition to potential GHG emissions, DAR 21 requires that each CLCPA analysis include the project’s actual direct emissions (in tons/year), defined as “the highest 24-month average GHG emissions during the five years preceding the permit application”. The CVEC combustion turbines commenced commercial operation in late 2019 and early 2020. For the December 2022 RFAI response, the 24-month period with the highest facility GHG emissions was from October 2020 to September 2022. For this response to RFAI No. 2, the updated 24-month period with the highest facility GHG emissions was from July 2021 through June 2023.

Actual GHG emissions calculations for the CVEC facility are included in Appendix A and summarized in Table 3 below. Direct GHG emissions from the combustion turbines and duct burners were calculated based on quarterly reports of unit heat input and CO2 emissions submitted to US EPA. Average direct GHG emissions from the auxiliary boiler and emergency diesel engines, which are a minor portion of the total facility GHG emissions, were estimated using plant records of actual fuel use and heat input. Table 3 also includes estimated upstream GHG emissions from the extraction, processing and transport of fuels used at the facility based on the actual annual fuel use and emission factors in the *NYSDEC 2024 Statewide GHG Emissions Report*.

3.4.2 Projected Actual GHG Emissions

The NYSDEC RFAI No. 1 stated that the CLCPA analysis should also include, if possible, calculations of the projected GHG and CO2e emissions for the years 2030 and 2050. Future operations and GHG emissions from the facility will depend, in part, on factors that are uncertain and not under CVEC’s control; including the specific requirements of future NYSDEC regulations (due by 2024) to implement the state-wide CLCPA emission limits and changes in the state electric power grid and markets as they transition to meet the 2030 and 2040 renewable energy targets of the CLCPA.

In its *2023-2042 System & Resource Outlook* report⁸, the New York Independent System Operator (NYISO) found that a significant amount of new, zero GHG emissions, electric generating resources will be required to meet the CLCPA targets; including Dispatchable Emission-Free Resources (DEFERs) consisting of technologies that are not currently mature or commercially available. The report acknowledges that until these technologies emerge, fossil-fueled dispatchable resources will be required in some manner. The report does not, however, forecast how much individual GHG emission sources will operate.

As discussed in Section 5 below, it is likely that CVEC, as one of the most efficient and lowest-emitting⁹ fossil-fuel electric generating facilities in the state will continue to operate in some capacity through 2030 and beyond to support the transition to renewable energy sources. Any forecasts of future facility operations are, however, speculative because of the uncertainties concerning future regulatory requirements, the rate of development and installation of renewable generating resources (including DEFERs), retirement of existing fossil-fueled resources, and possible electrical transmission and fuel supply constraints.

For the purpose of this analysis, Table 3 indicates projected 2030 GHG emissions that are equal to current actual emissions, but this estimate will require revision (e.g., at the next Title V Permit renewal). For 2050, the projected GHG emissions in Table 3 reflect the CLCPA requirement that electric power generation in the state must be GHG emissions-free by 2040 and assume that the CVEC CT-DBs will not operate or will be converted to zero-emissions fuel (see Section 6). The remaining 2050 GHG emissions in Table 3 are consistent with past actual emissions from the auxiliary boiler and emergency diesel engines which do not generate electric power for use off site.

Table 3: CVEC Actual and Projected Actual GHG Emissions

Estimated Facility Actual GHG Emissions (tons/year, CO2e – GWP20)	Direct Emissions from Combustion	Upstream Emissions for Fuels Used	Facility Totals
		2,333,131	1,766,032
Estimated Projected GHG Emissions (tons/year, CO2e – GWP20)			
2030	2,333,131	1,766,032	3,665,245
2050	2,515	1,959	4,475
Current Title V Permit GHG Emissions Limit (tons/year, CO2e – GWP20)			
Facility-wide GHG Emissions Limit*	3,597,312	---	---

* The facility-wide Permit limit, based on 100-year Global Warming Potentials (GWP100) is (3,593,609 tons/year, CO2e). The equivalent facility-wide limit using 20-year Global Warming Potentials (GWP20) is 3,597,312 tons/year.

⁸ *2023-2042 System & Resource Outlook (The Outlook): A Report from the New York Independent System Operator*, July 23, 2024.

⁹ Based on quarterly data reported to US EPA’s Data Clean Air Markets Division for the period from 4Q2020 – 3Q2022, the heat rate (BTU/kWh) and direct CO2 emissions (lb/MWh) from electric generation at the CVEC facility were more than 15% less than the average for all other reporting facilities in the state and more than 20% less than the average for other units that fire only pipeline natural gas.

Consistency with CLCPA Emission Limits

The revised NYSDEC Policy CP-49 states that a Department action that complies with the CLCPA implementing regulations and the CAC Scoping Plan may be considered consistent with the Emission Limits and, therefore, in compliance with Section 7(2) of the CLCPA; but DEC has not yet proposed the implementing regulations. Consequently, the draft CP-49 calls for a phased-in approach when applying CLCPA Section 7(2) which, at the current stage, requires that the NYSDEC review decisions in the context of “consistency with [6 NYCRR] Part 496 Statewide GHG Emission Limit, [the] CLCPA Annual GHG Emissions Inventory, and the policies and programs included in the Scoping Plan”.

Part 496, the Annual GHG Emissions Inventory, and the CAC Scoping Plan address statewide emissions and policies and do not provide any requirements or guidance for evaluating an individual permit decision; however, both the revised Policy CP-49 and the DAR-21 state that routine permit renewals that would not lead to an increase in actual or potential GHG emissions and that do not include a significant modification would ordinarily be considered consistent with the CLCPA pending finalization of the scoping plan and future regulations. The CVEC Title V Permit renewal application does not include any significant modifications to the permit and will not lead to an increase in actual or potential GHG emissions. On that basis, therefore, the Permit Renewal is consistent with the CLCPA Emission Limits per DAR-21 and the revised CP-49.

CVEC has noted that several recent Title V Permit renewals by NYSDEC contain a requirement to “comply with regulations to be promulgated by the Department” to ensure that the CLCPA statewide greenhouse gas emissions are met. This would be an appropriate requirement for the CVEC Title V renewal to ensure ongoing consistency with the CLCPA limits following the promulgation of the 2024 implementing regulations. In the meantime, the CVEC Title V Permit contains the following limits on GHG emissions that represent the “Best Available Control Technology” (BACT) and are typically not found in Permits for other facilities:

- A limit on the maximum heat rate (i.e., minimum efficiency) of the combustion turbines that ensures GHG emissions *per MWh of electricity* produced will be minimized
- A limit on the GHG emission rate from the auxiliary boiler
- Annual limits on the total GHG emissions from the emergency diesel engines
- A facility-wide annual limit on total GHG emissions

The combined-cycle units are also subject to the NYSDEC CO₂ Budget Trading Program in 6 NYCRR 242 and the CO₂ Performance Standards for new Major Electric Generating Facilities in 6 NYCRR 251.3(a).

The above requirements will ensure that CVEC remains one of the most efficient and lowest emitting (on a lb CO₂e/MWh basis) electric generating facilities in the state at least until the next 5-year renewal when the CVEC Permit will be re-evaluated for CLCPA consistency in the context of the implementing regulations to be promulgated by NYSDEC.

4 Justification

Per the CLCPA Section 7(2) and DAR-21, if NYSDEC finds that a project is inconsistent with or will interfere with the State’s ability to meet the statewide emission limits, the Department must prepare a statement of justification before approving the project. While CVEC believes, as stated above, that the five-year

renewal of the facility's Title V Permit is consistent with the CLCPA emission limits, it is justified in any event because of the need for efficient, dispatchable, fossil-fueled electric generating resources for grid reliability during the transition to renewable energy sources.

The NYISO estimates that, due to increased electric energy consumption, the generation capacity required to achieve CLCPA mandates will be about three times the capacity of the current generation fleet. Recent NYISO studies have noted, however, that the retirement of fossil fueled resources is currently outpacing the development of new renewable energy and other DEFRs resulting in a reduction in reliability margins to concerning levels and highlighting the need for a carefully coordinated and orderly transition of the grid¹⁰. The studies also note that research, development, and construction lead times for essential DEFR technologies may extend beyond the policy mandate deadlines requiring some existing generation technologies to remain in operation to maintain a reliable system.¹¹ As a new, highly efficient, natural gas fired facility, CVEC can provide a portion of that generation while producing less GHG emissions per MWh than older, less efficient facilities or facilities that fire higher emitting fuels. In addition, the NYISO *2020 Reliability Needs Assessment*¹² identified a specific need for the Cricket Valley Energy Center stating that CVEC was one of the reasons that the deactivation of the Indian Point nuclear facility in 2020 and 2021 did not cause a reliability need.

In its RFAI No. 2, NYSDEC requested that CVEC provide an updated and more detailed justification for the Title V permit renewal including any potential need for the facility as supported by independent third parties. To satisfy that request, CVEC contacted NYISO and two independent consultants to provide assessments of the impact on grid reliability and state-wide GHG emissions if the CVEC facility was not able to operate. The results of those assessments are included in Appendix C of this submittal and summarized as follows:

- In its response letter to CVEC¹³, NYISO cited its analyses of the transmission security margins following generator outages performed for the *2024 Quarter 1 Short-Term Assessment of Reliability*, the *2023-2032 Comprehensive Reliability Plan* and the *2024 Reliability Needs Assessment* (RNA) and noted that all three studies identified deficiencies in the state-wide system margins following the outage of the CVEC facility. Additionally, a zonal resource adequacy margin (ZRAM) analysis, performed for the 2024 RNA, showed that the ZRAM is only 50 MW from violating the loss of load expectation criterion in 2034. This condition would be aggravated if the CVEC facility was unavailable. NYISO concluded, therefore, that the unavailability of Cricket Valley Energy Center may result in adverse impacts to the reliability of the transmission system.
- CVEC retained Hudson Energy Economics (HEE), LLC, an energy consulting company specializing in electric market design and market operations with a focus on the NYISO controlled market, to provide

¹⁰ *2023-2032 Comprehensive Reliability Plan: A Report from the New York Independent System Operator*, November 28, 2023, pg. 72.

¹¹ *2023-2042 System & Resource Outlook (The Outlook): A Report from the New York Independent System Operator*, July 23, 2024, pg. 9.

¹² *2020 RNA Report; Reliability Needs Assessment: A Report from the New York Independent System Operator*, November 2020, pg.18.

¹³ Zachary Smith, Senior Vice President, System & Resource Planning, NYISO, Inc. to Ronald Paryl, Director, Markets and Risk Management, Advanced Power Services (NA) Inc., October 17, 2024.

an independent assessment of the reliability need for the CVEC facility. In a letter to NYSDEC¹⁴, HEE cited analyses which project that NYISO could not meet peak loads while remaining in normal operation in eight of the next ten years if the CVEC facility was retired. The HEE letter also notes that CVEC has been designated as a medium-impact Interconnection Reliability Operating Limit (IROL) Critical Unit and, as such, provides critical services to maintain the voltage collapse transfer limits across the UPNY-Coned interface. The letter concludes that the CVEC facility's rapid load response capability and low GHG emission rates make it an ideal generation source until sufficient highly dispatchable emission free resources are developed and added to the system.

- CVEC also retained ESAI Power of Wakefield, MA to provide an assessment of how the statewide power plant generation and emissions are affected by the continued dispatch of the CVEC facility. In its assessment report¹⁵, ESAI noted that CVEC is among the most efficient and lowest GHG emitting electric generators in the State and that its capabilities to ramp up and down as needed are valuable for balancing the intermittent output from renewable energy resources being added grid. The report concluded that removing CVEC from the market would result in higher overall emissions in all of the forecast years included in the assessment (2025, 2030, and 2035) because the electric generation needed to replace CVEC output, whether from in-state or imported generation, would come from less efficient sources with generally higher GHG emission rates.

Collectively, these independent assessments concluded that continued operation of the CVEC facility is required to ensure grid reliability and provide efficient, low emissions electric generation pending the technological and commercial development of dispatchable GHG emissions free resources. Per Section V.D of the NYSDEC DAR-21 policy, these are examples of acceptable justification for a project.

5 Mitigation

The NYSDEC RFAI No. 1 requested that CVEC discuss how the emissions from the facility will be mitigated or reduced consistent with the 2030 and 2050 statewide GHG emission limits and the CLCPA requirement that the energy generation sector be “zero-emissions” by 2040 or explain if there are no feasible ways to reduce GHG emissions. RFAI No. 2 requested that CVEC submit “a more detailed suite of quantifiable, feasible mitigation options” for review. In subsequent discussions, NYSDEC indicated that CVEC should also include in the response any short-term GHG emissions mitigation projects that have been implemented or are planned for the near future.

Short term mitigation projects are discussed in Section 6.1 below. Sections 6.2 through 6.5 below discuss potential options that could be used, alone or in combination, to reduce or mitigate CVEC facility GHG emissions. The discussion includes, per Section V.D & E of DAR-21, the feasibility of each option and any technical or economic barriers to their implementation.

The feasibility of these options depends on several factors that are currently uncertain and outside the control of CVEC, including future regulatory actions and policies by the NYSDEC and PSC, the development of infrastructure for alternate fuels, financial considerations (e.g., capital and operating costs and

¹⁴ Mark Younger, President, Hudson Energy Economics, LLC to Michael Higgins, Section Chief, Bureau of Energy Project Management, NYSDEC Division of Environmental Permits, September 20, 2024.

¹⁵ ESAI Power, *Cricket Valley Energy Center, Assessment of Impacts on NYSIO Generator Dispatch & Emissions*, October 2024.

availability of financing for mitigation projects), development of new technologies, and the growth of renewable resources in the state, etc. Consequently, CVEC cannot confirm at this time which, if any, of these options will be implemented at the facility.

5.1 Short Term Mitigation Projects

In discussions concerning RFAI No. 2, NYSDEC indicated that CVEC should include in the response any short-term GHG emissions mitigation projects. The following projects are planned for the near future or have already been implemented at the CVEC facility. Currently, we have not identified any other offset projects.

5.1.1 Dover Union Free School District Carbon Footprint Reduction Project

The CVEC facility has agreed to assist the Dover Union Free School District in its efforts to reduce its carbon footprint. Accordingly, CVEC has committed to providing \$50k toward the purchase of an electric vehicle and charging station or two-cylinder, gas-powered utility vehicles to replace full-sized, gas-powered vehicles (truck/van) currently in use by the school district. The reduction in GHG emissions will depend on the type of vehicle purchased and its utilization.

5.1.2 Combustion Turbine Efficiency Projects

As noted, the CVEC combined-cycle units are among the most efficient, and consequently the lowest GHG emitting, fossil-fueled electric generators in the state. Equipment degradation results in a loss of plant efficiency over time. CVEC has an ongoing program to identify and correct equipment deficiencies that impact plant efficiency and increase emissions. Over the past two years the following routine and corrective maintenance actions have been completed for one or more of the three units:

- Combustion turbine hot gas path inspection and parts refurbishment
- Hot reheat bypass valve repairs
- Combustion turbine exhaust seal replacement
- Combustion turbine inlet air filter replacement

This maintenance ensures that the unit GHG emissions remain as low as possible.

5.2 Reduction in Operations

In its 2021-2040 System Outlook report, NYISO concluded that dispatchable fossil fuel generating resources would be dispatched more frequently but would operate for fewer hours during the year as more renewable energy resources come online and the state transitions to an emission-free grid to meet the CLCPA renewable energy targets¹⁶. Reduced annual operations would result in lower GHG emissions from these dispatchable fossil fuel sources, including CVEC.

The conclusion that dispatchable fossil fueled units will be dispatched less as New York State builds out renewable energy resources is also recognized in the 2024 NYISO 2023 – 2042 System and Resource Outlook report¹⁷. The Generation output from fossil fueled generation reduces by 14% to 26% between 2025 and 2035 in the three scenarios studied due to the projected addition of significant new generation

¹⁶ 2021-2040 System & Resource Outlook (The Outlook): A Report from the New York Independent System Operator, September 22, 2022, pgs. 7 & 8.

¹⁷ 2023-2042 System & Resource Outlook (The Outlook): A Report from the New York Independent System Operator, July 23, 2024, Appendix H: Capacity Expansion Model Results pg. 8, 14 and 19.

from offshore wind, land based wind, solar and storage resources. All three scenarios studied also result in GHG emission reductions between 2025 through 2035 due to decreased reliance on fossil fueled generation. As per the CAC Scoping Plan¹⁸, the transition to renewable energy resources will be driven by NYSDEC and NY PSC regulations and market initiatives.

5.3 Alternative Fuels - Hydrogen

5.3.1 Discussion

The use of “green” hydrogen, alone or blended with natural gas, as an alternative fuel can significantly reduce¹⁹ direct GHG emissions. To the extent that hydrogen replaces natural gas from out of state sources, it can also reduce upstream GHG emissions. The New York Power Authority (NYPA) and GE recently completed a demonstration project using 5% - 44% green hydrogen, by volume, in the GE LM6000 aeroderivative gas turbine at NYPA’s 45-MW, Brentwood Power Station. The project demonstrated that CO₂ mass emissions could be reduced by about 14%, using a fuel blend of 35% hydrogen by volume with natural gas while maintaining NO_x and CO emissions within regulatory permit limits using existing emission controls.

The GE Model 7FA.05 combustion turbines installed at the CVEC facility can be operated, with only minor modifications, using natural gas blended with up to 15% - 20% hydrogen. Fuel blends with higher percentages of hydrogen are possible but currently require replacement of the DLN combustors with a less efficient diffusion flame-type combustion system that uses steam or water injection.

Because of the size of its F-class combustion turbine fleet (over 1,600 units worldwide) there is a strong economic incentive for GE to develop a DLN retrofit that can burn 100% hydrogen. GE is actively engaged in research and development to that end. In July 2021, GE signed a memorandum of understanding (MOU) with CVEC to advance a demonstration project²⁰ wherein one of the facility turbines would fire 5% percent hydrogen blended with natural gas; and in May 2022 GE was awarded \$12MM in federal funding from the U.S. Department of Energy (DOE) to develop technologies for using higher percentages of hydrogen in fuel blends for gas turbines, with a specific focus on retrofits for the F-class fleet.

Currently carbon-free or “green” hydrogen, produced by electrolysis of water using renewable energy sources, comprises only about 1% of the 10 million metric tons (MMT) total annual U.S. hydrogen production²¹. Approximately 95% of the annual hydrogen production is from natural gas via the steam methane reforming (SMR) process which produces CO₂ as a byproduct that must then be captured and utilized or sequestered (see Section 6.2 below). The estimated amount of hydrogen required for one of the three CVEC combined-cycle units firing 100% hydrogen is about 18,000 kg/hour (0.1 - 0.2 MMT/year).

¹⁸ CAC Scoping Plan, Appendix A, Power Generation Advisory Panel Recommendations, Initiatives #1 and #14.

¹⁹ Burning pure hydrogen in the combustion turbines would eliminate CO₂ and methane emissions, but there would still be some NO_x (including nitrous oxide) emissions. Nitrous oxide is a GHG, but total CO₂e emissions would be much lower than when firing natural gas.

²⁰ CVEC is currently monitoring the state of the Hydrogen gas turbine market and met with GE Vernova in Cambridge, Massachusetts in 2024 to discuss the topic..

²¹ *Hydrogen Strategy: Enabling a Low-Carbon Economy*, Office of Fossil Energy, U.S. Department of Energy, July 2020.

Hydrogen is typically stored and transported as a high pressure compressed gas, in tube trailers or via pipeline, or as a cryogenic liquid²². Hydrogen is more flammable than natural gas and thus poses greater safety concerns in the event of leakage or venting. It is also more reactive than natural gas and can permeate and cause embrittlement of certain metals. Hydrogen can be transported in existing natural gas pipelines at concentrations of 5% - 15% by volume with only minor modifications required²³.

5.3.2 Barriers to Implementation

Hydrogen and hydrogen blended fuels are promising technologies for reducing GHG emissions that could be phased in as the needed technology and infrastructure are developed. There are, however, some significant technological and economic barriers that would need to be addressed for full-scale implementation at the CVEC facility. These include the following:

- Retrofit DLN technology for firing higher percentages of hydrogen in GE 7FA.05 combustion turbines is currently under development but it is not known when it will be commercially available or what the associated costs will be.
- Current production costs for hydrogen range from < \$2/kg to \$5 - \$6/kg, depending on the method of production, with “green” hydrogen from electrolysis being the most expensive. This is equivalent to about 2 – 10 times the cost of natural gas and presents an economic barrier for implementation of hydrogen fuel. (Note that the US DOE has launched initiatives with the goal of lowering the price of clean hydrogen to \$1/kg within the next 10 years.)
- The large amounts of hydrogen required would necessitate either onsite production or transportation to the site via a dedicated pipeline or the existing natural gas pipeline. Of these options, introducing hydrogen into the existing gas pipeline could have the fewest technical barriers and could be implemented incrementally using limited quantities of hydrogen at first, but it would require a suitably located source of sufficient hydrogen production.

Installation of a dedicated hydrogen pipeline requires a supporting hydrogen infrastructure that does not yet exist and would require substantial capital investment. In addition, permitting a new hydrogen pipeline could be difficult.

Onsite production of hydrogen could also be implemented incrementally, using modular production units; but it would require carbon capture and sequestration (see Section 6.2) or large amounts of electrical power from renewable sources (see Section 6.3) depending on whether SMR or electrolysis of water would be used as the hydrogen production method. The current source of water to the facility is on-site wells with permitted withdrawal limits. Additional sources of water would be required if electrolysis is used for hydrogen generation.

²² Tube trailers for hydrogen typically have a capacity of a few hundred kilograms and liquid hydrogen trailers have a capacity of 3,000 – 5,000 kilograms.

²³ *Blending Hydrogen into Natural Gas Pipeline Networks: A Review of Key Issues*, National Renewable Energy Laboratory, March 2013.

5.4 Carbon Capture, Utilization and Sequestration (CCUS)

5.4.1 Discussion

A typical carbon capture system (CCS) uses a liquid solvent (usually amine-based) with an affinity for CO₂ to absorb carbon dioxide from the combustion exhaust gases. The exhaust gas stream is cooled and directed through an absorption column where it mixes with the solvent. The CO₂-rich solvent is collected at the bottom of the absorption column and pumped to a stripper column where it is heated and releases the CO₂. The CO₂ can then be collected and compressed for transportation and geologic storage (sequestration) or utilization in industrial processes. The CO₂-lean solvent is cooled and returned to the absorption column for reuse²⁴.

Capture of direct CO₂ emissions from fossil fuel combustion does not reduce upstream emissions associated with the production, processing, and transport of the fuel. In addition, many current CO₂ sequestration projects are associated with Enhanced Oil Recovery (EOR) where captured CO₂ is injected into petroleum wells to increase their productivity. In this case, the captured CO₂ is used to produce more fossil fuel, which may not lead to a net decrease in GHG emissions.

CCUS demonstration projects have been implemented for industrial processes (including CO₂ capture for SMR production of hydrogen from natural gas), coal-fired power plants, and a few gas-fired power plants. The Inflation Reduction Act of 2022 included an expansion of the eligibility and amounts of federal tax credits for CCUS under Section 45Q of the Internal Revenue Code which may incentivize future projects.

CVEC is not aware of any current large scale retrofit of a CCUS for an existing, combined-cycle power generating facility, although U.S. DOE has awarded funding for several studies. In 2020, the Electric Power Research Institute (EPRI) was awarded funding from the U.S. DOE National Energy Technology Laboratory (NETL) to conduct a Front-End Engineering and Design (FEED) study to determine the technical and economic feasibility of a retrofit, post-combustion carbon capture unit at the California Resources Corporation's (CRC's) 550 MW, natural gas combined cycle (NGCC) Elk Hills Power Plant. EPRI submitted the final public report²⁵ for the study in January 2022. In February 2022, General Electric announced a \$5.7MM award from US DOE for a FEED study focused on retrofitable CCUS for power generations applications, with a goal of commercial deployment by 2030, specifically for Alabama Power's James A. Barry Electric generating plant. Both the Elk Hills and James A. Barry projects involve GE F-Class combined-cycle combustion turbines.

Because of the large amount of equipment and the energy needed for heating, cooling, and pumping the solvent and for compression, storage, and transport of the captured CO₂, the initial capital, and operating costs of CCUS are high. Per G.E. literature²⁶, adding a CCUS system with a 90% capture rate to an existing gas-fired power plant will roughly double its capital cost and footprint and cause a 6% - 10% reduction in combined cycle efficiency due to the heat and electrical power required to operate the CCS. The costs are not linear and increase exponentially with carbon capture rates.

²⁴ Eventually, depending on the chemical used, the solvent becomes degraded and must be replenished which adds to the CCS operating cost.

²⁵ *Public Final Report: Front-End Engineering Design Study for Retrofit Post-Combustion Carbon Capture on a Natural Gas Combined Cycle Power Plant*, Electric Power Research Institute, January 2022.

²⁶ *Decarbonizing Gas Turbines through Carbon Capture: A Pathway to Lower CO₂*, GE Gas Power, 2021, pgs. 8 – 11.

According to the EPRI FEED study report, the total installed cost of the retrofit CCS for the Elk Hills facility, which includes two, GE 7FA combustion turbines and a single stream turbine, would be \$748MM including a new auxiliary boiler to provide heating steam. The system would consume about 35 MW of electrical power (~ 6% of the nominal plant output) and would achieve a net overall CO₂ capture rate of 74%, including CO₂ emissions associated with the new boiler. (An alternate design using extraction steam from the combined-cycle plant in lieu of a new boiler would increase the overall CO₂ capture rate but would decrease plant output and efficiency by another ~ 6%.) The project costs do not include transportation and storage²⁷ of the captured CO₂.

5.4.2 Barriers to Implementation

The following economic and technological barriers make it unlikely that CCUS could be feasibly implemented to reduce or mitigate CO₂ emissions at the CVEC facility:

- Given the costs from the EPRI FEED study report and the fact that the CVEC facility consists of three, not two, GE 7FA combined-cycle units, it is likely that the total installation costs of a comparable system at CVEC would exceed \$1B.
- Since there are no utilization opportunities or sequestration sites in the vicinity of the CVEC facility, construction of a pipeline would be required to transport the captured CO₂ to a suitable storage location (possibly in western NY or PA). At a cost of \$2.2MM to \$3.9MM per mile²⁸, not including permitting, this would add another \$0.66B to \$1.17B to the cost of the project. Permitting for such a pipeline could be costly and difficult to obtain.
- The amount of makeup water required for CCS heating may exceed the current supply of water to the facility, in which case additional sources of water would be required.
- Degradation of the CCS solvent produces ammonia and organic compounds that may increase co-pollutant emissions (see Section 7).

5.5 On-Site Renewable Energy Generation and Storage

5.5.1 Renewable Energy Generation

Per the CLCPA renewable energy targets, generating resources such as solar and wind power will eventually replace fossil-fuel generation in the state. With respect to onsite development of these resources at the CVEC facility, the biggest barrier is the large footprint required.

Land use estimates from the National Renewable Energy Laboratory (NREL)²⁹ for large scale solar and wind projects are 5.5 – 6.1 acres/MW for photovoltaics and 30 – 44.7 acres/MW for onshore wind. Replacing the nominal 1,000 MW net electrical output capacity of the CVEC facility would, therefore, require around 6,000 acres of solar power generation or 30,000 – 40,000 acres of wind power. The CVEC property is < 200 acres, of which 57 acres are occupied by the combined-cycle facility. Thus, only a small fraction of the CVEC generating capacity could be replaced by on-site solar or wind power.

²⁷ The facility is in the middle of the Elk Hills Oil field which provides options for both EOR and non-EOR storage.

²⁸ Estimated using the *FECM/NETL CO₂ Transport Cost Model (2022)*.

²⁹ <https://www.nrel.gov/analysis/tech-size.html>

5.5.2 Energy Storage

Energy storage systems do not provide generating capacity, but they can supply energy for short periods of time, when renewable resources are not generating, or provide other grid support functions. They can, therefore, reduce the need for dispatchable fossil-fueled facilities to operate.

Depending on the type of energy storage, the required footprint may be less than solar or wind power generation. For example, a utility-scale battery storage system of 100 MWh could fit on less than 0.5 acres³⁰. Nonetheless, an energy storage system that would replace the facility output for 1 hour would not fit on the CVEC property.

CVEC has not conducted an in-depth evaluation of offsite renewable energy and energy storage opportunities.

6 Co-Pollutant Impacts

The NYSDEC RFAI No. 1 requests that CVEC provide calculations of co-pollutant emissions from each GHG source if the project is in or impacts a Disadvantaged Community identified by the NYS Climate Justice Working Group and discuss existing measures or alternatives or mitigation measures that will be used to reduce the impact of those emissions. The CVEC facility is in Dutchess County near the intersection of County Route 26 (Cricket Hill Road) and New York Highway 22. The facility is on the northeast boundary of Census Tract 3602704003, which is on the CJWG list of designated Disadvantaged Communities.

6.1 *Co-Pollutant Emission Calculations*

“Co-pollutants” are defined in ECL Article 75 as hazardous air pollutants (HAPs) produced by greenhouse gas emissions sources. Accordingly, Appendix B contains calculations of short-term (lb/hr) and long-term (tons/yr) potential HAP emissions from the operation of GHG emission sources at the CVEC facility using published emission factors and maximum firing rates³¹. These calculations are consistent with Appendix F of the 2020 Title V renewal application and are a conservative estimate of the worst-case emissions. The actual maximum HAP emissions are expected to be significantly lower because the HAP emissions factors used in Appendix B do not consider the effect of the DLN combustors and oxidation catalysts on total HAP emissions from the combustion turbines and duct burners.

Dry-low NO_x (lean-premix) combustion systems typically have lower emission rates of CO, VOC, and VOC HAPs than conventional, diffusion flame combustion systems due to more complete fuel combustion. A 2002 EPA memorandum³² comparing source test data from diffusion flame and lean pre-mix turbines found that pre-mix turbines had > 85% lower HAP emissions. For the CVEC GE Model 7FA.05 combustion

³⁰ <https://www.nyserda.ny.gov/All-Programs/Energy-Storage-Program/Energy-Storage-for-Your-Business/Types-of-Energy-Storage>

³¹ For the CTG and DB, the firing rate for the 100% load GE design case at ISO conditions (i.e., 59 deg. F) are used for calculating annual emissions while the maximum design firing rates (i.e., at -8 deg. F) are used for calculating hourly HAP emission rates.

³² "HAP Emission Factors for Stationary Combustion Turbines" memorandum from Melanie Taylor, Alpha-Gamma Technologies, Inc., to Sims Roy, US EPA OAQPS, 10/23/2002.

turbines, test data for a similar model suggest that the HAP emission rates may be even lower³³. The calculations of combustion turbine HAP emissions in Appendix B use a lean-premix turbine emission factor from the 2002 EPA memorandum for formaldehyde and uncontrolled emission factors from Table 3.1-3 of US EPA's AP-42, *Compilation of Emissions Factors* for other HAPs; therefore, actual HAP emissions from the turbines will be lower.

The oxidation catalyst used to reduce CO and VOC emissions in the combined combustion turbine and duct burner exhaust will also reduce VOC HAP emissions³⁴. The HAP emission factors used in Appendix B do not account for this reduction; therefore, actual emissions will be lower than calculated.

6.2 Co-Pollutant Mitigation Measures

The combination of the CT DLN combustion systems and the oxidation catalysts ensure that VOC HAP emissions from the CTGs and duct burners are as low as feasibly possible. The CVEC facility employs the following additional measures to minimize the impact of HAP emissions from GHG sources:

- The CTGs, DBs and Auxiliary Boiler fire only natural gas fuel. The Title V Permit contains short term VOC emission rate limits for these sources and a facility-wide annual VOC emissions limit which are the "Lowest Achievable Emission Rate" (LAER). Minimizing VOC emission also minimizes emissions of VOC HAPs which constitute the majority of the HAP emissions from gas-fired sources.
- The Emergency Diesel Generator and Diesel Fire Pump engines are subject to NESHAPS (40 CFR 63, Subpart ZZZZ) and NSPS (40 CFR 60, Subpart IIII) requirements including NOx + HC emission standards. These limits and annual VOC limits in the Title V Permit are considered LAER for VOCs. Minimizing VOC emissions also minimizes emissions of VOC HAPs rates from the engines.
- The Emergency Diesel Generator and Diesel Fire Pump engines use only ULSD diesel, which typically contains a low content of trace metals. This minimizes emissions of HAP metals from the engines.
- Operation of the emergency diesel engines is limited to 500 hours per year or less. Operation of the Auxiliary Boiler is limited to 4500 hours per year or less.
- In lieu of a wet cooling tower, the CVEC facility uses air cooled condensers with no emissions. This eliminates the potential for air toxic emissions associated with cooling water treatment chemicals.

CVEC believes these existing measures minimize HAP emissions from GHG sources at the facility to the extent possible and are sufficient to mitigate impacts outside the facility. An Air Toxics Evaluation was submitted with the initial facility permitting information that demonstrated that maximum projected HAP impacts from dispersion modeling were below the NYS Annual and Short Term Guidance Concentrations (AGCs and SGCs).

³³ An August 2001 GE White Paper on CO emission controls cites CARB Method 430 formaldehyde test results from two, natural gas fired, PG7241FA combustion turbines that are less than 25 ppbvd @ 15% O₂ (5.95E-05 lb/MMBTU) which is 8% of the uncontrolled emission factor in AP-42, Table 3.1-3 and 54% of the emission factor used in Appendix B.

³⁴ A comparison of selected uncontrolled and controlled HAP emission factors in the emission factor documentation for AP-42, Section 3.1 suggests that HAP emissions from combustion turbines equipped with a CO catalyst are ~ 30% - 80% lower than uncontrolled emissions. HAP emissions from the duct burners would be similarly reduced.

7 Conclusions

Based on the current Policy documents and the CAC Scoping Plan, CVEC concludes that the requested five-year renewal of its Title V Permit is consistent with the state-wide emission limits in the NYS CLCPA. The Title V renewal application does not include any increase in actual or potential GHG emissions and does not interfere with the attainment of the statewide limits or the CLCPA renewable energy targets. Per the NYISO Outlook report, dispatchable fossil fuel generation will be required during the transition to renewable sources and CVEC, as the lowest emitting source in the state, can provide that generating capacity with the minimum GHG emissions and co-pollutant impacts. Consequently, CVEC requests that NYSDEC approve the renewal application.

As noted in the NYISO 2021-2040 Outlook report, “Future uncertainty is the only thing certain about the electric power industry”³⁵. CVEC will continue to evaluate ways to reduce or mitigate GHG emissions from its operations in light of future NYSDEC regulations and changing market conditions and will update this analysis at the next Permit renewal.

³⁵ 2021-2040 System & Resource Outlook (*The Outlook*), September 22, 2022, pg. 76.

Appendix A: GHG Emission Calculations

Cricket Valley Energy Center (CVEC) Maximum Potential GHG Emissions (including upstream emissions)

GHG Emission Factors & Global Warming Potentials Used in Calculations

Emission Unit and Fuel Type	GHG Emission Factors						Source
	Units	CO2	CH4	N2O	CO2e (GWP-20)	CO2e (GWP-100)	
Combustion Turbines and Duct Burners firing Natural Gas	kg/MMBTU	---	0.001	0.0001	---	---	40 CFR 75, App. G, Eq. G-4 (CO2); 40 CFR 98, Table C-2 (CH4 & N2O)
	lb/MMBTU	118.9	0.0022	0.00022	119.1	119.0	
Aux. Boiler firing natural gas	kg/MMBTU	53.06	0.001	0.0001	---	---	40 CFR 98, Tables C-1 & C-2; (Permit Limit for CO2e is 119 lb/MMBTU)
	lb/MMBTU	117.0	0.0022	0.00022	117.2	117.1	
Diesel engines firing #2 fuel oil (ULSD)	kg/MMBTU	73.96	0.003	0.0006	---	---	40 CFR 98, Tables C-1 & C-2
	lb/MMBTU	163.1	0.0066	0.0013	164.0	163.6	
Upstream emission factors for natural gas imported into NYS	kg/MMBTU	12.55	0.34	0.00014	42.147	43.147	From the NYSDEC 2024 Statewide Greenhouse Gas Emissions Report
	lb/MMBTU	27.67	0.7429	0.0003	92.92	95.12	
Upstream emission factors for diesel fuel imported into NYS	kg/MMBTU	13.63	0.117	0.00025	25.375	26.375	
	lb/MMBTU	30.06	0.2579	0.0006	55.94	58.15	
20-year Global Warming Potentials (GWP-20)	---	1	84	264	---	---	6 NYCRR 496.5
100-year Global Warming Potentials (GWP-100)	---	1	25	298	---	---	40 CFR 98, Table A-1

Maximum Potential GHG Emissions from Combustion		Each CTG ¹	Each DB ¹	Total for All CT-DB ¹	Aux. Blr	Emer. Dsl. Gen. ²	Dsl. Fire Pump ²	Facility
Fuel Type	---	natural gas			natural gas	diesel fuel oil		---
Design Heat Input Capacity @ ISO Conditions	MMBTU/hr	2,396	247	7,928	60	14.9	1.8	---
Max. Annual Operations	hours	8,760	8,760	8,760	4,500	500	500	---
Max. Annual Heat Input	MMBTU	20,437,080	1,611,840	66,146,760	270,000	7,452	900	66,425,112
Calculated Maximum Annual GHG Emissions (tons/year)	CO2	1,214,546	95,789	3,931,007	15,792	608	73.4	3,947,480
	CH4	23	2	73	0.3	0.02	0.003	73
	N2O	2	0	7	0.03	0.005	0.0006	7
	CO2e ³	1,217,034	95,986	3,939,057	15,825	611	74	3,955,567
Permit Limits on Potential GHG Emissions (tons/year)	CO2e ⁴	---	---	---	---	595	74	3,593,609

Equivalent facility-wide limit based on GWP-20: 3,597,312

Maximum Potential Upstream GHG Emissions	Natural Gas	Diesel Fuel Oil	Total	
Max. Fuel Use w/o Exceeding Annual GHG Emission Limits ⁵	MMBTU	60,400,722	8,149	60,408,872
Calculated Maximum Annual Upstream GHG Emissions (tons/year)	CO2	835,503	122	835,626
	CH4	22,437	1.1	22,438
	N2O	9	0.002	9
	CO2e	2,722,690	211	2,722,902

Facility Total Potential GHG Emissions (tons/year, CO2e, GWP20)	
Direct Emissions	3,597,312
Upstream Emissions	2,722,902
Total Potential GHG Emissions	6,320,214

Notes:

- The CTG and DB heat input rates for the 100% load GE design case at ISO conditions (59 deg. F, 1 atm. and 60% R.H.) are used for calculating annual emissions.
- Diesel engine design capacity based on full load fuel consumption rates from manufacturer's specifications (i.e., 108 gph & 12.7 gph for the EDG and DFP, respectively) and the default heating value (0.138 MMBTU/gal) from 40 CFR 98, Table C-1.
- Calculated using 20-year GWPs.
- Title V Permit limitd on annual GHG (CO2e) emissions based on 100-year GWPs.
- Based on the lower of the Max. Annual Heat Input values in the Potential GHG Emissions Table above or the maximum fuel use that does not result in the exceedance of an annual GHG emissions limit in the Title Permit as follows:

- Max. annual diesel fuel use for the diesel fire pump = 876 MMBTU
 - Max. diesel fuel use w/o exceeding annual GHG permit limit for the emergency diesel generator = 7273 MMBTU
 [(595 tons CO2e limit) x (2000 lbs/ton) / 163.6 lb/MMBTU]
 - Max. annual natural gas use for the auxiliary boiler = 270,000 MMBTU
 - Max. naural gas use in the CTG/DB without exceeding the facility-wide annual GHG permit limit = 60,130,722 MMBTU
 [2000 lbs/ton x (3,593,609 tons CO2e (facility limit) - 595 tons CO2e (EDG limit) - 74 tons (DFP limit) - 15,825 tons CO2e (AB potential emiss.)) / 119.0 lb/MMBTU CO2e]

Cricket Valley Energy Center (CVEC) Actual GHG Emissions from Combustion Sources

GHG Emission Factors & Global Warming Potentials Used in Calculations

Emission Unit and Fuel Type	GHG Emission Factors (lb/MMBTU)				Fuel Heat Value	Source
	CO2	CH4	N2O	CO2e		
Combustion Turbines and Duct Burners firing Natural Gas	118.86	0.0022	0.00022	119.1	---	40 CFR 98, Table C-2 (CH4 & N2O) 40 CFR 75, App. G, Eq. G-4 (CO2)
Aux. Boiler firing natural gas	116.98	0.0022	0.00022	117.2	1.026E-03 MMBTU/scf	40 CFR 98, Tables C-1 & C-2
Diesel engines firing #2 fuel oil (ULSD)	163.05	0.0066	0.0013	164.0	0.138 MMBTU/gal	40 CFR 98, Tables C-1 & C-2
Upstream emission factors for natural gas imported into NYS	27.67	0.7429	0.0003	90.2	---	From the NYSDEC 2024 Statewide Greenhouse Gas Emissions Report
Upstream emission factors for diesel fuel imported into NYS	30.06	0.2579	0.0006	51.9	---	
Global Warming Potentials (GWP-20)	1	84	264	---	---	Per 6 NYCRR 496.5

Combustion Turbine and Duct Burner Heat Input & CO2 Emissions¹

Quarter	Heat Input (MMBTU)				CO2 Emissions (tons)			
	CT-DB 1	CT-DB 2	CTDB 3	CT-DB Total	CT-DB 1	CT-DB 2	CTDB 3	CT-DB Total
3rd Quarter 2021	4,213,030	4,294,696	4,396,655	12,904,381	250,404	255,229	261,292	766,925
4th Quarter 2021	2,569,871	3,195,017	3,330,017	9,094,905	152,739	189,876	197,900	540,514
1st Quarter 2022	1,056,016	1,070,436	991,413	3,117,865	62,758	63,615	58,920	185,293
2nd Quarter 2022	3,834,499	4,368,131	3,786,874	11,989,504	227,879	259,594	225,052	712,525
3rd Quarter 2022	4,072,956	4,832,357	4,476,145	13,381,458	242,063	287,192	266,026	795,281
4th Quarter 2022	2,989,376	2,874,914	3,667,726	9,532,016	177,662	170,862	217,977	566,500
1st Quarter 2023	2,616,235	2,732,690	1,999,538	7,348,463	155,474	162,400	118,830	436,703
2nd Quarter 2023	4,254,132	2,803,018	3,913,242	10,970,392	252,824	166,586	232,566	651,975
Highest 24-month total (3Q21 - 2Q23)				78,338,984	Highest 24-month total (3Q21 - 2Q23)			4,655,717
Annual Average				39,169,492	Annual Average			2,327,859

CVEC Annual Average Heat Input and GHG Emissions (7/21 - 6/23)		Auxiliary Boiler ²	Emer. Dsl. Gen. ²	Diesel Fire Pump ²	Total CT-DB ¹ (Avg. 3Q21 - 2Q23)	Upstream Emissions	
						Natural Gas	ULSD
Annual Fuel Use (MCF/yr, gals/yr)	7/21 - 6/22	8,176	524	314	---	---	---
	7/22 - 6/23	8,334	291	464			
	Annual Avg.	8,255	408	389			
Annual Heat Input (MMBTU/yr)	7/21 - 6/22	8,389	72	43	---	---	---
	7/22 - 6/23	8,551	40	64			
	Average	8,470	56	54			
CO2 Emissions	tons/year	495	6	4	2,327,859	541,936	1.65
CH4 Emissions	tons/year	0.01	0.0002	0.00014	43	14,554	0.01
N2O Emissions	tons/year	0.001	0.00005	0.000029	4	6	0.00
CO2e Emissions	tons/year	496	6	4	2,332,625	1,766,030	3

Notes:

1. Combustion turbine and duct burner (CT-DB) heat input and CO2 emissions from quarterly reports to US EPA.
2. Auxiliary Boiler and diesel engine emissions calculated from monthly fuel use records.

Actual GHG Emissions		Direct Emissions from Fuel Consumption				Upstream Emissions		Facility Total
		CT-DB Total	Aux. Blr	Emer. Dsl. Gen.	Dsl. Fire Pump	Natural Gas	Diesel Fuel	
Total GHG Emissions (tons/yr CO2e)	24-month average	2,332,625	496	6	4	1,766,030	3	4,099,164
		Facility Total Direct Emissions				2,333,131	Total	1,766,032
Estimate of Projected 2030 & 2050 Emissions								
Total GHG Emissions (tons/yr CO2e)	2030	2,332,625	496	6	4	1,766,030	3	4,099,164
		Total Direct Emissions				2,333,131	Total	
	2050*	0	2,507	7	2	1,956	3	4,475
		Total Direct Emissions				2,515	Total	1,959

* 2050 projected emissions from CVEC's December 2022 response to the NYSDEC RFAI No.1

Appendix B: Co-pollutant (HAP) Emission Calculations

Cricket Valley Energy Center (CVEC) Maximum Potential Hazardous Air Pollutant (HAP) Emissions

Hazardous Air Pollutant	Each CTG ⁴		Each DB ⁴		Total for All CT-DB ⁴		Auxiliary Boiler	Emergency Diesel Generator ⁵	Diesel Fire Pump ⁵	Facility Total										
	Maximum	ISO Cond.	Maximum	ISO Cond.	Maximum	ISO Cond.														
	Design Capacity (MMBTU/hr)		247 184		7,928 7,551						60	15.6	1.8	---						
	---	8,760	---	8,760	---	8,760	4,500	500	500	8,760										
	---	20,437,080	---	1,611,840	---	66,146,760	270,000	7,825	876	66,425,461										
Co-Pollutant Emission Factors (lb/MMBTU)																				
Maximum Potential Co-Pollutant Emissions																				
Hazardous Air Pollutant	CT ¹	DB & Aux. Blr. ²	Emer. Dsl. Gen. ³	Dsl. Fire Pump ³	NYSDEC HAP	Each CTG		Each DB		Total for All CT-DB		Auxiliary Boiler		Emer. Dsl. Gen.		Diesel Fire Pump		Facility Total		
						lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr
Acetaldehyde	4.00E-05	---	2.52E-05	7.67E-04	X	9.58E-02	0.41	---	---	2.87E-01	1.23	---	---	3.94E-04	0.000	1.34E-03	0.000	2.9E-01	1.2	
Acrolein	6.40E-06	---	7.88E-06	9.25E-05	X	1.53E-02	0.07	---	---	4.60E-02	0.20	---	---	1.23E-04	0.000	1.62E-04	0.0000	4.6E-02	0.2	
Benzene	1.20E-05	2.06E-06	7.76E-04	9.33E-04	X	2.87E-02	0.12	5.09E-04	0.00	8.78E-02	0.37	1.24E-04	0.00	1.21E-02	0.003	1.64E-03	0.0003	1.0E-01	0.4	
1,3-Butadiene	4.30E-07	---	---	---	X	1.03E-03	0.00	---	---	3.09E-03	0.01	---	---	---	---	0.00E+00	---	3.1E-03	0.0	
Dichlorobenzene	---	1.18E-06	---	---	---	---	---	2.91E-04	0.00	8.72E-04	0.00	7.06E-05	0.00	---	---	0.00E+00	---	9.4E-04	0.0	
Ethylbenzene	3.20E-05	---	---	---	X	7.67E-02	0.33	---	---	2.30E-01	0.98	---	---	---	---	0.00E+00	---	2.3E-01	1.0	
Formaldehyde	1.11E-04	7.35E-05	7.89E-05	1.18E-03	X	2.66E-01	1.13	1.82E-02	0.06	8.52E-01	3.58	4.41E-03	0.01	1.23E-03	0.000	2.07E-03	0.0000	8.6E-01	3.6	
Hexane	---	1.76E-03	---	---	X	---	---	4.36E-01	1.42	1.31E+00	4.27	1.06E-01	0.24	---	---	0.00E+00	---	1.4E+00	4.5	
Naphthalene	1.30E-06	5.98E-07	1.30E-04	8.48E-05	---	3.11E-03	0.01	1.48E-04	0.00	9.79E-03	0.04	3.59E-05	0.00	2.03E-03	0.001	1.49E-04	0.0001	1.2E-02	0.0	
Propylene Oxide	2.90E-05	---	---	---	X	6.95E-02	0.30	---	---	2.08E-01	0.89	---	---	---	---	0.00E+00	---	2.1E-01	0.9	
Toluene	1.30E-04	3.33E-06	2.81E-04	4.09E-04	X	3.11E-01	1.33	8.23E-04	0.00	9.37E-01	3.99	2.00E-04	0.00	4.40E-03	0.001	7.17E-04	0.0001	9.4E-01	4.0	
Xylene (Total)	6.40E-05	---	1.93E-04	2.85E-04	X	1.53E-01	0.65	---	---	4.60E-01	1.96	---	---	3.02E-03	0.001	4.99E-04	0.0001	4.6E-01	2.0	
Total Organic HAPs	4.27E-04	1.85E-03	1.49E-03	3.75E-03	X	1.02	4.35	0.46	1.49	4.43E+00	17.53	1.11E-01	0.25	2.33E-02	0.006	6.57E-03	0.0007	4.6E+00	17.8	
Acenaphthene	---	1.76E-09	4.68E-06	1.42E-06	---	---	---	4.36E-07	0.00	1.31E-06	0.00	1.06E-07	0.0	7.32E-05	0.000	2.49E-06	0.000	7.7E-05	0.0	
Acenaphthylene	---	1.76E-09	9.23E-06	5.06E-06	---	---	---	4.36E-07	0.00	1.31E-06	0.00	1.06E-07	0.0	1.44E-04	0.000	8.87E-06	0.000	1.5E-04	0.0	
Anthracene	---	2.35E-09	1.23E-06	1.87E-06	---	---	---	5.81E-07	0.00	1.74E-06	0.00	1.41E-07	0.00	1.92E-05	0.000	3.28E-06	0.0000	2.4E-05	0.0	
Benzo(a)anthracene	---	1.76E-09	6.22E-07	1.68E-06	---	---	---	4.36E-07	0.00	1.31E-06	0.00	1.06E-07	0.00	9.73E-06	0.000	2.94E-06	0.0000	1.4E-05	0.0	
Benzo(a)pyrene	---	1.18E-09	2.57E-07	1.88E-07	---	---	---	2.91E-07	0.00	8.72E-07	0.00	7.06E-08	0.00	4.02E-06	0.000	3.29E-07	0.0000	5.3E-06	0.0	
Benzo(b)fluoranthene	---	1.76E-09	1.11E-06	9.91E-08	---	---	---	4.36E-07	0.00	1.31E-06	0.00	1.06E-07	0.00	1.74E-05	0.000	1.74E-07	0.0000	1.9E-05	0.0	
Benzo(g,h,i)perylene	---	1.18E-09	5.56E-07	4.89E-07	---	---	---	2.91E-07	0.00	8.72E-07	0.00	7.06E-08	0.00	8.70E-06	0.000	8.57E-07	0.0000	1.1E-05	0.0	
Benzo(k)fluoranthene	---	1.76E-09	2.18E-07	1.55E-07	---	---	---	4.36E-07	0.00	1.31E-06	0.00	1.06E-07	0.00	3.41E-06	0.000	2.72E-07	0.0000	5.1E-06	0.0	
Chrysene	---	1.76E-09	1.53E-06	3.53E-07	---	---	---	4.36E-07	0.00	1.31E-06	0.00	1.06E-07	0.00	2.39E-05	0.000	6.19E-07	0.0000	2.6E-05	0.0	
Dibenzo(a,h)anthracene	---	1.18E-09	3.46E-07	5.83E-07	---	---	---	2.91E-07	0.00	8.72E-07	0.00	7.06E-08	0.00	5.41E-06	0.000	1.02E-06	0.0000	7.4E-06	0.0	
7,12-Dimethylbenz(a)anthracene	---	1.57E-08	---	---	---	---	---	3.87E-06	0.00	1.16E-05	0.00	9.41E-07	0.0	---	---	---	---	1.3E-05	0.0	
Fluoranthene	---	2.94E-09	4.03E-06	7.61E-06	---	---	---	7.26E-07	0.00	2.18E-06	0.00	1.76E-07	0.00	6.31E-05	0.000	1.33E-05	0.0000	7.9E-05	0.0	
Fluorene	---	2.75E-09	1.28E-05	2.92E-05	---	---	---	6.78E-07	0.00	2.03E-06	0.00	1.65E-07	0.00	2.00E-04	0.000	5.12E-05	0.0000	2.5E-04	0.0	
Indeno(1,2,3-cd)pyrene	---	---	4.14E-07	3.75E-07	---	---	---	---	---	0.00E+00	0.00	---	---	6.48E-06	0.000	6.57E-07	0.0000	7.1E-06	0.0	
3-Methylchloranthrene	---	1.76E-09	---	---	---	---	---	4.36E-07	0.00	1.31E-06	0.00	1.06E-07	0.0	---	---	---	---	1.4E-06	0.0	
2-Methylnaphthalene	---	2.35E-08	---	---	---	---	---	5.81E-06	0.00	1.74E-05	0.00	1.41E-06	0.0	---	---	---	---	1.9E-05	0.0	
Phenanthrene	---	1.72E-08	4.08E-05	2.94E-05	---	---	---	4.24E-06	0.00	1.27E-05	0.00	1.03E-06	0.00	6.38E-04	0.000	5.15E-05	0.0000	7.0E-04	0.0	
Pyrene	---	4.90E-09	3.71E-06	4.78E-06	---	---	---	1.21E-06	0.00	3.63E-06	0.00	2.94E-07	0.00	5.81E-05	0.000	8.38E-06	0.0000	7.0E-05	0.0	
Total PAH (except Naphthalene)	9.00E-07	8.52E-08	8.15E-05	8.33E-05		2.16E-03	0.01	2.10E-05	0.00	6.31E-05	0.00	5.11E-06	0.00	1.28E-03	0.000	1.46E-04	0.000	1.5E-03	0.0	
Arsenic	---	1.96E-07	2.59E-07	2.59E-07	X	---	---	4.84E-05	0.00	1.45E-04	0.00	1.18E-05	0.00	4.05E-06	0.000	4.54E-07	0.0000	1.6E-04	0.0	
Beryllium	---	1.18E-08	---	---	X	---	---	2.91E-06	0.00	8.72E-06	0.00	7.06E-07	0.00	---	---	---	---	9.4E-06	0.0	
Cadmium	---	1.08E-06	---	---	X	---	---	2.66E-04	0.00	7.99E-04	0.00	6.47E-05	0.00	---	---	---	---	8.6E-04	0.0	
Chromium	---	1.37E-06	---	---	X	---	---	3.39E-04	0.00	1.02E-03	0.00	8.24E-05	0.00	---	---	---	---	1.1E-03	0.0	
Cobalt	---	8.24E-08	2.59E-07	2.59E-07	X	---	---	2.03E-05	0.00	6.10E-05	0.00	4.94E-06	0.00	4.05E-06	0.000	4.54E-07	0.0000	7.0E-05	0.0	
Lead	---	4.90E-07	2.59E-07	2.59E-07	X	---	---	1.21E-04	0.00	3.63E-04	0.00	2.94E-05	0.00	4.05E-06	0.000	4.54E-07	0.0000	4.0E-04	0.0	
Manganese	---	3.73E-07	2.59E-07	2.59E-07	X	---	---	9.20E-05	0.00	2.76E-04	0.00	2.24E-05	0.00	4.05E-06	0.000	4.54E-07	0.0000	3.0E-04	0.0	
Mercury	---	2.55E-07	2.59E-07	2.59E-07	X	---	---	6.30E-05	0.00	1.89E-04	0.00	1.53E-05	0.00	4.05E-06	0.000	4.54E-07	0.0000	2.1E-04	0.0	
Nickel	---	2.06E-06	6.57E-06	6.57E-06	X	---	---	5.09E-04	0.00	1.53E-03	0.00	1.24E-04	0.00	1.03E-04	0.000	1.15E-05	0.0000	1.8E-03	0.0	
Selenium	---	2.35E-08	2.59E-07	2.59E-07	X	---	---	5.81E-06	0.00	1.74E-05	0.00	1.41E-06	0.00	4.05E-06	0.000	4.54E-07	0.0000	2.3E-05	0.0	
Total HAP Metals	0.00E+00	5.94E-06	8.12E-06	8.12E-06		0.00E+00	0.00	1.47E-03	0.00	4.40E-03	0.01	3.56E-04	0.00	1.27E-04	0.000	1.42E-05	0.000	4.9E-03	0.0	
Total HAP Emissions (TPY)							4.36		1.49		17.54		0.25		0.006		0.001		4.6	17.8

- Notes:
- Combustion Turbine (CT) emission factors, except formaldehyde, are from Tables 3.1-3 and 3.1.4 of AP-42: *Compilation of Air Emissions Factors* and are for diffusion-flame combustion turbines. The emission factor for formaldehyde is for lean-premix turbines at >80% load and is the 95th upper percentile value from Table 9 in the
 - Emission factors for duct burners and auxiliary boiler are from Tables 1.4-3 and 1.4-4 of AP-42 and do not account for any reduction in DB HAP emissions due to the oxidation catalysts.
 - Organic HAP emission factors for the emergency diesel generator and the fire pump engine are from Tables 3.3-2, 3.4-3 and 3.4-4 of AP-42. HAP metal emission factors for the diesel engines are based on the test results for ULSD in the *NYSERDA Updated Determination of Sulfur and Other Trace Element Content of Fuel Oil in New York State - Final Report, July 2017*.
 - The CTG and DB heat input rates for the 100% load GE design case at ISO conditions (59 deg. F, 1 atm. and 60% R.H.) are used for calculating annual emissions. The worst case (-8 deg. F) heat input rates are used for calculating the hourly HAP emission rates.
 - Diesel engine design capacity based on max. fuel consumption from manufacturer's specifications (i.e., 113.4 gph & 12.7 gph for the EDG and DFG, respectively) and the default heating value (0.138 MMBTU/gal) from 40 CFR 98, Table C-1.

Appendix C: Independent Facility Need Assessments

October 17, 2024

Ronald Paryl
Advanced Power Services (NA) Inc.
Director, Markets and Risk Management
155 Federal | 17th Floor | Boston, MA 02110

Subject: Continued Operation of Cricket Valley Energy Center

Dear Mr. Paryl:

In your May 23, 2024 email, you requested that the New York Independent System Operator, Inc. (“NYISO”) provide a “justification of need” for continued operation of the Cricket Valley Energy Center (“CVEC”). As a threshold matter based on recent studies, it is important to note that limiting operations of any generating facility could have adverse impacts on the short-term and long-term reliability of the New York State Power System.

The NYISO analyzed the transmission security margins¹ following generator/plant outages as part of the 2024 Quarter 1 Short-Term Assessment of Reliability, the 2023-2032 Comprehensive Reliability Plan and the draft 2024 Reliability Needs Assessment² (RNA). All three studies identified deficiencies in the statewide system margins over the study horizon following the outage of 1,029 MW of Cricket Valley Energy Center. The transmission security and system margins could be further exacerbated under the high demand forecast, a heatwave (also known as 90/10 or 90th percentile load) and an extreme heatwave (1-in-100-year forecast). A negative statewide system margin is not, on its own, a Reliability Criteria violation. It is, however, a leading indicator of the inability to securely meet system load under applicable normal transfer criteria.

Additionally, the NYISO performed a zonal resource adequacy margin (“ZRAM”) analysis as part of the 2024 RNA to determine the amount of “perfect”³ capacity in each zone that could be removed before the loss of load expectation (“LOLE”) criterion reaches 0.1 days/year. Although no violation was identified, the results relied on the use of emergency operating procedures. In 2034, the ZRAM is only 50 MW away from violating the LOLE criterion. CVEC becoming unavailable would increase the LOLE, and thus reduce the resource adequacy margin, highlighting the need to preserve adequate generation capacity.

¹ The transmission security margin measures the ability of the electric system to meet load plus losses and system reserve (*i.e.*, total capacity requirement) using NYCA generation, interchange, and including temperature-based generation derates (total resources). Decreasing the transmission security margin indicates a reduction in the capacity available to meet consumer demand and to deal with extreme weather or other system contingencies.

² The current draft 2024 Reliability Needs Assessment (RNA) is available [here](#) and will be finalized by the end of the year.

³“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 assessed for transmission security or interface impacts

Given the system conditions currently under study and assuming no further changes consistent with the referenced studies, the unavailability of Cricket Valley Energy Center may result in adverse impacts to the reliability of the transmission system.

If desired, NYISO would be willing to meet with you and your staff to discuss these matters further.

Very truly yours,

Zach Smith
Senior Vice President, System & Resource Planning
New York Independent System Operator, Inc.
10 Krey Boulevard
Rensselaer, New York 12144
Tel: (518) 356-6000

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

September 20, 2024

VIA US AND ELECTRONIC MAIL: michael.higgins@dec.ny.gov

Mr. Michael Higgins
Section Chief, Bureau of Energy project Management
New York State Department of Environmental Conservation
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, NY 12233-1750

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

Dear Mr. Hogan,

Cricket Valley Energy Center, LLC (“CVEC” or “Applicant”) has retained Hudson Energy Economics, LLC as a consultant to review the reliability need for CVEC in the New York electric system. This analysis is based upon two reliability studies that are performed periodically by the New York Independent System Operator (“NYISO”). The first analysis is the NYISO quarterly Short Term Assessment of Reliability (“STAR”). The STAR report for the second quarter of 2024 was published on July 12, 2024.¹ The NYISO also performs a more extensive Reliability Needs Assessment (“RNA”) that is performed every two years. The NYISO is currently in the process of completing the 2024 RNA but has provided preliminary results on July 25, 2024.²

In addition, CVEC has been identified as an Interconnection Reliability Operating Limit (“IROL”) unit. I will address the significance of that designation and the reliability benefits that the unit provides as an IROL unit.

¹ See Short-Term Assessment of Reliability: 2024 Quarter 2; A Report by the New York Independent System Operator; July 12, 2024 (“2024 Q2 STAR”). Available at: <https://www.nyiso.com/documents/20142/16004172/2024-Q2-STAR-Report.pdf/097c2819-669f-fa60-9877-d485fdc73d28>

² 2024 RNA Preliminary Results; Ross Altman, Laura Popa, Alison Stuart; Presented to the Electric System Planning Working Group/Transmission Planning Advisory Subcommittee July 25, 2024 meeting. Available at https://www.nyiso.com/documents/20142/46031967/2024RNA_PrelimResults_July25ESPWG-TPAS.pdf/f635a8ab-458f-35e5-cf92-0847c0ea6bca

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 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 and have been an alternate to the NYSRC Executive Committee for the past several years. 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. The NYSRC is also responsible for defining the Reliability Rules that the NYISO must follow in planning and operating its system

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.

2024 Q2 STAR

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. The NYISO performs these evaluations in its quarterly STAR study. The study looks both at: 1) whether in the absence of a potentially retiring unit the NYISO is projected to meet its Resource Adequacy requirements (an expected Loss of Load of no more than once-in-ten years due to insufficient generation capability); and, 2)

the system margin to meet projected peak loads under normal operation³ after suffering the largest system contingency (i.e. largest unit or transmission outage) and with other units at expected availability (i.e. average outages for traditional units). In the case of the System Margin analysis a value of less than 0 MW means that the NYISO would not be able to meet peak loads after the largest contingency under normal operation.

The STAR reports also provides System Margin information on what would happen to the system if it specific generating facilities were to be retired. The analysis of the CVEC facility shows that if the entire facility were retired then the NYISO projects its system margin would be negative in eight of the next ten years. This means that without CVEC, the NYISO projects that they could not meet peak loads while remaining in normal operation in eight of the next ten years. The loss of even one of the three generating units at CVEC would result in the system not being able to meet the peak load under normal operating after suffering the largest contingency in half of the next ten years.

2024 Preliminary RNA Results

The Reliability Needs Assessment is the NYISO's more extensive evaluation of reliability needs over the long run. The 2024 RNA has updated assumptions, most importantly about projected load growth, compared to the 2024 Q2 STAR. The updated load growth assumptions will be included in the 2024 Q3 STAR through the 2025 Q2 STAR.

The load peak load growth projection is lower for the first couple years of the RNA compared to the 2024 Q2 STAR but is more than 1,500 MW higher by the 2033, the last year from the STAR study. The result is that the updated analysis in the RNA shows even greater need for CVEC.

The RNA results show the NYISO failing to meet its Resource Adequacy requirements in 2034.⁴ The loss of CVEC would likely cause a deficiency two years earlier.⁵

Another concern for the Resource Adequacy analysis is that the NYISO switches to a system where the Loss of Load risk shifts from the Summer to Winter as a result of projected increases in winter loads from CLCPA related electrification as well as some units that are available to run during summer not being able to get natural gas on the winter days with the highest load.

CVEC has informed me that they have a firm gas contract that enables them to get

³ Normal operation means that the NYISO is operating the transmission system at normal limits and is not relying upon Emergency Operating Procedures (generally without eroding operating reserves, calling for load reductions and voltage reductions).

⁴ 2024 RNA Preliminary Results, p. 15.

⁵ 2024 RNA Preliminary Results, p. 17.

sufficient fuel to operate the facility on the coldest days of the year. Consequently, the loss of CVEC would result in eliminating another winter critical unit.

The 2024 Preliminary RNA results show that the NYISO is not projected to be able to meet projected peak loads under normal operation in eight of the next ten years.⁶ Without CVEC it would not be able to meet projected peak loads under normal operation in any of the next ten years.

CVEC is an Interconnection Reliability Operating Limit (“IROL”) Critical Unit

CVEC has been designated a Medium impact IROL Critical Unit by the NYISO under NERC guidelines CIP Standard 002-5 Attachment 1, Section 2.6. The designation is based on the Automatic Voltage Regulator and Power System stabilizers associated with CVEC which are critical to maintain the voltage collapse transfer limit across the UPNY-Coned interface. CVEC has had this designation since May 2021.

The IROL standard is the “subset of operating limits identified to prevent instability, uncontrolled separation or cascading outages that adversely impact the reliability of the bulk transmission system.... The Standard is aimed at preventing instances of exceeding IROLs – and for those rare occasions when an IROL may be exceeded, the standard is aimed at minimizing the impact of such an event.”⁷

As an IROL Critical Unit, CVEC provides data that the NYISO needs to monitor in real-time to assure that the system is operating within its reliability area IROLs.

Other Considerations

There are other factors that the Department should consider in determining whether CVEC should be granted its Title V air permit. CVEC is a state of the art generating unit with state-of-the-art pollution abatement equipment.

Moreover, CVEC has inherent flexibility to adjust quickly to changing conditions on the grid due to load changes and variability of intermittent generators. CVEC has the ability to very quickly adjust output from min load to full load in a matter of minutes which is critical to integrate intermittent renewables on the NYISO system while maintaining reliability. CVEC also has the ability to quickly start up in one to two hours (based on plant conditions) and shut down according to NYISO Schedules adding additional flexibility to the NYISO grid for meeting these operational concerns

This operating flexibility means that CVEC 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”).

⁶ 2024 RNA Preliminary Results, p. 43.

⁷ Questions and Answers about the Operate within Operate within IROLs Standard [sic]; p. 3; Available at: [https://www.nerc.com/pa/Stand/Operate Within Interconnection Reliability Operati/FAQ for IROL Standard v11.pdf](https://www.nerc.com/pa/Stand/Operate%20Within%20Interconnection%20Reliability%20Operati/FAQ%20for%20IROL%20Standard%20v11.pdf)

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 CVEC.

The Facility's short start up time and low emission rates makes it an ideal source for this reliability service. As the NYISO grid serves a larger portion of load with renewable energy, CVEC operations and capacity factors are very likely to decrease, lowering annual CO2 emissions from the facility.

The NYISO's resource adequacy and transmission security evaluations show that if CVEC were to be retired then it would violate reliability requirements over the next ten years. While there may be new entry in the future that lessens this reliability risk, failing to approve CVEC's Title V air permit will mean that the NYISO would be required to rely upon other, less flexible, less efficient, and higher emitting units to assure the reliability of the NYCA.

Sincerely,

A handwritten signature in black ink, appearing to read 'MD Younger', with a long horizontal flourish extending to the right.

Mark D. Younger

President

Hudson Energy Economics, LLC

MARK D. YOUNGER

Mr. Younger is President of Hudson Energy Economics, LLC and has over forty years of experience in energy analysis.

EDUCATION

MBA, Cornell University, 1983

M.E., Operations Research
Cornell University, 1983

B.S., Engineering, Major - Operations Research
Cornell University 1981

PROFESSIONAL EXPERIENCE

President

Hudson Energy Economics, LLC (2012 - Present)

Specialist on electric deregulation, market structure issues and deregulated electric energy, ancillary service and capacity market design. Involved as an active participant in the working groups refining the New York Independent System Operator, Inc. ("NYISO") market structure and developing methods to improve the market design, including all aspects of its energy, ancillary services and capacity markets.

Vice President

Slater Consulting (1994 - 2012)

Involved as an active participant in the working groups refining the New York Independent System Operator, Inc. ("NYISO") market structure and developing methods to improve the market design, including all aspects of its energy, ancillary services and capacity markets. One of the original architects of New York's capacity demand curve.

Senior Project Manager

Morse, Richard, Weisenmiller & Associates, Inc. (1986-1994)

Responsible for directing MRW's projects on production cost modeling. Prepared extensive analysis and expert witness testimony on avoided costs in California, New York, Pennsylvania and New Jersey. Performed analyses of electric utility emissions reductions associated with cogeneration projects.

Energy Economist

Pacific Gas & Electric Company (1983-1986)

Responsible for developing models and methods for integrated supply and demand-side resource analysis. Developed and performed an analysis of resource planning under uncertainty using Monte Carlo techniques.

Research Specialist for Duane Chapman, Professor of Resource Economics Cornell University (1982-1983)

Formulated the financial simulation section of the University Research Group on Energy's (URGE) integrated model of the electric utility industry. Performed an analysis of the impact on New York Pollution levels and New York utilities of proposed acid rain abatement strategies.

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Affidavits and Testimony

- Affidavit on behalf of the Independent Power Producers of New York on the flaws associated with New York State Electric and Gas and Rochester Gas & Electric Companies' proposal to own solar energy facilities as part of their proposed Low-Income Clean Generation Program and to own battery storage facilities (NY PSC Docket Nos. 22-E-0317, 22-G-0318, 22-E-0319, and 22-G-0320) September 26, 2022.
- Affidavit on behalf of the Independent Power Producers of New York on the flaws associated with Consolidated Edison Company of New York, Inc.'s proposal to own solar energy facilities as part of their proposed Clean Energy Credit for Low-Income Customers Program (NY PSC Docket Nos. 22-E-0064 and 22-G-0065) May 20, 2022.
- Supplemental Affidavit on behalf of the Independent Power Producers of New York on the flaws in the Clean Energy Advocates objections to the NYISO's proposed Marginal Capacity Accreditation (FERC Docket No. ER22-772-000) March 23, 2022.
- Affidavit on behalf of the Independent Power Producers of New York on the benefits of the NYISO's proposal to implement Marginal Capacity Accreditation (FERC Docket No. ER22-772-000) January 26, 2022.
- Affidavit on behalf of the Independent Power Producers of New York on the flaws in the NYISO's proposed revisions to the Buyer-Side Mitigation Part A test (FERC Docket No. ER20-1718-000) May 21, 2020.
- Reply Affidavit on behalf of the Independent Power Producers of New York on the flaws in various parties' proposal to greatly expand the NYISO's methodology for calculating the number of allowed MW of Renewable Exemptions from Buyer-Side Mitigation (FERC Docket No. ER16-1404-002) May 13, 2020
- Affidavit on behalf of Helix Ravenswood, LLC on the flaws in the NYISO's methodology for calculating the number of allowed Renewable Exemptions from Buyer-Side Mitigation (FERC Docket No. ER16-1404-002) April 28, 2020.
- Affidavit on behalf of the Independent Power Producers of New York on why the NYISO's estimate of the derate for Duration Limited Resources is consistent with the NYISO's resource adequacy process and should be approved. (FERC Docket No. ER19-2276-000) August 9, 2019.
- Affidavit on behalf of the Independent Power Producers of New York on why allowing Linden VFT and the Hudson Transmission Project to continue to sell capacity in NYISO markets after converting their Transmission Withdrawal Rights from Firm to Non-Firm violates the NYISO and PJM tariffs. (FERC Docket No. EL18-189-000) July 31, 2018.
- Affidavit on behalf of the Independent Power Producers of New York on why allowing Linden VFT and the Hudson Transmission Project to continue to sell capacity in NYISO markets after converting their Transmission Withdrawal Rights from Firm to Non-Firm violates the NYISO and PJM tariffs. (FERC Docket No. EL18-54-000) February 23, 2018.
- Affidavit on behalf of the Independent Power Producers of New York on the dollars that gas local distribution companies would collect annually by charging electric generator gas interruptible transportation customers in New York City a \$0.10 per Dth charge and the cost that would impose on electricity consumers in NYC. (NY PSC Docket No. 17-G-0011)

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- Affidavit on behalf of Roseton Generating, LLC on the inappropriateness of blocking generators located in the NYISO Localities from selling capacity to the ISO-NE market during the 2017-2018 capability year (FERC Docket No. ER16-2451-000) September 23, 2016
- Affidavit on behalf of the Independent Power Producers of New York and the Electric Power Supply Association on the flaws in the NYISO's proposed implementation of a Renewable and Self Supply Exemption (FERC Docket No. ER16-1404-000) May 31, 2016.
- Affidavit on behalf of the Independent Power Producers of New York and the Electric Power Supply Association on the flaws in the NYISO's Information Response on the Deficiencies in Its Analysis of the Need for Uneconomic Retention Mitigation and NYCA wide Uneconomic Entry Mitigation (FERC Docket No. EL13-62-002) January 19, 2016.
- Affidavit on behalf of the Independent Power Producers of New York and the Electric Power Supply Association on the flaws in the NYISO's proposed Reliability Must Run compliance filing (FERC Docket No. ER16-120-000) November 30, 2015.
- Affidavit on behalf of the Independent Power Producers of New York regarding the flaws in claims that lightly regulated utilities claimed confidential information is already in the public domain and in the harm from releasing such data. (NY PSC Matter No. 13-01288) September 3, 2015.
- Affidavit on behalf of the Independent Power Producers of New York regarding the flaws in the NYISO Evaluation of the Need for Uneconomic Retention Mitigation in NYCA Rest of State Market. (FERC Docket No. EL13-62-002) July 17, 2015.
- Affidavit on behalf of the Independent Power Producers of New York regarding the flaws in the NY PSC, NYPA and NYSERDA proposed fundamental revisions to the NYISO's Buyer-Side Mitigation Rules. (FERC Docket No. EL15-64-000) June 29, 2015.
- Affidavit on behalf of the Independent Power Producers of New York regarding the need to maintain confidentiality for certain data submitted to the New York Public Service Commission by lightly regulated utilities. (NY PSC Matter No. 13-01288) June 17, 2015.
- Affidavit on behalf of the PSEG Companies regarding how market rules that affect price formation have developed within the NYISO and how those rules should be incorporated into PJM Interconnection L.L.C.'s ("PJM") market design. (FERC Docket No. AD14-14-000) March, 6, 2015.
- Affidavit on behalf of the Independent Power Producers of New York regarding the failure of TDI to show that they Champlain Hudson Power Express should be given a line specific exemption from Buyer-Side uneconomic entry mitigation and the failure of TDI to demonstrate that the existing NYISO tariff's application of mitigation to its project was not Just and Reasonable (FERC Docket No. EL15-33-000), January 15, 2015.
- Affidavit on behalf of the Independent Power Producers of New York regarding flaws in the NYISO's and Transmission Owners proposals for a Competitive Entry Exemption from Buyer-Side uneconomic entry mitigation and the failure of the Transmission Owners to demonstrate that the existing NYISO tariff was not Just and Reasonable (FERC Docket No. EL15-25-000), January 15, 2015.

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- Affidavit on behalf of the Independent Power Producers of New York regarding the flaws in the NYISO's proposal to define generator outage states and associated requirements and calculations (FERC Docket No. ER14-2518-000), September 2, 2014.
- Affidavit on behalf of the Independent Power Producers of New York regarding the need to maintain confidentiality for certain data submitted to the New York Public Service Commission by lightly regulated utilities. (NY PSC Matter No. 13-01288) August 6, 2014.
- Second Supplemental Affidavit on behalf of the Independent Power Producers of New York regarding the need to mitigate the uneconomic retention of the Dunkirk Power Plant which is being retained pursuant to a 10 year out-of-market contract (FERC Docket No. EL13-62-000), March 25, 2014.
- Supplemental Affidavit on behalf of Entergy rebutting the claimed rate impacts associated with the implementation of the NYISO Lower Hudson Valley capacity zone. (FERC Docket No. ER14-500-000), January 6, 2014.
- Affidavit on behalf of Entergy regarding the need to reject a phase in for implementing the NYISO Lower Hudson Valley capacity zone Demand Curve. (FERC Docket No. ER14-500-000), December 20, 2013.
- Affidavit on behalf of the Independent Power Producers of New York regarding the appropriate values for determining the NYISO Installed Capacity Demand Curves. (FERC Docket No. ER14-500-000), December 20, 2013.
- Second Supplemental Affidavit on behalf of Entergy regarding why it is inappropriate to phase in capacity prices for the NYISO New Capacity Zone for the Lower Hudson Valley region and why the new information that the NYISO relied upon for their filing is neither new nor correct. (FERC Docket No. ER13-1380-000), November 12, 2013.
- Affidavit on behalf of the Independent Power Producers of New York before the Board of the NYISO regarding the proposed demand curves being set at too low a level to adequately address the risk of entering the New York electricity markets as a merchant facility. October 2, 2013.
- Supplemental Affidavit on behalf of the Independent Power Producers of New York regarding the why regulated RMR contracts must bid into the NYISO Installed Capacity Market at their full going forward costs. (FERC Docket No. EL13-62-000), June 14, 2013.
- Supplemental Affidavit on behalf of Entergy regarding the need to not delay in implementing a New Capacity Zone for the Lower Hudson Valley region and the flaws in arguments that a New Capacity Zone is not needed at this time. (FERC Docket No. ER13-1380-000), June 5, 2013.
- Affidavit on behalf of Entergy regarding the need to implement a New Capacity Zone for the Lower Hudson Valley region. (FERC Docket No. ER13-1380-000), May 21, 2013.
- Affidavit on behalf of the Independent Power Producers of New York regarding the need to revise the NYISO tariff to assure that generators with regulated RMR contracts bid into the NYISO Installed Capacity Market at their going forward costs. (FERC Docket No. EL13-62-000), May 10, 2013.

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- Affidavit on behalf of the Independent Power Producers of New York to the NYISO Board of Directors regarding why a peaking unit should continue to be used as the Demand Curve Proxy Unit. April 17, 2013.
- Affidavit on behalf of the Independent Power Producers of New York regarding the inappropriate requirement that Cayuga bid into the NYISO Installed Capacity Market at a de minimis price while recovering its costs from a regulated RMR contract. (FERC Docket No. ER13-405-000), January 7, 2013.
- Affidavit on behalf of the New York City Suppliers rebutting Hudson Transmission Partners claims that their Buyer-Side Mitigation examination by the NYISO had been performed in a manner inconsistent with the NYISO Service Tariff Requirements. (FERC Docket No. EL12-98-000), November 13, 2012.
- Affidavit on behalf of Entergy Nuclear Power Marketing, LLC and the GenOn Parties concerning the NYISO's June 29, 2012 Compliance Filing proposing tariff revisions to its Market Administration and Control Area Services Tariff ("Services Tariff") to implement both buyer-side and supplier-side mitigation measures for New Capacity. (FERC Docket No. ER12-360-001), July 20, 2012.
- Rebuttal Testimony on behalf of the Independent Power Producers of New York on the flaws in the project sponsor's and the New York Department of Public Service's evaluation of the economics of the Champlain Hudson Power Express. (NYPSC Docket No. 10-T-0139), June 28, 2012.
- Testimony on behalf of the Independent Power Producers of New York on the economics of the Champlain Hudson Power Express. (NYPSC Docket No. 10-T-0139), June 7, 2012.
- Third Supplemental Affidavit on behalf of the New York City Suppliers rebutting Bayonne Energy Center's claims regarding their gas pricing advantage and the value of TCCs for their project. (FERC Docket No. EL11-50-000), October 10, 2011.
- Second Supplemental Affidavit on behalf of the New York City Suppliers on the New York Independent System Operator's flawed analysis in its mitigation determination for Astoria Energy II and the Bayonne Energy Center. (FERC Docket No. EL11-50-000), September 23, 2011.
- Supplemental Affidavit on behalf of the New York City Suppliers on the New York Independent System Operator's failure to properly apply its capacity market mitigation rules to Astoria Energy II and the Bayonne Energy Center. (FERC Docket No. EL11-50-000), July 11, 2011.
- Second Supplemental Affidavit on behalf of the New York City Suppliers on the tight correlation between natural gas pricing and LBMPs and the inability of the NERA model to represent this relationship. (FERC Docket No. EL11-42-000), July 21, 2011.
- Affidavit on behalf of the New York City Suppliers on the New York Independent System Operator's failure to properly apply its capacity market mitigation rules to Astoria Energy II and the Bayonne Energy Center. (FERC Docket No. EL11-50-000), July 11, 2011.
- Supplemental Affidavit on behalf of the New York City Suppliers on the flaws and inconsistencies shown in the New York Independent System Operator release of data to use

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for the New York City uneconomic entry mitigation exemption test. (FERC Docket No. EL11-42-000), June 15, 2011.

- Affidavit on behalf of the New York City Suppliers on the proper way to apply the New York City uneconomic entry mitigation exemption test. (FERC Docket No. EL11-42-000), May 31, 2011.
- Affidavit on behalf of the Independent Power Producers of New York in response to the NYISO's Compliance Filing on the Capacity Demand Curve on the appropriate level of average excess to assume in setting the Capacity Demand Curve. (FERC Docket No. ER11-2224-004), April 19, 2011.
- Affidavit on behalf of New York City Suppliers on the need to revise the Baseline for Special Case Resources. (FERC Docket No. ER11-2906-000). March 4, 2011.
- Reply Affidavit on behalf of the Independent Power Producers of New York on New York Installed Capacity Demand Curve on the arguments against including System Deliverability Upgrade costs in the Demand Curves, on the inappropriateness of using a Long Island unit as a proxy for the NYCA demand curve and set the Demand Curve based upon inaccurately and the flaws of using historic auction results to determine the amount of excess capability due to winter unit ratings. (FERC Docket No. ER11-2224-000), January 7, 2011.
- Affidavit on behalf of the Independent Power Producers of New York on New York Installed Capacity Demand Curve on the need for accurate representation of the average excess capacity levels, System Deliverability Upgrade costs and New York City interconnection costs in the development of the Demand Curves. (FERC Docket No. ER11-2224-000), December 21, 2010.
- Affidavit on behalf of New York City Suppliers on the New York Independent System Operator's proposed revisions to the New York City Installed Capacity Mitigation measures on the impact of the NYISO's changes on reducing the effectiveness of the mitigation. (FERC Docket No. ER10-3043), November 22, 2010.
- Affidavit on behalf of the Independent Power Producers of New York in response to the Comments of the New York Transmission Owners on the NYISO's Second Tariff Compliance Filing and Request for Waiver of the NYISO on the inappropriateness of using the price at the 104% point on the New York City Demand Curve as the Net CONE value. (FERC Docket No. ER08-695-001), June 21, 2010.
- Affidavit on behalf of AES Eastern Energy, L.P., Constellation Energy Nuclear Group, LLC, Empire Generating Co., LLC, GDF SUEZ Energy North America, NRG Companies, PSEG Companies, Shell Energy North America (US), L.P., and TC Ravenswood, LLC on the New York Independent System Operator and New York Transmission Owner compliance filing to implement the Comprehensive Deliverability Plan on the need to apply a deliverability test to capacity imports. (FERC Docket No. ER04-449-019), May 18, 2009.
- Affidavit on behalf of the Independent Power Producers of New York on the NYISO's October 30, 2008 Tariff Compliance Filing on the In-City Capacity Mitigation on the inappropriateness of the NYISO's proposed Special Case Resource uneconomic entry mitigation and test for uneconomic exports. (FERC Docket No. EL07-39), December 2, 2008.

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- Affidavit on behalf of the In City Capacity Suppliers in support of their Section 206 filing to restate the New York City Installed Capacity Demand Curve pursuant to expiration of the New York City ICIP Tax Abatement Program. (FERC Docket No. EL09-4), October 14, 2008.
- Affidavit on behalf of the Independent Power Producers of New York in support of their motion for leave to file answer, and answer to the New York Transmission Owner's Comments on the Commission decision implementing New York City Capacity Market Mitigation on the appropriateness of using the Net CONE as shown at 100% of the minimum capacity requirement as the basis for the mitigation offer floor. (FERC Docket No. ER08-695), June 11, 2008.
- Affidavit in support of the limited protest being submitted by Astoria Generating Company, L.P. to address the New York Independent System Operator's ("NYISO") Second Tariff Compliance Filing of and Request for Waiver of the New York Independent System Operator Inc. Implementing New York City ICAP Market Mitigation Measures ("NYISO Compliance Filing") to address appropriate recognition of opportunity costs associated with exports and appropriate thresholds and penalties for determining mitigation. (FERC Docket No. ER08-695-001), May 27, 2008.
- Testimony on behalf of the Independent Power Producers of New York on the Vertical Market Power concerns on the Acquisition of Energy East Corporation by Iberdrola, S.A. (NY PSC Case 07-M-0906). January 11, 2008.
- Affidavit on behalf of AES Eastern Energy, L.P., Astoria Generating Company, L.P., a US Power Generating Company, Entergy Nuclear Power Marketing, LLC and the Mirant Parties on New York Installed Capacity Demand Curve on the appropriate values for the Demand Curve. (FERC Docket No. ER08-283-000), December 31, 2007.
- Affidavit on behalf of AES Eastern Energy on the New York State Department of Environmental Conservation's and New York State Energy Research Development Authority's proposed regulations to implement the Regional Greenhouse Gas Initiative (6 NYCRR Part 242, 6 NYCRR Part 200 and 21 NYCRR Part 507), December 19, 2007
- Affidavit on behalf of Astoria Generating Company, L.P., a U.S. Power Generating Company on the NYISO's proposed Capacity Market Mitigation Measures on the appropriate design of New York City Installed Capacity mitigation measures. (FERC Docket No. EL07-39-000), December 10, 2007.
- Affidavit on behalf of Astoria Generating Company, L.P., a U.S. Power Generating Company on the NYISO's proposed Capacity Market Mitigation Measures. (FERC Docket No. EL07-39-000), November 19, 2007.
- Affidavit on behalf of AES Eastern Energy, LP., Astoria Generating Company, L.P., a U.S. Power Generating Company, Dynegy Northeast Generation, Inc., Entergy Nuclear Power Marketing, LLC, the Indeck Companies, and the Mirant Parties to NYISO Board of Directors on NYISO Staff proposed Installed Capacity Demand Curves on the appropriate values for the Demand Curves. October 1, 2007.

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- Affidavit on behalf of the Independent Power Producers of New York to NYISO Board of Directors on NYISO Staff proposed Installed Capacity Demand Curves on the appropriate values for the Demand Curves. October 1, 2007.
- Affidavit on behalf of the Independent Power Producers of New York on the Vertical Market Power concerns in the Merger of National Grid PLC and KeySpan Corporation. (NY PSC Case 06-M-0878), July 11, 2007.
- Affidavit on behalf of the Independent Power Producers of New York on the proper determination of Location Based Marginal Costs on May 8 and 9, 2000 (FERC Docket No. EL01-19-006), July 8, 2005.
- Affidavit on behalf of Entergy Corporation, Mirant Bowline, LLC, Mirant Lovett, LLC, Mirant NY-Gen, LLC, Mirant Americas Energy Marketing, and Sithe Energies, Inc. to NYISO Board of Directors on NYISO Staff proposed Installed Capacity Demand Curves. October 15, 2004
- Affidavit on behalf of the Independent Power Producers of New York to NYISO Board of Directors on NYISO Staff proposed Installed Capacity Demand Curves. October 15, 2004
- Affidavit on behalf of the Independent Power Producers of New York on New York Installed Capacity Demand Curve (FERC Docket No. ER03-647-000) on the need to implement an Installed Capacity Demand Curve for the NYISO. April 10, 2003.
- Affidavit on behalf of AES, Mirant & Sithe to NYISO Board of Directors on Appeal of the Management Committee Decision on the ICAP Demand Curve on the need to implement an Installed Capacity Demand Curve for the NYISO. March 7, 2003.
- Affidavit on behalf of the Independent Power Producers of New York to NYISO Board of Directors on Appeal of the Management Committee Decision on the ICAP Demand Curve on the need to implement an Installed Capacity Demand Curve for the NYISO. March 7, 2003.
- Affidavit on behalf of the Independent Power Producers on the ICAP Demand Curve under Appeal of the NYISO Business Issues Committee decision at the NYISO Management Committee on the need to implement an Installed Capacity Demand Curve for the NYISO. December 27, 2002.
- Affidavit on behalf of Reliant Energy Power Generation on Setting the Conduct and Impact Thresholds for in-City Generating Units. (FERC Docket No. ER01-3155-002 et. al.), May 15, 2002.
- Testimony on behalf of TransGas Energy Systems in their Article 10 Citing proceeding (NY PSC Case 01-F-1276) on the energy and pollutant savings associated the TransGas Energy Systems proposed 1000 MW Combined Cycle facility.
- Affidavit on behalf of Reliant Energy Power Generation on New York Independent System Operator's Compliance Filing Regarding Comprehensive Market Mitigation Measures. (FERC Docket No. ER01-3155-002 et. al.), April 23, 2002
- Testimony on behalf of Orion Power New York GP, Inc. on Con Edison Company of New York, Inc.'s Proposal to Revise the Localized Market Power Mitigation Measures (FERC Docket No. ER98-3169-000), April 3, 2001.

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- Affidavit on behalf of Southern Energy North America, Inc., AES NY, L. L. C, Sithe Power Marketing, L. P., & FPL Energy LLC on the need to retain the PJM Installed Capacity Market. (FERC Docket No. EL01-3-000), October, 25, 2000.
- Testimony on behalf of the Mid-Atlantic Power Supply Association on the Baltimore Gas & Electric Company stranded costs. (Maryland PSC Case No. 8794), December 22, 1998.
- Testimony on behalf of Enron Power Marketing, Inc on New York Electricity Companies' request for market-based rate authority. (FERC Docket No. ER97-1523 et al.), October 31, 1997.
- Testimony on behalf of Sithe Energies, Inc on Petition of Niagara Mohawk Power Corporation to Employ 1996 Fuel Adjustment Clause Targets in 1997 (NY PSC Case 96-E-0928) on the inappropriateness of using the outdated targets to determine the 1997 avoided costs.
- Testimony on behalf of the Independent Power Producers of New York and Enron Capital & Trade Resources on Central Hudson Gas & Electric Corporation rate/restructuring proceeding (NY PSC Case 96-E-0909) on the problems with the proposed settlement associated with the proposal that Central Hudson continue to be a vertically integrated utility holding company and to propose interim rate treatment until the time that Central Hudson divests its generation assets.
- Testimony on behalf of the Independent Power Producers of New York and Enron Capital & Trade Resources on Orange & Rockland Utilities, Inc. rate/restructuring proceeding (NY PSC Case 96-E-0900) on the problems in the proposed settlement associated with Orange and Rockland continuing to own generation resources in the deregulated competitive generation market, propose incentives for Orange and Rockland to divest, and, to propose interim rate treatment until the time that Orange and Rockland divests its generation assets..
- Testimony on behalf of the Independent Power Producers of New York and Enron Capital & Trade Resources on Consolidated Edison Company of New York, Inc. rate/restructuring proceeding (NY PSC Case 96-E-0897) on the problems in the propose settlement associated with Con Edison continuing to be a vertically integrated utility owning generation resources in the developing competitive generation market, to propose stronger incentives for divestiture of Con Edison's fossil generation and to propose interim regulatory treatment until the time that Con Edison divests its generation assets.
- Testimony on behalf of the Independent Power Producers of New York and Enron Capital & Trade Resources on New York State Electric & Gas Corporation rate/restructuring proceeding (NY PSC Case 96-E-0891) on the problems with NYSEG's proposal to continue owning generation under a utility holding structure, the manner in which the proposed structure shielded the generating company from competition, and the need to divest the generating assets.
- Testimony on behalf of Sithe Energies, Inc on Consolidated Edison Company of New York, Inc. rate proceeding (NY PSC Case 96-E-0798) on the appropriate bases for calculating the short run avoided energy costs for Qualifying Facilities for Con Ed.

Mark D. Younger
Affidavits and Testimony

- Testimony on behalf of California Cogeneration Council on Southern California Edison 1995 Energy Cost Adjustment Clause (CPUC Application No. 95-05-049) on the value of Qualifying Facilities for SCE
- Testimony on behalf of California Cogeneration Council on Pacific Gas & Electric Company 1995 Energy Cost Adjustment Clause (CPUC Application No. 95-04-002) on the value of Qualifying Facilities for PG&E and the O&M costs avoided by QFs
- Testimony on behalf of Sithe Energies, Inc on Consolidated Edison Company of New York, Inc. rate proceeding (NY PSC Case 94-E-0334) on the appropriate bases for calculating the short run avoided energy costs for Qualifying Facilities for Con Ed.
- Testimony on behalf of the Independent Power Producers of New York on Niagara Mohawk Power Corporation rate proceeding, (NY PSC Cases 94-E-0098 and 94-E-0099) on need to retire certain generating units that are part of their portfolio or in the alternative to introduce rate making that puts Niagara Mohawk at risk for the units being economic.
- Testimony on behalf of California Cogeneration Council on San Diego Gas & Electric Company 1994 Energy Cost Adjustment Clause (CPUC Application No. 94-10-023) on the value of Qualifying Facilities for SDG&E and the O&M costs avoided by QFs
- Testimony on behalf of California Cogeneration Council on Pacific Gas & Electric Company 1994 Energy Cost Adjustment Clause (CPUC Application No. 94-04-002) on the value of Qualifying Facilities for PG&E and the O&M costs avoided by QFs
- Testimony on behalf of Sithe Energies, Inc on Combined Long Run Avoided Cost and Generic Fuel Adjustment Clause proceeding (NY PSC Cases 93-E-0912 and 93-E-1075) on the appropriate long and short run avoided energy costs for Qualifying Facilities.
- Testimony on behalf of Sithe Energies, Inc on Niagara Mohawk Power Corporation 1993 Rate Case (NY PSC Cases 93-E-0376, et al.) on the appropriate bases for calculating the short run avoided energy costs for Qualifying Facilities for NMPC.
- Testimony on behalf of Kamine and Besicorp Companies on New York Public Service Commission Curtailment Proceeding (NY PSC Case Nos. 92-E-0814 and 88-E-081) on the need for Niagara Mohawk Power Corporation to curtail Qualifying Facilities
- Testimony on behalf of KELCO Division of MERCK & Co., Inc. on San Diego Gas & Electric Company 1992 Energy Cost Adjustment Clause (CPUC Application No. 92-09-078) on the value of Qualifying Facilities for SDG&E and the O&M costs avoided by QFs
- Testimony on behalf of California Cogeneration Council on Southern California Edison 1992 Energy Cost Adjustment Clause (CPUC Application No. 92-05-047) on the value of Qualifying Facilities for SCE
- Testimony on behalf of California Cogeneration Council on Pacific Gas & Electric Company 1992 Energy Cost Adjustment Clause (CPUC Application No. 92-04-001) on the value of Qualifying Facilities for PG&E and the O&M costs avoided by QFs

Mark D. Younger
Affidavits and Testimony

- Testimony on behalf of KELCO Division of MERCK & Co., Inc. on San Diego Gas & Electric Company 1991 Energy Cost Adjustment Clause (CPUC Application No. 91-09-059) on the value of Qualifying Facilities for SDG&E and the O&M costs avoided by QFs
- Testimony on behalf of California Cogeneration Council on Pacific Gas & Electric Company 1991 Energy Cost Adjustment Clause (CPUC Application No. 91-04-003) on the value of Qualifying Facilities for PG&E
- Testimony on behalf of California Cogeneration Council on Pacific Gas & Electric Company 1990 Energy Cost Adjustment Clause (CPUC Application No. 90-04-003) on the value of Qualifying Facilities for PG&E
- Testimony on behalf of California Cogeneration Council on San Diego Gas & Electric Company 1989 Energy Cost Adjustment Clause (CPUC Application No. 89-09-031) on the value of Qualifying Facilities for SDG&E
- Testimony on behalf of California Cogeneration Council on Pacific Gas & Electric Company 1989 Energy Cost Adjustment Clause (CPUC Application No. 89-04-001) on the value of Qualifying Facilities for PG&E (1989, Phases I and II)
- Testimony on behalf of California Cogeneration Council on Pacific Gas & Electric Company 1990 Test Year General Rate Case (CPUC Application No. 88-12-005) on the amount of utility operations and maintenance costs avoided by the presence of QF generation.
- Testimony on behalf of California Cogeneration Council on San Diego Gas & Electric Company 1988 Energy Cost Adjustment Clause (CPUC Application No. 88-07-003) on the value of Qualifying Facilities for SDG&E.
- Testimony on behalf of California Cogeneration Council on Pacific Gas & Electric Company 1988 Energy Cost Adjustment Clause (CPUC Applications Nos. 88-04-020 and 88-04-057) on the value of Qualifying Facilities for PG&E (1988, Phases I and II).



Cricket Valley Energy Center

Assessment of Impacts on NYSIO Generator Dispatch & Emissions

A Study Prepared

For

Cricket Valley Energy Center, LLC

October 2024

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1. OVERVIEW

Cricket Valley Energy Center, LLC (CVEC) retained ESAI to provide an analysis of CVEC operations and assessment of how the statewide power plant generation and emissions are affected by the continued dispatch of the CVEC plant. CVEC is a 1,100MW, gas-fired combined cycle generation facility with three independent gas turbine and steam turbine power trains. CVEC came online in early 2020 and is the newest major gas-fired generator in New York.

Approach:

ESAI has conducted an analysis of the CVEC plant operations, contributions to meeting New York demand, and their impact on statewide and overall CO₂, NO_x and SO₂ emissions. Specifically, ESAI estimated CVEC's contributions to the market by comparing a base case forecast with CVEC included to a scenario in which CVEC was assumed to not be operational. Results of the analysis are provided for 2025, 2030, and 2035.

To model these scenarios, ESAI used the AURORA_{xmp} production cost model and our proprietary database of unit-level generator data, forecasted demand, and projected commodity input prices. The model is used to perform a chronological dispatch of the system for all 8,760 hours of the year. Relevant outputs from the model include hourly generation output and emissions for each generating unit in the NYISO market and in the surrounding markets to which NYISO imports and exports power.

Summary:

CVEC's emission rates are among the lowest of any generator in the state of New York. The CVEC plant is also more efficient than other plants available to meet New York demand. The plant's unique capabilities to ramp up and down as needed is valuable for balancing intermittent output from renewable energy resources being added to the New York power grid to meet the State's greenhouse gas reduction mandates.

Overall, our analysis shows that removing CVEC from the market results in higher overall emissions in all of the forecasted years. This is because the increased generation needed to replace CVEC to meet New York load comes from less efficient sources with generally higher emissions rates. Most of the increase in generation needed to replace CVEC is expected to come from in-state resources, but ESAI found that an increase in net imports would also contribute to meeting forecasted energy demand in the absence of CVEC. Section 2.1 below discusses these findings in detail.

2. RESULTS

2.1. IMPACTS ON GENERATION, EMISSIONS, AND FUEL MIX

CVEC will continue to be an important resource for meeting demand in the future. In 2023, CVEC produced 5,215 GWh, or approximately 4.25 percent of net energy generation in New York.¹ If CVEC is not able to continue to operate, other dispatchable resources will need to ramp up in order to meet load.

SYSTEM WIDE IMPACTS:

As discussed above, ESAI compared base case market projections with CVEC operating to a scenario in which we assumed CVEC is excluded from the market and therefore does not operate. Based on our analysis ESAI found that removing CVEC from the NYISO system resulted in higher net imports and increased generation from less efficient units with higher emissions rates.

Table 1, Table 2, and Table 3 show the projected change in generation and emissions when CVEC is removed from the system in 2025, 2030, and 2035, respectively. As shown, between 5,959 GWh and 6,218 GWh of CVEC energy generation needs to be replaced to meet load when CVEC is removed from our base case scenario in the forecast years. This CVEC generation is replaced by both NYISO generators and increases in net imports. Of the replacement generation between 65 and 71 percent is expected to come from NYISO generators (depending on the forecast year), and the rest is expected to come from net imports.

Table 1: 2025 Change in Generation and Emissions without CVEC

	Generation (MWh)	Emissions (Tons)		
		CO2	NOX	SO2
CVEC	(6,274,309)	(2,588,138)	(167)	(26)
Other NYISO Generation	3,885,827	1,837,969	824	229
Imported Generation	1,926,368	1,460,206	984	1,467
Total		710,037	1,640	1,669

Table 2: 2030 Change in Generation and Emissions without CVEC

	Generation (MWh)	Emissions (Tons)		
		CO2	NOX	SO2
CVEC	(6,618,474)	(2,721,540)	(176)	(27)
Other NYISO Generation	3,277,814	1,543,484	803	267
Imported Generation	1,691,463	2,010,049	1,559	891
Total		831,993	2,186	1,130

¹ NYISO 2024 Gold Book

Table 3: 2035 Change in Generation and Emissions without CVEC

	Generation (MWh)	Emissions (Tons)		
		CO ₂	NO _x	SO ₂
CVEC	(5,958,729)	(2,448,708)	(158)	(25)
Other NYISO Generation	3,362,659	1,551,438	761	200
Imported Generation	1,344,317	1,021,495	251	526
Total		124,225	854	701

Removing CVEC from the New York dispatch does avoid the associated emissions we would expect the plant to generate in the forecast years. However, the reduction of emissions associated with removing CVEC is more than offset by the increase in emissions from the additional in state and imported generation needed to meet load. This is because the available in-state and imported dispatchable generation are less efficient and have higher emissions rates than CVEC. So, removing CVEC from the market results in more CO₂, NO_x, and SO₂ emissions, than if we assume CVEC is online.

The CO₂ emissions that are avoided by removing CVEC from the system in 2025 (2,588,138 tons, which equates to approximately 8.8 percent of New York's 3-year historical average annual CO₂ emissions)², is more than offset by emissions from in-state and imported generation with higher emissions rates. Similarly, the decrease in NO_x and SO₂ emission with the assumed retirement of CVEC in all years is more than offset by the expected increase in NO_x and SO₂ emissions from in-state generation alone. The expected increase in NO_x and SO₂ is even larger when we take into consideration the increase in emissions from imported generation. For example, in 2030, ESAI projects that removing CVEC from the system results in additional NO_x emissions from replacement generation of 2,362 tons, which is substantially more than the 176 ton decrease that would have been emitted by CVEC if it were online. In 2030, the 1,158-ton increase in SO₂ emissions from replacement generation offsets the estimated 27 tons of SO₂ emissions that CVEC would have emitted.

Table 4 shows both the change in imported generation and emissions when CVEC is excluded from the market and compares average emissions rates of imported generation to CVEC's emissions rates. As shown, net imports are expected to increase when CVEC is removed from the system. Additionally, the emissions rates of imported generation are higher than CVEC's emissions rates for all of the forecast years. In other words, the imported generation is dirtier, or produces more emissions per MWh of energy produced, than CVEC.

² The EPA Clean Air Markets Program data (<https://campd.epa.gov/data/custom-data-download>)

Table 4: Change in NYISO-Wide Imports and Imported Emissions, Average Emissions Rates of Imports and CVEC

Year	Import MWh	Import Emissions (Tons)			Import Emissions Rates (lbs/MWh)			CVEC Emissions Rate (lbs/MWh)		
		CO2	NOX	SO2	CO2	NOX	SO2	CO2	NOX	SO2
2025	2,157,425	1,460,206	984	1,467	1,354	0.91	1.36	825	0.05	0.01
2030	2,516,062	2,010,049	1,559	891	1,598	1.24	0.71	822	0.05	0.01
2035	1,970,194	1,021,495	251	526	1,037	0.26	0.53	822	0.05	0.01

NYISO SPECIFIC IMPACTS:

Table 5 shows the changes in emissions within NYISO associated with the increased generation when CVEC is excluded. As shown, emissions from replacement generation increase in all the forecasted years.

Table 5: NYISO Emissions Delta (Tons), Replacement Generation Only

Year	CO2	NOX	SO2
2025	1,837,969	824	229
2030	1,543,484	803	267
2035	1,551,438	761	200

Table 6 shows the change in overall emissions within NYISO, including the decrease in emissions when CVEC is excluded. Although CVEC is a highly efficient plant and has one of the lower emissions rates of the plants within NYISO, removing it from the system does result in a net decrease in in-state CO2 emissions. Despite CVECs relatively low emissions rate, it is one of the largest plants in the state and therefore, does generate a large quantity of CO2 emissions. However, as discussed above, this impact is offset when we also consider the emissions impacts from net imports.

The most meaningful NYISO specific emissions impacts were the projected increase in net NOx and SO2 emissions when CVEC is excluded from market. In 2025, NOx emissions were projected to be 657 tons or 5 percent higher than NOx emissions in our base case. By 2035, NOx emissions are expected to be 7 percent higher without CVEC. For context, all of the power plants in New York have generated on average 8,607 tons of NOX annually over the last three years (2021-2023).³

SO2 emissions are also expected to be much higher if CVEC is excluded from the market. For instance, we found that net SO2 emissions were 239 tons, or 15 percent higher in New York in 2030 if we assumed CVEC was no longer available. For context, all of the power plants in New York have generated on average 1,627 tons of SO2 annually over the last three years (2021-2023).⁴

³ *ibid*

⁴ *ibid*

Table 6: NYISO Emissions Delta (Tons), CVEC emissions included

Year	CO2	NOX	SO2
2025	(750,169)	657	203
2030	(1,178,056)	627	239
2035	(897,270)	602	175

Table 7, Table 8, and Table 9, show the top 10 in-state resources that were dispatched in place of CVEC. The resources dispatched in place of CVEC are generally less efficient and mostly consist of combined cycles with dual fuel capability. Removing CVEC from the NYISO system resulted in a less efficient NYISO dispatch and produced higher emissions from replacement generation than if CVEC is assumed to be operational. Since renewable resources are not dispatchable, they cannot increase or decrease output in response to the exclusion of CVEC from the market.

The tables below show the heat rates of these facilities. Most of the facilities have a higher heat rate (Btu/kWh) compared to CVEC, which has an approximate average heat rate of 6,900 Btu/kWh. Facilities with higher heat rates are less efficient because they consume more fuel to produce an equivalent amount of electricity.

Table 7: Top 10 Sources of CVEC Replacement Generation in 2025

Name	Zone	Generation (MWh)	CO2 (Tons)	NOX (Tons)	SO2 (Tons)	Incremental Heat Rate (Btu/KWh)
Athens Generation	F	1,739,204	721,683	75	6.1	7,033
Bethlehem Energy Center #5-8	F	184,444	75,509	8	0.4	6,880
Arthur Kill #2-3	J	154,157	88,736	66	0.8	9,756
Bowline #1-2	G	152,639	97,997	65	2.3	10,882
Brooklyn Navy Yard Cogeneration Partners	J	143,792	72,594	5	0.6	8,557
Empire Generating Company #1-3	F	112,099	46,893	3	0.4	7,090
Ravenswood #3	J	86,687	51,531	25	2.3	9,991
Ravenswood CC	J	78,225	32,842	101	0.2	7,056
Kennedy International Airport Cogen	J	65,594	32,142	7	0.3	8,305
Richard M Flynn #NA1-NA2	K	48,888	22,858	5	0.3	7,858

Table 8: Top 10 Sources of CVEC Replacement Generation in 2030

Name	Zone	Generation (MWh)	CO2 (Tons)	NOX (Tons)	SO2 (Tons)	Incremental Heat Rate (Btu/KWh)
Athens Generation	F	1,652,722	686,141	71	5.8	7,037
Astoria Energy Project CC1-CC2	J	215,460	91,788	11	0.8	7,221
Charles Poletti 1	J	144,649	59,679	4	0.5	6,993
Bowline #1-2	G	129,644	78,393	62	0.6	10,249
Ravenswood CC	J	128,323	53,815	165	0.3	7,048
Brooklyn Navy Yard Cogeneration Partners	J	101,532	51,069	3	0.4	8,525
Arthur Kill #2-3	J	80,601	46,458	35	0.4	9,770
Saranac Energy #1-3	D	74,584	37,717	12	0.3	8,571
Empire Generating Company #1-3	F	72,395	29,874	2	0.3	6,994
Richard M Flynn #NA1-NA2	K	63,888	29,912	7	0.4	7,869

Table 9: Top 10 Sources of CVEC Replacement Generation in 2035

Name	Zone	Generation (MWh)	CO2 (Tons)	NOX (Tons)	SO2 (Tons)	Incremental Heat Rate (Btu/KWh)
Athens Generation	F	542,262	221,956	23	1.9	6,938
Bethlehem Energy Center CCCT #5-8	F	396,964	164,610	17	0.8	6,969
Astoria Energy Project CC1-CC2	J	303,850	126,549	15	1.1	7,059
Empire Generating Company #1-3	F	258,351	107,466	8	0.9	7,050
Linden Cogen #CTG1-6 & STG1-3	J	169,769	71,535	11	0.6	7,142
Arthur Kill #2-3	J	143,303	83,547	63	0.7	9,882
Ravenswood CC	J	123,229	51,612	158	0.3	7,039
Bowline #1-2	G	87,357	53,787	41	0.7	10,436
Sithe Independence Station #5	C	80,602	35,722	9	0.2	7,449
Brooklyn Navy Yard Cogeneration Partners	J	74,046	37,351	2	0.3	8,550

Some of the resources that are expected to increase generation and emissions to replace CVEC in our analysis are located in Environmental Justice Areas (EJAs). Table 10 shows the change in emissions from replacement generation in EJAs if CVEC is excluded from the system. As shown, CO2 and SO2 increase from replacement generation in disadvantaged communities if CVEC is removed from the system in all of the forecasted years. Additionally, generators replacing CVEC in EJAs produces more NOx emissions during Ozone Season. Note that CVEC is located in an EJA, and therefore emissions from CVEC are avoided in EJAs when we assume CVEC does not operate.

Table 10: Emissions from Replacement Generation in EJAs (Tons)

Year	Annual		Ozone Season
	CO2	SO2	NOX
2025	132,830	38	105
2030	124,176	57	66
2035	96,519	53	47