June 12, 2024

Secretary of the Board
44 South Clinton Ave., 1st Floor
PO Box 350
Trenton, NJ 08625-0350
Phone: 609-292-1599
Email: board.secretary@bpu.nj.gov

RE: Docket No. QO24040223 – IN THE MATTER OF COMPREHENSIVE ENERGY EFFICIENCY AND RENEWABLE ENERGY RESOURCE ANALYSIS FOR FISCAL YEAR 2025 CLEAN ENERGY PROGRAM

RE: Docket No. QO24040224 - IN THE MATTER OF THE CLEAN ENERGY PROGRAMS AND BUDGET FOR THE FISCAL YEAR 2025

The Northeast Chapter of the Combined Heat and Power Alliance ("The NE Chapter") respectfully submits comments to the Secretary of the Board of Public Utilities ("BPU") on the above referenced dockets.

The NE Chapter is a group of manufacturers, system developers, engineers, and end-user representatives with the purpose of reducing energy costs and carbon emissions using the highly efficient technology of Combined Heat and Power ("CHP"). The NE Chapter and its member organizations fully support the innovative and extensive goals and objectives that are the foundation of the NJ Clean Energy Programs in achieving the state's decarbonization goals and believe that CHP technology will play a critical role in facilitating the state's mission. The NE Chapter strongly believes that CHP must play a crucial role in reducing marginal grid emissions in the near-term while assisting New Jersey's efforts to achieve a fully decarbonized grid. The United States Department of Energy ("DOE") shares this sentiment, stating that "[i]ndustrial CHP can provide significant greenhouse gas emissions reductions in the near- to mid-term as marginal grid emissions continue to be based on a mix of fossil fuels".[1]

[1] US Department of Energy, Industrial Decarbonization Roadmap, Sep. 2022 at 14, https://www.energy.gov/sites/default/files/2022-09/Industrial%20Decarbonization%20Roadmap.pdf

The NE Chapter and its members heartily endorse the conclusions of the Fiscal Year 2025 Comprehensive Energy Efficiency & Renewable Energy Resource Analysis of the New Jersey Clean Energy Program ("CRA straw proposal"), as stated below: [2]

> "Staff's FY25 CRA straw proposal is intended to advance the State toward that goal and to recognize the value of energy efficiency, renewable energy, and distributed energy resources as foundational energy resources that, when delivered cost-effectively, reduce the cost of energy for all ratepayers while providing additional benefits. These benefits include the health benefits associated with improved air quality, lower environmental compliance costs, increased grid reliability, as well as economic development opportunities in the form of jobs and a more competitive business environment. This proposal recommends that the State continue to make the investments necessary to keep NJ on the path toward achieving the Governor's clean energy goal."

The NE Chapter endorses the BPU Staff ("Staff") recommendation to the Board of an appropriate total FY25 funding level for distributed energy resources ("DERs") at $93,188,194, which includes CHP–FC funding of $31,500,694 and microgrids funding of $1,687,500. The CRA straw proposal recognizes that DERs, when delivered cost-effectively, reduce the cost of energy for all ratepayers while providing additional benefits.

In determining an appropriate Total FY25 Funding level for DERs at $93,188,194, including CHP–FC at $31,500,694, the CRA straw proposal properly recognizes the numerous benefits of CHP:

1. CHP reduces CO_2 emissions, today, by displacing dirtier grid resource CO_2 emissions.
2. CHP reducing CO_2 emissions **today** is more valuable than waiting for the grid to deliver lower carbon electricity in five, seven, or 12 years.
3. As the grid gets cleaner, CHP can and will evolve to use low and non-emitting fuel sources.
4. CHP provides an important energy efficiency measure.
5. CHP saves energy costs by operating at higher efficiency.
6. CHP fosters economic development opportunities in the form of jobs and a more competitive business environment, by saving energy costs.
7. CHP systems, properly designed and configured, provide significant resiliency benefits, ensuring continued operation of critical infrastructure, essential health care services and community "centers of refuge."

CHP reduces CO_2 emissions, today.

[2] New Jersey Board of Public Utilities. Division of Clean Energy. Comprehensive Energy Efficiency & Renewable Energy Resource Analysis: Funding Levels – Fiscal Year 2025. May 24, 2024. Page 23.

According to a 2019 study by ICF, CHP emissions are estimated at 652 lbs. CO_2/MWh when accounting for offset boiler emissions.[3] The eGRID non-Base load emissions rate, a suitable estimate of marginal generation most likely to be offset by CHP and other DERs, is 1,357.3 lbs. CO2/MWh for eGRID 2021 Sub-region RFCE (the region New Jersey resides in).[4] CHP provides significant carbon savings relative to marginal emissions across the state.

CO_2 reductions <u>today</u> are more valuable than future reductions.

CHP is reducing carbon emissions today — not 5 or 10 years out — given that it is still a cleaner resource for heat and power rather than separate generation by traditional central power plants and on-site boilers. Atmospheric CO_2 accumulation is cumulative and any attempt to discourage use of this carbon reducing technology is counterproductive vis-à-vis the state goals. The time value of carbon is the concept that greenhouse gas emissions cut today are worth more than cuts promised in the future, due to the escalating risks associated with the pace and extent of climate action. "Because emissions are cumulative and because we have a limited amount of time to reduce them, carbon reductions now have more value than carbon reductions in the future. The next couple of decades are critical."[5]

Exhibit A[6] demonstrates the degree of CO_2 savings that a CHP system can provide:

CHP's High Efficiency Saves CO_2 Emissions Today

- **CHP is a low carbon resource**, not a zero-carbon resource like PV & Wind, but it reduces grid carbon by displacing higher marginal emission sources
- **CHP's high operating efficiency and high capacity factor** enables it displace more marginal grid generation and reduce more CO_2 than the same capacity of zero carbon wind or PV

Category	Natural Gas CHP	Utility Solar PV	Utility Wind	Biogas CHP
Capacity, MW	20.0	20.0	20.0	20.0
Annual Capacity Factor	90%	24.3%	34.3%	90%
Annual Electricity, MWh	157,680	42,574	60,094	157,680
Annual Thermal Provided, MWh_{th}	169,466	None	None	169,466
Annual Energy Savings, MMBtu	628,000	382,992	540,002	628,300
Annual CO_2 Savings, Tons	70,114	32,654	46,092	163,187
Annual NOx Savings, Tons	53.5	16.4	23.1	53.5

Savings based on EPA AVERT Uniform EE Emissions Factors as a first level estimate of displaced marginal generation (https://www.epa.gov/avert)
Prepared by: Entropy Research, LLC, 7/28/2022

U.S. DEPARTMENT OF ENERGY | OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY | 3

[3] ICF. "As the grid gets greener, combined heat and power still has a role to play." https://www.icf.com/insights/energy/chp-role-in-decarbonization
[4] Environmental Protection Agency. Subregion Output Emission Rates (eGRID2021): eGRID Subregion RFCE, Non-Baseload output emission rates. January 30, 2023. https://www.epa.gov/system/files/documents/2023-01/eGRID2021_summary_tables.pdf
[5] "Time Value of Carbon," Larry Strain. Carbon Leadership Forum. April 2020.
[6] Entropy Research, LLC. CHP's High Efficiency Saves CO2 Emissions Today. July 28, 2022.

As the grid gets cleaner, CHP can and will evolve to low and non-emitting fuel sources.

Existing CHP systems can and do utilize biogas, biofuels, and hydrogen fuels. All natural gas-fueled CHP is compatible with renewable gas. The Department of Energy's Combined Heat and Power eCatalog of recognized packaged CHP systems denotes many systems are clean fuels compatible today, including:[7]

- 46 existing CHP packages capable of running on digester gas,
- 4 existing CHP packages capable of running on landfill gas,
- 59 existing CHP packages capable of running on a hydrogen blend, and
- 5 existing CHP packages that are 100% hydrogen capable.

Greater availability of equipment options is soon to become available. Most existing turbines and engines can operate on hydrogen mixtures up to 10-40%. All major engine and gas turbine manufacturers are working on the capability to operate at high levels of hydrogen, targeting 2030 for 100% hydrogen prime movers.[8]

CHP systems can be changed out or modified in the field to operate on high hydrogen-fuel blends and/or 100% hydrogen fuel. CHP operating and installed today is easily adaptable to low-carbon and zero-carbon fuels including clean hydrogen.

CHP is a long-established energy efficiency and cost savings measure.

Operating at higher total system efficiency than is achievable with separately produced heat and power, CHP reduces customers total energy bills. Reduced energy costs improve business margins and profitability. In the case of non-profit or government enterprises, less spent on energy costs allows the organization to dedicate more resources to their core mission. Reducing energy cost burdens for an enterprise fosters economic development opportunities in the form of jobs and a more competitive business environment.

[7] U.S. Department of Energy. Combined Heat & Power eCatalog. Last Accessed June 2023. https://chp.ecatalog.ornl.gov/search

[8] Combined Heat and Power Alliance. Clean Hydrogen and CHP: A Roadmap for Industrial and Commercial Decarbonization. March 2022. https://chpalliance.org/resources/publications/clean-hydrogen-and-combined-heat-and-power-a-roadmap-for-industrial-and-commercial-decarbonization/

DOE's Industrial Decarbonization Roadmap recognizes CHP.

The DOE Industrial Decarbonization Roadmap[9] identifies four decarbonization pillars, each representing foundational elements of an overall industrial decarbonization strategy. Among the four pillars is energy efficiency, and a key component of the DOE roadmap for efficiency is CHP.[10]

In the near to midterm, the DOE Roadmap states: "Industrial CHP can provide significant GHG emissions reductions in the near- to mid-term as marginal grid emissions continue to be based on a mix of fossil fuels in most areas of the country." In the future, RNG and hydrogen fueled CHP systems can be a long-term path to decarbonizing industrial thermal processes resistant to electrification.[11]

CHP is a part of a strategy to "de-risk" the decarbonization path. This is recognized in the DOE Roadmap: "There are opportunities for further integration of CHP with renewable energy and storage to backstop risk and variability and improve resilience."[12]

At several points, the DOE Roadmap states CHP's role not only in the near- to medium-term, but as a long-term decarbonization solution. CHP is cited as an essential component of the fully decarbonized economy: "The use of nuclear energy for electricity and heat, renewable and synthetic fuels, and clean sources of energy as the prime movers for CHP systems can avoid the use of fossil fuels, which will support the integration of CHP into a fully decarbonized energy economy."[13]

CHP systems, properly designed and configured, provide significant societal resiliency benefits.

CHP systems provide a portfolio of societal benefits including ensuring continued operation of critical infrastructure, essential health care services and community "centers of refuge." These benefits are not readily available today, and not as economically delivered as is the resiliency offered by CHP investments.

In recognition of this invaluable societal benefit, ensuring resiliency for critical operations and vulnerable populations, the State of New Jersey has recently invested in several CHP systems for resiliency. A snapshot of these important societal investments, able to deliver clean, affordable and resilient power, include:

---

[9] U.S. Department of Energy. Industrial Decarbonization Roadmap. DOE/EE-2635. September 2022. https://www.energy.gov/sites/default/files/2022-09/Industrial%20Decarbonization%20Roadmap.pdf
[10] Combined Heat and Power Alliance. The Role of CHP in the Industrial Decarbonization Roadmap. September 2022. https://chpalliance.org/the-role-of-chp-in-the-department-of-energys-industrial-decarbonization-roadmap/
[11] U.S. Department of Energy. Industrial Decarbonization Roadmap. DOE/EE-2635. September 2022. Page 14. https://www.energy.gov/sites/default/files/2022-09/Industrial%20Decarbonization%20Roadmap.pdf
[12] U.S. Department of Energy. Industrial Decarbonization Roadmap. DOE/EE-2635. September 2022. Page 80. https://www.energy.gov/sites/default/files/2022-09/Industrial%20Decarbonization%20Roadmap.pdf
[13] U.S. Department of Energy. Industrial Decarbonization Roadmap. DOE/EE-2635. September 2022. Page 14. https://www.energy.gov/sites/default/files/2022-09/Industrial%20Decarbonization%20Roadmap.pdf

- Cooper University Health System in Camden, NJ
- Ocean County Utilities Authority at the Southern Water Pollution Control Facility in Stafford Township, NJ
- St. Peters Hospital in New Brunswick, NJ
- Trinitas Regional Medical Center in Elizabeth, NJ
- Bergen County Utilities Authority in Little Ferry, NJ

In the words of the Community Development Systems Disaster Recovery Grant Reporting System report: "The extensive damage and power outages caused by Superstorm Sandy prompted the State to create the Energy Resilience Bank (ERB) to assist critical facilities such as hospitals, water treatment plants and wastewater facilities with securing resilient energy technologies that will transform them, and by extension, the communities they serve into less vulnerable sites to future severe weather events and other emergencies."[14]

Conclusion

The NE Chapter is grateful for the opportunity to supply comments to the Secretary of the BPU on the above referenced dockets. The NE Chapter endorses the BPU Staff recommendation to the Board of an appropriate Total FY25 Funding Level for Distributed Energy Resources ("DERs") at $93,188,194, that includes CHP–FC funding of $31,500,694 and Microgrids funding of $1,687,500.

CHP saves energy, reduces criteria pollutants, lowers business costs, and avoids CO_2 emissions. CHP remains a beneficial component of a carbon mitigation strategy by avoiding CO_2 emissions now, in the present and near term. As the grid decarbonizes, CHP can and will de-carbonize as well. There's a large existing base of systems operating on renewable fuels. Available equipment for delivering low and no carbon heat and power from CHP systems will continue to expand significantly over time. CHP is not a technology lock in. Systems can be readily adapted and replaced. If better alternatives are available, CHP can be reevaluated at the site, reconfigured to support decarbonization, or retired if it proves to be an impediment to decarbonization.

As noted above, DOE's Industrial Decarbonization Roadmap recognizes the myriads of benefits available from CHP systems, today, as well as in the medium- and long-term. CHP delivers invaluable resiliency benefits for critical infrastructure, necessary public health and safety services, and can provide refuge centers, allowing vulnerable populations to safely shelter in place, during outages of extended duration.

[14] Community Development Systems Disaster Recovery Grant Reporting System. Grantee: New Jersey Grant: B-13-DS-34-0001. April 1, 2022, thru June 30, 2022, Performance Report. Page 8. https://www.nj.gov/dca/ddrm/pdf_docs/2022%20Q2%20Sandy%20QPR%20Rpt.pdf

CHP can work in complimentary fashion, assisting decarbonization and electrification, by reducing some of the risks, increasing the affordability of electrification schemes. CHP facilitates a 100% renewable grid by providing necessary grid services as a distributed and dispatchable resource.

Respectfully,

The Northeast Chapter of the Combined Heat and Power Alliance
The Combined Heat and Power Alliance
2-G Energy, Inc.
Aegis Energy Solutions, LLC
Batten Consulting LLC
Bloom Energy
BROAD U.S.A. Inc
Capstone Green Energy
DT Energy Consultants
E Cubed
Energy Investment Systems, Inc.
Kraft Power Corporation
Matt Cinadr PE
Martin Energy Group
Northeast Western Energy Systems USA LLC
Tedom USA Inc
RSP Systems
Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)