



June 12, 2023

Secretary of the Board  
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**RE: Docket No. QO23040235 – IN THE MATTER OF COMPREHENSIVE ENERGY EFFICIENCY AND RENEWABLE ENERGY RESOURCE ANALYSIS FOR FISCAL YEAR 2024 CLEAN ENERGY PROGRAM**

**RE: Docket No. QO23040236 - IN THE MATTER OF THE CLEAN ENERGY PROGRAMS AND BUDGET FOR THE FISCAL YEAR 2024**

The Northeast Chapter of the Combined Heat and Power Alliance (“The NE Chapter”) respectfully submits comments on behalf of the undersigned organizations 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 and its members heartily endorse the conclusions of the Fiscal Year 2024 Comprehensive Energy Efficiency & Renewable Energy Resource Analysis of the New Jersey Clean Energy Program (“CRA straw proposal”), as stated below:<sup>1</sup>

*“Staff’s FY24 CRA straw proposal is intended to advance the State toward Governor Murphy’s Executive Order 315 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 recommends that the State continue to make the investments necessary to keep New Jersey on the path toward achieving the Governor’s clean energy goals.”*

The NE Chapter endorses the BPU Staff (“Staff”) recommendation to the Board of an appropriate Total FY24 Funding Level for Distributed Energy Resources (“DERs”) at \$20,180,161, that includes CHP–FC funding of \$17,992,661 and Microgrids funding of \$2,187,500.

The Staff’s FY24 CRA straw proposal recognizes that distributed energy resources when delivered cost-effectively, reduce the cost of energy for all ratepayers while providing additional benefits.

In determining an appropriate Total FY24 Funding level for DERs at \$20,180,161 including CHP–FC at \$17,992,661, the Staff’s CRA straw proposal properly recognizes the numerous benefits of CHP:

1. CHP reduces CO<sub>2</sub> emissions **today** by displacing dirtier grid resource CO<sub>2</sub> emissions.
2. CHP reducing CO<sub>2</sub> emissions **today** is more valuable than waiting for the grid to deliver lower carbon electricity in 5, 7 or 12 years.
3. As the grid gets cleaner, CHP can and will evolve to low and non-emitting fuel sources.
4. CHP provides an important energy efficiency measure.
5. By operating at higher efficiency, CHP saves energy costs.

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<sup>1</sup> New Jersey Board of Public Utilities. Division of Clean Energy. Comprehensive Energy Efficiency & Renewable Energy Resource Analysis: Funding Levels – Fiscal Year 2024. May 22, 2023. Page 21.  
[https://njcleanenergy.com/files/file/BPU/FY24/2\\_%20CRA%20Straw%20Proposal.pdf](https://njcleanenergy.com/files/file/BPU/FY24/2_%20CRA%20Straw%20Proposal.pdf)



6. By saving energy costs, CHP fosters economic development opportunities in the form of jobs and a more competitive business environment.
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<sub>2</sub> emissions, today.**

According to a 2019 study by ICF, CHP emissions are estimated at 652 lbs. CO<sub>2</sub>/MWh when accounting for offset boiler emissions.<sup>2</sup> 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. CO<sub>2</sub>/MWh for eGRID 2021 Sub-region RFCE (the region New Jersey resides in).<sup>3</sup> CHP provides significant carbon savings relative to marginal emissions across the state.

### **CO<sub>2</sub> reductions today 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<sub>2</sub> accumulation is cumulative and any attempt to discourage use of this carbon reducing technology is counterproductive vis-à-vis the state goals.

“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.”<sup>4</sup>

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.

Exhibit A demonstrates the degree of CO<sub>2</sub> savings that a CHP system can provide.

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<sup>2</sup> 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>

<sup>3</sup> 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](https://www.epa.gov/system/files/documents/2023-01/eGRID2021_summary_tables.pdf)

<sup>4</sup> “Time Value of Carbon,” Larry Strain. Carbon Leadership Forum. April 2020.



Exhibit A.<sup>5</sup>

## CHP's High Efficiency Saves CO<sub>2</sub> 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 to displace more marginal grid generation and reduce more CO<sub>2</sub> 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 <sub>th</sub>	169,466	None	None	169,466
Annual Energy Savings, MMBtu	628,000	382,992	540,002	628,300
Annual CO <sub>2</sub> 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/averf>)  
Prepared by: Entropy Research, LLC, 7/28/2022

### 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 U.S. Department of Energy's ("DOE") Combined Heat and Power eCatalog of recognized packaged CHP systems denotes many systems are clean fuels compatible today, including:<sup>6</sup>

- 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

<sup>5</sup> Entropy Research, LLC. CHP's High Efficiency Saves CO<sub>2</sub> Emissions Today. July 28, 2022.

<sup>6</sup> U.S. Department of Energy. Combined Heat & Power eCatalog. Last Accessed June 2023. <https://chp.ecatalog.ornl.gov/search>



manufacturers are working on the capability to operate at high levels of hydrogen, targeting 2030 for 100% hydrogen prime movers.<sup>7</sup>

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.

**DOE’s Industrial Decarbonization Roadmap recognizes CHP.**

The recently published DOE Industrial Decarbonization Roadmap<sup>8</sup> identifies four 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.<sup>9</sup>

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.<sup>10</sup>

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<sup>7</sup> 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/>

<sup>8</sup> 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>

<sup>9</sup> 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/>

<sup>10</sup> 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>



CHP is a part of a strategy to “de-risk” the decarbonization path. This is recognized in the US DOE Roadmap: “There are opportunities for further integration of CHP with renewable energy and storage to backstop risk and variability and improve resilience.”<sup>11</sup>

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.”<sup>12</sup>

**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:

- 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 (DRGR) 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

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<sup>11</sup> 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>

<sup>12</sup> 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>



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.”<sup>13</sup>

## Conclusion

The NE Chapter is grateful for the opportunity to supply comments to the Secretary of the Board of Public Utilities on the above referenced dockets. The NE Chapter endorses the BPU Staff recommendation to the Board of an appropriate Total FY24 Funding Level for DERs at \$20,180,161, that includes CH–FC funding of \$17,992,661 and Microgrids funding of \$2,187,500.

CHP saves energy, reduces criteria pollutants, lowers business costs and avoids CO<sub>2</sub> emissions. Avoiding CO<sub>2</sub> emissions now, in the present and near term, CHP remains a beneficial component of a Carbon mitigation strategy.

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 technology lock in. Systems can be readily adapted and replaced. If better alternatives are available, CHP can be re evaluated at the site, reconfigured to support decarbonization, or retired if, it proves to be an impediment to decarbonization.

DOE’s recently released Industrial Decarbonization Roadmap recognizes the myriad 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.

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.

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<sup>13</sup> Community Development Systems Disaster Recovery Grant Reporting System (DRGR). Grantee: New Jersey Grant: B-13-DS-34-0001. April 1, 2022, thru June 30, 2022, Performance Report. Page 8. Accessed on June 7 2023, [https://www.nj.gov/dca/ddrm/pdf\\_docs/2022%20Q2%20Sandy%20QPR%20Rpt.pdf](https://www.nj.gov/dca/ddrm/pdf_docs/2022%20Q2%20Sandy%20QPR%20Rpt.pdf)





Respectfully,

2G Energy Inc.  
Alturus  
BROAD U.S.A.  
Capstone Green Energy  
Caterpillar Inc.  
CHP-Funder.com  
Clarke Energy  
ComAp, LLC  
Combined Heat and Power Alliance  
Dalkia Aegis  
E-Finity Distributed Generation  
Integrated CHP Systems Corp.  
Kraft Power Corporation/ Kraft Energy Systems  
Lima Company  
Martin Energy Group  
Northeast-Western Energy Systems  
Northeast Chapter of CHP Alliance  
RENEW Energy Partners  
Sheet Metal and Air Conditioning Contractors National Association  
Solar Turbines Inc.  
Tecogen  
The E Cubed Company, LLC  
Thermax USA  
World Cogeneration Day