



July 5, 2023

Secretary of the Board
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RE: Docket No. QO20080531: In the Matter of Clean Energy – Request for Energy Savings Improvement Program (“ESIP”) – Regulations Straw Proposal

The Northeast Chapter of the Combined Heat and Power Alliance (“The NE Chapter”) respectfully submits comments to the New Jersey Board of Public Utilities (“Board”) regarding its Staff ESIP Regulations Straw Proposal (“Straw Proposal”).

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 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 Straw Proposal lays out the “purpose and scope” for the ESIP, a form of energy performance contracting, to serve as a funding mechanism for public entities to improve and retrofit their facilities by installing Energy Conservation Measures (ECMs), reducing energy consumption and costs without capital expenditure. The definition of ECMs includes combined heat and power systems. Approved applicants can execute up to 15-year contracts; however, contracts can be up to 20 years for CHP or cogeneration projects.¹

The NE Chapter and its members heartily endorse the inclusion of CHP within the ESIP’s armamentarium of energy savings technologies applicable for New Jersey State agencies, authorities, public institutions of higher education, county colleges, local boards of education, transit authorities, and county and municipal governments.

¹ NJ Board of Public Utilities. ESIP Regulations Staff Straw Proposal. Chapter 4A. <https://www.nj.gov/bpu/pdf/publicnotice/Draft%20ESIP%20Regs%20v%203.323.pdf>



The Straw Proposal recognizes that distributed energy resources such as CHP, when delivered cost-effectively, reduce the cost of energy for all ratepayers while providing additional benefits, including:

1. CHP reduces CO₂ emissions **today** by displacing dirtier grid resource CO₂ emissions.
2. CHP reducing CO₂ 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.
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 CO₂ emissions, today.

According to a 2019 study by ICF, CHP emissions are estimated at 652 lbs. CO₂/MWh when accounting for offset boiler emissions.² 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).³ CHP provides significant carbon savings relative to marginal emissions across the state.

CO₂ 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 CO₂ accumulation is cumulative and any attempt to discourage use of this carbon reducing technology is counterproductive vis-à-vis the state goals.

² 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>

³ Environmental Protection Agency. Subregion Output Emission Rates (eGRID2021): eGRID Subregion RFCE, Non-Base load output emission rates. January 30, 2023. https://www.epa.gov/system/files/documents/2023-01/eGRID2021_summary_tables.pdf



“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.”⁴

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 CO₂ savings that a CHP system can provide.⁵

CHP’s High Efficiency Saves CO₂ 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 CO₂ 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

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:⁶

⁴ “Time Value of Carbon,” Larry Strain. Carbon Leadership Forum. April 2020.

⁵ Entropy Research, LLC. CHP’s High Efficiency Saves CO₂ Emissions Today. July 28, 2022.

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



- 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.⁷

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.

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 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 such as hospitals, water treatment plants and wastewater facilities with securing resilient energy

⁷ 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/>



technologies that will transform them, and by extension, the communities they serve into less vulnerable sites to future severe weather events and other emergencies.”⁸

Conclusion

The NE Chapter is grateful for the opportunity to supply comments to the Board on the above referenced matter. The NE Chapter endorses the Board staff recommendation to continue including CHP within the list of eligible Energy Conservation Measures.

CHP systems saves energy, reduces harmful criteria pollutants, lowers business costs and avoids CO₂ emissions. By avoiding CO₂ emissions both in the near- and long-term, CHP remains a beneficial component of a carbon mitigation strategy.

As the grid decarbonizes, CHP can and will decarbonize as well. There’s a large existing base of systems operating on clean fuels. Available equipment for delivering low and zero-carbon 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 become available, CHP can be reevaluated at the site and reconfigured to support decarbonization goals.

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 and extreme weather events.

Lastly, CHP facilitates the transition to a 100% renewable grid, by providing necessary grid services as a distributed and dispatchable resource.

We welcome the opportunity to engage with Board staff on both this Straw Proposal and future matters pertaining to the NJ Clean Energy Program.

Respectfully,

Diane Molokotos
President, NE Chapter of the CHP Alliance

⁸ 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