NE CHAPTER
OF THE COMBINED HEAT AND POWER ALLIANCE

November 21, 2024

New York City Department of Buildings
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RE: DOB-184 – Proposed Rules on Article 320 of Chapter 3 of Title of the New York City Administrative Code

The Northeast Chapter of the Combined Heat and Power Alliance ("The NE Chapter") respectfully submits comments to the New York City Department of Buildings ("DOB") on the above referenced docket.

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 New York 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 York's efforts for a fully decarbonized grid. The United States Department of Energy shares this sentiment in 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]

The NE Chapter and its members heartily endorse the DOB's stated mission to utilize Local Law 97 (LL97) "to reduce the emissions produced by the city's largest buildings by 40 percent by 2030 and net zero by 2050."[2] However, DOB's proposed rules on Article 320 of Chapter 3 of Title 28 of the New York City Administrative Code (Proposed Rules) are insufficient to meet those goals since they only apply to qualified generation facilities (CHP) system installed prior to September 1, 2024. Additionally, the Proposed Rules' methodology terminates in 2030 based on central grid emissions, but they do not establish an objective measure of central grid emissions relative to CHP in 2030. CHP systems should be rewarded as long as they provide carbon savings relative to marginal grid emissions in New York.

[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
[2] https://www.nyc.gov/site/sustainablebuildings/ll97/local-law-97.page

1. **The Proposed Rules Should Not be Limited to CHP Systems Installed Prior to September 1, 2024, but Should Apply to All Qualified CHP Systems, Regardless of Their Installation Date.**

CHP reduces CO_2 emissions, <u>today</u>.

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 1,317.3 lbs. CO2/MWh for eGRID 2021 Sub-region NYCW.[4] CHP provides significant carbon savings relative to marginal emissions across the region. The DOB should abandon its arbitrary 2030 deadline and continue to reward the use of CHP systems for as long as their emissions provide carbon savings relative to marginal grid emissions in New York. Similarly, DOB should reward the installation of new CHP systems rather than limiting the Proposed Rules to systems installed prior to September 1, 2024, if as stated by DOB that CHP operates at lower carbon emissions than the separate generation of heat and power.[5]

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

CHP is reducing carbon emissions today 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."[6] Accordingly, DOB should reward CHP systems that are actively reducing carbon emissions today, and the Proposed Rules should not limit such their applicability to systems installed prior to September 1, 2024.

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[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] Urban Green Council, LL97: Unpacking the Proposed Rule (2024), Webinar, published October 10, 2024, https://www.urbangreencouncil.org/ll97-unpacking-the-proposed-rules-2024/.

[6] "Time Value of Carbon," Larry Strain. Carbon Leadership Forum. April 2020.

2. The Proposed Rules' Methodology Does Not Adequately Address the Benefits of CHP

CHP Results in Lower Carbon Emissions Relative to the Grid

While the Proposed Rules' methodology acknowledges the carbon reduction benefits of CHP by introducing lower carbon coefficients to be applied to the separate outputs of heat and power, this modest reduction does not fully reflect the carbon savings of a facility utilizing a CHP system and therefore is inconsistent with the DOB's goals.

The U.S. Environmental Protection Agency (EPA) recommends a method for calculating CO2 emissions savings from CHP. The displaced fuel use and CO2 emissions associated with the operation of a CHP system can be determined by:

a) Calculating the fuel use and emissions from displaced separate heat and power (SHP) (i.e., grid-supplied electricity and on-site thermal generation such as a boiler);
b) Calculating the fuel use and emissions from CHP; and
c) Subtracting (b) from (a).[7]

The above calculations could employ both average grid emissions and marginal grid emissions. In both cases, the facility utilizing a CHP system produces energy more efficiently and cleanly than the central grid. However, it is generally agreed that marginal grid emissions should be employed in comparing any distributed energy source to the central grid. "Average carbon factors are relatively easy to calculate. Knowing the total carbon emissions from generation and total electric generation establishes this value. For example, in 2020 the national value is 818 lb/MWh. Note that these values should not be used to evaluate technologies that add or subtract load to the grid."[8] According to an ASHRAE article published January 2024, it is the "order of dispatch" which will determine how electric demand affects carbon emissions.[9]

Although there has been growth in renewable generating resources which has created lower "average" emissions, there has been a corresponding increase in "marginal carbon emissions rates, because the new renewable sources are not operating at the margin but provide baseload when available.[10] Likewise, any new increase in electrical demand now is requiring Independent System Operators to operate their resources on the margin of the generation stack, which are significantly less clean and efficient than a natural gas fired cogeneration plant. Therefore, when the DOB is evaluating the effect of adding cogeneration to the grid support, it should be using *only* the marginal grid carbon coefficient when comparing to CHP to make its determination.

[7] Fuel and Carbon Dioxide Emissions Savings Calculation Methodology for Combined Heat and Power Systems, June 2021, EPA Combined Heat and Power Partnership.

[8] ASHRAE Journal, January 2024, "Understanding Marginal Carbon Factors and Why They Matter".

[9] ASHRAE Journal, January 2024, "Understanding Marginal Carbon Factors and Why They Matter".

[10] ASHRAE Journal, January 2024, "Understanding Marginal Carbon Factors and Why They Matter".

Figure 1 below demonstrates CHP displacing marginal grid emissions.

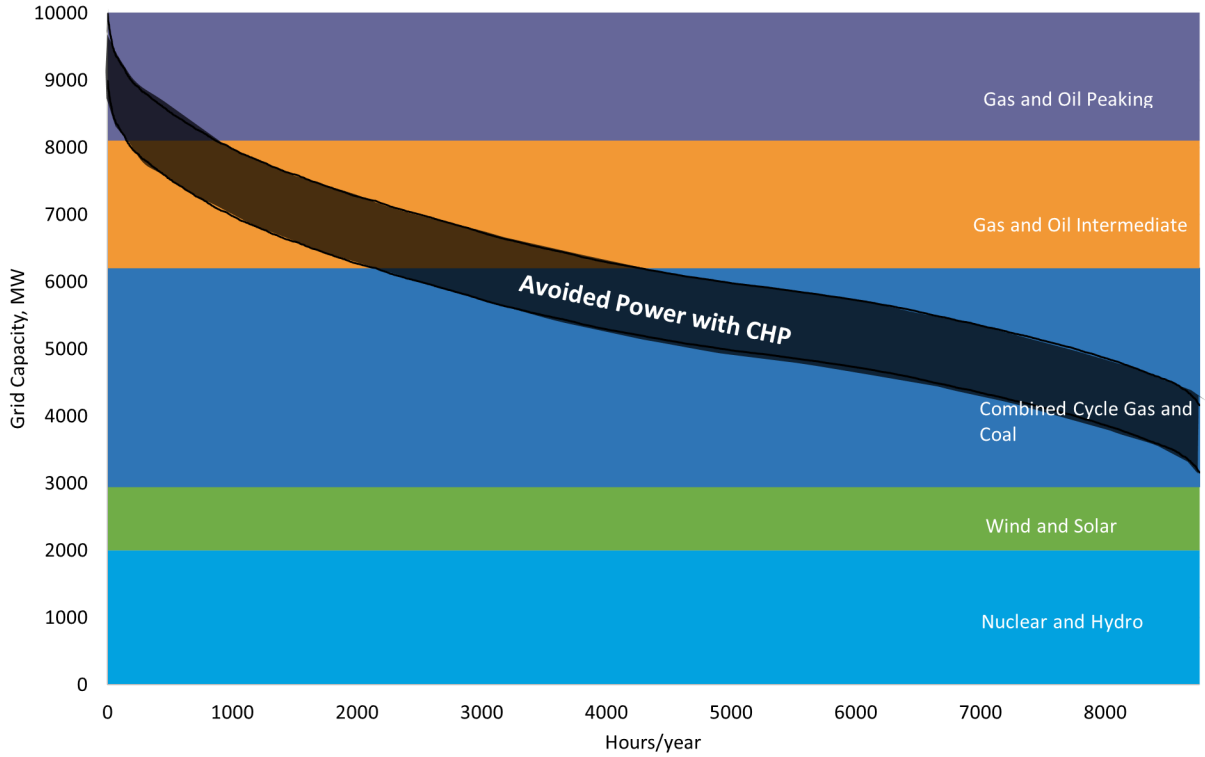

Figure 1. Marginal Displaced Generation Due to 1,000 MW CHP[11]

3. The Proposed Rules' Methodology Should Not Terminate in 2030, but Should Continue Until the Grid is Objectively Cleaner than CHP

CHP Systems will mitigate the impact of "Peaker Plants" on environmental justice communities

As expressly stated in LL97, "[t]he emissions reductions…shall be achieved through the applicable policies…including methods to ensure equitable investment in environmental justice communities that preserve a minimum level of benefits for all communities and do not result in any localized increases in pollution."[12] However, discouraging the adoption of CHP systems while demand for energy in New City is increasing will result in increased pollution in environmental justice communities. The New York Independent System Operator (NYISO) has identified a 446 MW shortfall of energy in New York City "due to ongoing electrification efforts, growth in energy intensive sectors such as microchip manufacturing,

[11] [11] Fuel and Carbon Dioxide Emissions Savings Calculation Methodology for Combined Heat and Power Systems, June 2021, EPA Combined Heat and Power Partnership,

[12] LL97, Subdivision b(2) of Section 24-803 of the administrative code of the city of New York, as added by local law number 22 for the year 2008.

and the retirement of New York City's dirtiest peakers."[13] Discouraging the adoption of new efficient CHP systems, will further exacerbate this energy shortfall, which will lead to increased use of peaker plants, and increased pollution, in New York City's environmental justice communities.

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 DOE's Combined Heat and Power eCatalog of recognized packaged CHP systems denotes many systems are clean fuels compatible today, including:[14]

- 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.[15]

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. Limiting the Proposed Rules to systems already in existence as of September 1, 2024, will discourage many large buildings of the opportunity to utilize carbon reducing CHP systems that are expected to evolve to low and non-emitting fuel sources in the near future. Relatedly, the 2030 termination deadline does not account for these additional carbon savings and the methodology should be adjusted so that CHP is measured objectively against grid emissions, rather than an arbitrary deadline.

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

[13] New York Independent System Operator. (2024, July 12). Short-Term Assessment of Reliability: 2024 Quarter 2. https://www.nyiso.com/documents/20142/39103148/2024-Q1-STAR-Report.pdf/f5e38d94-3578-e297-d2ce-8173c380395f.

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

[15] 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/.

profitability. Equally important, reduced energy costs also benefits residents, especially in economically disadvantaged communities. 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. Accordingly, building owners should be rewarded for adopting new CHP systems.

DOE's Industrial Decarbonization Roadmap recognizes CHP.

The DOE Industrial Decarbonization Roadmap[16] 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.[17] 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.[18]

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."[19]

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."[20]

[16] 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.

[17] 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/.

[18] 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.

[19] 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.

[20] 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.

Conclusion

CHP saves energy, reduces criteria pollutants, lowers business costs, and reduces 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 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 myriad 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.

Accordingly, the Proposed Rules must be amended to: (i) apply to all CHP systems, not just those systems installed prior to September 1, 2024; (ii) establish an objective measure of central grid emissions relative to CHP, rather than automatically terminating in 2030; and (iii) establish a carbon accounting methodology which is reflective of the carbon reduction benefits of an on-site CHP system. CHP systems should be rewarded as long as they provide carbon savings relative to marginal grid emissions in New York.

Respectfully,

The Northeast Chapter of the Combined Heat and Power Alliance