



July 1, 2022

NYSERDA
Climate Action Council
17 Columbia Circle
Albany, NY 12203-6399

RE: Comments on the Climate Action Council Draft Scoping Plan

The Combined Heat and Power Alliance (CHP Alliance) commends the New York Climate Action Council (the Council) for providing the opportunity to submit comments on the Draft Scoping Plan that serves as an initial framework for how the state will reduce greenhouse gas emissions and achieve net-zero emissions, increase renewable energy usage, and ensure climate justice.

In 2019, with the passage of the Climate Law and Community Protection Act (CLCPA), the State of New York established the goal of a 100% renewable electric grid by 2040, and net-zero carbon emissions economy wide by 2050. To meet the targets laid out in CLCPA, the state should strongly consider the increased deployment of combined heat and power (CHP) technologies. CHP systems utilizing renewable and lower-carbon fuels such as renewable natural gas (RNG) and clean hydrogen can enable significant emissions reductions, most notably in the buildings and energy-intensive industrial sectors. Well applied CHP systems are the most efficient method of using traditional fuels, requiring less fuel inputs for the same energy outputs compared to other generation units, and integrating lower-carbon fuels can allow for even greater carbon reductions and efficiency savings. Not to mention CHP systems provide enhanced resilience in environment with increasing climate-related disruptions to the grid, serving as the critical backbone to a majority of microgrid systems throughout the U.S.

About the CHP Alliance

The CHP Alliance is a diverse coalition with more than 70 members including equipment manufacturers and distributors, engineers, utilities, labor, contractors, non-profit organizations, and educational institutions, many with operations and interests in New York.¹ Our members come together with the common purpose to educate all

¹ "Who We Are," Combined Heat and Power Alliance, accessed March 2022, <https://chpalliance.org/about/>.



Americans about CHP and waste heat to power (WHP), and how CHP and WHP can make America's manufacturers and other businesses more competitive, reduce energy costs, enhance grid reliability, and reduce emissions.

About CHP

CHP is a proven and highly efficient technology that can reduce emissions using traditional fuels and can reduce emissions even further using clean hydrogen fuel. Properly designed systems typically operate with an overall efficiency of 65 to 85 percent, with some systems approaching 90 percent.² No other technologies using traditional fuels can reach these levels of efficiency. This is compared to an average efficiency of 39 percent for fossil-fueled power plants in the U.S., and an efficiency of 50 percent when electricity generation is combined with an on-site boiler for thermal energy needs.³ CHP systems achieve these high efficiencies by recovering the waste heat by-product of electricity generation as useful thermal energy for heating and cooling.⁴ Because they operate efficiently, CHP systems combust less fuel to provide the same energy services. This efficient generation of energy reduces all types of emissions, including greenhouse gases such as carbon, criteria pollutants, and hazardous air pollutants.

CHP in New York

Today, there is over 5,600 megawatts (MW) of CHP capacity installed across over 800 sites in New York.⁵ Looking to the future, the Department of Energy has identified 10,818 MW of remaining CHP (including WHP) total technical potential capacity at nearly 17,000 sites in New York, as described in the table below.

² "Combined Heat and Power (CHP) Technical Potential in the United States," U.S. Department of Energy, March 2016, p. 3, www.energy.gov/sites/prod/files/2016/04/f30/CHP%20Technical%20Potential%20Study%203-31-2016%20Final.pdf; "CHP Benefits," U.S. Environmental Protection Agency Combined Heat and Power Partnership, last accessed March 2022, <https://www.epa.gov/chp/chpbenefits>.

³ "Combined Heat and Power and a Changing Climate: Reducing Emissions and Improving Resilience," Combined Heat and Power Alliance, January 2021, p. 10. <https://chpalliance.org/resources/chp-and-a-changing-climate-reducing-emissions-and-improving-resilience/>.

⁴ "Fuel and Carbon Dioxide Emissions Savings Calculation Methodology for Combined Heat and Power Systems," U.S. Environmental Protection Agency, Combined Heat and Power Partnership, February 2015, p. 3. https://www.epa.gov/sites/production/files/2015-07/documents/fuel_and_carbon_dioxide_emissions_savings_calculation_methodology_for_combined_heat_and_power_systems.pdf.

⁵ "Combined Heat and Power Installation Database," U.S. Department of Energy, data current as of October 31, 2021, <https://doe.icfwebservices.com/state/chp/CA>



CHP Technical Potential in New York (including WHP)⁶

Top Industrial Sectors		Top Commercial Sectors	
Chemicals	798 MW	Commercial Office Buildings	1,290 MW
Food	286 MW	Colleges and Universities	831 MW
Paper	267 MW	Multifamily Buildings	510 MW
Primary Metals	143 MW	Govt. Buildings	464 MW
Textiles	74 MW	Hospitals	462 MW

CHP and Clean Hydrogen

Historically, CHP units have run on traditional fuels, and many today use natural gas. This use of CHP can be thought of as “CHP 1.0,” the first wave of CHP technologies that relied on fossil fuels. However, CHP units can be fueled by renewable and lower-carbon fuels, including hydrogen, known as “CHP 2.0.” Use of hydrogen fuel can allow CHP systems to reduce emissions even further than they do under CHP 1.0. Hydrogen fuel can serve as the primary fuel source for CHP systems and further reduce emissions across the industrial, commercial, and municipal sectors. Moreover, CHP systems use hydrogen fuel efficiently, requiring less fuel inputs for the same energy outputs compared to other generation units. Given the high cost of hydrogen, using hydrogen fuel efficiently in CHP systems will help to keep costs low and enable significant greenhouse gas reductions. Efficient use of hydrogen fuel should be central to any hydrogen and climate strategy, and CHP helps to meet this goal.

Today’s existing and newly installed CHP systems can use a substantial blend of clean hydrogen – ranging from 20-100%, according to equipment manufacturers.⁷ Work is being done to increase the volume of hydrogen fuel that can be used in CHP systems industry-wide, and some CHP systems are already capable of running entirely on clean

⁶ “Combined Heat and Power (CHP) Technical Potential in the United States,” U.S. Department of Energy, March 2016, p. D-9, www.energy.gov/sites/prod/files/2016/04/f30/CHP%20Technical%20Potential%20Study%2031-2016%20Final.pdf

⁷ “Clean Hydrogen and CHP: A Roadmap for Industrial and Commercial Decarbonization,” Combined Heat and Power Alliance, March 2022, <https://chpalliance.org/resources/publications/clean-hydrogen-and-combined-heat-and-power-a-roadmap-for-industrial-and-commercial-decarbonization/>



hydrogen.⁸ Gas turbine manufacturers are looking to provide equipment that can accommodate higher percentages of hydrogen fuel: various companies in the U.S. and abroad are deploying or working on hydrogen-ready technology. In 2019, a number of European companies committed to provide gas turbines that can handle 20% hydrogen content in fuel by 2020, and 100% by 2030.⁹ Earlier this year, the CHP Alliance put out a roadmap to convert all existing and new CHP systems to 100% clean hydrogen by 2030 or sooner, highlighting that existing systems, including ones installed today, can convert to 100% hydrogen at reasonable cost and with minimal downtime because these conversions can occur during scheduled overhauls.¹⁰

However, a critical barrier to clean hydrogen is its price and the need to scale up production to ensure adequate supply to meet demand. In the past several decades, America has succeeded in driving down the cost of wind and solar energy using a variety of policy tools to scale up these technologies. State governments should use the same approaches to scale up production and supply of clean hydrogen, which will help drive down the costs and should ensure this fuel is used as efficiently as possible by pairing it with CHP. We urge New York to bring together hydrogen suppliers, CHP developers, end-users, industry experts, and other stakeholders to understand, analyze, educate, and address the key issues for the deployment of clean hydrogen, such as modernizing gas pipeline infrastructure. We also urge New York to adopt policies to incentivize gas utilities to scale up the use of clean hydrogen, and to ensure that any tax credit or incentive must be made available to all technologies capable of utilizing clean hydrogen for electric power.

While hydrogen fuel has the potential to see more extensive use in CHP systems in the future and achieve deeper emissions reductions, it is critical that the Council keep in mind the following considerations when developing hydrogen policies to ensure that this potential becomes a reality:

⁸ "The UKs First 100% Hydrogen CHP," 2EA, February 19, 2021, <https://www.2ea.co.uk/The-UKs-first-100Percent-hydrogen-CHP.html>

⁹ Sonal Patel, "High-Volume Hydrogen Gas Turbines Take Share," *POWER*, May 1, 2019, <https://www.powermag.com/high-volume-hydrogen-gas-turbines-take-shape/>.

¹⁰ A CHP system overhaul typically occur every 8-10 years for a unit that runs continuously. "Clean Hydrogen and CHP: A Roadmap for Industrial and Commercial Decarbonization." Combined Heat and Power Alliance, March 2022, <https://chpalliance.org/resources/publications/clean-hydrogen-and-combined-heat-and-power-a-roadmap-for-industrial-and-commercial-decarbonization/>



- **Transportation:** The existing gas pipeline system may provide a cost-effective way to transport clean hydrogen, but additional research is required to determine what quantities of hydrogen can safely be transported or what retrofits may be required.
- **Distributed Generation:** Distributed generation technologies such as CHP can be deployed at the point of clean hydrogen production, allowing the use of hydrogen fuel in CHP systems and the realization of corresponding emissions benefits while the development of hydrogen-ready pipelines is still underway.
- **Use:** While research and development of 100% hydrogen-ready CHP technologies is ongoing, technology manufacturers and end users will need support as they continue to evaluate what amount of hydrogen current equipment can use, identifying the retrofits and upgrades needed to ensure the adjustment of existing equipment for hydrogen use is easy and affordable, and the development and deployment of new equipment as required.

CHP and Resiliency

CHP is unparalleled in its ability to provide continuous power, both electric and thermal, to critical infrastructure and limit the impact of outages by localizing power generation close to critical services. CHP can not only provide the benefit of essential energy services during catastrophic weather events and emergencies, but also create cost savings, distribution capacity, power quality benefits, and environmental benefits for entire communities.¹¹ During some climate events, as was the case with Superstorm Sandy, grid outages could last for days or weeks on end. On-site battery storage cannot feasibly provide power for that duration as the technology currently stands and would be compounded by a likely lack of production by wind and solar leading up to and during the climate event. CHP, however, is proven to keep the lights on during such events, supporting critical infrastructure including hospitals, healthcare providers, nursing homes, colleges and universities, and other facilities that serve as emergency shelters and places of sanctuary.

Additionally, microgrids are emerging as a key enabler of electrification and decarbonization at industrial facilities and in the U.S. over 200 microgrids used CHP,

¹¹ "CHP and the Clean Energy Future: How CHP Fits into a Modern Electric Grid and a Green Gas System," Combined Heat and Power Alliance, November 2021, p. 23. https://chpalliance.org/wp-content/uploads/2019/08/CHP_Clean-Energy-Future-1.pdf.



equivalent to 35 percent of all the nation's microgrids. Moreover, CHP serves as a critical backbone to over 67 percent of those microgrids that operate continuously.¹²

Conclusion

The CHP Alliance appreciates the Council's consideration of these comments, and respectfully requests that the Draft Scoping Plan appropriately recognize the numerous emission-reduction and resiliency benefits of CHP systems utilizing clean fuels and its potential as an option to meet New York's carbon-neutrality goals.

Sincerely,

David Gardiner, Executive Director
Combined Heat and Power Alliance
3100 Clarendon Blvd., Suite 800
Arlington, VA 22201
703-717-5590
david@dgardiner.com

¹² "Microgrid Installations," U.S. Department of Energy, data current as of July 31, 2021.
<https://doe.icfwebservices.com/microgrid>