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Submitted Via USPS and Via Email To: [info@rggi.org](mailto:info@rggi.org)

**Re: RGGI Program Review Comment**

As a company, Vicinity Energy is aligned with RGGI Inc. in our shared commitment to achieving net carbon zero carbon emissions by 2050. We are supportive of the Regional Greenhouse Gas Initiative (“RGGI”). Vicinity is the largest owner and operator of public combined heat and power (CHP), or cogeneration, systems in the United States. Our highly efficient operations provide zero-carbon “green steam” for millions of square feet of medical, educational, government, research and office facilities.

CHP is not only a vital low-carbon option for electric and steam generation, but it will also be for the foreseeable future. The consulting firm ICF has stated that cogeneration will be a net contributor to lowering carbon emissions through at least 2040.<sup>1</sup> It should be noted that ICF has an extensive history in developing climate and environmental modeling and is considered a leader in analysis and policy development for carbon reduction. The continued operation and expansion of CHP can be an important contributor to the goals of RGGI and Vicinity Energy seeks to work with RGGI and its member states to reduce carbon emissions.

**Vicinity Energy Company Description**

Vicinity owns and operates the Boston-Cambridge District Energy System. Vicinity Energy’s robust, underground district energy network distributes 99.99% reliable cogenerated thermal energy — or green steam — to over 230 facilities that use it for heat, hot water, chilled water, steam-driven cooling and processes like sterilization and humidification. Green steam refers to our low carbon thermal product, which in large part comes from a 225-megawatt unit combined heat and power (CHP) process and the integration of renewable energy. By combining the production of thermal energy (used for both heating and cooling) and electricity into one process, CHP results in the most efficient use of fuel to generate electricity and condition buildings, using far less fuel than when heat and power are produced separately. District energy also offers our customers a green energy alternative. With our goal to achieve net zero carbon emissions by 2050, we are continuously implementing a cleaner energy mix and investing in the city’s infrastructure to reduce carbon impacts.

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<sup>1</sup> <https://www.icf.com/insights/energy/chp-role-in-decarbonization>

## **Vicinity in Boston and Cambridge**

Vicinity tackles global energy problems on a local level, with local resources. For over 90 years, the Boston-Cambridge district system has distributed reliable, resilient and sustainable district energy to some of the area's premier hospitals, biotechnology and pharmaceutical companies, universities, hotel and entertainment venues, commercial space, and government facilities. An innovative and resilient energy solution, district energy involves the production of thermal energy from a central plant, eliminating the need to install or manage onsite boilers and chillers.

## **Green Steam Investments for a Cleaner Future**

In the Boston-Cambridge district alone, Vicinity has invested over \$110 million in a series of green steam projects to improve efficiencies and reduce environmental impacts — incorporating the interconnection of the two previously separated district energy systems, a new 7,000-foot steam pipeline extension, Vicinity's acquisition and reconfiguration of Kendall Cogeneration Station and the integration of renewable energy. The new pipeline from Kendall captures and leverages the plant's excess heat for use in Vicinity's district networks, thereby recycling thermal energy that was previously discarded. These combined efforts have dramatically reduced the region's carbon footprint by nearly 165,000 tons of greenhouse gas (GHG) emissions per year — the equivalent of removing nearly 36,000 cars from the road. Under Vicinity's ownership, facility upgrades at Kendall, including replacement of the plant's original cooling system design with an air-cooled condenser, have also reduced thermal impacts to the Charles River ecosystem. Vicinity's Clean Energy Future is our formalized commitment, vision and roadmap to achieve net zero carbon by 2050.

## **District Energy Benefits in Boston and Cambridge**

In addition to improving the region's critical energy infrastructure and reducing its carbon footprint, with district energy, individual buildings don't require onsite boilers or chillers — freeing up space for building amenities, eliminating the risk of onsite combustion, and reducing upfront capital and ongoing operations and maintenance (O&M) costs. Furthermore, Vicinity CHP systems deliver 99.99% reliable energy delivery, which is vital for critical facilities such as hospitals and educational institutions. Our interconnected central energy facilities have built-in redundancy, back-up generation and multiple water and fuel sources.

## **Vicinity Philadelphia**

Vicinity owns and operates the Grays Ferry Cogeneration Facility ("Grays Ferry Cogeneration") and the largest district energy system serving downtown Philadelphia. Grays Ferry Cogeneration consists of a 170MW electric generator and steam generation system that delivers thermal energy in the form of steam into Vicinity's district energy system and end use

customers throughout Philadelphia. Vicinity's district energy system is the second largest system in the United States with more than 41 miles of underground piping.

Vicinity leverages heat from Grays Ferry Cogeneration to deliver carbon free steam to customers in Philadelphia, including hospitals, universities, government, and commercial buildings. Vicinity serves the thermal needs of approximately 100 million square feet of commercial and institutional space and employs around 100 people from the Philadelphia area.

Grays Ferry Cogeneration is important for electric system reliability in Eastern Pennsylvania. It is interconnected with the PJM Interconnection at a constrained portion of the grid, an area known as the Mid-Atlantic Area Electric Reliability Council or "EMAAC" region.

In 2013, Vicinity completed a \$60 Million investment in its Philadelphia network, converting it to 100% "green steam" through cogeneration and the installation of new and efficient rapid response boilers. Vicinity's investment has improved the city's critical energy infrastructure and avoids more than 300,000 tons of CO<sub>2</sub> emissions annually.

Vicinity recently announced a corporate commitment to achieve net zero carbon emissions across all operations by 2050.<sup>2</sup> Vicinity is implementing a strategy to make further reductions in greenhouse gas ("GHG") emissions and will continue to be a major contributor to the City of Philadelphia's Greenworks GHG reductions goals.

### **Importance of CHP to Base Load Generation**

One of the fundamental challenges in reducing carbon emissions is that zero-carbon options aside from nuclear and hydroelectric are intermittent and require energy storage, which is not currently technically feasible in significant quantities. Nuclear energy is in decline within the RGGI region, and no additional nuclear capacity is in development. Hydroelectric is also highly constrained with, at best, limited options for expansion.

CHP is currently the most carbon-efficient option for base load electric generation. The Vicinity CHP facilities operate at up to 80% efficiency as compared to less than 60% efficiency for the most modern combined-cycle natural gas generators. Further, CHP can be expanded both in its current locations and via the addition of new facilities. The large CHP facilities in the RGGI region alone (Philadelphia/Grays Ferry and Boston/Kendall) are able to add over 400 MW in generation, if so incentivized. In short, CHP is the only option at this time for low-carbon base load generation expansion.

New technologies are currently in development that will allow CHP to function as energy storage hubs. As technology improves and the supply of intermittent electricity increases in the RGGI region, CHP systems will be able to shift to zero-carbon energy storage and distribution

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<sup>2</sup> <https://www.vicinityenergy.us/clean-energy-future/>

hubs, unlike gas, biomass or other carbon-emitting generators which will either operate as carbon emitters or close.

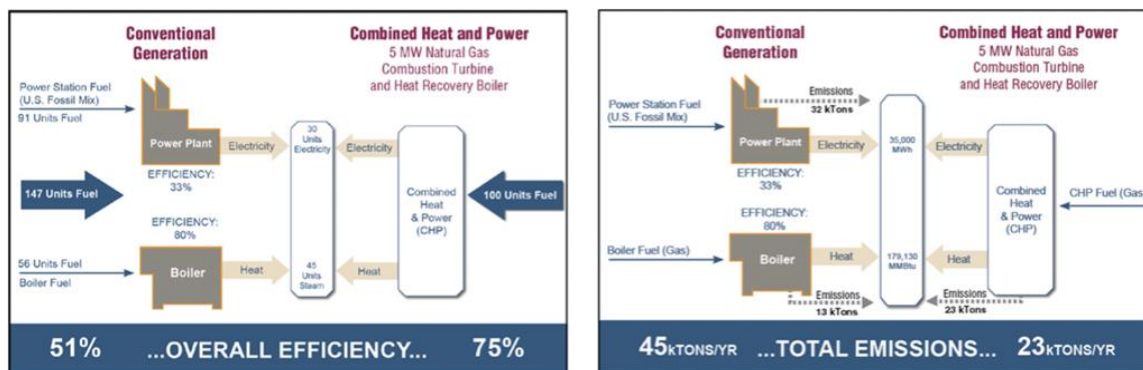
Vicinity CHP facilities have the ability to serve an additional 90 million square feet of office, research and institutional space with no marginal investment. Given the fact that the overall goal of RGGI is to reduce carbon emissions, Vicinity believes that RGGI, Inc. should take into consideration the potential for reductions in building-related carbon emissions, even though carbon-efficiency for buildings is outside the current scope of RGGI.

### **CHP Carbon Efficiency**

CHP units are by far the most carbon efficient method of producing baseload power, heat, and cooling with significantly higher efficiency than modern combined-cycle natural gas generating facilities.

As stated at the beginning of our comment, cogeneration will continue to reduce carbon emissions through at least 2040, according to ICF. Cogeneration reduces emissions because it displaces fossil fuel generation resources running on the margin in grid operations. As long as there are fossil fuel load following resources on the grid, natural gas-fired cogeneration will always result in less carbon emissions than separate heat and power, even when compared to the most efficient combined cycle turbine plants.<sup>3</sup>

CHP is a sustainable and efficient energy solution that uses heat that would otherwise be wasted from power generation and converts it into useful thermal energy. The simultaneous production of power and thermal energy consumes less fuel than if produced separately. CHP units can exceed 80 percent efficiency compared to traditional power plants which average much lower efficiency. The graphics below from the EPA Combined Heat and Power Partnership provide an example of the benefits of CHP.



CHP-fed district energy systems are unique carbon reduction tools. In fact, they are the most robust tools we have in the toolbox to achieve carbon reduction goals in dense urban environments, providing benefits above and beyond traditional CHPs. A CHP-fed district energy

<sup>3</sup> <https://www.icf.com/insights/energy/chp-role-in-decarbonization>

system supplies critical thermal energy (for heating, hot water, sterilization, and cooling) to buildings typically in densely populated urban areas. Since a district energy system serves many customers, it provides added carbon emissions reduction benefits by reducing or eliminating the need for on-site boilers across a city's footprint. In addition, the presence of district energy allows for urban growth without erecting "more stacks", which would release more emissions. In fact, when more square footage is added to a district energy system, overall carbon emissions drop substantially.

**Conclusion**

Vicinity appreciates the opportunity to submit this stakeholder input to RGGI Inc.

Respectfully,

William DiCroce

Chief Executive Officer

Vicinity Energy