

## COMBINED HEAT AND POWER

Combined heat and power (CHP), also called co-generation, is an energy savings strategy that works by producing heat and electricity in the same locations and using the same steam. CHP works well in industrial and institutional settings, where buildings are already producing their own steam for heat and/or industrial purposes that can do double-duty by turning an electric turbine. CHP can also be paired with district heating to be make cities and institutions even more efficient.<sup>1</sup> Even when powered by fossil fuels, CHP achieves efficiencies, but when powered by nuclear or biomass, the benefits for the climate are even greater. Biomass is one of the most common sources of power in CHP systems, especially in industrial settings where it is produced as a byproduct of manufacturing, such as at pulp and paper mills and sugar cane processing facilities.<sup>2</sup>

CHP is a mature technology that was first pioneered by Thomas Edison. Newer technologies are enabling CHP systems to add cooling to the services they provide (by incorporating chillers that use waste heat for refrigeration), in what is known as “trigeneration.” Recent years have seen the launch of “micro-CHP” plants, which represent a form of distributed energy. These typically have a capacity of less than 5 kW and are deployed in homes and businesses to produce heat onsite as well as electricity that can be used onsite or distributed into the electric grid.<sup>3</sup>

- Fishery friendliness: Since CHP is an efficiency technology, as opposed to a generation technology, it has no negative impacts on fishery resources and ecosystems and may help to alleviate pressure from energy generation on these resources by reducing the overall need for energy.
- Co-benefits: CHP can reduce costs by achieving greater energy efficiency and resilience.
- Environmental externalities: Since combined heat and power is an efficiency technology, as opposed to a generation technology, it has no environmental externalities of its own, and may help to alleviate environmental impacts from energy generation by reducing the overall need for energy.
- Policy catalysts: Industrial CHP can be promoted through tax incentives, loans, grants, carbon pricing, and renewable/clean energy standards. Micro-CHP can be promoted through net metering, feed-in tariffs, interconnection standards, tax incentives, loans, grants, and carbon pricing.
- More information:
  - [Department of Energy: Combined heat and power technology](#)
  - [Wikipedia: Cogeneration](#)
  - [CHP Alliance: CHP and a changing climate – Reducing emissions and improving resilience](#)

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<sup>1</sup> Wikipedia. “Cogeneration.” <https://en.wikipedia.org/wiki/Cogeneration#MicroCHP>

<sup>2</sup> DOE. “Overview of CHP technologies.”

[https://www.energy.gov/sites/default/files/2017/12/f46/CHP%20Overview-120817\\_compliant\\_0.pdf](https://www.energy.gov/sites/default/files/2017/12/f46/CHP%20Overview-120817_compliant_0.pdf)

<sup>3</sup> Wikipedia. “Cogeneration.” <https://en.wikipedia.org/wiki/Cogeneration#MicroCHP>

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