# State Policies Could Help Realize Potential Data Center Heat Reuse

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States should adopt policies that advance the reuse of data center heat by nearby facilities, according to David Gardiner and Associates. Their report explains that heat reuse has the technical potential to lower data center power demand by up to 30 percent. It offers a set of "strategic policy interventions" that can help realize these energy use reductions as well as mitigate the long-range need for new power plants that may be needed to meet future energy demands, while providing a range of other environmental and economic benefits.

Estimates of data center energy use vary considerably. A recent Vanderbilt Law School study found that estimates provided by four footprint calculators for the identical AI query varied by as much as 50 times.

**States may be missing a "significant yet underutilized opportunity"**

But there is little disagreement that data center energy use is on the uptick, spurred in part by AI. As ELI's Alexandria Nelson explains: "Data centers are projected to account for up to 12 percent of U.S. energy demand by 2028, and this increase is coming alongside other important energy demands from the electrification of the building and transportation sectors." Nelson cautions that "our energy grid is struggling to keep up"—a fact that has not gone unnoticed by state legislators around the country who are concerned about the impact of data center energy use on grid reliability and residential power bills.

According to the Department of Energy, about 40 percent of data center energy use is for cooling. Data centers employ a range of cooling methods, but the most common use liquid, such as water, which serves as a medium for transferring heat to commercial or industrial "offtakers," who can make use of the embodied energy. By using a closed loop piping system, the water can be returned to the data center at a lower temperature and used to cool servers in a process that can be repeated over and over again.

The large quantities of low-temperature heat (between 120-140 degrees Fahrenheit) produced by many data centers is particularly well suited for reuse in nearby pharmaceutical and food and beverage industry operations, and in commercial buildings for heating and cooling. And new cooling methods are yielding higher temperature heat, which can expand the field of potential offtakers and further reduce energy use. Accordingly, heat reuse can reduce grid loads by providing reliable heating and cooling to offtakers. Furthermore, according to the report, heat reuse can "drastically" reduce water consumption, because it provides an alternative to cooling methods that require a continuous supply of water.

In addition, heat reuse can lower the greenhouse gas emissions from both data centers and offtakers—the former by reducing the electricity used for cooling and the latter by using a byproduct of data center operations rather than new combustion—which can also be economically beneficial. And, in some cases, data centers can benefit from selling their heat or building goodwill by donating heat to surrounding communities for use in residential homes or other applications.

Although there are ample international examples of data center heat reuse, projects are few and far between in the United States. The report sets out three categories of state policies designed to remove current barriers. First up, states could address barriers to identifying appropriate offtakers by adopting policies that increase awareness of heat reuse opportunities, including through technical feasibility demonstration projects and platforms that match data centers with end users.

More generally, states could support development of additional district thermal energy networks that move heat from a central source to multiple buildings. And state zoning policies could facilitate locating data centers near industrial parks or existing thermal energy networks. States could also impose requirements for new infrastructure to include heat pipeline connections.

Second, to address project costs, states could offer data centers an investment or production tax credit based on the heat provided to offtakers or reductions in electricity consumption. States could also provide grants or low-interest loans for projects.

Last, states could fill a policy void by adopting specific requirements or standards that foster heat reuse. For example, states could establish data center energy efficiency standards or permitting requirements that include heat reuse or impose greenhouse gas emissions fees on data center electricity consumption.

While the feasibility of adopting heat reuse policies will vary from state to state, Nelson emphasizes that "it's worth exploring every tool in the toolkit because heat reuse could help data centers reduce climate impacts while creating local community benefits."