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District energy and combined heat and power

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When developers and building owners evaluate energy management strategies for their facilities, they can take advantage of energy-efficient technologies that are both cost-effective and eco-friendly, while still accommodating innovative and structurally advanced building design. In densely populated urban environments, district energy is often an attractive option that meets a building owner's objectives.

District energy is the production and distribution of thermal energy (steam, hot water, and/or chilled water). The energy is produced at a central plant and is then distributed to the community through an underground piping network. Therefore, instead of each building investing capital in its own in-building heating and cooling systems, along with fuel and chemical storage, leveraging a district energy network for space heating and cooling allows a building to optimize its life-cycle costs.

District energy conserves building owners' capital, and lowers their operating, maintenance and labor costs for facilities. The removal of on-site fuel and chemical storage can also improve safety of operation and lower insurance rates. In addition, buildings that leverage district energy networks can increase their revenue-generating space by reducing the size requirements for on-site mechanical rooms. The district energy network operator assumes responsibility for capital investment and ongoing network upgrades, operating risks, fuel procurement, and compliance with stringent environmental rules.

District energy networks also reduce regional greenhouse gas emissions when thermal energy is produced using combined heat and power (CHP) technology. Typically, when power and heat are produced separately, only 50% of the fuel consumed is converted into useful energy, and the remainder is expelled as waste heat. In contrast, CHP recycles the waste heat and can convert 85% of the fuel to useful energy. This equates to approximately 40% less fuel consumed than when heat and power are produced separately, which results in a significant reduction in greenhouse gas emissions. "Green" steam from CHP is both cost-competitive and environmentally responsible.

In New England cities such as Boston and Cambridge, a wide range of buildings reap the benefits of district energy and CHP. Hospitals, universities, research centers, and manufacturers leverage the high reliability of the networks to meet their critical energy requirements. District energy and CHP are also a great fit for office buildings, hotels, mixed-use developments, high-rise condos, retail establishments, arenas, and convention centers. All of these facilities require cost-competitive, reliable and efficient solutions for their process use, space heating, and space cooling needs.

Rowan Sanders is director of marketing and communications of Veolia Energy North America, Boston.