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## "Green Steam" ahead in Boston and Cambridge

July 31, 2014 - Owners Developers & Managers

Located beneath the streets and bridges of Boston and Cambridge, invisible to the cities above, lies Veolia North America's (Veolia), district energy system, a network of steam pipes supplying co-generated, environmentally friendly thermal energy or "Green Steam" to some of the Commonwealth's premier medical research institutions, hospitals, hotels, museums and government buildings. The Boston-Cambridge district system supplies steam used for space heating, hot water, humidification, and sterilization, in addition to cooling with the use of steam driven chillers in buildings.

As the owner and operator of the Boston-Cambridge district energy network, Veolia recently invested \$112 million to acquire the 256-megawatt Kendall Cogeneration plant and completed the construction of a 7,000-foot pipeline extension to export additional co-generated "Green Steam" to the city of Boston. "Green steam" is an environmental solution that increases energy conservation by using an efficient process and cogeneration technology for electrical and steam generation.

The cogeneration technology used at Kendall Station is highly-efficient as it converts up to 70 percent of fuel into useful energy, which equates to roughly 20% less fuel consumed than when heat and power are produced separately in boilers and power plants, respectively. Electricity is generated by burning natural gas in a combustion turbine. The heat exhausted by the combustion turbine produces steam, which is then used to generate additional electricity. A portion of that steam is then directed into the district system and distributed through underground steam pipes to over 250 customers in the central business district of Boston, the biotechnology corridor of Cambridge and the Longwood Medical Area.

The addition of the new 7,000-foot pipeline allows for the capture and reuse of the additional exhaust heat, which was previously lost to the environment. With the new pipeline in place, this thermal energy is now being leveraged to produce steam, thereby reducing thermal pollution to the Charles River ecosystem, improving air quality and reducing the region's carbon footprint.

The "Green Steam" infrastructure project has reduced the cities of Boston and Cambridge greenhouse gas emissions by avoiding 475,000 tons of carbon per year that would have otherwise been generated through conventional means - a nearly 6% reduction of non-transportation carbon emissions for both cities. The use of cleaner burning fuel sources, cogeneration technology, combined with recent infrastructure improvements has also reduced NOx and SO2 emissions by approximately 36% and 61%, respectively. With the two pipes together, the total reduction in carbon dioxide emissions thanks to the use of "Green Steam" is the equivalent of removing more than 80,000 cars from the road each year, or the equivalent of installing about 900 football fields worth of solar PV panels on building rooftops.

As a testament to the project's environmental and economic benefits, the Boston-Cambridge "Green Steam" project was recently recognized by Boston mayor Martin Walsh with a Greenovate Boston

Award at the May 2014 Greenovate Boston Community Summit, an annual event celebrating Boston's sustainability movement and climate action efforts.

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