

Markham's Hilton Suites Switches to District Energy

The preferred district energy connection occurs when a building is under construction. Planning, engineering and construction are all easier when the building is new. Now consider the challenge of connecting an operating five-star hotel with the original heating and cooling plant located on the roof. This was the job facing Markham District Energy (MDE) in Markham, Ont., as it secured the opportunity to add the Hilton Suites Toronto/Markham Conference Centre & Spa to its growing district energy system.

Established in 1999, MDE currently serves 6 million sq ft of downtown Markham building space from four plants; further system expansion is expected when Markham Centre becomes home to more than 30 million sq ft of development at full buildout.

The Hilton is a landmark building for the city of Markham. The 500-room hotel was constructed in 1992 and operates a fitness center, multiple restaurants and convention center. With the Hilton facing a full chiller plant replacement in 2011, the option of district cooling was considered. Despite the boiler plant being at midlife, the hotel and MDE reached an agreement where hot water district heating would be connected at the same time.

On the penthouse level of the hotel sat the original heating and cooling plants. To minimize changes to the hotel's existing heating and cooling distribution systems, MDE's challenge was to construct the energy transfer station in the basement level of the hotel and run a four-pipe system through the core of the facility to the penthouse while maintaining normal hotel operations.

The project faced a number of challenges including noise and vibration of the piping installation, finding a suitable piping route through existing corridors and staging construction materials to minimize guest disruption and hotel appearances. The largest single technical challenge was schedule: The goal was to supply chilled water by April 2011, with construction starting in late December 2010. Hot water supply would follow.

A key hurdle in negotiations with Hilton involved the competing advice hotel management received from consultants and vendors about installing replacement boilers and chillers. Some presented unverifiable information about the efficiencies, operations and service life of the replacement equipment. Such claims were important as they formed the basis of comparing system replacement costs to the district energy rate structure. After considerable review, MDE and the Hilton arrived at contract efficiencies and base case assumptions that made sense for both parties. The other commercial challenge was quantifying the value of the ownership risk transfer to an outsourced energy provider, including the value of premature equipment failure, the cost to manage unforeseen repairs and the value of high reliability.



The Hilton Suites Toronto/Markham Conference Centre & Spa, a Markham District Energy customer, is located 25 minutes from downtown Toronto.

The parties signed a 25-year energy services agreement where district energy became the supplier of heating and cooling energy for the next generation of hotel operations. MDE's construction group started Dec. 28, 2010, and within 14 days had cored a piping pathway to the penthouse level. The district cooling supply was fully functional by April 15, 2011 (14 weeks). Hot water was supplied to the hotel by the first week of May.

One interesting outcome was that district energy thermal metering uncovered several secondary side issues – most notably that at times the heating and cooling systems operated simultaneously, increasing utility costs. District energy provided helpful thermal trending information to improve this situation.

To meet the tight construction schedule for the project, planning was the key. As a necessity, much of the work was design-build on the fly with overlapping project elements. For all its challenges, however, the project was clearly a success: One year later, Hilton General Manager Patrick A. Regina stated, "The Hilton is pleased it decided to connect to district energy. From an operational perspective, the thermal energy supply is 100 percent reliable, and being free of equipment ownership responsibilities has allowed my staff to concentrate on other hotel operations to improve the guest experience."

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