

"THE ECONOMIC DEVELOPMENT BENEFITS FOR A MUNICIPALITY USING DISTRICT ENERGY CAN BE HUGE. THIS PLATFORM CAN ATTRACT BUSINESS, AND SKILLED EMPLOYEES."

THE **PERFECT** STORM

Sustainable Business Magazine speaks to Bruce Ander, President and CEO of Markham District Energy, about withstanding extreme weather, attracting tech companies, and how flexibility is integral to sustainability. ▶



Markham is the 16th largest city in Canada, home to around 350,000 residents, as well as headquarters of more than 400 Canadian head offices and 1000 high-tech and life sciences companies. Yet thirty years ago, the population was only 70,000. The story of this dramatic expansion is also the story of how a municipality can use district energy to provide reliable, cost-effective heat and power to densely-populated areas – and how quickly this investment can pay off.

SELF-SUFFICIENT

“One could say that we had a perfect storm in Markham for the development of district energy,” explains Bruce Ander, President and CEO of Markham District Energy. “In the late ‘90s, the electricity sector in Ontario was being restructured so municipalities could not only own their local utilities but also start affiliate utilities to get into industries like district energy. Then in January of 1998 we had a large

ice storm in Ottawa and the Quebec area. One of the lessons we took from that is to be less dependent on external grids.”

At the time, to accommodate unprecedented population growth, Markham was encouraging areas of increased density, one of which was right in the geographical center of the municipality. “They decided to make that a downtown center, with a community energy system being created in concert with the new downtown,” says Mr. Ander.



Markham Center will eventually be 40 million square feet, home to 40,000 residents and 40,000 employees. So far, the city is a quarter of the way through that build, and every building which has been constructed so far is connected to the Markham District Energy system. “We started operations in 2000, so we’re now in our 16th year,” says Mr. Ander. “In 2012 we launched our second system. That’s about 10 kilometers to the east, serving another

planned area of urban density called Cornell Center.”

INSURANCE POLICY

In Ontario, winters are cold, and a consistent supply of power is essential. “If we lose power in the depths of winter for any period of time, lives are at risk,” says Mr. Ander. “We started out with the goal of increased resiliency within the city for major utility disruptions or severe weather. We have a 15 megawatt

electrical fleet of Caterpillar generators fueled by natural gas, providing combined heat and power. In the case of a municipal emergency, we can work with the local electrical utility and begin opening up manual pathways to a series of public buildings in our downtown system here, which would be the places people would be encouraged to go. That’s now a part of the City’s emergency preparedness plan. It may never happen, but it’s good to have an insurance policy.”





In the winter of 2013-14, another ice storm struck Eastern Canada, and this time it hit Markham. Markham District Energy's second system at Cornell Center serves Markham Stouffville Hospital, a major regional hospital. "We simply separated from the grid," explains Mr. Ander. "So we're able to keep running indefinitely. After a couple of days of the regional power outage, citizens dependant on home dialysis or oxygen machines flooded to the hospital as a place of refuge. It could have been worse. The damage these ice storms do goes up exponentially as the ice builds in depth, and fortunately this one fell just short."

ECONOMIC DEVELOPMENT

Since the establishment of Markham District Energy, three data centers and several other companies have opened in Markham. "Back

at the beginning of Markham Center, before we had any buildings, IBM were looking into relocating their Software Lab," says Mr. Ander. "The City said: 'How about you stick to what you do well, which is software development, and we'll be the energy provider.' That way, IBM didn't have to worry about running their own big chiller plants and heating plants. IBM said yes to that, which brought 3000 highly educated employees to Markham."

Since then, another data center has opened in Markham, and a third was recently announced. Markham District Energy's cooling system has 99.998% reliability, which allows businesses to avoid putting capital into non-core assets. "The economic development benefits for a municipality using district energy can be huge," says Mr. Ander. "This platform can attract business, and skilled employees."

ENVIRONMENTAL BENEFITS

Markham District Energy has reduced Markham Center's greenhouse gas emissions by 35% compared to conventional buildings with their own heating and cooling plants. The next step, as Mr. Ander sees it, is a transition to alternative fuels. "We're only fifteen years old, and we're going to be around for another hundred," says Mr. Ander. "Sometime in the near future, we will introduce renewables to our fuel mix including biomass, biogas, and solar. Because of the nature of district energy, we have fuel flexibility at a community scale. We can change the technology and the fuel, and as long as we're distributing hot water to their buildings, it makes no difference to our customers. If we wanted to phase out natural gas, I could do it tomorrow without any building code changes, or increase in electricity rates, or anything like that. That's

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SUSTAINABLE EXPANSION

Next on Markham District Energy's radar is a third system. "Markham has been designated by the provincial government as one of the Places to Grow," says Mr. Ander. "There are four areas of urban density that are identified and are being planned. We have district energy systems in two of them,

and we're planning our third one right now. We're the first municipally-owned district energy utility to have two systems, and we'll also be the first to have three."

This new system will be at the Buttonville Redevelopment. "It's currently a small regional airport, which is closing," explains Mr. Ander. "Once it's closed, they're developing it into a mixed use community, and we are the selected district energy partner. So district energy and combined heat and

power is an official city policy; in high-density developments, district energy is the assumed base case. We're also going to be expanding our flagship system in Markham Center, where it all started."

Markham District Energy's model is an unusual one, because it's not mandatory to connect to their system. "Some jurisdictions where they have regulated district energy, the connection to the district energy utility would be mandated," says Mr. Ander.



"Here, that's not the case. If our company was expensive and unreliable, buildings wouldn't have to connect to us. Fortunately, we're not, and so far we've had 100% take-up. The Ontario Energy Board has been asked: 'Should you regulate district energy?' And their answer so far has been: 'Why should we? It seems that customers signing district energy contracts are satisfied and well served. We are proud of our commercial contracts and the service we provide.'"

AWARD-WINNING ENERGY

In addition to his role at Markham District Energy, Mr. Ander is the outgoing Chair of the International District Energy Association (IDEA). In fact, Markham District Energy won IDEA's System of the Year Award in 2013. "If you compare us to a lot of the other winners along the way, we're not the oldest or the largest by a large stretch," says Mr. Ander. "But our story is unique, building these systems in-step with the

build-out of major green-field developments. Importantly, we are closely tied to the city's development process. So we've done a lot in 15 years. We're very proud of that award. With Superstorm Sandy and some of the other severe weather that's hit us, systems like ours are foremost in the minds of many mayors in this region. I think our city is delighted that we started down this path many years before others were even talking about it." □

