



SCOTIA PLAZA – TORONTO FINANCIAL CORE ENERGY OPTIMIZATION CASE STUDY

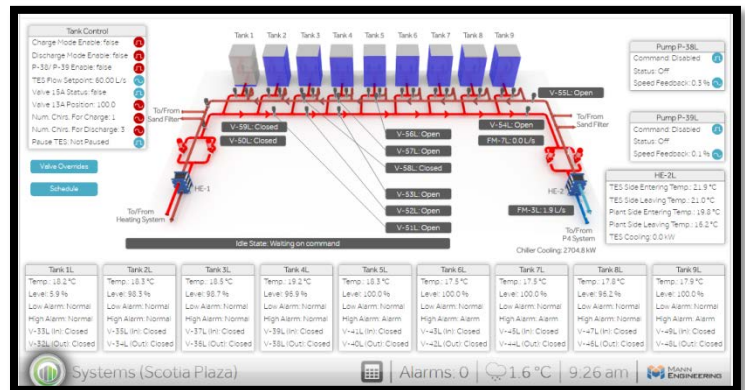
Objective

In 2014 Mann Engineering was tasked to help improve the operating efficiency of the aging Toronto landmark building Scotia Plaza. Energy efficiency was becoming a pressing issue due to environmental concerns and rapidly rising utility rates. Optimizing the energy management strategy is no simple task for a mixed use office building 70 stories tall with over 2,000,000 ft² of conditioned space.

What Was Done

For Scotia Plaza, the whole energy management strategy was redesigned to not only lower the total power consumed but also reduce the peak demand to further save. The following upgrades are some highlights of the innovative new ideas being implemented at Scotia Plaza.

- Installation of three (3) 190-ton heat recovery chillers to provide all of the buildings heating requirements without needing to use any of the six(6) electric boilers. These utilize a COP of 6.0 meaning that they can provide the same heat as the electric boilers using 1/6th the energy. Mann Engineering is **one of the first in North America** to work with Templifier chillers!
- Upgraded controls for the thermal storage system. Scotia Plaza makes use of 9 water storage tanks at 72,000 gallons each to heat or cool at off peak times to save on peak demand charges. This reprogramming has reduced charging energy consumption and discharging usefulness to increase system effectiveness by 100%.
- Installation of a new high efficiency chilled water plant (3500 tons) and an improved control strategy to reduce the cooling load consumption by over 50%. As well as reducing the ozone depleting substance content to zero.
- Installed Variable Frequency Drives (VFDs) on all compartmental air handling units and supply fans, and the majority of HVAC pumps. Resulting in a reduction of hot/cold calls by over 30% year



SCOTIA PLAZA CASE STUDY



round, as well as reducing ventilation and pump load consumptions by over 20%.

- Whole facility LED lighting retrofit (over 41,000), improving lighting levels and reducing bulb failures to nearly zero. Reducing lighting load consumption by over 50%. These LEDs are guaranteed for 7 years reducing annual maintenance cost as well.
- All applicable devices including boilers, chillers, transformers, VFDs were connected to a new BACNet loop. A new High-Performance Optimization Controls complete with Dashboard and M+T was provided to give building operators more data including alarms and power consumption to promote smarter decisions, troubleshooting, and better control strategies. This allows for demand reduction, and real-time global adjustment peak hour information to curb demand during high risk hours.



Results

The combined result of all of these energy saving initiatives has led to a 30% reduction in energy consumption, and an estimated savings of \$1.8 million in the first year alone. The project qualified for over \$1.7 million in incentives. This led to a payback period of around 4 years.

Estimated Project Cost	Estimated Total Incentives	Estimated Project Cost after Incentives	Estimated Annual Savings	Estimated Annual Maintenance Savings	Simple Payback (years)	3 Year Cost Escalation Payback (years)
\$ 10,242,638	\$ 1,772,563	\$ 8,470,317	\$ 1,831,317	\$ 107,000	4.4	3.98

The retrofit successfully converted mechanical equipment from cost centers to valuable assets.

This has resulted in a **savings of over 18 million kWh**, directly reducing emissions by over 823,000 kg of CO₂ annually.

50% saved in global adjustment charges, by reducing peak demand.

The reduction of the tenant utility portion of lease cost is **dropping by 20%**, allowing further opportunity for additional landlord profit with new or renewed leases, while also providing tangible benefits for the existing leases.

Based on the energy saving initiatives Scotia Plaza is in the process of obtaining a **LEED**

Platinum Certification, an elite title that only a handful of buildings in Toronto can claim. The LEED certification has provided tenants with significant opportunity to provide feedback as well as transparency into operations, especially as tenants can be proud that their building is meeting the highest standards for environmentally friendly purchasing, recycling and operations.

