Demand Response and Smart Grid in Ontario

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About Rodan Energy

• Largest provider of demand response in Canada (300MW of load under control)

• Smart grid integration company; expertise in metering, energy management and demand response

• Played an integral role in development and implementation of Ontario Power Authority’s (OPA) demand response programs

• Load control operator for OPA’s residential and small commercial DR program (peaksaver);

• DR clients include: City of Toronto, Loblaw, Gerdau Ameristeel, University of Ottawa, University of Toronto and Chrysler Canada
Smart Grid in Ontario
(Where It Is and Where It’s Going)

Where It Is
• Smart grid is key to a sustainable energy economy and an essential element of Ontario’s clean energy future
• Ontario is Canada’s smart grid pioneer and a North American leader in smart grid investment
• Closing down coal in 2014
• Continued AMI (Smart meter) roll-out
• Certifications and standards incorporating energy management technologies (LEED, ISO 50001)
• Most wind power in Canada

Where It’s Going
• Worldwide smart grid investments rising dramatically
• Ontario smart grid spend - $200M/year over next 5 years (SG Forum)
• Canada’s electricity infrastructure spend - $15 billion a year for the next 20 years (Conference Board of Canada)
• Innovation and investment is key
Today’s Power Grid

Centralized Power System

| Color Key: | Blue: Transmission | Green: Distribution | Black: Generation |

Generating Station

Generator Step Up HV Transformer

Transmission Customer 138kV or 230kV

Transmission Lines 765, 500, 345, 230, and 138 kV

Substation Step-Down HV Transformer

Subtransmission Customer 26kV and 69kV

Industrial Customer 13kV and 4kV

Residential/Commercial Customer 120V and 240V
Understanding the Smart Home or Business

Utility Communications

Efficient Building Systems

Internet

Renewables

PV

Dynamic Systems Control

Distributed Operations

Advanced Metering

Consumer Portal and Building EMS

Control Interface

Plug-In Hybrids

Distributed Generation and Storage

Data Management

Smart End-Use Devices
Case Study: Loblaw

Loblaw Companies Limited is Canada’s largest food retailer with more than 1,000 corporate and franchise stores from coast-to-coast.

- Successfully implemented demand response in 170+ retail locations using lighting and HVAC
- Rodan working with Loblaw to determine DR capabilities at new state-of-the-art data centre (with planned capacity of 15MW) using back-up generation
- Developed customized program to fully automate demand response program participation
- Rodan continues to work with Loblaw to seek out and implement new demand management opportunities
Challenges
• Risk averse to using data centre for DR; concerns: data loss, 100% uptime
• Limited resources to manage program; needed fully automated experience
• Customer experience at store level could not be effected

Opportunities & Results
• DR at data centre allows for regular usage of back-up generation in true load setting; ensures availability in emergency situation and “fitness” of equipment
• Rodan delivered fully automated DR experience using controls technology limiting Loblaw resources needed
• DR had no adverse effect on customer experience and showed Loblaw commitment to efficient energy usage and provided new revenue stream
• Additional demand management opportunities exist for Loblaw (ie. Regulation Service)
 Dispatch Administrator and Aggregation Operator for Ontario Power Authority's (OPA) peaksaver™ program.

Rodan has been the Aggregation Operator of the program since 2008

DR program involving thousands of residential and small commercial facilities embedded within Ontario's leading utilities, representing over 144 MW of demand response capacity.

Rodan’s Network Operations Centre (NOC) operates numerous technologies allowing utilities to operate a wide variety of devices offering greater choice to their customer
Case Study: peaksaver®
Enabling tomorrow’s Smart Grid today

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