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The Energy Solutions People

Integrated Demand Response (DR) and Distributed Energy Resources (DER)

ADS National Town Meeting May 28, 2015



About Rodan

- Leading smart grid integrator and demand side enabler
- Offices in Ontario & Alberta
- Focus on metering, demand response, utility services and energy management
- Connecting power producers, power consumers and utilities to the smarter grid
- Manage 400MW of demand response resources
- Support over 60 utilities and ISOs throughout NA
- Metering and Meter Data Management tools and services
- Network Operations Centre dispatches & controls several hundred thousand homes and businesses by operating multiple leading software platforms for the residential and commercial/industrial markets

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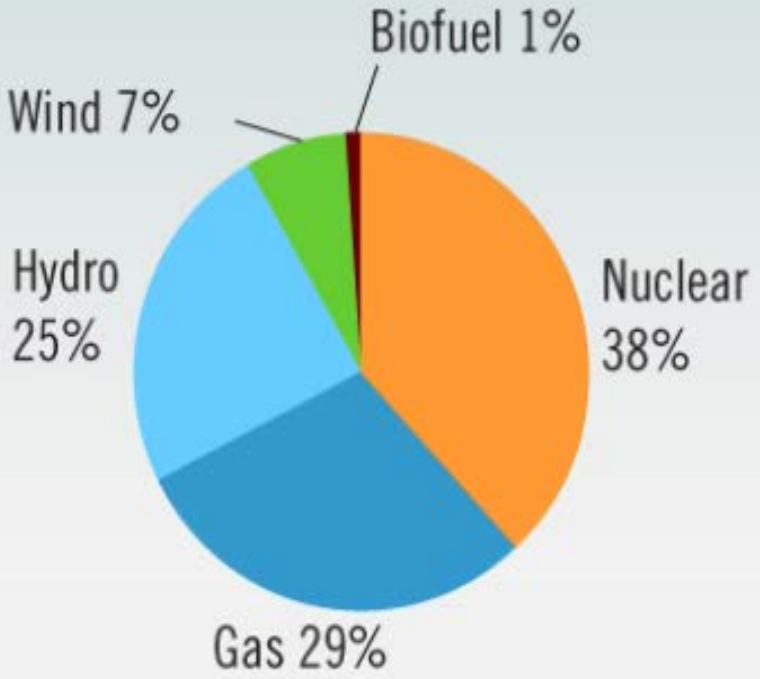
Canadian Power Markets

- Provincial Jurisdiction – no federal oversight or influence
- Largely government-owned infrastructure
- Ontario is the largest DR market with some in Alberta with small programs and pilots in other provinces
- Power generation still largely government owned but trend towards private developers
- Growing penetration of renewables and AMI
- Smart Grid is top of mind

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Ontario's Installed Capacity

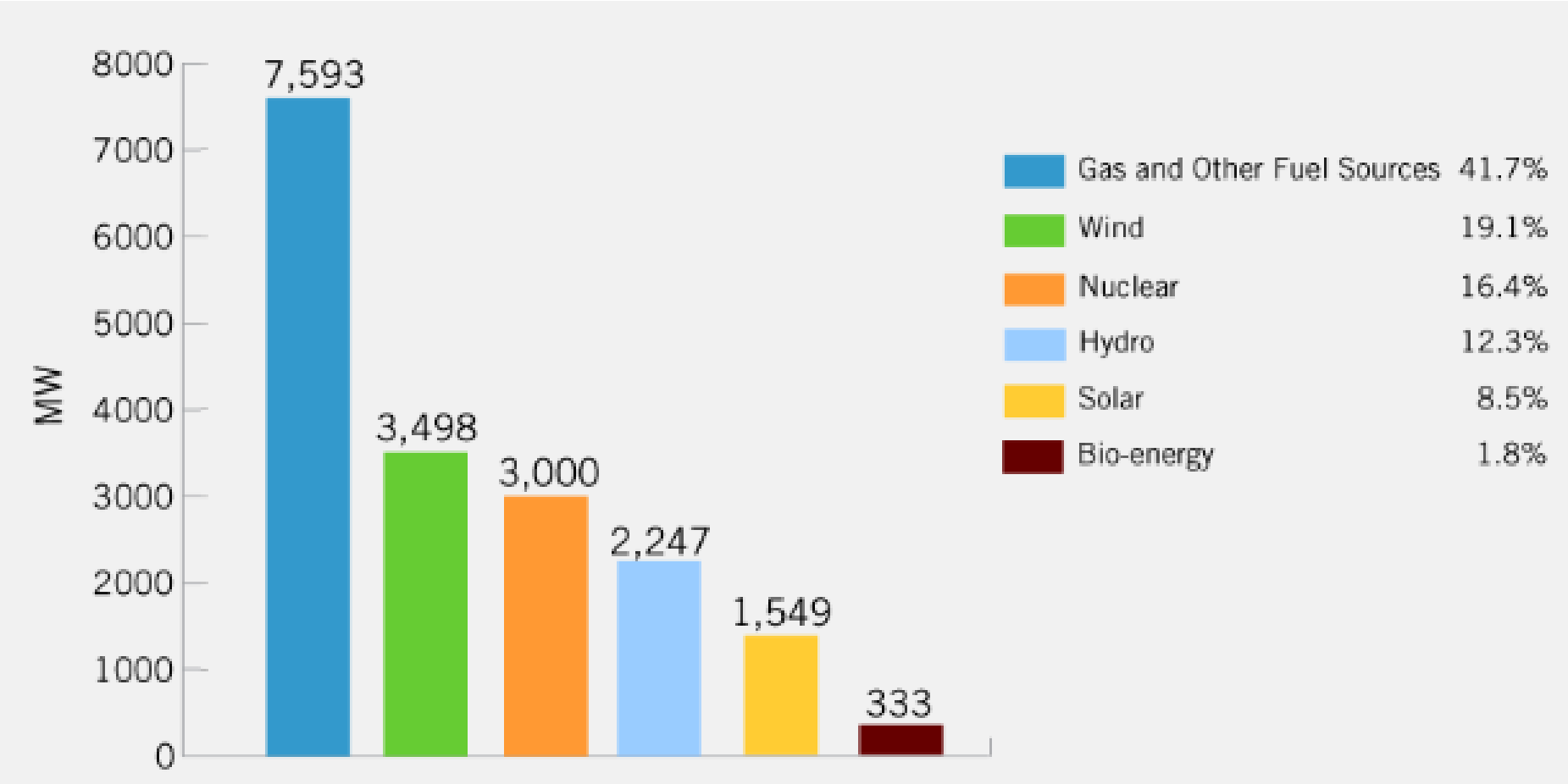
Nuclear:	**12,947 MW** or 38%
Gas/Oil:	**9,920 MW** or 29%
Hydro:	**8,462 MW** or 25%
Wind:	**2,543 MW** or 7%
Biofuel:	**455 MW** or 1%
Solar:	**40 MW** or 0.1%



Total transmission installed capacity 34,000MW (excluding distribution connected)

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Ontario's Installed Capacity



Generation capacity under IESO contract in the Ontario transmission and distribution grid.

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Current State of DR in Ontario

Current DR resources

- 600MW – Dispatchable Load/Operating Reserve
- 500MW – CBDR
- 300MW - Global Adjustment (+3MW customers)
- 200MW – *PeakSaver* (residential & small commercial)
- 10MW Regulation (IESO pilot)
- 35MW Storage (pilot under development)

Future DR resources

- Unit commitment, day ahead or intra day
- Load following – hour or 5 minute dispatch
- Surplus base load generation – increased consumption during times of excess generation
- Grid Balancing – second by second adjustments to keep the grid in balance

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DER drivers

Customer

- Reduction of total energy spend
- Power reliability
- Carbon reduction
- Social responsibility

Utility/regulator

- Policy mandate
- System optimization
  - Infrastructure spend
  - Operational improvements

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DER vs DR

- DR is a key DER resources
- DER includes
  - Demand Response
  - Conservation
  - Energy Efficiency
  - Local generation (solar, gas, CHP, biomass)
  - Storage (battery, thermal, fly-wheel)
  - Energy management information systems & controls

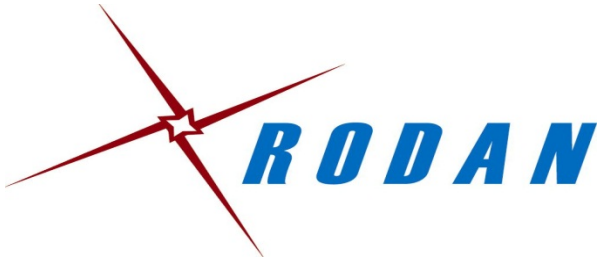
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DER Case study

- Large national retailer in Canada
  - Solar rooftop generating to the grid
  - DR 15% of peak load
  - Chasing 5 Coincidental Peaks to reduce Global Adjustment charges
  - Energy efficiency – lighting, refrigeration and HVAC
  - Building controls for Auto DR
  - Energy markets dashboard
  - Waste to energy – organic diversion (300,000 tonnes/yr)
  - Currently examining power reliability roll-out (full-back up power due to sever weather issues)
  - Future opportunities – thermal storage
  - Grid power remains key

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Thank you!



Enabling tomorrow's Smart Grid today

Paul Grod, President & CEO

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