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Building the Business Case for Renewables, Energy Storage, and Demand-Side Resources

CI Energy Group's 3rd Annual Alberta Power Symposium
Paul Grod, President, Rodan Energy Sept. 29, 2015

About Rodan Energy / MIDAS Metering

- We enable the demand side to reduce their total energy spend
  - Metering, monitoring & targeting
  - Demand response development
  - Management and control of those resources
- 400MW of demand response resources
- Monitor $9 Billion in annual electricity flows
- > 60 utilities and ISOs throughout North America
- Network Operations Centre – 350,000 homes and businesses

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Presentation Outline

1. Demand side resources
   a) What are they?
   b) Impact on the customer & the grid
   c) Business case
2. Overview of smart grid implementation – how DR supports renewables & storage
3. Overview of DR in Ontario and Alberta
4. Residential and C&I DR case studies

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Demand Side Resources

- Distributed Energy Resources
  - Load curtailment
  - Behind the meter generation (gas, diesel, solar, etc.)
  - Storage (thermal, electrical, other)
- Dispatch either:
  - by grid operators to meet system needs (price and/or reliability), or
  - economic self-dispatch by load (revenue or saving)

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Demand Side Resources

- Support the intermittency of renewable resources
- Cost-effective peak management resource

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State of Demand Response in Ontario

- Demand response resources
  - 600MW – Dispatchable Load/Operating Reserve
  - 500MW – Capacity-Based Demand Response
  - 300MW - Global Adjustment (+3MW customers)
  - 125MW – PeakSaver (residential & small commercial)
  - 10MW - Regulation (IESO pilot)
  - 80MW - Dispatchable DR pilot
  - 360 MW - DR Auction – December 2015

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Demand Response opportunities in Alberta

Funding mechanisms dramatically different than Ontario or PJM

- Ontario funds DR via uplift - Global Adjustment
- Alberta monetizes via market mechanism:
  - Avoid Coincident Metered Demand (CMD) charges resulting from Demand Transmission Service (DTS) peaks
  - Operating Reserve
  - Load Shed Service for Imports (LSSi)
  - Avoid Regional System and POD charges
  - Develop new ramp product to enable renewables
  - Avoid high commodity prices

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Smart Grid – what is it?

- Reliable and fast-adapting power grid
- Matches supply and demand in real-time
- Combines computing and communications to manage/automate two-way flow of electricity
- Integrates:
    - Renewable (intermittent) generation
    - Advanced Metering infrastructure (AMI)
    - Distributed generation
    - Demand response
    - Energy storage
    - Smart appliances

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Smart Grid – what is it?

- The internet of electricity systems – metering, big data, controls, two-was flows of power, managing a network of distributed energy resources
- Smart grid is key to a sustainable energy economy
  - Reliable
  - Clean
  - Economically viable
- Did we have a “not so smart” grid in the past?
  - Transmission grid has historically been smart
  - Distribution system – less so

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Smart Grid- where is it going?

Source: IESO Smart Grid Forum Report 20

Case Study: *peaksaver* ®

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Case Study: *peaksaver* ®

- 250,000 residential and small business participants
- 125 MW of demand response capacity.
- Delivered by 60 local electricity distribution companies
- Managed by the IESO
- Rodan is the IESO's Dispatch Administrator and Aggregation Operator
- Rodan's NOC operates multiple technologies allowing utilities to operate a wide variety of devices offering greater choice to their customer
- Able to deliver province-wide, regional or local control

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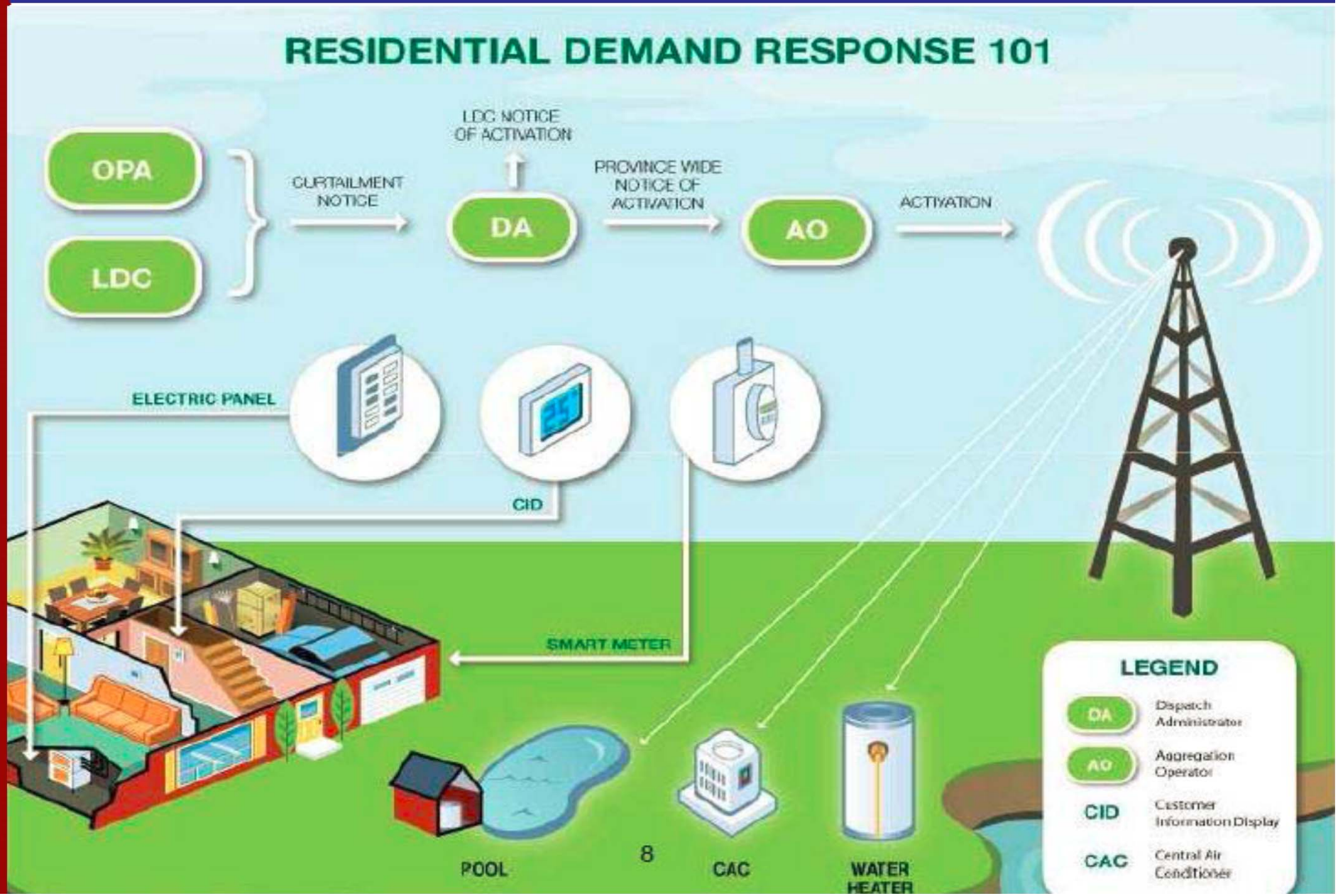
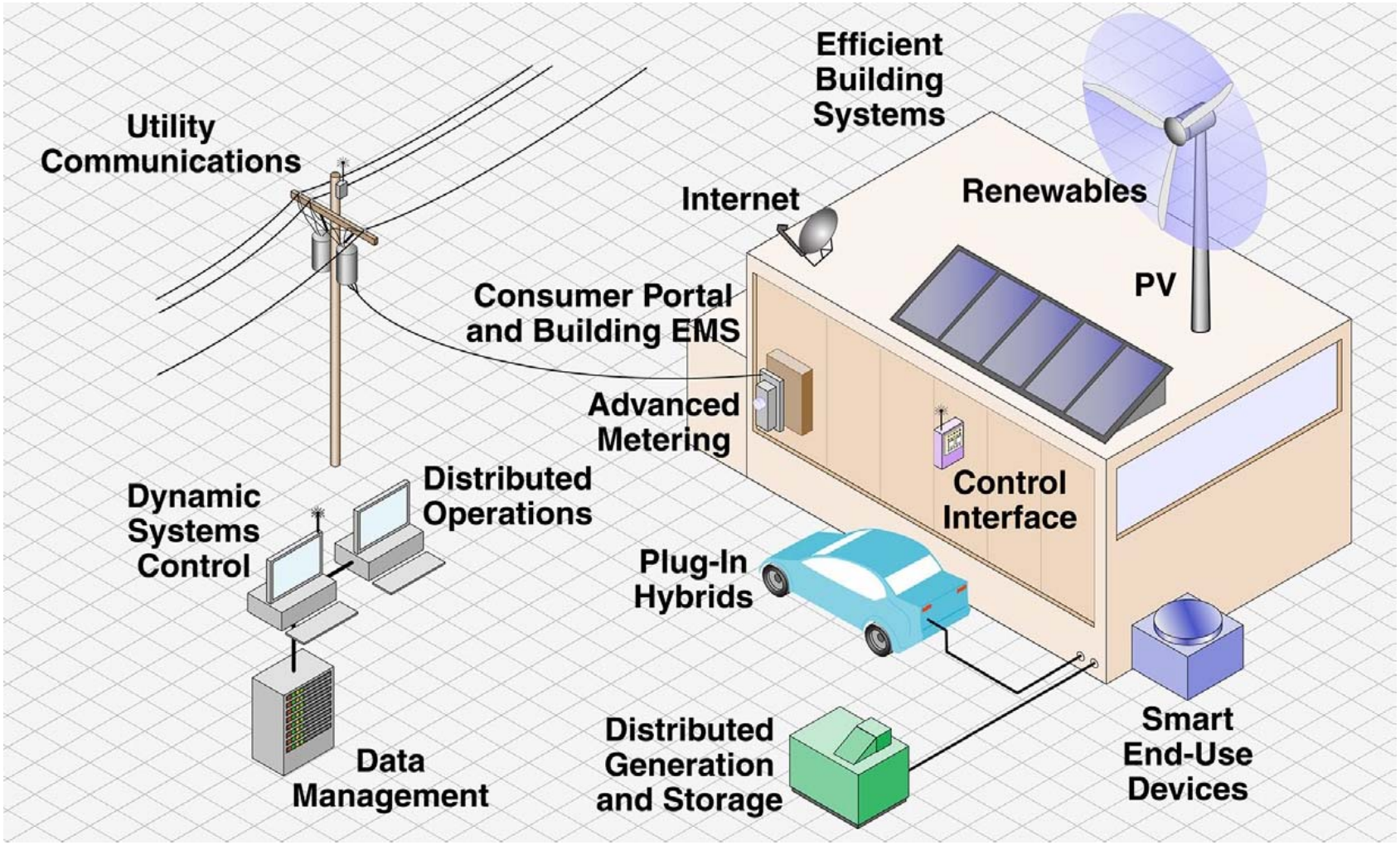
Case Study: *peaksaver* ®



Understanding the Smart Home or Business



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Case Study

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 Distribution Centers 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

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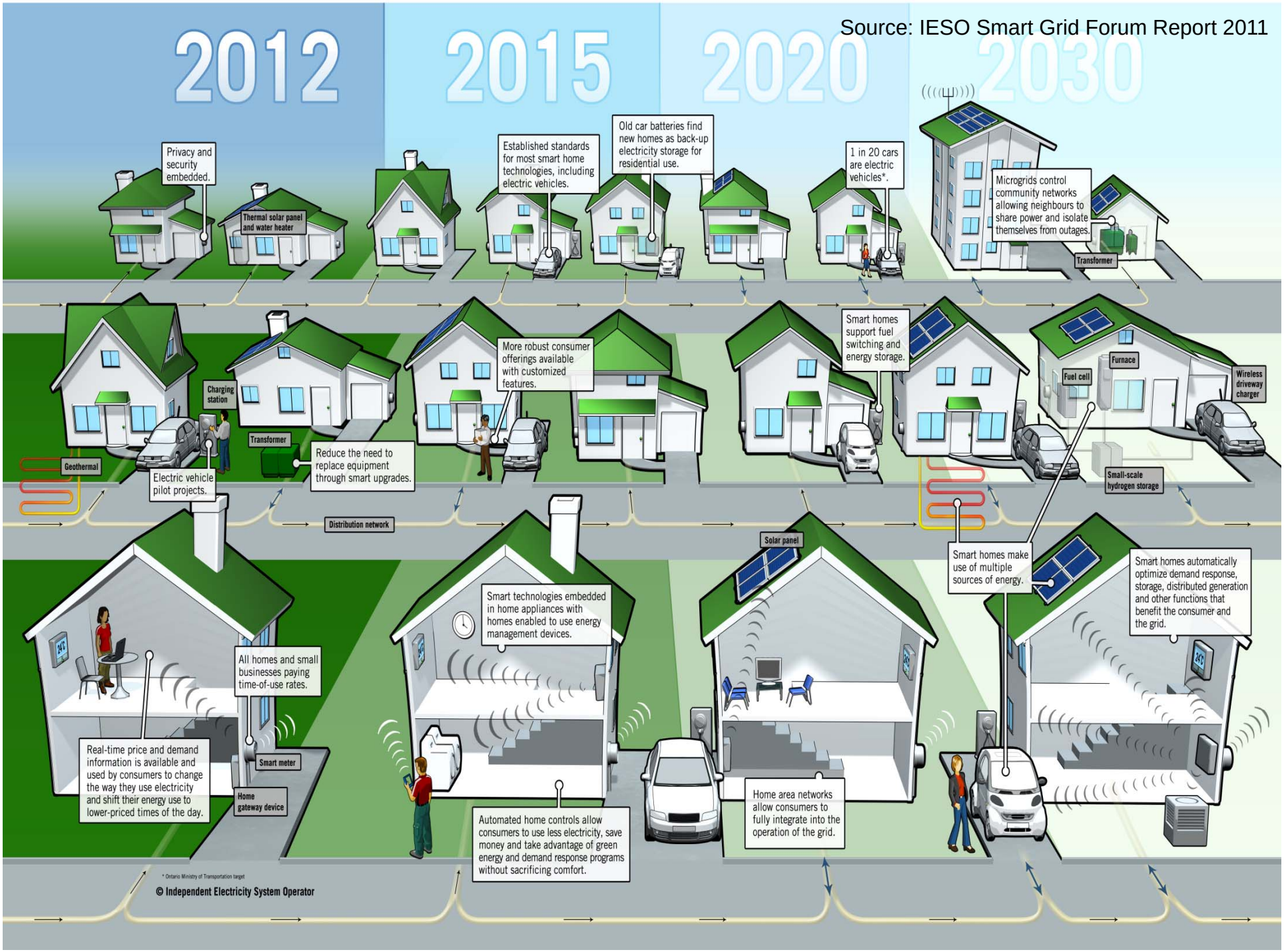
Source: IESO Smart Grid Forum Report 2011



Conclusion

- Smart grid provides intelligent load management adding operating flexibility to traditional peak load management.
- Demand-side management is a critical distributed energy resource within a smart grid
- DSM provides a cost effective peaking hedge
- Supports renewables, storage and ensure all of these pieces work together.

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Enabling tomorrow's Smart Grid today

Paul Grod, President & CEO

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