

Energy Programme Update

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Independent Electricity System Operator

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IESO: Who we are and what we do



Reliably operate Ontario's
province-wide system
24/7



Enable province-
wide energy
conservation



Support innovation



Create electricity
market efficiencies

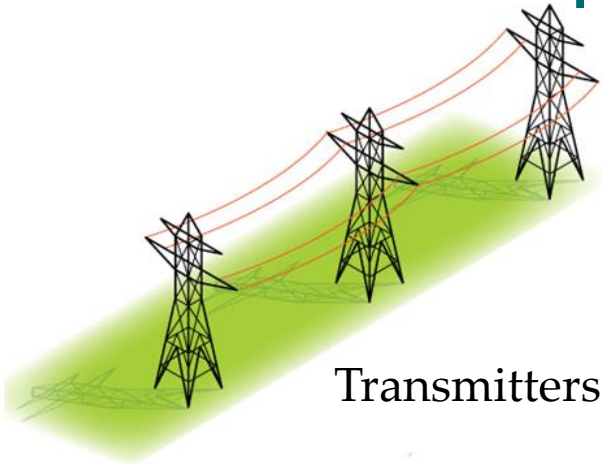


Plan for Ontario's
future energy needs

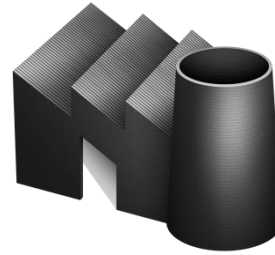


Work closely with
communities to
explore sustainable
options

Market Participants



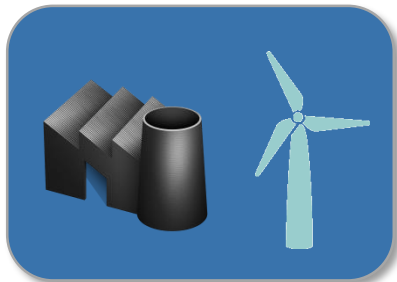
Transmitters



Directly Connected
Large Consumers



Electricity Traders



Local
Distribution
Companies



Storage



Directly Connected
Generators



Demand
Response
Aggregator

An Evolving Sector



Smart Meters



Renewables



DER



POWER.HOUSE

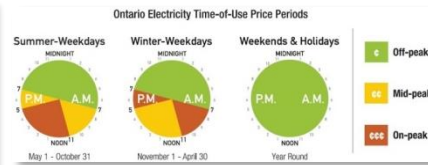
2002

2009

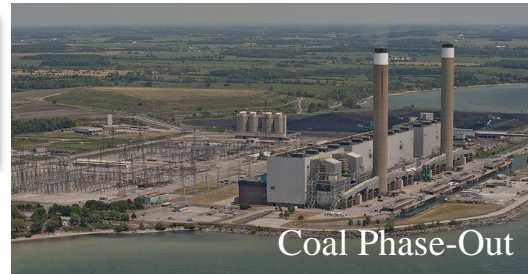
2017



Market Opening



TOU Pricing



Coal Phase-Out



ENERGY

Transforming Our Supply Mix



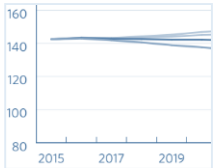
- Coal-fired generation has been removed (6,000 MW)



- Renewable resources now account for 35 percent of the system's energy capacity (14,000 MW)



- Embedded "local power" resources are on the rise (3,800 MW)



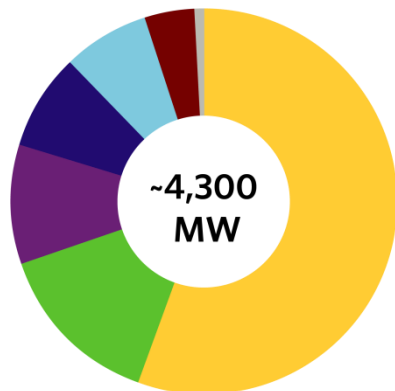
- Conservation savings, growing embedded generation and demand reduction programs have offset increased demand



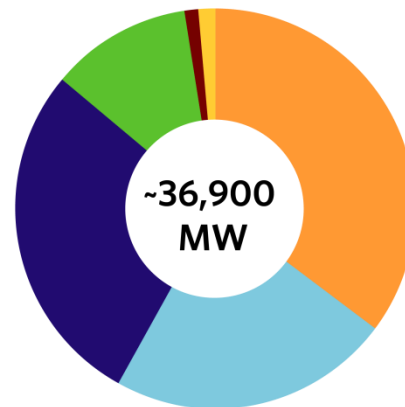
- Stable supply means the IESO can focus on implementing needed market design changes. Our Market Renewal Program underway has an estimated net benefit of \$2.2 - \$5.2 billion, over a 10 year period

Distributed Energy Resources

Distribution-connected



Transmission-connected



- Solar
- Wind
- DR
- Gas/Oil
- Hydroelectric
- Biofuel
- Other

- Nuclear
- Hydroelectric
- Gas/Oil
- Wind
- Biofuel
- Solar

Market Renewal

Renewing Ontario's market

Address Inefficiencies of Current Design

- Two-schedule market results in misalignment between price & dispatch
- Reliance on out-of-market payments
- Price distortions and out-of-market actions

Reduce Costs and Risks

- Reduce risk of producing electricity
- More efficiently schedule and optimize resources
- Greater flexibility

Enable a More Dynamic Future

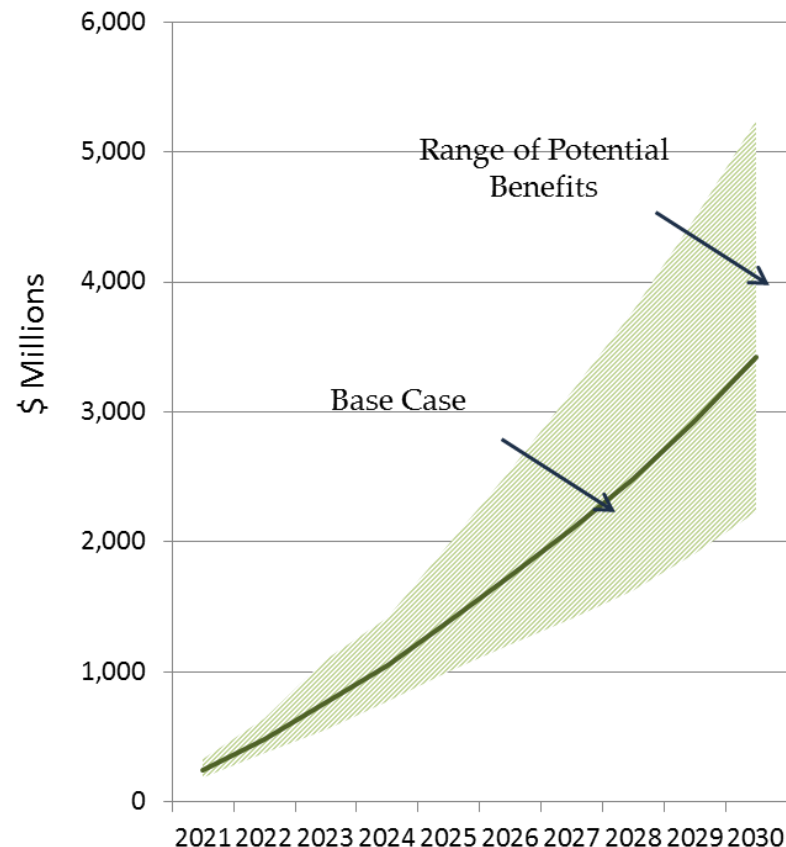
- Decentralization and digitization
- Empowered customers

Solutions well tested in other markets but will need to be designed to meet Ontario needs

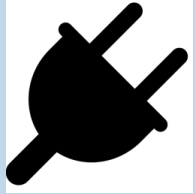
Efficiencies will come from . . .

- Improved price signals
- Opportunities for new technologies
- Lower risk for producers
- Focus on system needs
- Better use of interties
- Greater reliance on competition
- Better use of existing assets

Market renewal benefits case



Market Renewal



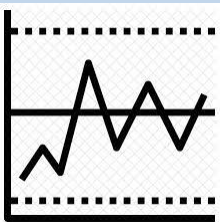
An **ENERGY** work stream to reduce the cost of scheduling and dispatching energy to meet real time energy demand

- **Single Schedule Market**
- **Day Ahead Market**
- **Real Time Unit Commitment**



A **CAPACITY** work stream to reduce the cost of procuring MW to meet future resource adequacy needs

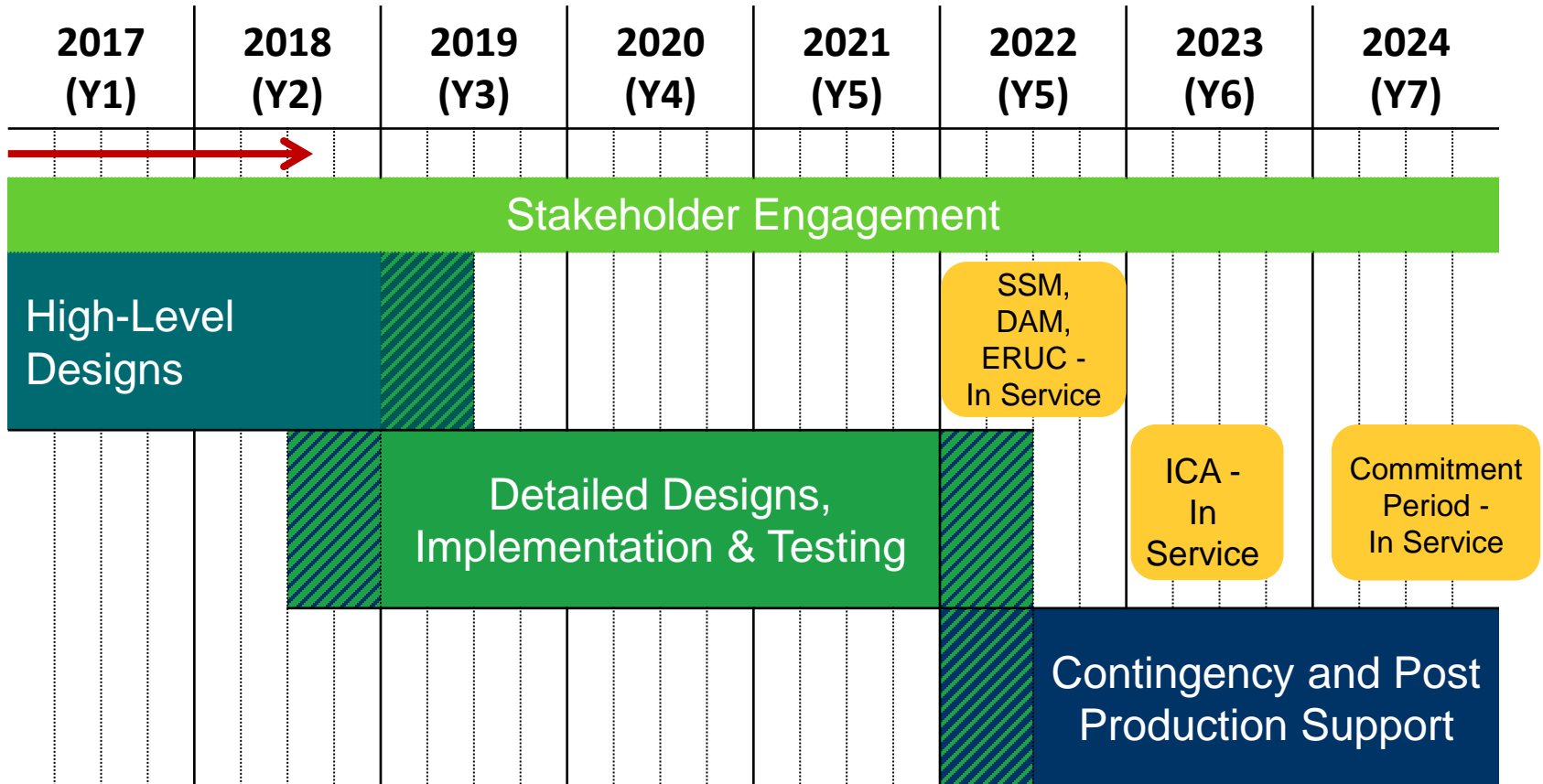
- **Introduce an Incremental Capacity Auction**
- **Enable Capacity Trade**



A **FLEXIBILITY** engagement to find near term ways to meet intra hour operability needs

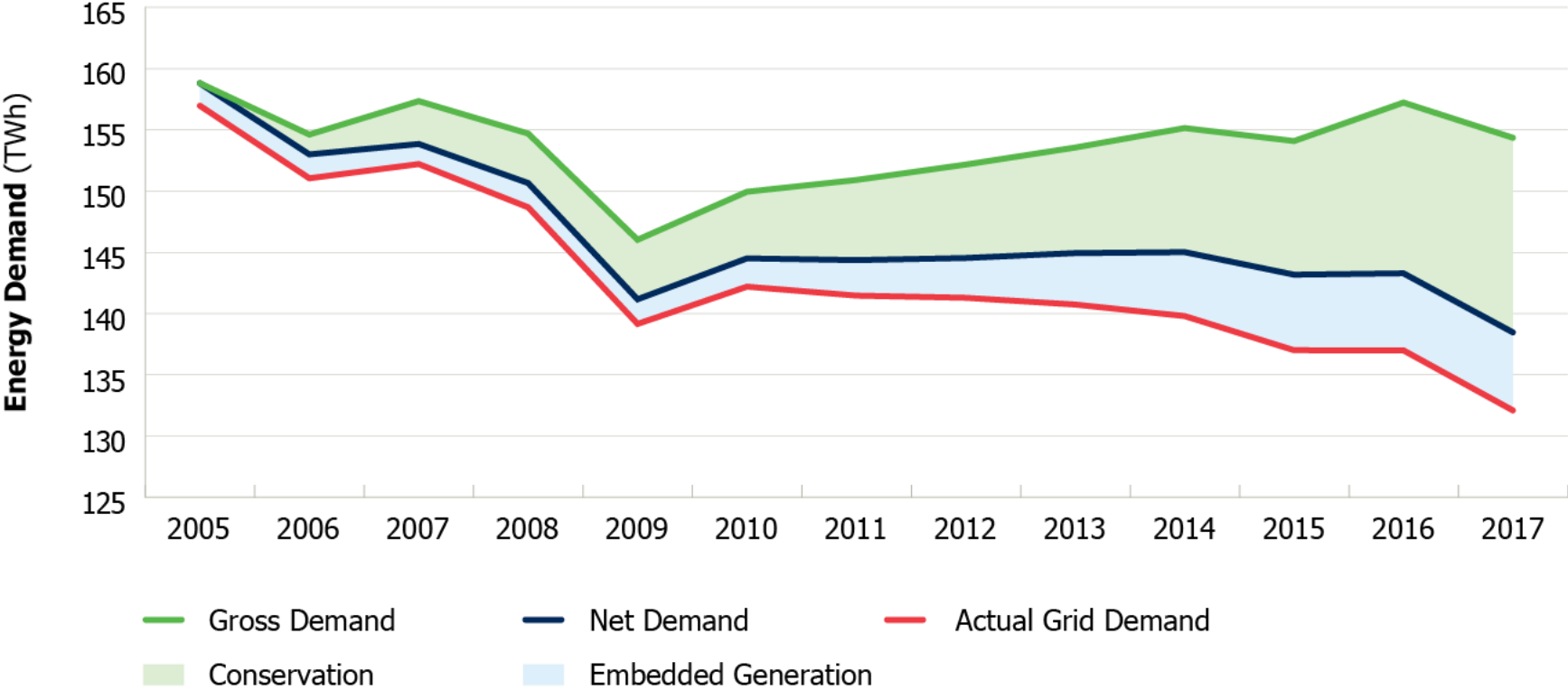
- **Expanded Participation in the Market**
- **Maximising Use of Inerties**

What to expect and when

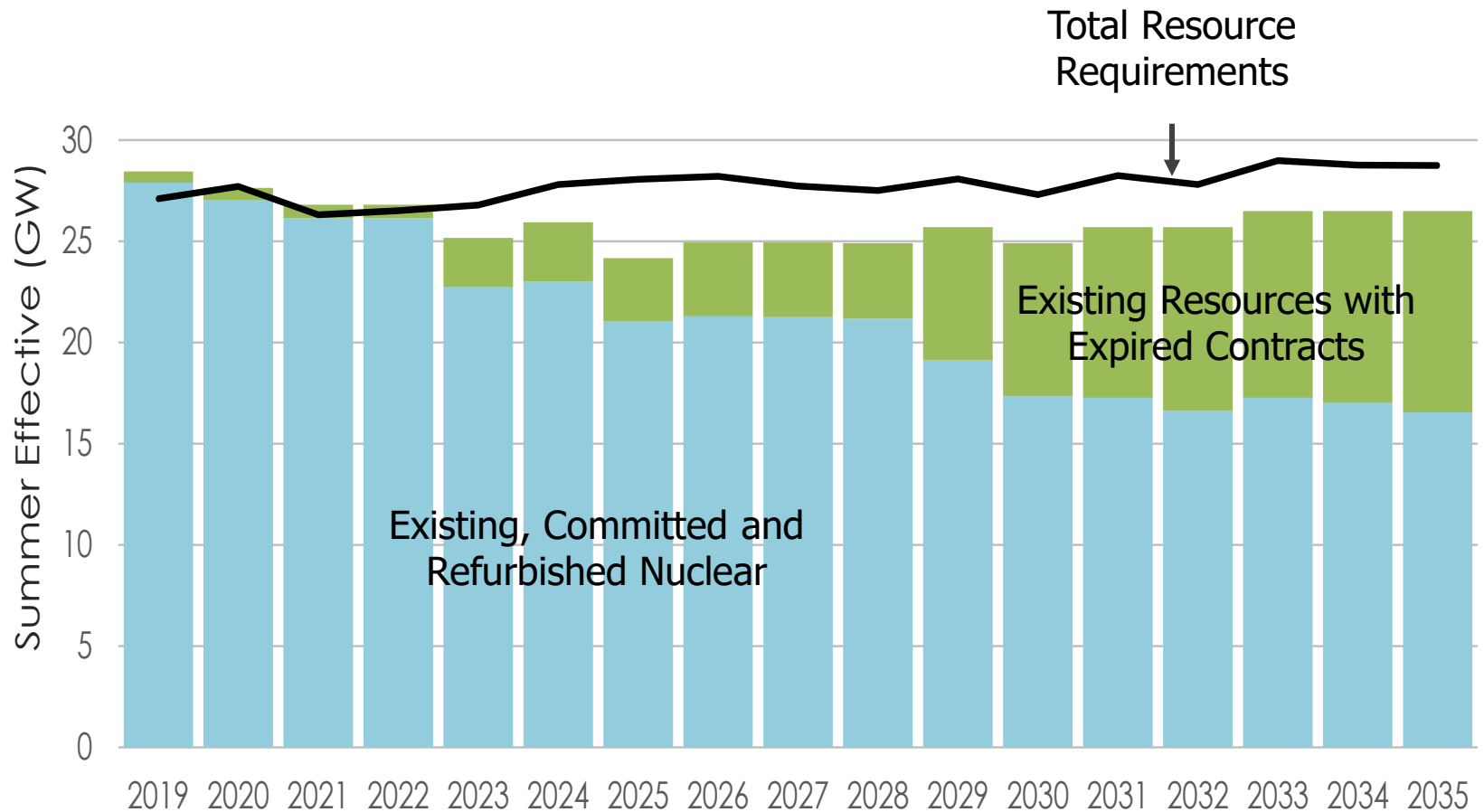


Energy Efficiency

Historical Perspective



Supply / Demand Outlook



Energy-Efficiency Achievements



2017 best-performing year on record:

- Portfolio remains cost-effective at under **3¢/kWh**
- Ontario has saved **15.4 TWh** of electricity since 2006
- IESO & LDCs achieved 1.8 TWh of energy savings in 2017, reaching **4.9 TWh**
- In 2017 the Industrial Accelerator Program achieved **280 GWh** of energy savings – 22% of the 1.3 TWh target based on 117 projects

What's New and What's Next

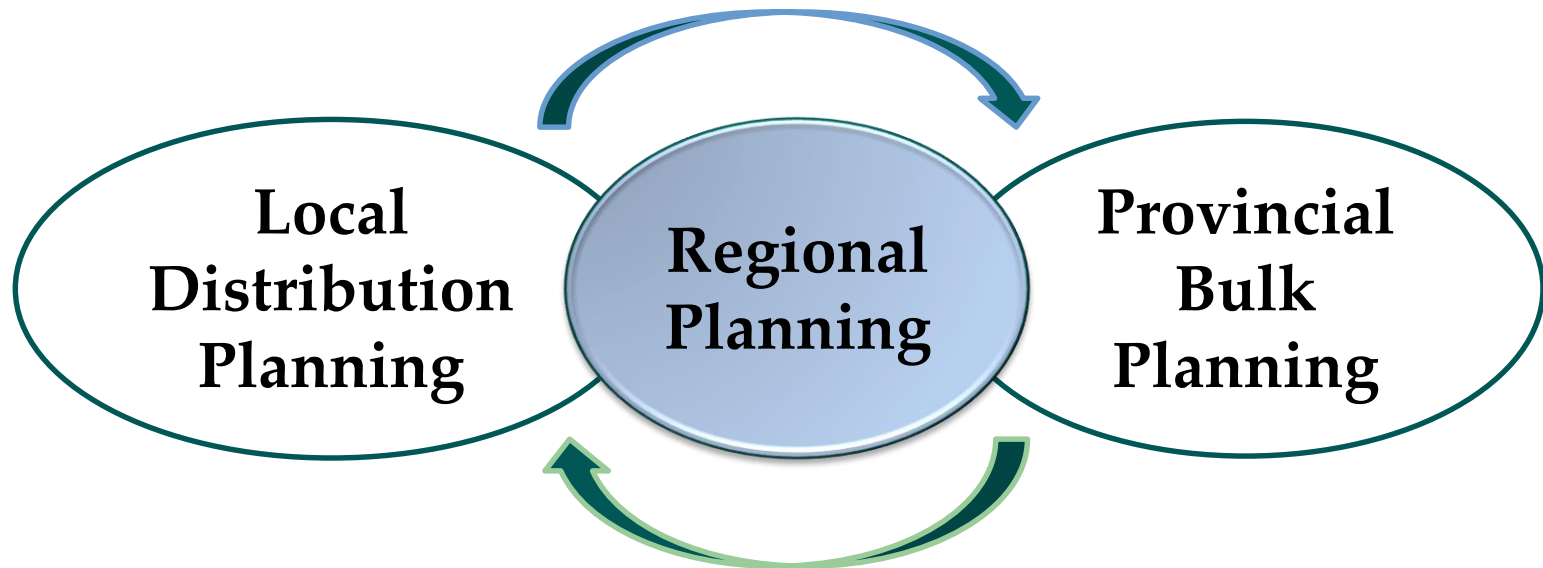
- Recent report on Indigenous energy-efficiency to guide program design efforts
- Outreach with Municipal Energy Profile report
- New Save on Energy Website
- Province-wide Home Assistance Program
- Deal Days on now

SAVE ON ENERGY
POWER WHAT'S NEXT

Regional Planning

Electricity Planning in Ontario

Regional Planning is the link between provincial and local planning



21

Electricity
Regions

16

Integrated Regional
Resource Plans
completed

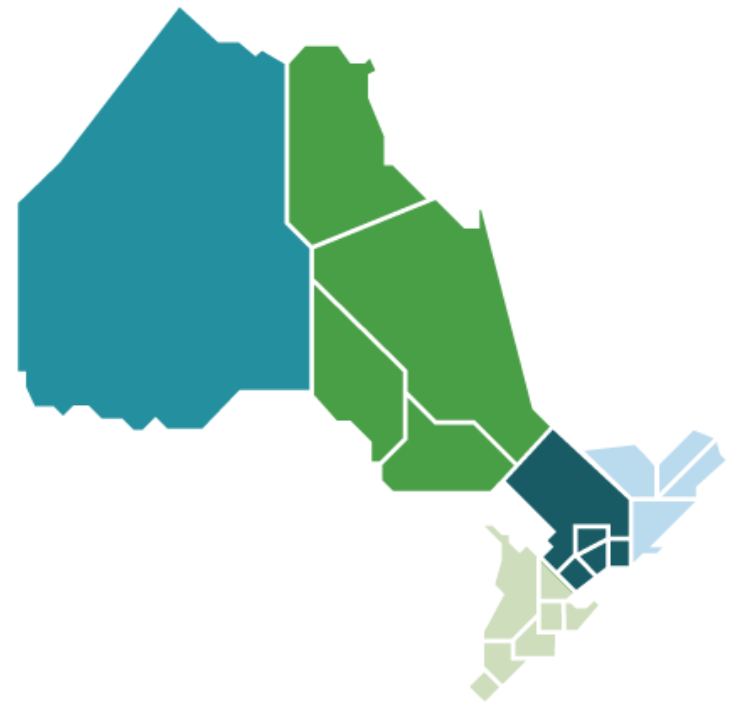
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Local Advisory
Committees

Preparing for change: regional planning

- Needs for all 21 planning regions re-evaluated on a five-year cycle
- 20-year plans ensure a reliable electricity supply through a variety of options including:
 - Energy efficiency
 - Generation
 - Transmission & distribution
 - Other innovative solutions

21 electricity
regions



Community engagement

- Critical to the success of the IESO's decision-making process
- Ways to engage:
 - Participate in regional planning
 - Attend an IESO Regional Forum
 - Email communityengagement@ieso.ca
- Visit ieso.ca - Get Involved>Regional Planning and Community Engagement

2018 regional electricity forums



Southwest, Waterloo – Nov 7-8

Northeast, Timmins – Nov 21-22

East, Kingston – TBD, Spring 2019

Northwest, Thunder Bay – TBD, Spring 2019

Stay Engaged

IESO Resources

The Bottom Line on Energy Management
Making Ontario's Electricity Market Work for Your Business

INSIDE

- Why demand response is worth a second look
- Now is the time to take control of your electricity costs
- How Western University is investing in the future of higher learning

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Compressed Air Incentive

Lighting Incentive

VFD Incentive

Motors Incentive

Peaksaver Plus®

AUDIT FUNDING

EXISTING BUILDING CORRECTION INCENTIVE

Energy Managers

HIGH PERFORMANCE NEW CONSTRUCTION

PROCESS AND SYSTEMS

DEMAND RESPONSE

Business Programs

SMALL BUSINESS LIGHTING

Along with saving energy, new lights for your business can provide more attractive product displays and improve worker productivity.

LEARN MORE

ENERGY MANAGERS

Hire an energy manager to recommend and implement energy savings initiatives for your business. Your customers, employees, and your bottom line will thank you.

LEARN MORE



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