Conservation: Let’s Get Serious

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Environmental Commissioner
Who is the Environmental Commissioner?

- **Guardian of *Environmental Bill of Rights***
  - EBR compliance by 15 prescribed ministries
- **Watchdog on:**
  - Energy conservation
  - Greenhouse gas emissions (climate)
  - Environmental protection
- **Few exact equivalents**
Overview

- Ontario Energy Facts
- Energy Efficiency Opportunities in Buildings
- There’s More to Sustainability
80% Fossil Fuel Dependence

- Every fossil fuel, except coal, is up since 2007

![Fossil fuel energy sources]

Ontario's energy use by fuel type in 2014
24 years of Ontario GHG emissions
Some decoupling

- Total energy use is flat
- Energy use per capita (all fuels) down 7% from 2007 to 2014
Mostly from Electricity

- Use down 6% from 2007 (8% excluding embedded gen.), summer peak down 17%
  - 90% low emission in 2015
- LDCs: 109% of energy target, 70% of peak demand target
Cap and trade will make electricity even cleaner - IESO
Natural gas: use is up

- Twice as much energy use as electricity, but 1/6 the conservation spending ($66M in 2014)
- Weather? Price? Replacing coal?
Transportation fuel: use is up

- No dedicated conservation funding
- Government targets: no action (10% Low Carbon Fuel Standard), or poor performance (land use; only 1% of the way towards 2020 EV target)

![Graph showing transportation fuel use from 2007 to 2014](image-url)
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Efficiency/ conservation?

- Most building and water heating is from fossil fuel,
  - Usually natural gas
- IEA: About 40% of the reductions we need by 2050 can come from efficiency and conservation
- Let’s go get them!
Where are the Energy Hogs?

- Poor energy use data
- Mandatory reporting by 15,000 buildings in the Broader Public Sector (O. Reg. 397/11)
Energy in the BPS

- **Admin & Storage Facilities**: 2,057,002,060 ekWh/yr
- **Hospitals & Emergency Response**: 4,746,486,624 ekWh/yr
- **Schools, Universities, Colleges and Libraries**: 8,548,905,751 ekWh/yr
- **Community, Sports, & Rec Centres**: 1,774,408,680 ekWh/yr
- **H₂O & Sewage**: 1,595,722,106 ekWh/yr
Energy Use Intensity in BPS Buildings

- Good and bad performers in all categories of buildings.
Large variations in energy intensity

- Buildings with the same function perform very differently...

Figure 4.3: Energy consumption curve for Ontario schools – 2011
Huge potential savings ....

- 35% energy savings; 1 MT/yr GHG reduction; $450M in utility bills.
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It’s cold in Sweden too

- 80% reduction in combustion emissions in residential and commercial buildings since 1990
For Decarbonization

• Energy efficiency by individual buildings not enough

• For deep decarbonization:
  • Get off fossil fuels
  • Heat pumps using low-carbon grid electricity
  • Recovery and reuse of waste heat (particularly in sites with multiple buildings)
  • District energy for heating/cooling using low-carbon energy sources

• Embodied energy
District-Energy Ready Buildings

- Design new buildings to be “district-energy ready” – ability to connect to future DE system at low cost:
  - Consider location of mechanical room, heating system design
- Esp. in urban nodes with high DE potential:

*Addendum A: District Energy Program Scan Potential Node Locations*
More to sustainability than building energy!

- Transportation
- Urban Form
- Water Use
- Stormwater Management
- Heat Island Effect
- Biodiversity
  - Birds!
Huge Opportunity

- Individual building improvements are essential
  - New and retrofit
- But only a first step towards sustainability

- We’re all counting on your vision, energy and commitment
Thank you!

eco.on.ca/reports/2016-lets-get-serious/

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