

Conservation & Demand Management in a Sustainable Energy Future
DeGroot School of Business
Role of Rates & Regulation
June 11, 2012

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Green Energy and Green Economy Act

Conservation Provisions in the GEGEA:

➤ Green Energy Act:

- Greening Ontario government - LEED standards
- Mandatory home efficiency disclosure
- Requiring energy conservation plans for BPS
- Re-enacted provisions for the Energy Efficiency Act

➤ Consequential amendments

- Energy Efficiency a “purpose” in OBC, 5 year review cycle, BCEAC
- Require ECO to report on energy conservation
- Establishing mandatory electricity conservation targets for LDC

CDM Framework

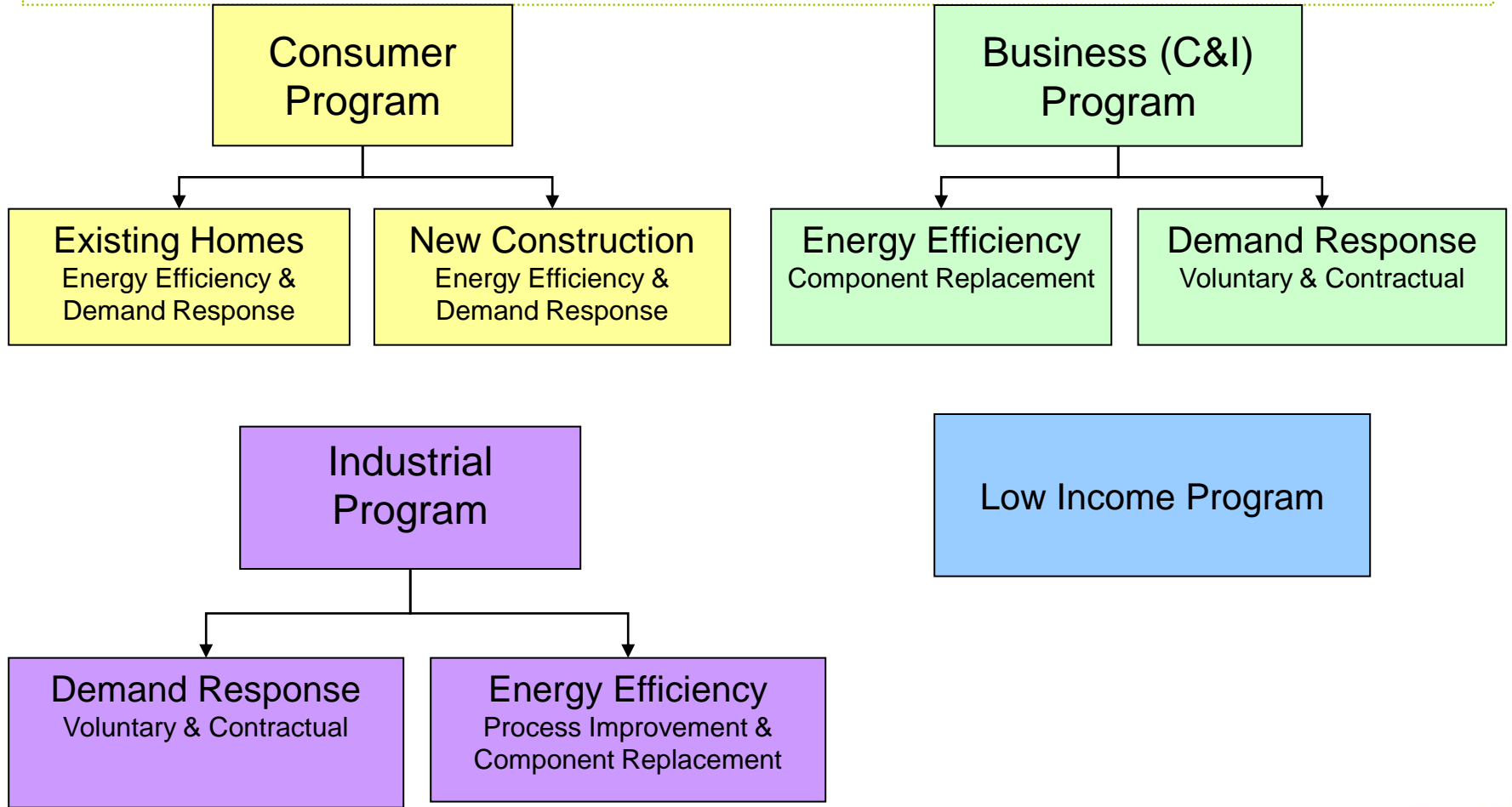
Directive to OEB to establish conservation and demand targets to be met by distributors as a condition of their license

- Multi –year 2012-14
- Public reporting on savings and budget
- Targets peak demand 1,300 MW and energy (6000GWh)
 - Allocated by share of provincial energy consumption , by customer type
- Provision for Board approved programs and development of CDM Code
- Provision for province wide programs contracted through OPA

Direction to OPA coordinate province wide programs

- Design and deliver OPA contracted province wide CDM programs, in collaboration with LDCs
- Consistent measures and incentives to consumers across all LDC service areas

LDC-OPA Province Wide Programs



saveONenergy

Banner from
Niagara On
the Lake



saveONenergy™

There are **many** programs available to make your home or business **energy-efficient**

Économisez tout au long de l'année grâce à des produits éconergétiques pour la maison.

Économisez jusqu'à 125 \$ par année en frais d'électricité en vous débranchant **GRATUITEMENT** de votre vieux réfrigérateur ou congélateur.

Recevez jusqu'à 600 \$ pour faire remplacer vos vieux systèmes de chauffage ou de refroidissement centraux.

Optez pour une nouvelle maison éconergétique. Informez-vous auprès de votre constructeur dès maintenant.

Recevez un thermostat programmable Honeywell qui sera installé **GRATUITEMENT** (une valeur de 350 \$).

Hydro Ottawa

FOR HOME Bilingual Brochure from Hydro Ottawa

saveONenergy™
HEATING & COOLING INCENTIVE

Receive up to **\$650*** when replacing your old central heating and cooling systems.

Power Stream
powerstream.saveonenergy.ca



Make it a habit to start saving energy now

Toronto Hydro is working with the Ontario Power Authority to help you save energy and money! Free fridge and freezer pickup, incentives for replacing your heating and cooling systems and year-round coupons for savings on energy-efficient products, are just some of the programs we offer to help you better manage your bill.

Small changes add up! Start making changes today and take advantage of lower-priced time-of-use rates by:

- Using power bars with timers
- Doing laundry in the evenings or on weekends
- Using energy-efficient products

Get all the details at torontohydro.com/conservation

Subject to terms and conditions found at torontohydro.com/conservation. Funded by the Ontario Power Authority and Ontario's Clean Energy Solutions Corporation. A part of the Province of Ontario produced under Canadian Endowment for the Arts. Under sub-section 37(1) of the Ontario Power Authority (Ontario Power Authority). The logo and star design is a registered trademark of Toronto Hydro Corporation used under license. *Toronto Hydro means Toronto Hydro Electric System Limited.

FOR HOME

HEATING & COOLING INCENTIVE
Receive up to \$650 when replacing your old central cooling and heating systems
Contact a participating contractor.

FRIDGE & FREEZER PICKUP
Save up to \$125 a year on electricity costs by having your old fridge or freezer removed for FREE.
Call toll-free: 1-877-797-9473

COUPONS
SAVE instantly on a wide range of energy-efficient products for your home.
Download all saveonenergy.ca

FOR BUSINESS

SMALL BUSINESS LIGHTING
Get up to \$1,000 worth in energy-efficient lighting and equipment upgrades
Call Niagara-on-the-Lake Hydro at 905-468-4235

RETROFIT PROGRAM
Install energy-efficient measures and earn up to 50% of your project costs.
Call Niagara-on-the-Lake Hydro at 905-468-4235

AUDIT FUNDING
Rebates up to 50% of the cost of an energy audit.
Call Niagara-on-the-Lake Hydro at 905-468-4235

Bill Insert from Powerstream

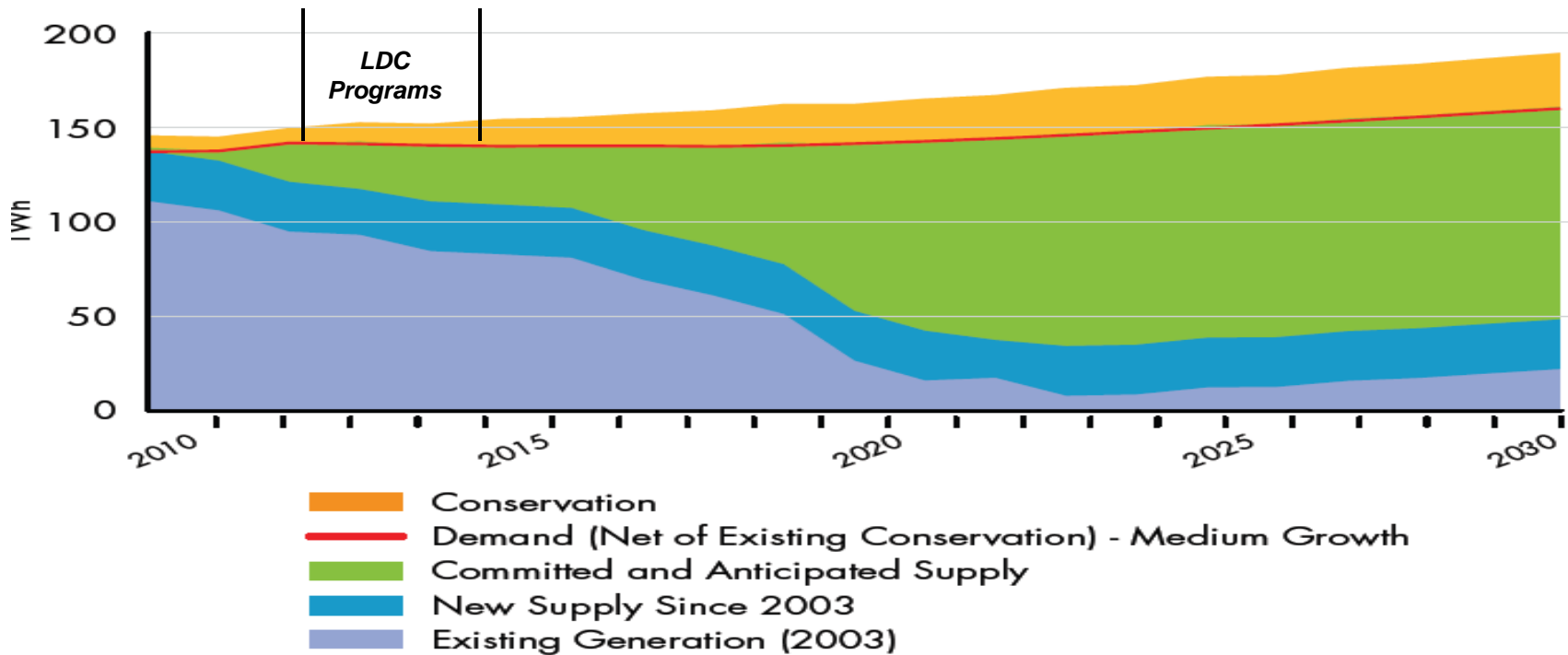
Print ad from Toronto Hydro

For more programs to help you **save money** visit **saveonenergy.ca**

Niagara On-The-Lake HYDRO

Long Term Energy Plan

LTEP conservation – aggressive targets developed and applied to demand projections, only then are supply options considered



LTEP – Conservation Targets

Date	2015	2020	2025	2030
MW	4,550	5,840	6,700	7,100
TWh	13	21	25	28

Through combination of:

- Programs – residential, commercial, industrial
- Building Code and product efficiency standards
- Demand Response programs
- Time-of-use rates

O.Reg. 397/11

BPS Energy Reporting and Conservation Plans

SECTOR is Very Diverse

- 445 Municipalities – big/small, urban/rural, upper/lower tier, varying servicing responsibilities – 26,000+ electricity accounts
 - 200+ Hospitals, 14 Local Health Integrated Networks, + Long Term Care Facilities
 - 104 School Boards and authorities, 5,000+ schools
 - 44 Colleges/Universities
-
- BPS organizations are major energy users. Municipalities, for example, spend \$680 million on electricity alone every year. In total municipalities consume more electricity than any other industrial sector other than Pulp and Paper).
 - BPS infrastructure is typically old and deferred maintenance is an issue.
 - Energy conservation initiatives compete for scarce funding with other institutional priorities such as social services, computers, school books, and hospital diagnostic equipment.

Energy Reporting

Beginning July 1, 2013,

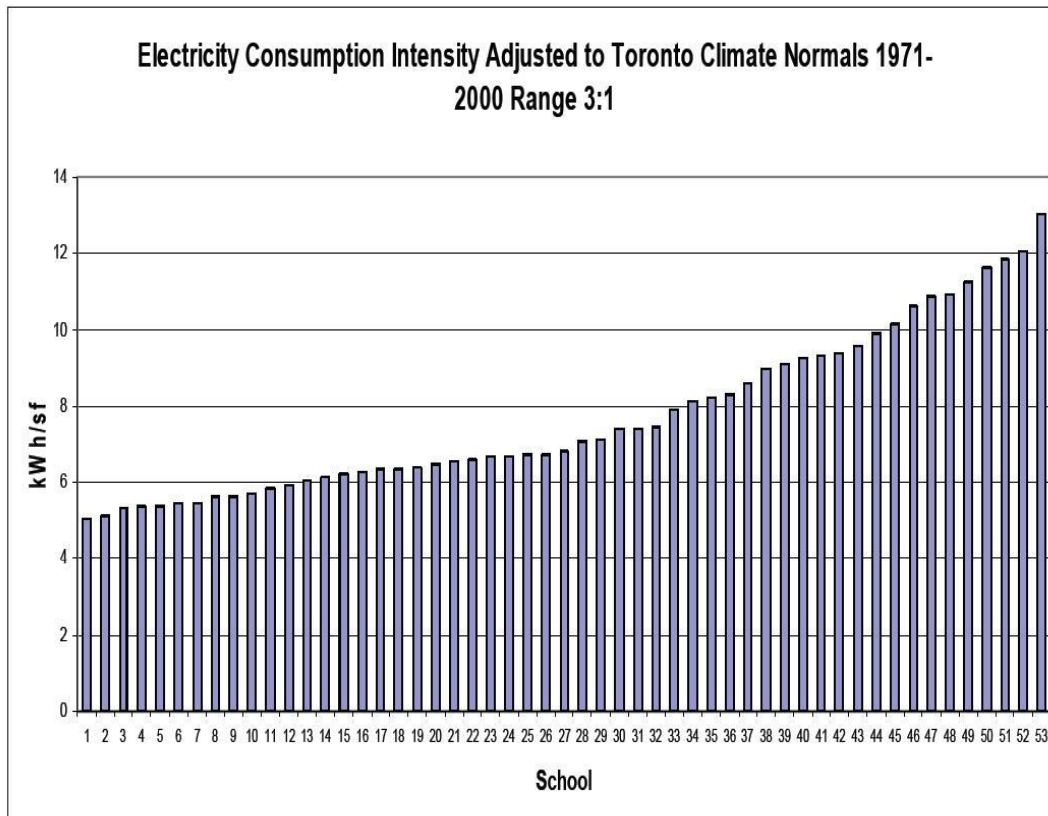
- report on the energy used (base year 2011) and GHGs emitted by facility; proposed minimum reporting requirements include:
 - 10 municipal facility types (e.g. arenas, community centres, administrative buildings)
 - 7 college/university facility types (administrative buildings, laboratories, Phys. Ed. Centres)
 - Schools noting special uses (portables, pools, etc.)
 - 2 hospital types – chronic care and acute care
- Energy reporting is simple but meaningful (template)
- Allows BPS organizations to develop capacity and benchmark their facilities against similar facilities in their organizations and others across the province

Energy Consumption and GHG Emission Template

Operation Name/Type	Address	Total Floor Area ¹	Operation Hours of Use (e.g., 9-5, 24/7, ice hours for arenas)	School and Hospital Attributes ²	Energy Type	Energy Purchased in Natural units	Energy consumed kWh/yr or (ekWh/yr) ⁴	GHG Emissions (tonnes CO2e/yr) ⁵	GHG Intensity (tonnes CO2e per year/sqf) ⁵	Energy Intensity (ekWh per year/sqf) ⁷
					Electricity ³	kWh				
					Natural Gas	M3				
					Steam	mega pounds				
					Propane	litre				
					Fuel Oil	litre				
					Chilled water	Ton hours				
					Wood	metric tonne				
					Coal	metric tonne				
Total by Operation Type										
Overall Agency Totals										

1. Total floor area of indoor space in which the operation is conducted. For water and sewage works would report water distributed and sewage treated annually in mega litres.
2. Schools should note the number of temporary accommodations, and if a pool is part of school. Hospitals should note if they are chronic or acute care facilities, or both
3. Electricity consumed should be in kWh not adjusted for line losses
4. Equivalent kWh will be automatically calculated in the template supplied by Ministry of Energy
5. GHG emission will be automatically calculated in the template factor to be supplied by Ministry of Energy
6. For water and sewage works GHG emissions intensity will be reported as tonnes CO2 equivalent per year/Mega Litre
7. For water and sewage works energy intensity will reported as Mega Watt Hours per year/Mega Litre

Benefits of Monitoring Energy Use - Benchmarking



- TRCA’s Sustainable Schools initiative compared electricity consumption at 53 schools built since 2000 in Ontario
- Energy benchmarking demonstrates the worst electricity consuming schools used 3 times the amount of electricity as the best
- Understanding the differences from lowest to highest performing buildings helps to identify:
 - Best practice in operations and operator training
 - Quick wins to improve performance
 - Lighting, HVAC
 - building automation standards
 - Best practice for future design standards

Conservation Plans

Beginning July 1, 2014

- Prepare energy conservation plans and post them on corporate web site
 - Plans would include a high level description of how the organization would conserve energy and reduce demand over the life of the plan and a forecast of the expected results
 - Templates on plan content will be developed to aid preparation
 - Target setting encouraged
 - Plans to be approved by senior executive CEO, CAO
 - Plans would cover a five year period
- Energy use data would be updated on an annual basis during the plan
- Subsequent plans would update previous plans and report on progress

BPS Plans – Value Chain

Province



- sector assistance
- research/demonstration
- technical standards
- capacity-building
- funding
- federal-provincial collaboration
- economic development strategy
- recognition
- CDM evaluation, link with energy sector planning

Facility
Type/Sector



Provides/Enables

- aggregate energy use
- combined action plans
- conservation potential
- benchmarking
- energy standards
- funding options
- collaborative projects
- research/demonstration
- best practices
- recognition

Individual
Facility

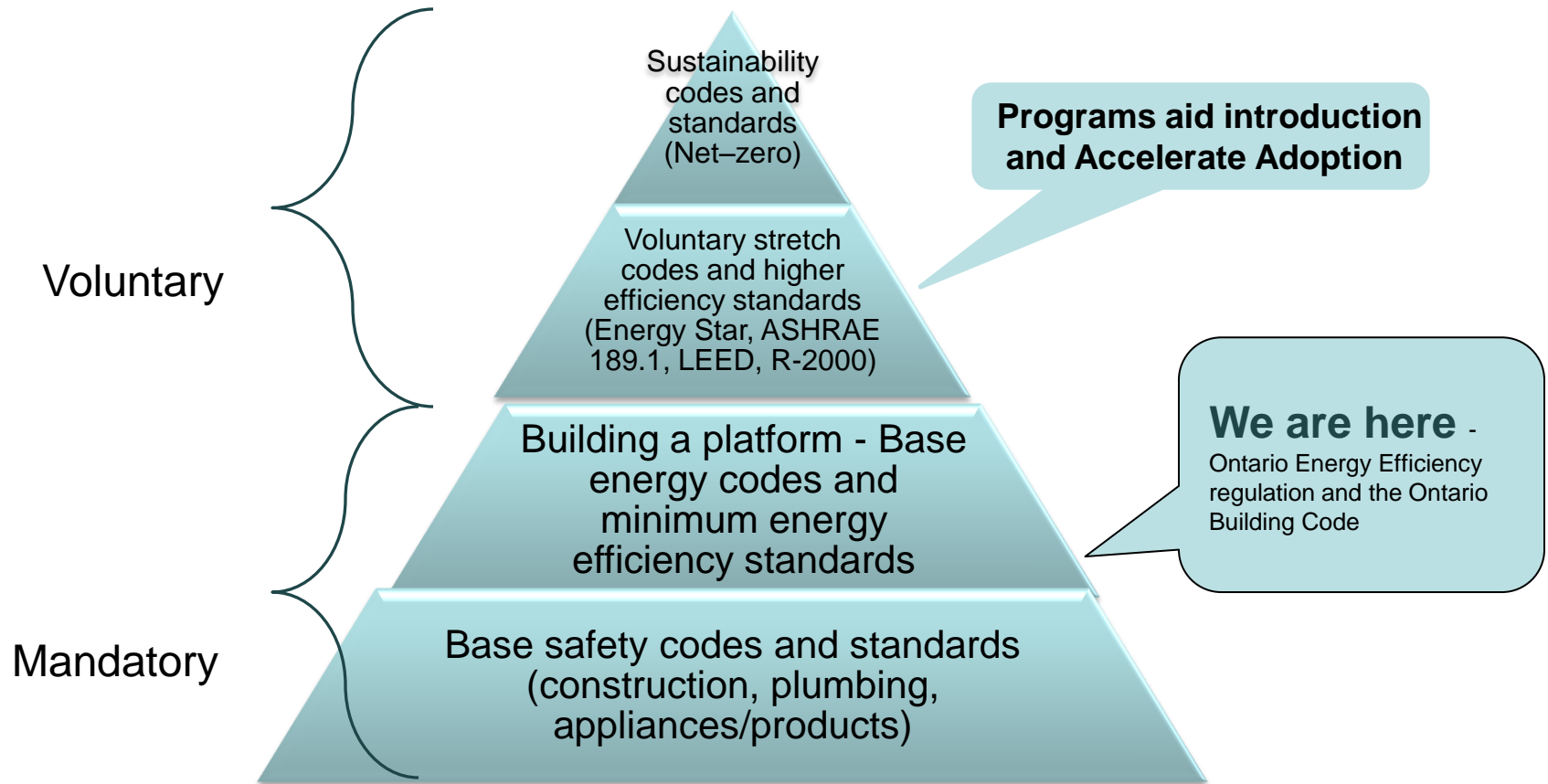
Provides/Enables

- energy use
- energy target
- energy savings
- action planning
- action to be taken
- participation in CDM programs

Minimum Energy Performance Standards

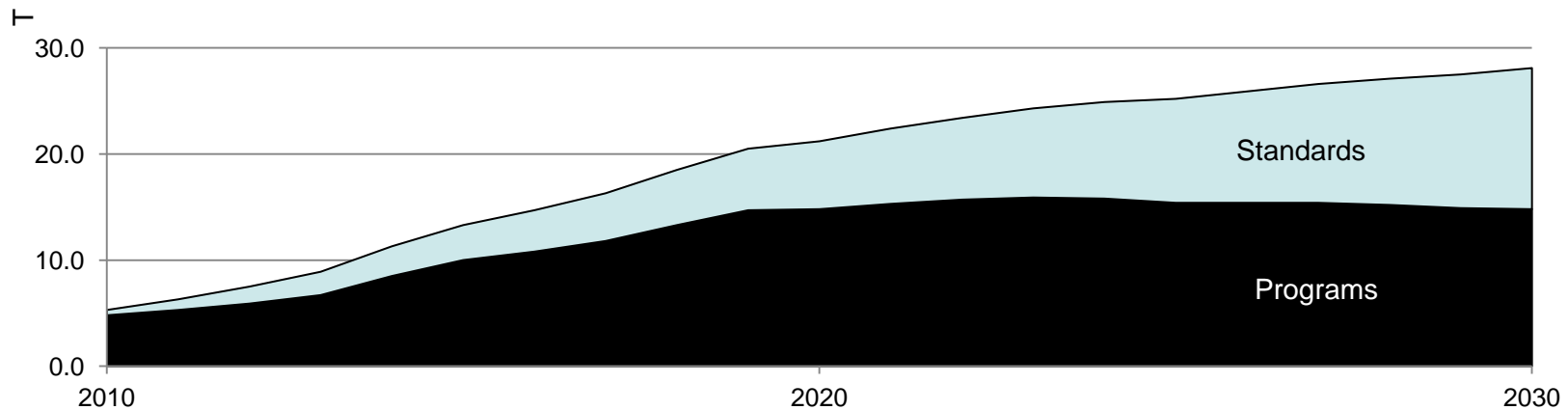
- Ontario was the first jurisdiction (1988) to regulate energy efficiency and currently prescribes more than 50 product categories that consume 80 percent of the energy used in the residential sector and 50 percent used in the commercial/institutional sectors
 - 11 household appliances, 5 commercial appliances
 - 10 categories of furnaces/boilers (oil/gas/propane)
 - 11 lighting products
 - 10 air-conditioning/heat pump – residential/commercial
- Most recent regulation on general service lighting
- Additional 40 products proposed as a catch up
 - 8 appliance products, 15 space and water heating products
 - 8 lighting products, 4 AC/Refrigeration products
 - 2 motors/power supply products, 3 consumer electronic products
 - 1 fenestration product
- More regular updating

Codes and Standards Hierarchy



Role of Efficiency Regulations in Conservation Strategy

- Energy efficiency regulations are an important strategy in transforming markets to higher efficient products and will make important contributions to achieving the government Long Term Energy Plan
 - Programs encourage adoption of new technology through incentives or awareness building
 - As new technologies and products become established in the market, minimum energy performance standards (MEPS) are developed to clean out lagging products.
- Product energy efficiency regulation is an effective tool to lock-in all MW and TWh savings. Minimum efficiency standards, when legislated, ensure that efficiencies gained by previous implementation are not lost, while innovation advances technology.
- Over time, efficiency regulation is a no cost/low cost strategy to enhance the “natural” conservation



Ontario's Energy Efficiency Regulation Timeline

Lighting (gen. service lighting, torchieres, traffic signals, exit signs)
Plug-in/electronics (standby power, external powers supplies, set-top boxes)
Residential appliances (wine chillers, dishwashers, dehumidifiers),
Commercial appliances (clothes washers, ice makers, split ACs)
Industrial equipment (dry type transformers, induction motors, etc.)
Windows

Plug-in/electronics (battery chargers, televisions, displays)
Furnace fans
Portable AC
Lighting (highway/street lighting, LED lamps, general service fluorescent lamps, CFLs, decorative lighting)
Commercial appliances (refrigerated displays, large ACs)

Lighting (LED Replacement, fluorescent lamp ballasts)
Plug in/electronics (small network equipment)
Residential appliances (refrigerators, clothes washers, room AC, clothes dryers)
Commercial equipment (refrigeration compressors packaged AC&Heat Pumps)
Industrial equipment (uninterruptible power supplies, liquid filled transformers, air compressors)

Smart Appliances, Advanced lighting (induction lamps plasma lighting lighting controls, plug in signs)
Integrated/Advanced Controls...

2012

2013-14

2015-16

2018-20 and beyond

Planned EE proposals/amendments (*electrical products only*)