Energy Efficiency – From Policy to Implementation

Stephen Brown, Director,
Canadian Standards Association

March 9, 2010
We’ve seen the messages...

Get up to $10,000 in rebates for your home’s retrofit

The Governments of Ontario and Canada will help pay for the retrofit your home needs. Following is a list of the total amount each upgrade is eligible for: you have 18 months from the date of your audit to complete some or all of these upgrades. Each upgrade you complete in this time is eligible for a rebate. You may apply for the rebate only after the work is done and you have had your post-retrofit audit.

March 25, 2010
Agenda

1. Overview and Key Issues
2. CSA Overview
3. Energy Policy Drivers
4. The landscape
5. Tools to allow Implementation of New Technologies
6. Standards – A Bridge between Policy and Implementation
   - Smart Regulation
7. Solutions – Developing a Sustainable Model for Market Transformation
CSA – Delivering Unique Solutions

to help certify consistent skill sets

Personnel Certification

Standards & Codes

to help set rules

Customized (advisory) Services

to help implement a best practices

Training

Seminars
eLearning Courses
Customized Training

to help understand standards

Application Tools

Handbooks
Smart CD
Mobile Publications

to help apply standards

March 25, 2010
We’ve seen the trends....

Social & Economic priorities:

1. ENERGY ACCESS,
2. ENERGY SECURITY AND
3. CLIMATE CHANGE

• ENERGY is essential for economic growth and social development
• GHG emissions (i.e. CO2) will increase by more than 50% by 2020
• Growing oil consumption in China and India will vanish oil reserves quicker than expected
• 43 out of 78 OPEC countries experienced a decline in production in 2005-06 with an average decline rate of 6.7%. Peak oil predictions suggest reaching a production plateau after 2010

(Source: IEA – WORLD ENERGY OUTLOOK 2007)
Essential Elements - Interplay

**POLICY**
Climate Change/Energy Access/Energy Security
Fragmented
Regional

**STANDARDS**
Energy Efficiency:
The Value Chain
Mining, Generation, Transmission, Distribution
and End Use
Installations & products
generally covered, some gaps
Gaps in other areas

**REGULATIONS**
Efficiency in Energy Use
Connection to electrical system:
Installations & products
Framework exists
Some expansion required
Compliance Challenges

March 25, 2010
Policy Instruments for Market Transformation

- Financial incentives
- Regulations
- Voluntary programs
- Leadership
- Information
Standards - Bridging the gap

**Preserve the Environment**
- Support development of best practices
- Raises profile of Renewables & Sustainable Energy
- Grow to support industry growth

**Enhance Public Health & Safety**
- Set minimum performance criteria
- Support Public Health & Safety
- Drive performance in other areas

**Market Transformation (economies of scale)**

**Facilitate Trade**
- Aids Market Expansion
- Drive technology adoption
- Supports incentives for new technologies
- Removes barriers to trade

**Core Foundation (Standards)**
- Standards are Enablers
- Creates level playing field
- Introduces minimum criteria
- Creates confidence
Standards Role in Market Transformation and Regulation

Market Transformation to Energy Efficiency

Market Maturity

- Introduction
- Commercialization and Increased Share
- Common Practice

Market Share

- Higher
- Lower

Information, education and capacity building

Voluntary measures

Pricing and incentives

Equipment Regulations

Targeted Market Position

The “Five A's” of Market Transformation

- Availability - Product
- Awareness - Promotion
- Accessibility - Distribution
- Affordability - Value – Benefit to Cost
- Acceptability – Market Penetration Cycle
EnerGuide and Energy Star labels promote consumer preference for more efficient products.
Minimum Efficiency levels - Provincial Considerations

- Tier 1 = minimum regulated
- Tier 2 = where Canada is currently with its Energy Efficiency levels
- Tier 3 = Energy Star
- Tier 4 = Golden carrot /aspirational level

Q - What role should the Standards Community Play?
Policy - Canadian Regulatory System

• Federal vs. Provincial
  – Federal mandate & Provincial mandate
Regulations in Canada

- **Legislation**: Federal Energy Efficiency Act (1992) and Energy Efficiency Regulations (ongoing)

- **Regulatory requirements** for:
  - Minimum energy performance **standards**
  - **Reporting** on energy efficiency
  - **Labeling** (EnerGuide label)
  - **Verification marks** (SCC accredited certification bodies)
  - **Import** requirements

- **Legislation**: Provincial Energy Efficiency Acts
  - BC, Manitoba, Ontario, New Brunswick, Nova Scotia, Quebec, Alberta (Pending)
National Standards and EE

- Regulations (mandatory)
  - Compliance
  - MEPS
- National Standards System
- Voluntary
  - EnerGuide Label
  - ENERGY STAR
  - Utility Incentives
## Energy Efficiency Act Amendments – Canadian Regulations

**Amendment 10:**

1. General service lighting
2. Lamp Labeling
3. Wine Chillers
4. Ceiling fan lighting
5. Torchiere Lamps
6. Gas unit heaters
7. Commercial clothes washers
8. Traffic & pedestrian signals
9. Gas furnaces
10. Dishwashers
11. Dehumidifiers
12. Icemakers

**Amendment 11:**

1. Line voltage thermostats;
2. Pre-rinse spray valves;
3. ER / BR incandescent reflector lamps;
4. Digital TV adaptors;
5. External power supplies;
6. Standby power;
7. Medium voltage dry-type transformers,
8. Liquid filled transformers, motors.

- **Date for publication in December 2009**

**Amendment 12:**

1. Residential hot tubs/spas;
2. Residential refrigerator freezers;
3. Battery chargers;
4. Cable and satellite set-top boxes;
5. Mercury vapor ballasts;
6. HID fixtures;
7. Large and very large AC;
8. Packaged terminal AC;
9. Commercial boilers;
10. Labeling of gas water heaters.

*Date for prepublication in Late 2011*

**Courtesy of NRCan**

Source: Natural Resources Canada Office of Energy Efficiency

March 25, 2010
CSA Standards Supporting Energy Efficiency Act Amendments

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Regulated EE standards

• Electricity savings from Amendment 10 of the Federal EE Act by 2020 is 15,600 GWh/year

• Reduced energy costs for Canadians (electricity at 10.47 cents/kWh) is **$1.633 Billion**
New CSA Projects – 2010/11
Impact – 13,348 GWh/YR
(112,315 homes)

**HVAC&R**
- Performance of residential mechanical ventilating equipment - (CSA C260)
- Design and installation of earth energy systems standards - (CSA C448)
- Refrigerated display cabinets (CSA C657)

**Residential Equipment**
- TV digital converters (CSA C380)

**Industrial Equipment**
- 3-phase equipment no-load power use (New Standard)
- Guideline for transformer sizing to minimize losses (New Standard)
- Dry-type Transformer load testing standards including no-load (CSA C802.2)
- Liquid filled distribution transformers (C802.1)

**Buildings**

**Lighting**
- Fluorescent Lamp Ballasts (CSA C654)
- General Service Lighting - (New Standard)
- Incandescent Reflector Lamps - (CSA C862)
- Roadway Lighting Lumnaires (CSA C653)

**Solar**
- Thin film PV modules (New Standard)
- Packaged Solar Domestic Hot Water Systems (F379)
- Installation of Packaged Solar Domestic Hot Water Systems (F383)
### Beyond NRCAN Amendment 12

<table>
<thead>
<tr>
<th>Phase 1 (EISA)</th>
<th>Phase II</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Refrigerators/Freezers</td>
<td>• 3-Phase Single SPAC and HP</td>
</tr>
<tr>
<td>• Elec. Motors</td>
<td>• Air cooled AC and Air source HP</td>
</tr>
<tr>
<td>• Furnace Fans</td>
<td>• Fractional Motors</td>
</tr>
<tr>
<td>• Res. Boilers</td>
<td>• Low Voltage Transformers</td>
</tr>
<tr>
<td>• Walk-ins</td>
<td>• Commercial Water heaters</td>
</tr>
<tr>
<td>• SPVUs</td>
<td>• Commercial furnaces</td>
</tr>
<tr>
<td>• BC/EPS</td>
<td>• Fluorescent Ballasts</td>
</tr>
<tr>
<td>• GSL</td>
<td>• Fluorescent lamps</td>
</tr>
<tr>
<td>• Inc Reflector Lamps</td>
<td>• HID Lamps</td>
</tr>
<tr>
<td>• Metal Halide Ballasts</td>
<td>• Residential Heating products</td>
</tr>
<tr>
<td></td>
<td>• Package AC and heating eq</td>
</tr>
<tr>
<td></td>
<td>• Residential water heater</td>
</tr>
<tr>
<td></td>
<td>• Standby</td>
</tr>
<tr>
<td></td>
<td>• TVs</td>
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Longer Term Priorities (2020)

Energy Savings

Phase I

Phase II

Petajoules

Refrigerator - Freezers
Electric Motors (1 - 200 hp)
Furnace Fans
Residential Boilers
Walk-ins
Single-Package Vertical Units
Battery Chargers External Power Supplies
Certain BR Reflector Lamps
Residential Indirect Heating Products
Social Services Incandescent Lamps
Fluorescent Lamp Ballasts
Fluorescent Lamps
Residential Warm Air Furnaces
Commercial Warm Air Furnaces
Residential Direct Heating Equipment, Single Motor
Commercial Direct Heating Equipment, Single Motor
Residential Water Heaters
Residential Water Heaters < 65 kBtu/h, 3-Phase
Commercial Water Heaters
Package Air Conditioning and Air-Source Heat Pumps
Air-Conditioners and Heat Pumps < 65 kBtu/h, 3-Phase
Televisions
Standby
Canadian Energy Efficiency Regulations Impact  
(Aggregate Annual Savings)

<table>
<thead>
<tr>
<th>Products</th>
<th>Energy Savings (PJ)</th>
<th>CO₂ Reductions (Mt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(amendment in brackets)</td>
<td>2010</td>
<td>2020</td>
</tr>
<tr>
<td>Residential Appliances</td>
<td>117.20</td>
<td>133.84</td>
</tr>
<tr>
<td>Lamps (fluor/Incan)</td>
<td>11.60</td>
<td>13.40</td>
</tr>
<tr>
<td>Motors</td>
<td>16.30</td>
<td>17.70</td>
</tr>
<tr>
<td>Commercial HVAC</td>
<td>6.40</td>
<td>7.50</td>
</tr>
<tr>
<td>Refrigerators (5)</td>
<td>4.92</td>
<td>10.96</td>
</tr>
<tr>
<td>Ballast/Room A/C, PAR, (6)</td>
<td>3.96</td>
<td>9.44</td>
</tr>
<tr>
<td>Clothes washers, DHW, Exit Signs, Chillers (8)</td>
<td>16.2</td>
<td>42.67</td>
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<tr>
<td>A/C, commercial refrig (9)</td>
<td>1.64</td>
<td>5.51</td>
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<tr>
<td>GSL, furnace + (10) draft</td>
<td>7.29</td>
<td>87.98</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>185.51</strong></td>
<td><strong>329.00</strong></td>
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</table>

* Values different from RIAS due to emission factor change (using 99.3) / NRCan- August 2007
Opportunities - Regional, National & International Coordination

1. Addressing Regional Priorities in a National Forum –
   - Eg. – *Ontario’s challenge - Becoming the “California of the North”*

2. ISO and IEC parallel committees to review Energy Efficiency & Renewables Strategy
   - Canadian Representation to IEC & ISO
   - Sustained support & good communications will ensure strategic direction maintained.
Future Trends

• Harmonization
  – Regionally, Nationally and Internationally – Facilitate Trade. EER - Test Procedures & Requirements.
  – EE Levels??
  – Drivers - Economic, Political, Technological

• Effective Process for Regulators & other stakeholders
  – Timely, Streamlined and Accepted

• Integrated Solutions
  – Systems vs. Products
  – Address Standards, Training and other market transformation Needs

• Common Requirements - Codes and Standards
Standards Role in Market Transformation and Regulation

Market Transformation to Energy Efficiency

Thank You!

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