



Natural Resources  
Canada

Ressources naturelles  
Canada

# SMARTER ENERGY USE IN CANADA

REPORT TO PARLIAMENT UNDER THE *ENERGY EFFICIENCY ACT*

2018–2019



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**2018-2019**

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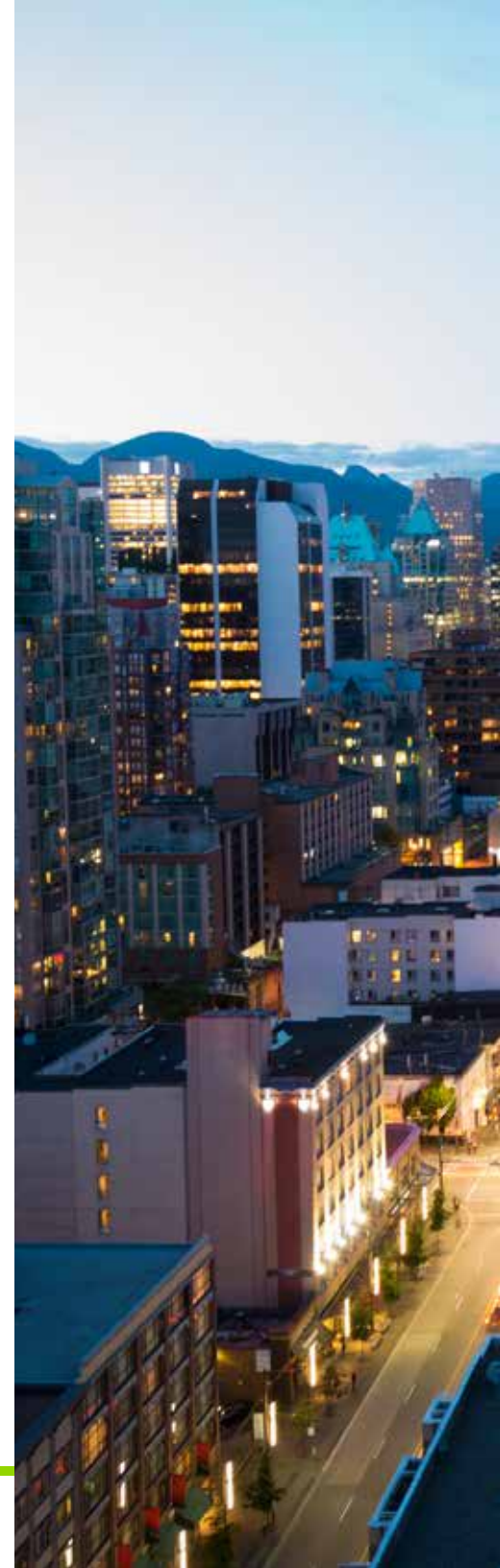
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## MESSAGE FROM THE MINISTER OF NATURAL RESOURCES

**We are at a pivotal juncture in building a clean energy future. While we made great strides in advancing energy efficiency in 2018–2019, the global events now shaping our economy, together with a changing climate, demand that we embrace its potential with even greater urgency and ambition.**

Smarter energy use – being more energy-efficient and switching to low-carbon fuels – is at the heart of the transition to a clean energy future. That transition will strengthen the economy and create good middle-class jobs while also reducing our greenhouse gas (GHG) emissions – all with the goal of reaching net-zero emissions by 2050.

We need to build on our current investments in energy efficiency and push further, together with provinces, territories, communities, businesses and individual Canadians. We need to deliver innovative strategies for energy efficiency across sectors and regions that will make today better and drive our clean growth century.

Before the pandemic, this sector was experiencing significant job growth. About 436,000 people worked in jobs related to energy efficiency in 2018 – more than in the oil and gas sector. These are green, well-paying, long-term and sustainable jobs, and we expect their growth to continue as part of our recovery. We are working with stakeholders to explore opportunities for training to upgrade skills and attract new entrants to the energy efficiency sector. The goal is to help Canadians benefit from new employment in the energy retrofit industry as we move toward a prosperous net-zero emissions future.

As we look to the future, we want to capture the opportunities energy efficiency presents by:

- mobilizing investment and accelerating building retrofits through increased adoption of programs and tools such as ENERGY STAR® Portfolio Manager®
- increasing the energy efficiency of homes by:
  - providing Canadians with information about their energy use through energy audits
  - using EnerGuide labels
  - ensuring new homes are built to net-zero National Building Code of Canada standards
- improving the energy performance of windows and space heating and water heating equipment
- working with provincial and territorial partners to encourage wider adoption of more efficient windows and heating equipment
- helping the industrial sector move to a low-carbon economy through energy efficiency programs that make it more competitive
- reviewing the *Energy Efficiency Act* (the Act) to ensure energy efficiency is considered in all future government procurement, programming and planning

Energy efficiency is at the nexus of the economy and the environment. It is good for the climate, good for our wallets, and good for job creation. Now is the time to leverage its potential.





## SMARTER ENERGY USE: WHY NOW?

### Energy demand is on the rise – at least 2% per year.

- Global recognition that efficiency gains can reduce demand and related emissions by at least 30%

### Helps households and businesses improve comfort, reduce costs, and make life more affordable

- Energy efficiency saved Canadians \$44.4 billion in 2017.

### Supports competitiveness and innovation, creates jobs, and reduces GHG emissions

- The 436,000 domestic energy efficiency jobs in 2018 are projected to grow 8.3% over 2019.
- Biofuels generate \$3.5 million of annual economic activity.

### Smarter energy use is at the heart of the transition to a clean energy future.

- Reduces pressures on existing energy infrastructure
- Reduces the need to build new energy infrastructure

### Energy efficiency: Product and process improvements that reduce energy demand

- Energy-efficient buildings: efficient windows, insulation and construction practices
- High efficiency appliances: such as refrigerators and heating and cooling systems
- Grid management: to optimize energy flow and manage and reduce peaks
- Efficient vehicle technologies and operating behaviours
- Behaviour change: such as awareness tools to help Canadians waste less energy

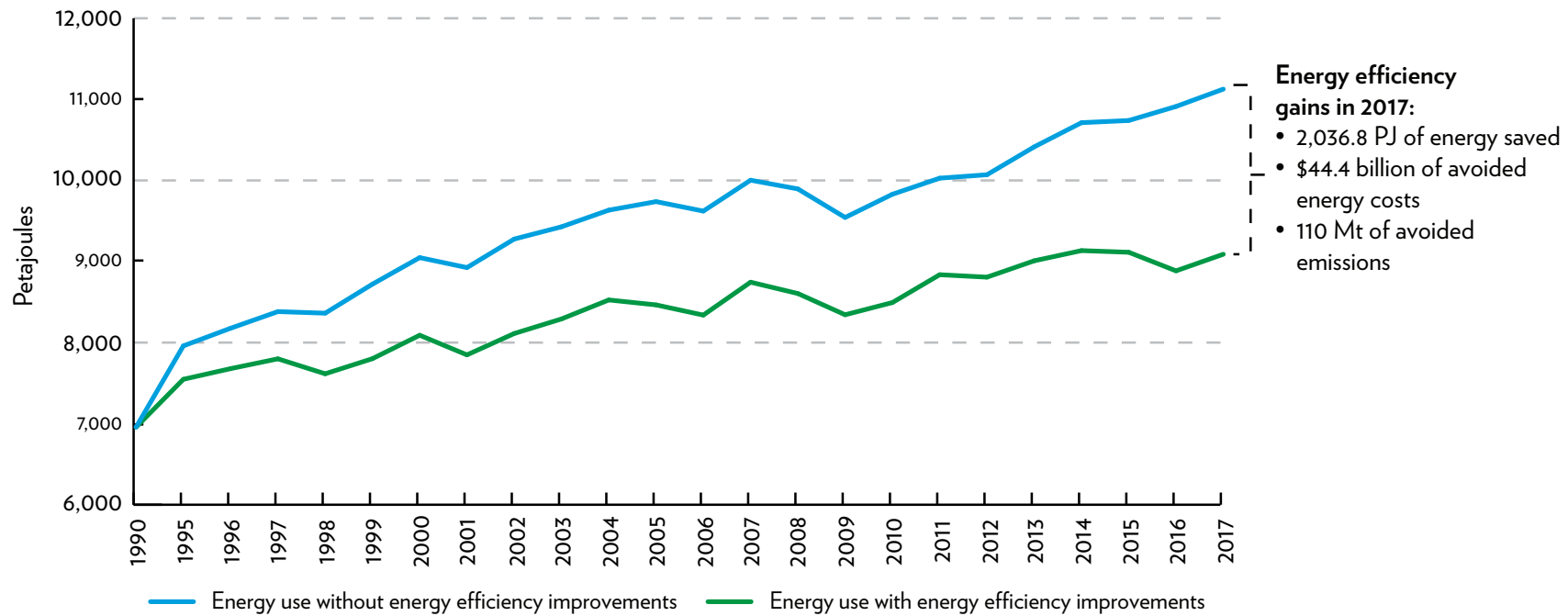
### Low-carbon fuels: Fuels that have a lower carbon footprint than comparable petroleum-based fuels

- Hydrogen, renewable natural gas, renewable diesel
- Cleaner energy





## FINAL ENERGY USE, WITH AND WITHOUT ENERGY EFFICIENCY IMPROVEMENTS, 1990-2017

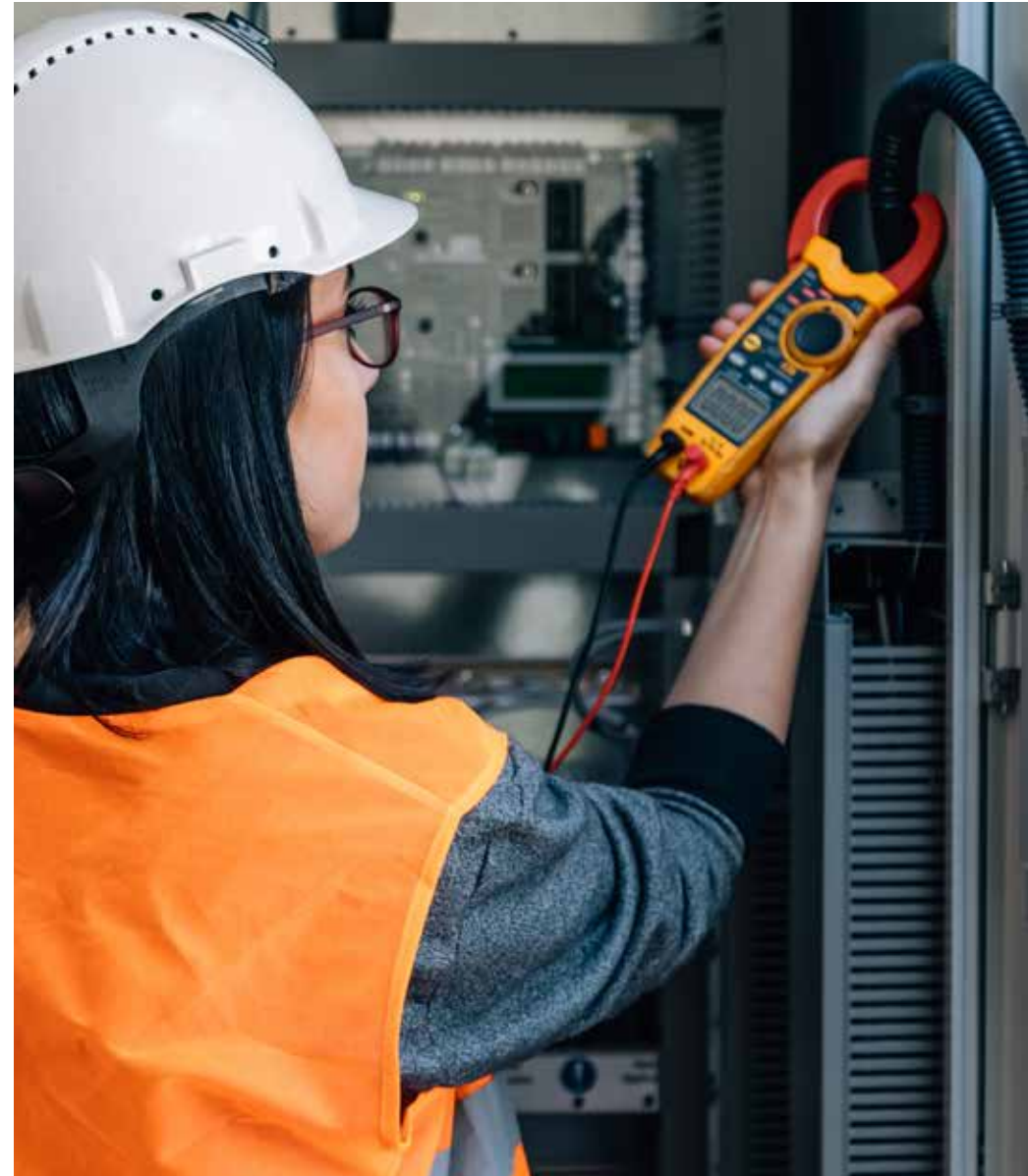


Source: *Energy Efficiency Trends in Canada, 1990 to 2017*



## ENERGY EFFICIENCY IN CANADA

- Energy efficiency is a shared responsibility. The federal, provincial and territorial governments and domestic and international industry stakeholders work together to advance smarter energy use: energy efficiency and the production and use of low-carbon fuels across the economy.
- At the federal level, the Act guides policy, program and regulatory authorities. The Act empowers the Minister of Natural Resources, as policy lead for energy efficiency for the Government of Canada, to:
  - Make and enforce regulations concerning minimum energy performance levels, labelling requirements and the collection of data on energy use
  - Promote energy efficiency and alternative energy sources
  - Deliver programs that result in energy savings and reduced GHG emissions, e.g. ENERGY STAR®, EnerGuide, FleetSmart
  - Produce an annual report to Parliament on government activities under the Act





# ENERGY EFFICIENCY PRIORITIES UNDER CANADA'S CLIMATE PLAN



## BUILD SMART: CANADA'S BUILDINGS STRATEGY



## INDUSTRIAL EFFICIENCY & ENERGY MANAGEMENT



## LOW-CARBON TRANSPORTATION & ALTERNATIVE FUEL



## GREENING GOVERNMENT

### CHALLENGE

17% of GHG emissions come from the built environment, and 75 % of existing buildings will still be standing in 2030.

37% of GHG emissions come from industrial operations, and efficiencies save money and improve competitiveness.

23% of GHG emissions come from transportation, a rapidly growing sector.

The federal government is responsible for less than 1% of Canada's GHG emissions, but it has a responsibility to lead by example.

### ACTIONS

- More stringent energy codes, including net-zero energy ready building code adopted in 2030 and development of a code for existing buildings in 2022
- Higher equipment standards and broader market adoption
- Wide adoption of benchmarking, labelling and disclosure
- Investments in RD&D for high-performance retrofits

- Energy management tools and performance certifications
- RD&D of GHG emission and energy reduction technologies

- Electric vehicle and alternative fuel infrastructure
- Influencing vehicle purchase decisions
- Fuel switching
- Lower carbon fuels and a hydrogen strategy

- Net zero carbon new buildings and low-carbon building retrofits
- Fleet assessment and deployment of electric and lower carbon vehicles
- Energy management training

# BUILD SMART, CANADA'S BUILDINGS STRATEGY: ACTIONS IN 2018-2019



**ENERGY STAR® AND R-2000**  
ARE VOLUNTARY ENERGY  
PERFORMANCE STANDARDS  
THAT ARE **20% AND**  
**50% MORE EFFICIENT,**  
RESPECTIVELY, THAN  
TYPICAL NEW HOMES.

**10,000**  
NUMBER OF NEW HOMES ISSUED  
ENERGUIDE, ENERGY STAR OR  
R-2000 LABELS IN 2018-2019

ENERGUIDE



R-2000



OVER 20,700 COMMERCIAL AND INSTITUTIONAL BUILDINGS ARE CAPTURED IN THE **ENERGY STAR® PORTFOLIO MANAGER® BENCHMARKING TOOL**, REPRESENTING OVER 255 MILLION M<sup>2</sup> OR 30% OF BUILDING FLOOR SPACE IN CANADA.

**PUBLISHED ONE FINAL AND TWO PROPOSED AMENDMENTS** TO THE *ENERGY EFFICIENCY REGULATIONS*, PROMOTING HIGHER EQUIPMENT STANDARDS AND BROADER MARKET ADOPTION OF HIGH-PERFORMANCE EQUIPMENT

**INVESTED IN RD&D FOR HIGH-PERFORMANCE RETROFITS**

IN 2018, ENERGY STAR CERTIFIED PRODUCTS **SAVED 32.97 PETAJOULES (PJ) OF ENERGY** AND AVOIDED 3.49 MEGATONNES (MT) OF GHG EMISSIONS.

SUPPORTED THE DEVELOPMENT OF A TIERED, **NET-ZERO ENERGY READY MODEL BUILDING CODE**, TO SUPPORT THE ADOPTION AND IMPLEMENTATION OF THE CODES BY THE PROVINCES AND TERRITORIES **BY 2030**



# INDUSTRIAL EFFICIENCY AND ENERGY MANAGEMENT: ACTIONS IN 2018-2019

**UP TO 45%**

OF OPERATING COSTS IN SOME INDUSTRIAL SECTORS ARE ENERGY-RELATED.

**OVER 70%**

OF ECONOMIC INDUSTRIAL ENERGY SAVINGS FROM EXISTING TECHNOLOGIES REMAIN UNTAPPED, ACCORDING TO THE INTERNATIONAL ENERGY AGENCY.

**LAUNCHED IN OCTOBER 2018,**

CRUSH IT! CHALLENGED CANADIAN INNOVATORS TO DELIVER GAME-CHANGING SOLUTIONS TO IMPROVE THE ENERGY EFFICIENCY OF CANADA'S MINES. IN 2021, A \$5 MILLION GRAND PRIZE WILL BE AWARDED TO THE INNOVATOR DEMONSTRATING THE BEST ENERGY BREAKTHROUGH IN CRUSHING AND GRINDING ROCKS.

**NRCAN CONVENED ENERGY SUMMIT 2018,**

WHICH ENGAGED OVER 425 INDUSTRY LEADERS ON THE IMPORTANCE OF ENERGY EFFICIENCY.

ENERGY STAR® ENERGY PERFORMANCE INDICATORS WERE DEVELOPED FOR THE INTEGRATED STEEL, AUTOMOTIVE AND COMMERCIAL BAKING SECTORS. **INDICATORS HELP BUSINESSES TRACK, ANALYZE AND IMPROVE THEIR ENERGY EFFICIENCY.**



**19 FACILITIES**

WERE REGISTERED IN THE ENERGY STAR CHALLENGE FOR INDUSTRY.

**13 FACILITIES RECEIVED ENERGY STAR FOR INDUSTRY CERTIFICATION.**



**14 ENERGY MANAGEMENT PROJECTS**

WERE SUPPORTED THROUGH NATURAL RESOURCES CANADA'S (NRCAN) INDUSTRIAL ENERGY MANAGEMENT PROGRAM.

# LOW-CARBON TRANSPORTATION AND ALTERNATIVE FUEL: ACTIONS IN 2018-2019

SUPPORTED THE CONSTRUCTION OF **369 ELECTRIC VEHICLE FAST-CHARGERS, 8 NATURAL GAS REFUELLING STATIONS, 4 HYDROGEN REFUELLING STATIONS,** AND DEMONSTRATION PROJECTS OF NEXT-GENERATION CHARGING TECHNOLOGIES BY 2019



SUPPORTED THE ONGOING DEVELOPMENT AND REVISION OF MORE THAN **25 BINATIONAL CODES, STANDARDS AND BEST PRACTICES FOR LOW-CARBON VEHICLES AND REFUELLING INFRASTRUCTURE**

THE GREEN FREIGHT ASSESSMENT PROGRAM **ASSESSED THE ENERGY USE OF MORE THAN 3,000 TRUCKS** FOR LOWER CARBON OPTIONS AND **SUPPORTED 250 INDIVIDUAL TRUCK RETROFITS** AND THE **PURCHASE OF 7 NATURAL GAS HEAVY-DUTY VEHICLES.**

PROVIDED FUEL CONSUMPTION INFORMATION TO SUPPORT VEHICLE-PURCHASING DECISIONS TO MORE THAN

**200,000 CANADIANS**

VIA THE *FUEL CONSUMPTION GUIDE ON-LINE*

IN 2018, CANADIAN FREIGHT COMPANIES **SAVED MORE THAN 155 MILLION LITRES (L) OF FUEL FOR OVER 47,000 CANADIAN TRUCKS,** WHICH IS ABOUT \$198 MILLION IN FUEL SAVINGS THROUGH THE SMARTWAY TRANSPORTATION PARTNERSHIP.

**SUPPORTED TIRE TESTING TO INFORM THE DEVELOPMENT OF MINIMUM EFFICIENCY STANDARDS** FOR REPLACEMENT TIRES FOR LIGHT-DUTY VEHICLES IN COLLABORATION WITH TRANSPORT CANADA AND FINALIZED A MARKET STUDY THAT ASSESSED CANADA'S REPLACEMENT TIRE MARKET

AS OF JANUARY 2019, THE CANADIAN BIOFUELS INDUSTRY HAD THE **CAPACITY TO PRODUCE OVER 2 BILLION L OF ETHANOL** AND MORE THAN **600 MILLION L OF BIODIESEL ANNUALLY.**

## **GREENING GOVERNMENT: ACTIONS IN 2018-2019**

THE GREENING GOVERNMENT SERVICES PROGRAM PROVIDED TECHNICAL SUPPORT TO **43 GHG REDUCTION AND ENERGY-SAVING FACILITY PROJECTS**, PROVIDED INFORMATION AND TRAINING TO **59 FEDERAL ORGANIZATIONS**, AND PROVIDED **607 PERSON-DAYS OF TRAINING** FROM APRIL 2017 TO MARCH 2019.

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**407 ELECTRIC OR HYBRID VEHICLES**  
WERE ADDED TO THE FEDERAL FLEET IN 2018-2019.

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IN FEBRUARY 2019, CANADA COMPLETED A COMPREHENSIVE FLEET ENERGY ANALYSIS ON **OVER 1,500 VEHICLES** ACROSS FIVE FEDERAL DEPARTMENTS.

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ABOUT **89%** OF THE GOVERNMENT'S DIRECT GHG EMISSIONS COME FROM THE ENERGY USED FOR ITS BUILDINGS (E.G. MILITARY BASES, OFFICE SPACE, LABORATORIES AND WAREHOUSES), AND **11%** OF EMISSIONS COME FROM ITS VEHICLE FLEET (ON-ROAD AND OFF-ROAD VEHICLES).



## CANADA'S ENERGY EFFICIENCY REGULATIONS

### Regulations

- In 2018–2019, NRCan published one final regulatory amendment to the Regulations and proposed two more regulatory amendments, covering 36 product category standards.
- Canada also committed to set new standards for heating equipment and other key technologies to the highest level of efficiency that is economically and technically achievable.
  - Published proposed new standards for 11 heating product categories in *Canada Gazette, Part I*, initiating a 70-day comment period.
- As a result of all updates to the Regulations published since 1995, the country saved 305.13 PJ of energy and avoided 40.47 Mt of GHG emissions in 2018.

### Enforcement

- As of March 31, 2019, there were 65 differentiated products in the Regulations.
- To monitor compliance with the Regulations, NRCan collects data from energy efficiency reports submitted by dealers before a product enters the market and from import documents provided to the Canada Border Services Agency at the time of importation.
- Between April 1, 2018, and March 31, 2019, NRCan processed almost 5 million records relating to the importation of regulated, energy-using products to Canada. More than 12 million new or revised model numbers were submitted for entry into NRCan's equipment database.



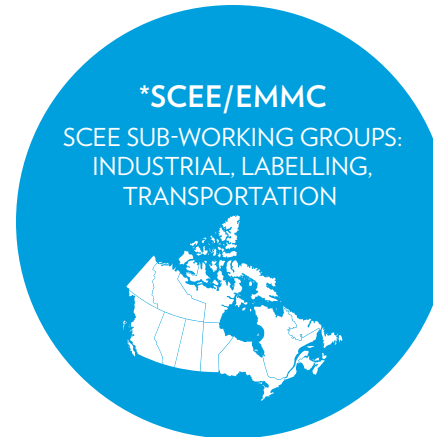




## COLLABORATION WITH PROVINCES AND TERRITORIES

- NRCan's Office of Energy Efficiency works with other orders of government and strategic partners to advance policy outcomes and share information about energy efficiency and low-carbon fuels.
- Collaborative work undertaken in 2018–2019 included advancing energy-efficient building codes, expanding the use of energy management systems, promoting the EnerGuide energy label, and supporting the development of electric vehicle infrastructure.
- This collaborative work is overseen by the Steering Committee on Energy Efficiency (SCEE), a group composed of federal, provincial and territorial energy efficiency officials. The committee members share information and ideas to promote and approve energy efficiency materials at the annual Energy and Mines Ministers' Conference (EMMC).
- Materials approved by ministers at the 2018 EMMC included updates on *Build Smart: Canada's Buildings Strategy*; the new *Encouraging Market Transformation through Collaboration on Energy Efficiency Standards*, and a "how-to" guide for greening government vehicle fleets.

### COLLABORATION WITH PROVINCES AND TERRITORIES



*\*Steering Committee on Energy Efficiency, Energy and Mines Ministers' Conference*



# INTERNATIONAL COOPERATION

- NRCan’s OEE develops and maintains bilateral and multilateral partnerships to support Canada’s energy and environmental goals, expands Canada’s international reach, and increases global uptake of energy efficiency policies. In 2018–2019, key actions included:
  - Expanding bilateral efforts by signing an Energy Efficiency **Memorandum of Understanding with Argentina** at the G20 Energy Ministerial Meeting in Buenos Aires
  - Chairing the Executive Committee of the International Partnership for Energy Efficiency Cooperation (IPEEC) and offering technical expertise to its working groups, including the **Energy Management Working Group** and the **Super Efficiency Appliance Deployment Initiative**
  - Leading efforts to develop a new **International Energy Efficiency Hub**
  - Leading **Clean Energy Ministerial (CEM)** Initiatives, including Electric Vehicles, Energy Management and Super-Efficient Equipment and Appliance Deployment
  - Working to establish future CEM directions in support of hydrogen policies to promote this emerging industry in Canada
  - Hosting the General Assembly of the Global Alliance for Buildings and Construction

## INTERNATIONAL COOPERATION

CANADA-U.S.  
TRADE, REGULATIONS,  
EMBASSY ENGAGEMENT,  
DOE, EPA



INTERNATIONAL  
ENGAGEMENT

\*IPEEC/EE HUB, IEA, CEM,  
EEGA, G20, BILATERAL MISSIONS,  
MOUS, TRADE



*\*International Partnership for Energy Efficiency Cooperation (IPEEC), International Energy Agency (IEA), Clean Energy Ministerial (CEM), Energy Efficiency Global Alliance (EEGA)*

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