

# The BC Energy Plan

**A Vision for Clean Energy Leadership**

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# Overview

- 2007 Energy Plan and other commitments
- Energy Efficient Buildings Strategy
- BC Green Building Code proposals
- Energy Efficiency Act
- Supportive programs

# Energy Plan Actions

1. Set an ambitious conservation target, to acquire 50 per cent of BC Hydro's incremental resource needs through conservation by 2020
  - Advancing ongoing efforts to develop energy-efficient products and practices through regulations, codes and standards
  - The government will introduce legislation this spring requiring 50 per cent of all new incremental power needs to be offset through conservation by 2020 (2007 UBCM Announcement)
2. Ensure a coordinated approach to conservation and efficiency is actively pursued in British Columbia
3. Encourage utilities to pursue cost effective and competitive demand side management opportunities
4. Explore with B.C. utilities new rate structures that encourage energy efficiency and conservation

# Energy Plan Actions

5. Implement Energy Efficiency Standards for Buildings by 2010
  - Publish a revised Energy Efficient Buildings Strategy
  - A new unified B.C. Green Building Code will be developed over the next year with industry, professional, and community representatives (2007 Throne Speech)
  - The new green building code will implement the highest energy efficiency standards in Canada, which will result in homes in B.C. costing less to heat and reduce impacts on the environment (2007 UBCM Announcement)
6. Undertake a pilot project for energy performance labeling of homes and buildings in coordination with local and federal governments, First Nations, and industry associations
  - New measures will be taken to help homeowners undertake "energy audits" that show them where and how savings can be achieved (2007 Throne Speech)

# Energy Plan Actions

7. New provincial public sector buildings will be required to integrate environmental design to achieve the highest standards for greenhouse gas emission reductions, water conservation and other building performance results such as a certified standard
  - All new government buildings or facilities shall be built to a minimum LEED Gold or equivalent certification (2007 UBCM Announcement)
8. Develop an Industrial Energy Efficiency Program for British Columbia to address specific challenges faced by British Columbia's industrial sector
9. Increase the participation of local governments in the Community Action on Energy Efficiency Program and expand the First Nations and Remote Community Clean Energy Program
  - Municipalities will be given the power to waive development cost charges as a way to encourage green developments, small unit housing and small lot subdivisions (2007 UBCM Announcement)

# Other Commitments

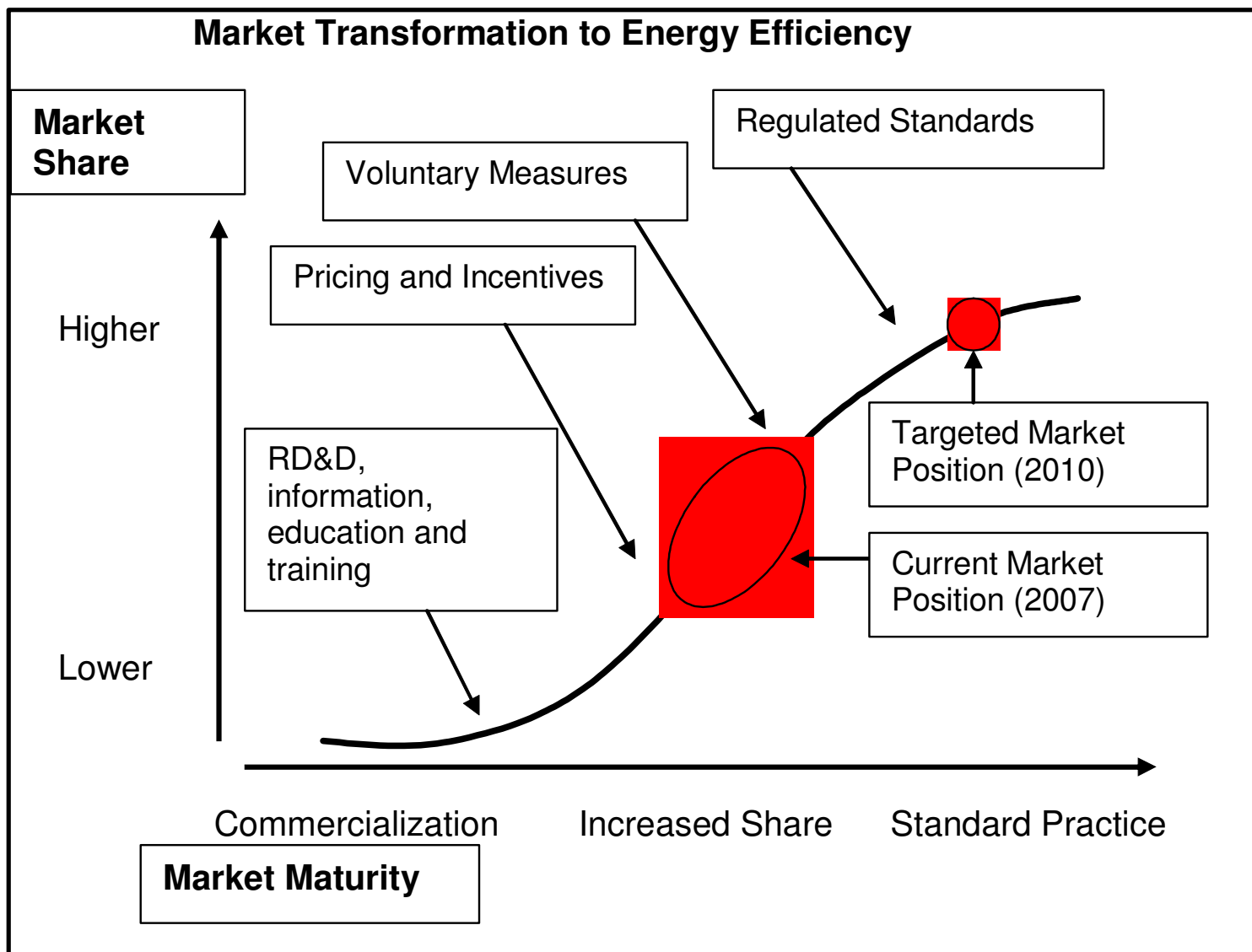
- 33% reduction in greenhouse gas (GHG) emissions below 2007 levels by 2020
  - Joined the Western Regional Climate Action Initiative
  - Includes MB, WA, OR, CA, AZ, NM, UT, MT
- Incentives will be implemented to retrofit existing homes and buildings to make them more energy efficient
- New real-time, in-home smart metering will be launched to help homeowners measure and reduce their energy consumption
- Help customers install “smart meters” and then develop a “smart electricity grid” that can precisely track and manage power demand
- PST Exemptions

# Energy Efficient Buildings: **A Plan for BC**

Creating a Legacy of  
Energy Efficient  
Buildings in  
British Columbia



# Market Transformation Approach





# Revised Energy Efficient Buildings Strategy

- Revised strategy to be released soon
- New targets for 2020 aligned with climate action goals
- Actions in the following areas:
  - Energy use in homes
  - Energy use at work and play
  - Community leadership
  - Government leadership
  - Energy using products
  - Creating a culture of conservation

# Net Zero Energy Buildings

- MEMPR perspectives
  - Applies to both thermal and electrical energy
  - Design aims to minimize energy demand (e.g., EGH90, 50% better than MNECB) while maintaining ventilation and indoor air quality
  - Incorporates community-based, clean energy and waste energy supplies (e.g., district heat)
  - Maximizes the use of existing energy currency infrastructure (e.g., renewable natural gas)
- Goal to launch a demonstration program

# BC Green Building Code

- Proposals for 2008 amendment of Code
  - Increased prescriptive standards for residential buildings of four stories or less
    - Alternative: energy estimation computer modeling, other acceptable good engineering principles or achieving an EnerGuide for New Houses rating of 77
  - Prescriptive standards for small, non-residential buildings (Part 9)
  - Comprehensive code for other buildings (ASHRAE 90.1-2004) with performance, simplified performance and prescriptive paths

# BC Green Building Code – houses

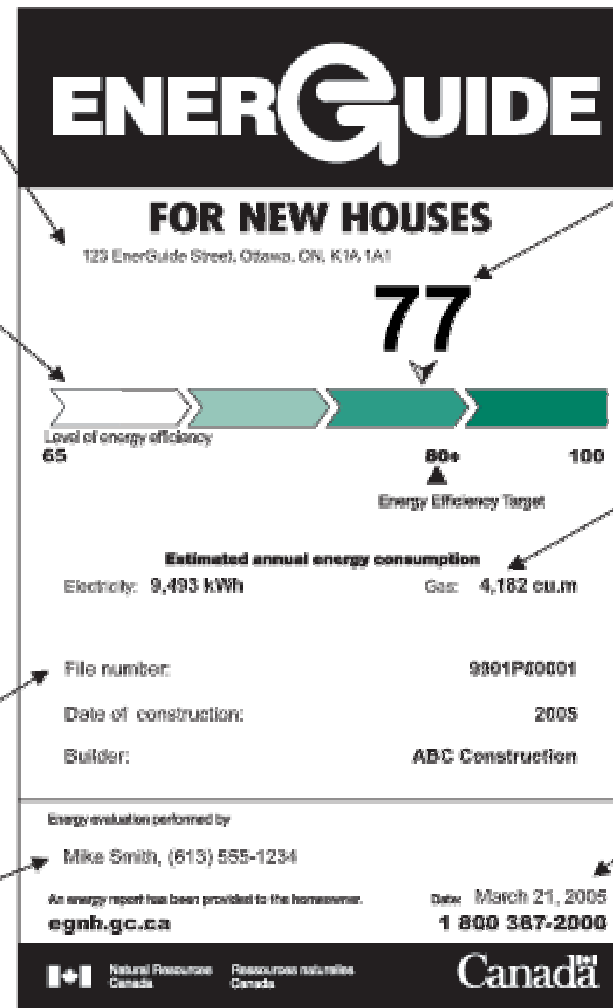
- “Performance Path”
- EnerGuide for New Houses
- Plan evaluation done by builder or consultant
- EnerGuide advisor verifies energy performance with blower-door test (\$300)
- Advisors serving all BC communities

Address

Scale

File Number

Evaluated By



**Energy Efficiency Rating**  
Allows comparison of energy performance between houses of the same size. The more efficient the house the higher the rating number.

**Estimated Annual Energy Consumption for the House under Standard Operating Conditions**  
Allows comparison of the energy consumption of the house to similar houses, and helps estimate energy costs.

**Date**  
The date that the energy efficiency evaluation was conducted.

# BC Green Building Code – houses

- Increased cost-effective insulation

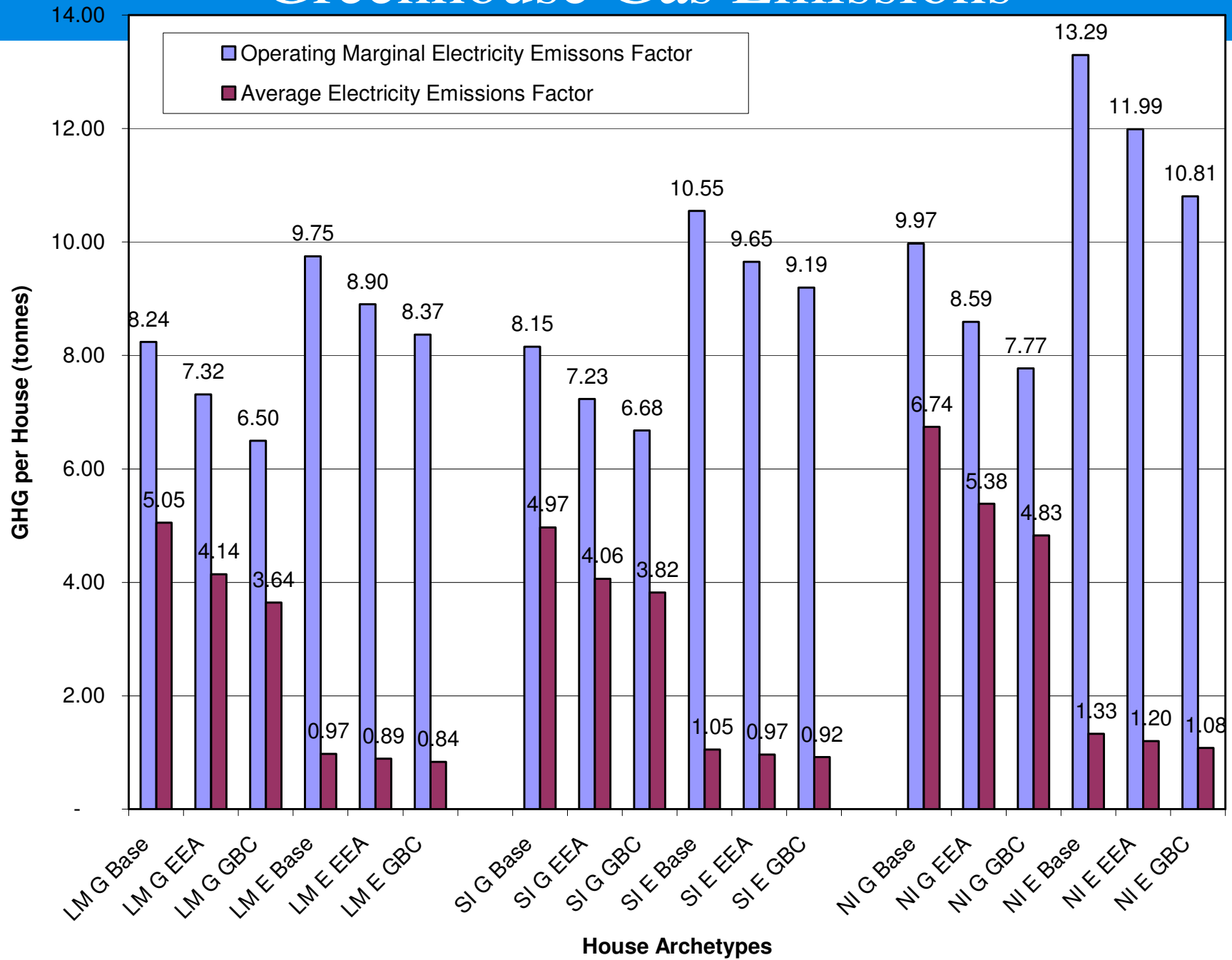
| <i>Building Assembly</i>                              | <b>Value Required</b>             |  |                                   |
|---|-----------------------------------|--|-----------------------------------|
|   | <b>Less than 3500 Degree Days</b> | <b>3500 Degree to 4500 Degree Days</b> | <b>More than 4500 Degree Days</b> |
| Attic Space   | 7.0                               | 7.7                                    | 9.0                               |
| Roof Joist Assemblies (Cathedral Ceilings/Flat Roofs) | 4.9                               | 4.9                                    | 4.9                               |
| Frame Walls (including frame crawl space walls)       | 3.5                               | 3.5                                    | 3.85                              |
| Suspended Floors (framed)                             | 4.9                               | 4.9                                    | 4.9                               |
| Suspended Floors (concrete slab)                      | 2.1                               | 2.1                                    | 2.1                               |
| Foundation Walls (full height)                        | 2.1                               | 2.1                                    | 2.1                               |
| Unheated Concrete Slabs ...                           | 1.8                               | 2.1                                    | 2.1                               |
| Radiant Heating Slabs ...                             | 2.1                               | 2.1                                    | 2.1                               |
| Radiant Heating Suspended Floor Assembly ....         | 2.1                               | 2.1                                    | 2.1                               |

# BC Green Building Code – houses

- Alternatives to attic insulation in the north, provided any of the following provisions with a total point value of at least 2.1 are employed

| Description   | Points |
|---|--------|
| Windows have a maximum heat loss coefficient U-value of 1.6 W/(m <sup>2</sup> •K), similar to ENERGY STAR Zone C                              | 0.4    |
| Frame Walls insulation is at least RSI 4.8  | 1.5    |
| Heat recovery ventilator with 55 % efficiency at a station 1 test temperature of 25°C at an air flow not less than 30 litres per second       | 2.3    |
| Ground-source or water-source heat pump (Geoexchange) system for 90% of space heating needs with a coefficient of performance of at least 3.0 | 5.0    |
| DC, variable speed (ECM) blower motor on the forced air furnace   | 0.2    |
| Tankless or condensing natural gas or propane water heater with EF > 0.8  | 0.8    |
| A drain-water heat recovery system of at least one meter in length  | 0.1    |
| Solar domestic water heater with a collector surface area of at least 5.92 m <sup>2</sup>   | 0.5    |

# Greenhouse Gas Emissions



BC Green  
Building  
Code –  
Institutional,  
commercial,  
industrial and  
multi-unit  
residential  
buildings



# BC Green Building Code – ICI/MURB

- ASHRAE 90.1 (2004) “Energy Standard for Buildings Except Low-Rise Residential Buildings”
- Three paths for compliance:
  - Prescriptive path (specific standards)
  - Tradeoff methods and simplified approaches
  - Energy cost budget method (modelling)
- Mandatory provisions for all three

# BC Green Building Code – ICI/MURB

- Chapters for:
  - Building Envelope – windows, walls, insulation, sealing, managing air leakage – includes building envelope tradeoff method
  - Heating, Ventilating and Air Conditioning (HVAC) – includes simplified approach
  - Service Water Heating
  - Power
  - Lighting – includes building area and space-by-space lighting power density methods
  - Other equipment

# Energy Efficiency Act – 2006 Standards

- Furnace efficiency  $\geq 90\%$  (effective January 1, 2008) similar to ENERGY STAR
- Low-E windows (U value  $\leq 2.0$  W/m<sup>2</sup>/K), effective January 1, 2009) – similar to ENERGY STAR Zone A
- Electronic thermostats for baseboard heaters (effective January 1, 2007)
- Gas fireplace labelling using CSA P4.1 (effective January 1, 2007)
- Large boilers, combustion efficiency  $\geq 80\%$  (effective January 1, 2007) – same as ASHRAE 90.1 (2004)

# Progress on 2006 Standards

- 56% market share for Energy Star furnaces in May, 2007 (for new and existing buildings), 50% average January-June
- 54 BC based window manufacturers to introduce Energy Star products, 20-30% market share as of fall 2006, prior to PST exemption announcement
- EnerChoice label for efficient gas fireplaces
- Proposal to exempt wooden doors due to their use of renewable resources
- Proposal to exempt windows used for buildings more than 4 stories in height

# Energy Efficiency Act – Short-term Priorities

- NRCan fluorescent ballast standard, including replacement products immediately (in advance of NRCan's 2010 effective date)
- Residential appliances
- Extend furnace regulation to retrofits of existing buildings with an effective date of December 31, 2009
- Gas-, oil- and propane-fired water heaters
  - Participation in SEGWHAI, super efficient gas water heater initiative

# Energy Efficiency Act – Long-term Priorities

- General service lighting (lumens per watt)
- Furnace blower motors
- Standby losses (reducing them to 1 watt), saving 73 megawatts of electricity
- Commercial refrigeration
- Commercial HVAC
- Industrial motors
- Hot water system design for new construction (GJ per litre) incorporating impacts of tankless units, heat recovery, pipe insulation and solar thermal

# Supportive Programs

- Built Green BC, LEED and Green Globes
- BC Hydro High Performance Building and New Home Programs
- FortisBC new construction programs
- Terasen Gas efficient boiler and thermal metering programs, geo-exchange utility
- Provincial Sales Tax exemptions for insulation, draftproofing, water heaters, ENERGY STAR windows, doors, appliances, furnaces, boilers and heat pumps, renewables

# Discussion Points

- Priorities for a demonstration program?
- New construction only, retrofits too?
- Role of emerging standards such as LEED-complete and ASHRAE 189
- Key components of a roadmap for net-zero to become mainstream practice
  - Research
  - Demonstration
  - Market stimulus
  - Voluntary measures
  - Regulation

# The BC Energy Plan

A Vision for Clean Energy Leadership

[www.energyplan.gov.bc.ca](http://www.energyplan.gov.bc.ca)

