



# **Government of Canada Approach to Greenhouse Gas and Criteria Air Contaminant Mitigation**

**Presentation to CARB International Symposium on  
Near-Term Solutions to Climate Change  
March 7, 2007**



Natural Resources  
Canada

Ressources naturelles  
Canada

**Canada**



# Canada's New Government Addressing Climate Change and Clean Air

## Overview of Presentation

- **Background**
- **New Government and Key Decisions**
- **Regulatory Path Forward**
- **Recent Program Commitments**
- **Canada's 2004 Greenhouse Gas Emission Inventory**
- **Key Economic Considerations**
- **Summary (importance of key technologies)**





# Canada's New Government

**January 2006 election**

**Minority Conservative Government**

- 125 of 308 seats

**Opposition Parties**

- Liberals 101, Bloc Quebecois 50, NDP 29, 1 independent, 2 vacant

**Speech from the Throne (April 2006) identified first year agenda reflecting 5 key platform priorities**

- Will take measures to achieve tangible improvements in our environment, including reductions in pollution and greenhouse gas emissions





# Canada's New Government - Key Decisions

**May 2006 Budget provided \$2 billion in funding over 5 years for “Made-in-Canada” approach to climate change**

- \$1.3 billion for public transit enhancements**
- \$370 million in tax credits for transit users**
- Indicated support for mandating renewable fuels standard by 2010 ( \$345 million and 5% ethanol and 2% bio-diesel standards )**
- Transitional funding to many existing climate change programs**





# Clean Air Regulatory Agenda

- **Clean Air Act tabled - strengthens existing legislation to achieve improved air quality and reduce greenhouse gas emissions in response to growing concerns about public health and climate change (most GHGs and CAC emissions stem from fossil fuel combustion)**
- **Notice of Intent (NOI) outlines commitment to regulate GHG and CAC emissions from large industry**





# Clean Air Regulatory Agenda - Notice of Intent

- **Aims to reduce harmful air emissions across range of products and industries through a regulatory multi-pollutant approach**
- **Will harmonize emission standards for on-road vehicles/engines and off-road engines with those of the U.S. EPA and enact mandatory fuel efficiency standards for automobiles in 2011**
- **Will develop short-term (2010/2015), medium-term (2020/2025) and long-term (2050) industrial air pollution targets (GHGs and CACs)**
- **Tasks national advisory group with advice on long-term targets and approaches**
- **Will set fixed emission caps for CACs and initial emission intensity targets for GHGs through regulation**
- **Commits to fixed caps and absolute reductions for GHGs by 2025**
- **Indicates absolute GHG emission reduction target for 2050 to be set at 45% to 65% from 2003 baseline**





# Clean Air Regulatory Agenda - NOI Details

## Targeted Substances

- **SO<sub>2</sub>, NO<sub>x</sub>, VOCs, PM, NH<sub>3</sub>, Hg, and 6 main GHGs**

## Targeted Sectors

- **Fossil-fired Electricity (including Biomass)**
- **Upstream Oil and Gas (including Oil Sands)**
- **Downstream Petroleum**
- **Base Metal Smelters**
- **Iron and Steel**
- **Aluminum**
- **Cement**
- **Forest Products (including Pulp and Paper)**
- **Chemicals**





# Clean Air Regulatory Agenda – NOI Details

## Governing Principles

- **Targets consistent with leading jurisdictions and/or as rigorous as U.S.**
- **Achieve measurable tangible reductions in air pollution**
- **Maximize gains through multi-pollutant approach**
- **Incorporate flexible compliance mechanisms**
- **Competitiveness of industry and alignment with capital stock turnover**
- **Respect shared responsibility among orders of government**
- **Promote investment in development/deployment of new technologies**
- **Provide regulatory certainty for industry**

## Next Steps

- **Consult on targets and timetables**
- **Decide on compliance mechanisms**
- **Harmonize monitoring and reporting requirements**
- **Establish national air quality objectives for O3 and PM**





# CARA Complementary Program Initiatives

## ecoENERGY Initiatives

- \$1.5 B renewable energy – wind; small hydro; biomass; and ocean and renewable heat for building space heating/cooling and water heating
- \$300 M energy efficiency – housing, smaller commercial buildings/industries
- \$230 M technology RD&D of transformative technologies

## ecoTrust Initiative

- \$1.5 B shared funding with provinces for mitigation efforts
- Engaging provinces key to advancing critical technologies (Provinces own and control development of natural resources)

## ecoTransport Initiative

- \$100 M transportation-related activities (information, labelling, technology deployment and demonstrations) at both passenger and freight sectors

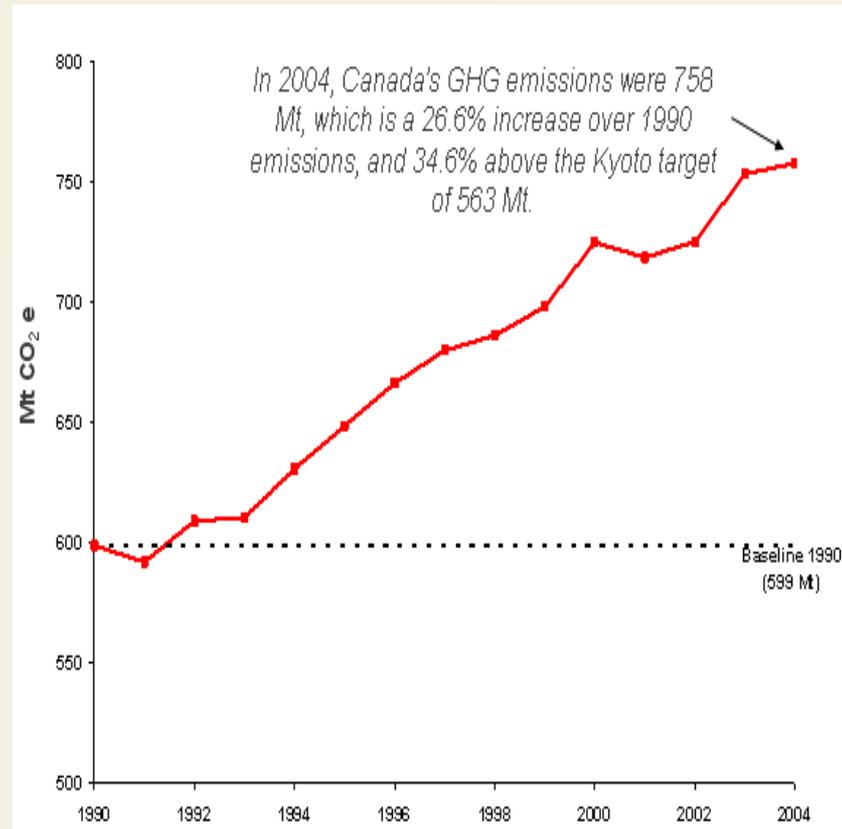




# Canadian GHG Emissions – 1990 to 2004

- Trend is generally upward – reflecting need to change approach
- Emissions up 26.6% over 1990 to 2004 timeframe
- Highlights need for developing and deploying transformative technologies that uncouple GDP expansion and GHG emissions

Source - Canada's 2004 National Inventory Report, Environment Canada

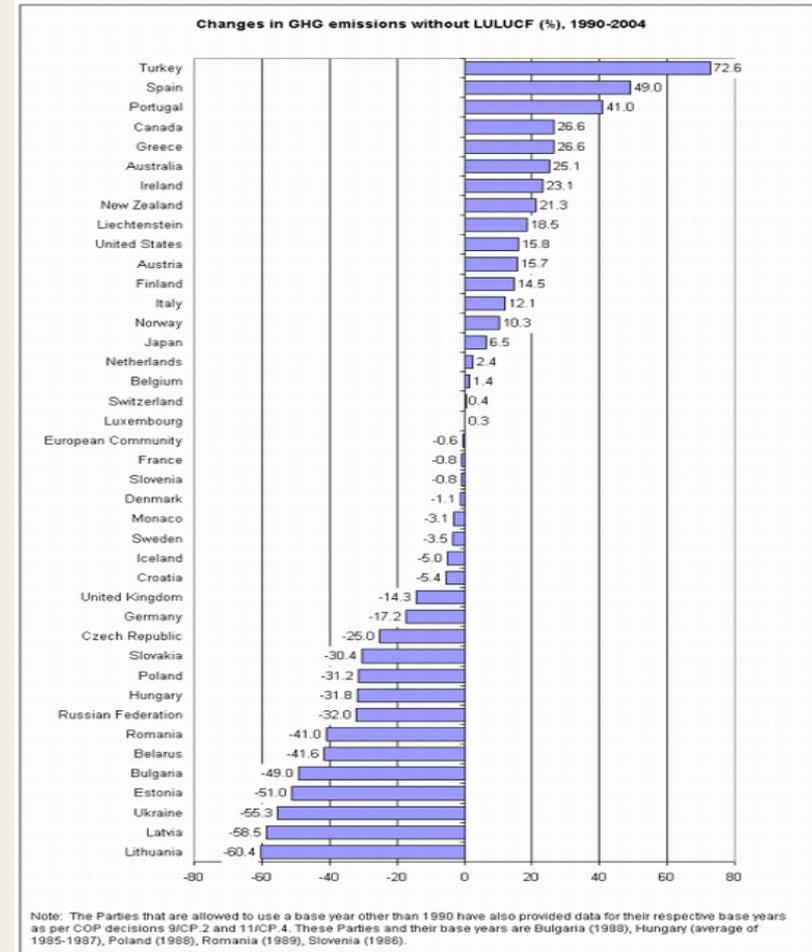




# International Comparison

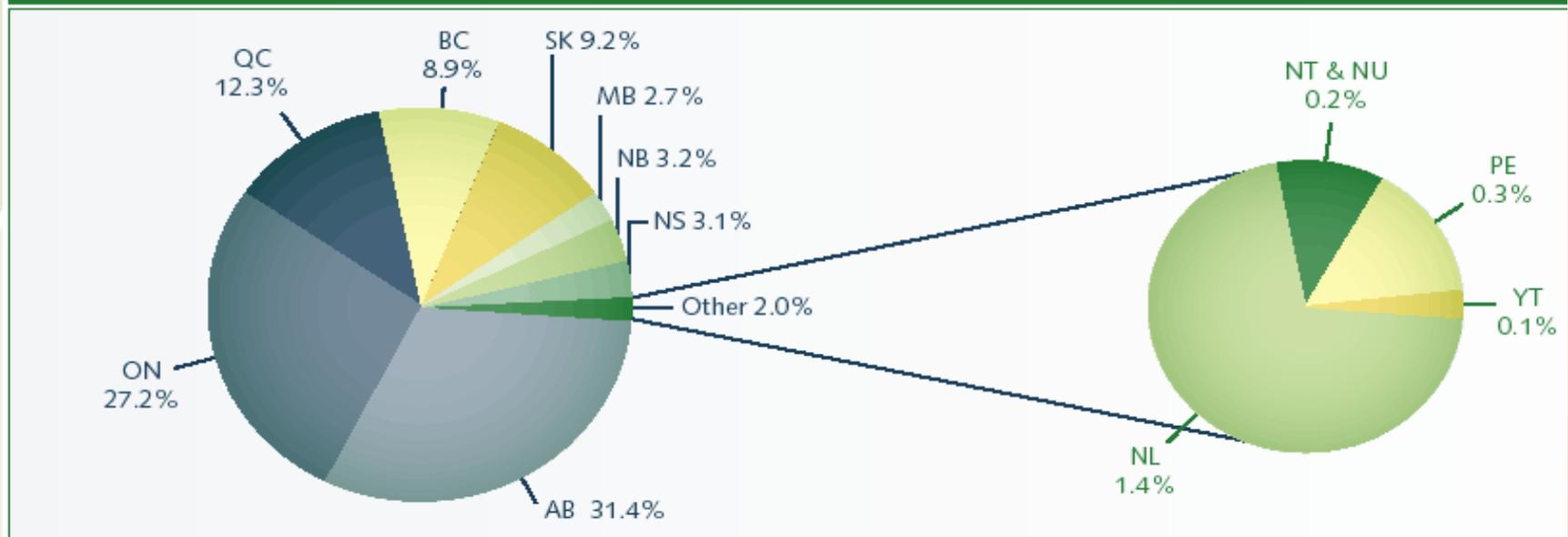
- **Canada ranks with other leading emitters on a percentage increase basis**
- **National circumstances include**
  - Above-average population growth
  - Above-average GDP growth,
  - significant expansion in energy sector - particularly oil and gas

Source - UNFCCC 2006



# Canadian Context

**FIGURE 5: Relative Provincial and Territorial Contributions to Canada's GHG Emissions in 2004**



- Alberta leads provinces in GHG emissions although Ontario has largest population
- Significant per capital emission variance across the country reflects both degree of industrialization and natural resource endowments

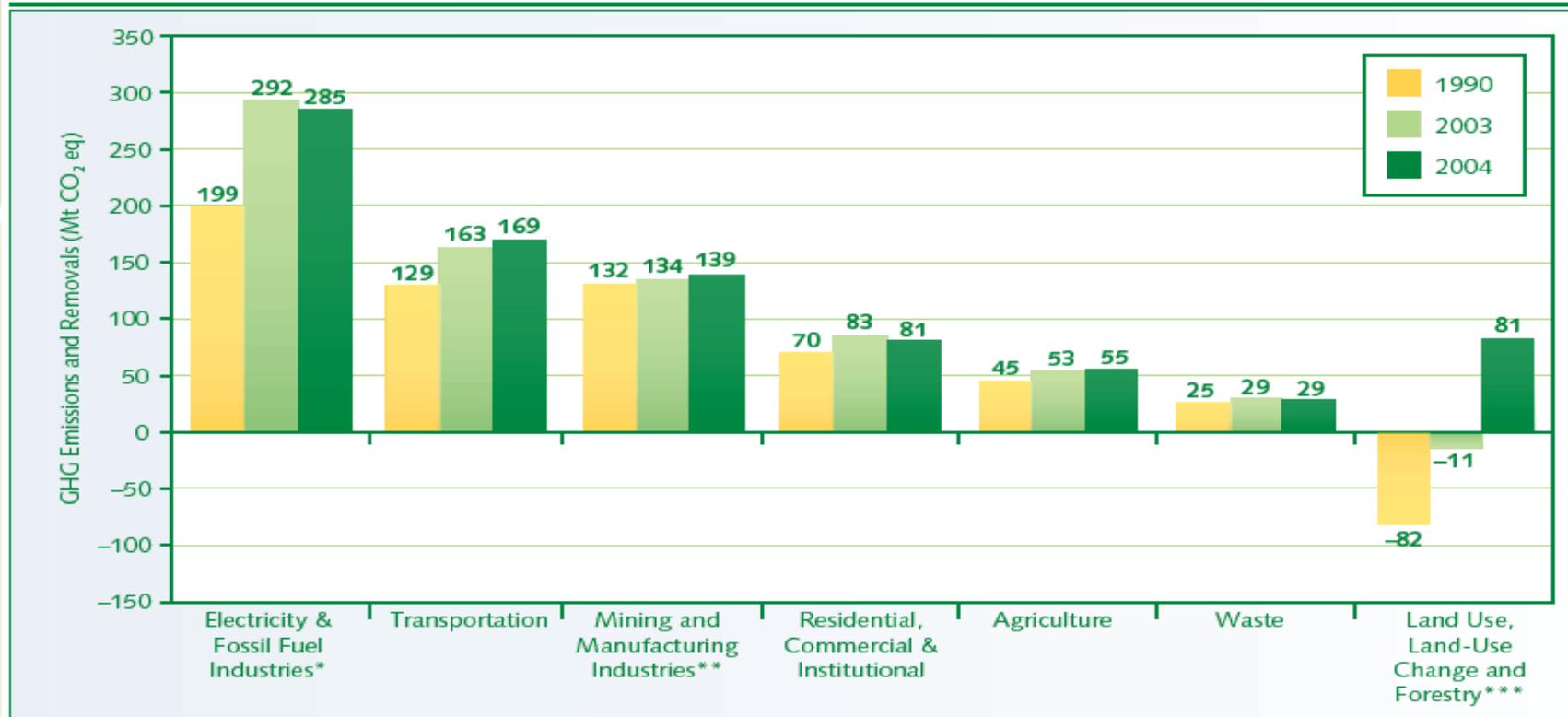
Source – Environment Canada, 1990 - 2004 National Inventory Report





# Canadian Context

**FIGURE 1: Canadian GHG Emissions and Removals, 1990, 2003 and 2004**



Source – Environment Canada, 1990 to 2004 National Inventory Report

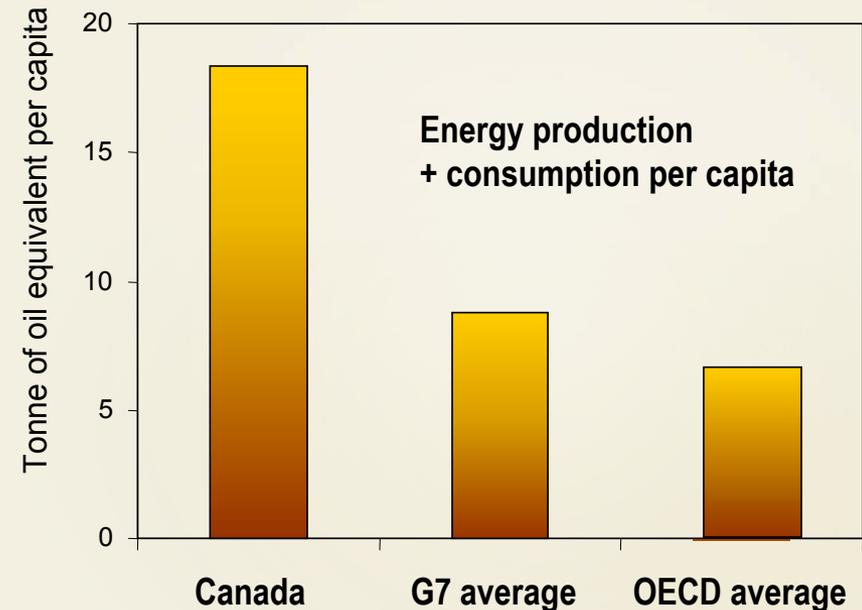




# Importance of Energy to Canada

## Energy use is pervasive in Canada

- Northern climate, large size and energy-intensive industrial base result in greater energy requirements
- World's 5<sup>th</sup> largest energy producer
- Energy is 3<sup>rd</sup> largest GDP contributor ~5.6%
- In 2004, sector invested \$48B in capital
- Largest contributor to Canada's trade surplus
  - In 2004, 99% of Canadian energy product exports went to the US (C\$67 billion)





# GHG Emission and Energy Trends 1990 to 2004

	1990	2003	2004	Percent Increase 1990 to 2004
<b>GHG Emission - MT CO<sub>2</sub> eq</b>	<b>599</b>	<b>754</b>	<b>758</b>	<b>26.6</b>
<b>GDP - Millions 1997 \$</b>	<b>712,019</b>	<b>1,012,635</b>	<b>1,045,643</b>	<b>46.9</b>
<b>Domestic Energy Consumption (PJ)</b>	<b>9230</b>	<b>11479</b>	<b>11618</b>	<b>25.9</b>
<b>Energy Production (PJ)</b>	<b>7746</b>	<b>12492</b>	<b>12784</b>	<b>65</b>
<b>Energy Exported (PJ)</b>	<b>3063</b>	<b>7473</b>	<b>7798</b>	<b>155</b>
<b>Net Energy Exported (PJ)</b>	<b>1769</b>	<b>4958</b>	<b>5172</b>	<b>192</b>
<b>GHG Emissions from with Exports - MT</b>	<b>28</b>	<b>69</b>	<b>73</b>	<b>161</b>
<b>GHG Emissions from Net Exports - MT</b>	<b>22</b>	<b>46</b>	<b>48</b>	<b>123</b>

Source - Natural Resources Canada 2006





# Canadian Context – Oil and Gas Activity

- **2005 Oil and Gas Statistics**
- **Capital Spending**
  - Conventional \$34.8 billion
  - Oil Sands \$10.4 billion
  - Total \$45.3 billion**
- **Wells Drilled**
  - Oil 5,482
  - Natural Gas 15,931
  - Total (including Dry & Service) 26,951**
- **Industry Revenues**
  - Oil, Gas & By-products \$109.0 billion
- **Payments to Governments**  
**Royalties, Bonuses, Fees & Income Taxes \$27.0 billion**
- **Employment - Direct and Indirect 365,000**
- **Total Employment Impact 500,000**

Source: CAPP



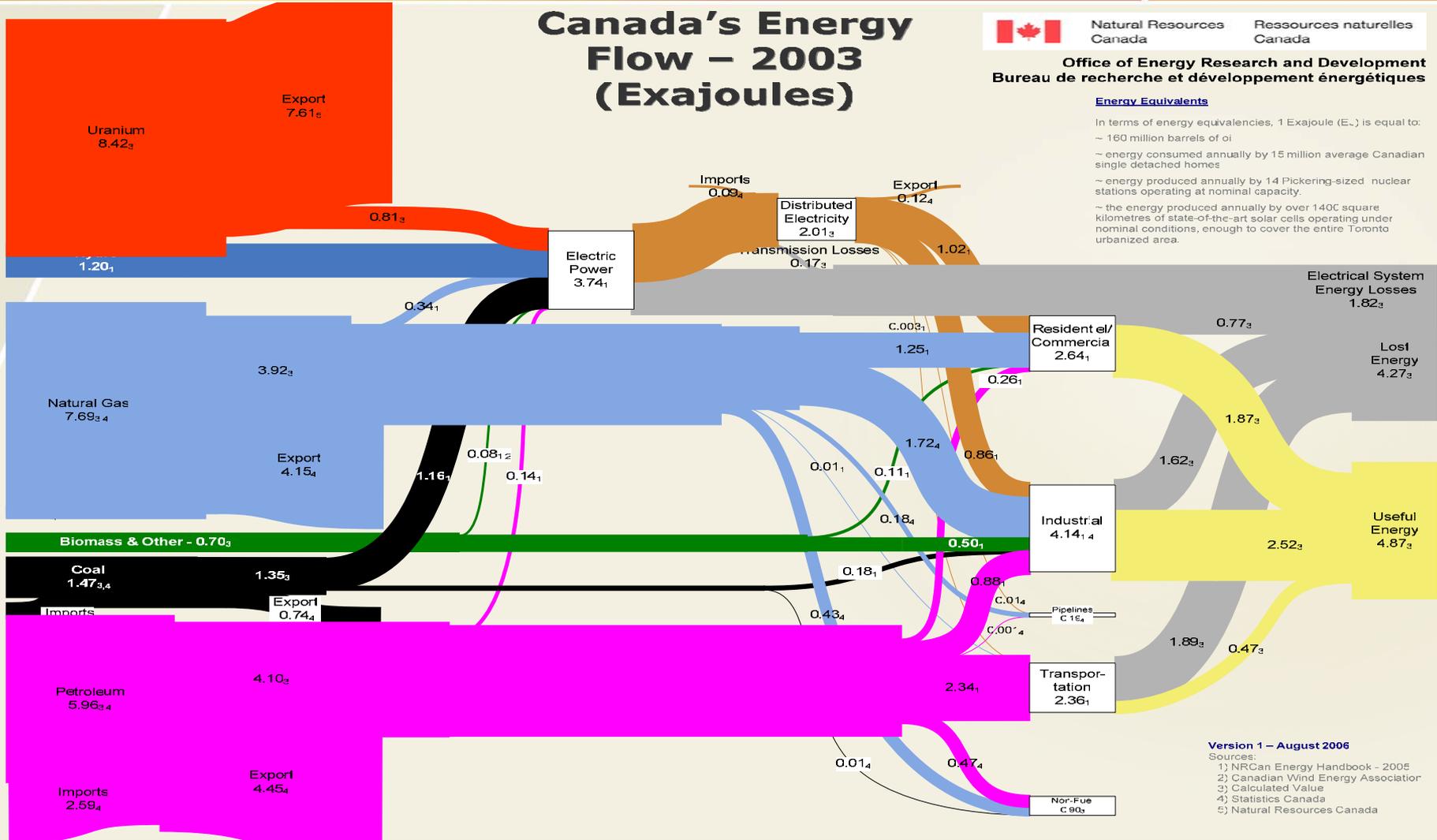


# Canadian Context

## Canada's Energy Flow – 2003 (Exajoules)

 Natural Resources Canada / Ressources naturelles Canada  
 Office of Energy Research and Development / Bureau de recherche et développement énergétiques

Energy Equivalents  
 In terms of energy equivalencies, 1 Exajoule (E<sub>J</sub>) is equal to:  
 ~ 160 million barrels of oil  
 ~ energy consumed annually by 15 million average Canadian single detached homes  
 ~ energy produced annually by 14 Pickering-sized nuclear stations operating at nominal capacity.  
 ~ the energy produced annually by over 140C square kilometres of state-of-the-art solar cells operating under nominal conditions, enough to cover the entire Toronto urbanized area.



Version 1 – August 2006  
 Sources:  
 1) NRCan Energy Handbook – 2005  
 2) Canadian Wind Energy Association  
 3) Calculated Value  
 4) Statistics Canada  
 5) Natural Resources Canada



# Summary - Canadian Perspective

- **Importance of action on climate change and strengthened national efforts to mitigate emissions clearly reflected in government's clean air regulatory agenda**
- **Domestic approach to greenhouse gas emission reductions and international position on climate change are central to political discourse in Canada**
- **Canada will meet combined challenges of climate change and competitive growing economy and will engage internationally to learn from and leverage our resources and capabilities**
- **Energy Science and Technology and clean energy technologies will play central roles in resolving overlapping objectives of clean air, stable climate, growing and vibrant economy, and public health**





# ecoENERGY Technology Initiative

- **Government of Canada announced \$230 M initiative to accelerate development and market readiness of clean energy technologies**
  - **Increase clean energy supplies**
  - **Improve energy end-use efficiency**
  - **Reduce environmental burden of conventional energy supplies**
  
- **Critical clean energy technologies include:**
  - **Carbon Capture and Storage/CO<sub>2</sub> Pipeline**
  - **Clean Thermal Electricity - Coal/Pet Coke Gasification**
  - **Clean Oil Sands**
  - **Renewable Energy – Generation, Grid Management, T&D and Storage**
  - **Advanced Vehicles - including Hydrogen and Fuel Cells**
  - **Advanced Nuclear (Generation IV)**
  - **Bio-energy**





# Thankyou

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