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Clean Air Regulatory Agenda – Regulatory Framework for Industrial Air Emissions

**In-depth Technical Briefing
April 30, May 1 and 2, 2007**



The Government is following through on its October commitment

- The Notice of Intent (October 21, 2006) publicly stated the Government of Canada's commitment to develop a regulatory framework for industrial air emissions.
- The government consulted extensively with key stakeholders in November-December 2006.
- Individual Canadians had the opportunity to submit formal comments over a 60-day period.
- Consultations and formal comments were instrumental in shaping/refining this Regulatory Framework for Air Emissions.



The Regulatory Framework provides a nationally consistent approach to reduce air emissions

- **Responding to**
 - Uneven effort across the country to reduce air emissions
 - Inconsistent messages to industry
 - Insufficient action to protect health and the environment
- **This approach provides**
 - Tangible benefits for Canadians and their environment
 - Nationally consistent regulations
 - Continued competitiveness of our economy
 - A level playing field across Canada
 - The basis for negotiations with our international partners



The framework will be implemented working with provinces/territories, industry and stakeholders

- Work being undertaken is to:
 - Validate sector-specific air pollutant targets by June 2007, including their date of coming into force
 - Translate greenhouse gas target structure into sector-specific regulatory targets
 - Address the scope of offsets system and the administration of technology fund
 - Develop sector-specific air emissions regulations
- Finalize air pollutant regulatory framework by fall 2007
- Begin publication of draft regulations by spring 2008
- Finalize all regulations by 2010





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Greenhouse Gases



Greenhouse gas emission targets

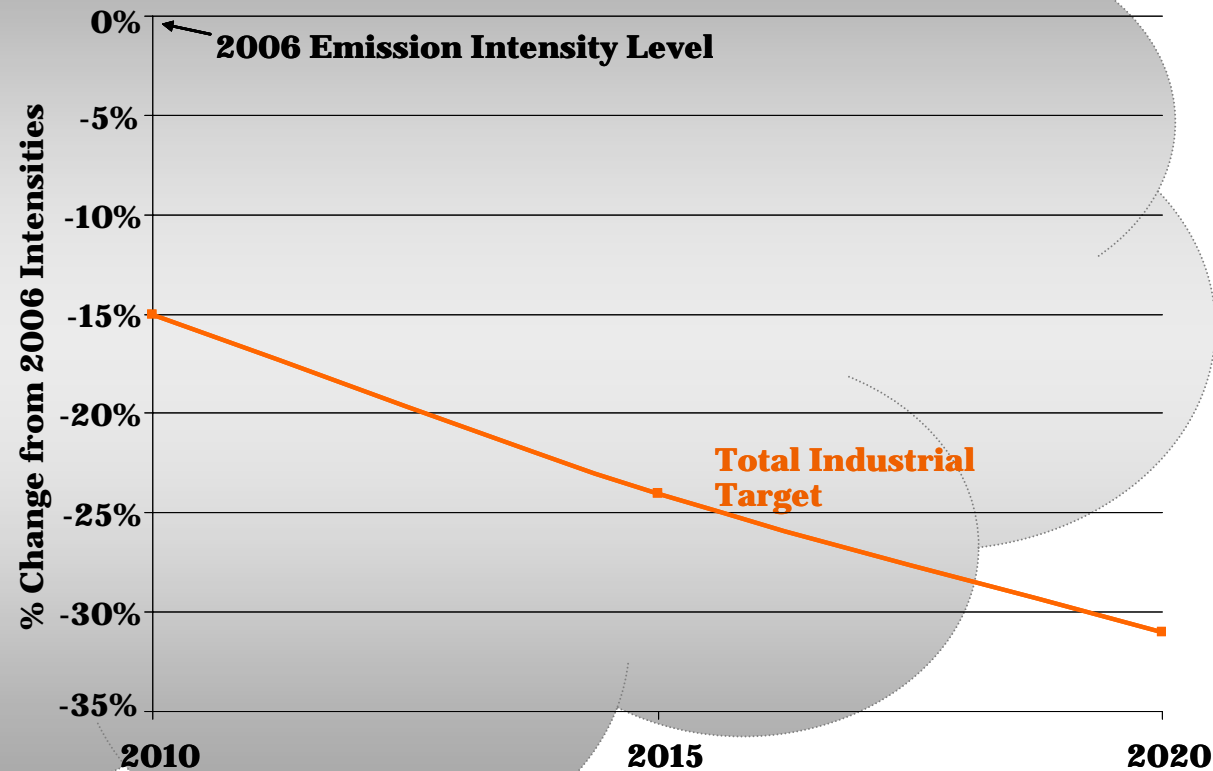
Target

Existing facilities

- 6% improvement each year from 2007 to 2010, giving an enforceable 18% reduction from 2006 emission intensity in 2010
- 2% annual improvement thereafter

New facilities

- 3-year grace period
- Clean fuel standard
- 2% annual improvement



Greenhouse gas compliance options

Ways to comply



In-house reductions

Climate Change Technology fund: one fund/two components

- Deployment & Infrastructure: focus on opportunities for near-term emission reductions: access as % of total target over 2010-2017 period – 70%, 65%, 60%, 55%, 50%, 40%, 10%, 10%
- Research & Development: focus on new transformative technologies: access over 2010-2017 period – 5 Mt annually
- Explore credit for certified project investments
- Contribution rate to funds (\$/tonne over 2010-2017 period) – \$15, \$15, \$15, \$20, \$20 escalating with GDP

Trading

- Domestic inter-firm trading
- Access to domestic offsets
- Access to the Clean Development Mechanism at 10% of each firms' total target
- Actively explore Canada-US linkages

Credit for early action of 15 Mt

- With a maximum of 5 Mt any given year



Estimated Sector GHG reductions in 2010

| | Estimated Reductions by Sector in 2010 | | | | |
|---|--|---|--|---|--|
| | Sector Average | For Existing Facilities | | Overall for Sector | |
| | Estimated Fixed Process Emissions (% of Total Emissions) | Estimated % Reduction from Year 2006 Emission Intensity | Estimated Mt Reduction from Projected 2010 Emission Levels | Estimated % Reduction from Year 2006 Emission Intensity | Estimated Mt Reduction from Projected 2010 Emission Levels |
| TOTAL (% reductions are a weighted average) | 10% | 16% | ~ 48 Mt | 15% | ~ 49 Mt |
| Electricity | 0% | 18% | 20.7 | 17% | 20.9 |
| Upstream Oil and Gas | 0% | 18% | 6.9 | 18% | 6.9 |
| Petroleum Refining | 5% | 17% | 8.4 | 17% | 8.4 |
| Oil Sands | 6% | 17% | 2.8 | 13% | 3.5 |
| Natural Gas Pipelines | 0% | 18% | 1.5 | 18% | 1.5 |
| Pulp and Paper | 1% | 18% | 1.2 | 18% | 1.2 |
| Iron & Steel, Titanium | 35% | 13% | 1.3 | 12% | 1.3 |
| Chemicals | 18% | 15% | 1.9 | 15% | 1.9 |
| Aluminum & Alumina | 33% | 12% | 1.1 | 12% | 1.1 |
| Base Metal Smelting | 5% | 17% | 0.3 | 17% | 0.3 |
| Mining | 16% | 15% | 0.6 | 15% | 0.6 |
| Cement | 68% | 6% | 0.9 | 6% | 0.9 |
| Lime | 66% | 6% | 0.2 | 6% | 0.2 |

Estimated Sector GHG reductions in 2015

| | Estimated Reductions by Sector in 2015 | | | | |
|---|--|---|--|---|--|
| | Sector Average | For Existing Facilities | | Overall for Sector | |
| | Estimated Fixed Process Emissions (% of Total Emissions) | Estimated % Reduction from Year 2006 Emission Intensity | Estimated Mt Reduction from Projected 2015 Emission Levels | Estimated % Reduction from Year 2006 Emission Intensity | Estimated Mt Reduction from Projected 2015 Emission Levels |
| TOTAL (% reductions are a weighted average) | 10% | 24% | ~ 67 Mt | 24% | ~ 72 Mt |
| Electricity | 0% | 28% | 27.4 | 31% | 28.1 |
| Upstream Oil and Gas | 0% | 26% | 8.9 | 26% | 8.9 |
| Petroleum Refining | 5% | 25% | 12.6 | 25% | 12.6 |
| Oil Sands | 6% | 24% | 5.1 | 18% | 8.9 |
| Natural Gas Pipelines | 0% | 26% | 2.7 | 26% | 2.7 |
| Pulp and Paper | 1% | 26% | 1.7 | 26% | 1.7 |
| Iron & Steel, Titanium | 35% | 18% | 1.6 | 17% | 1.6 |
| Chemicals | 18% | 21% | 3.0 | 21% | 3.0 |
| Aluminum & Alumina | 33% | 16% | 1.1 | 16% | 1.1 |
| Base Metal Smelting | 5% | 25% | 0.5 | 25% | 0.5 |
| Mining | 16% | 22% | 0.8 | 22% | 0.8 |
| Cement | 68% | 8% | 1.2 | 8% | 1.2 |
| Lime | 66% | 9% | 0.3 | 9% | 0.3 |

Estimated Sector GHG reductions in 2020

| | Estimated Reductions by Sector in 2020 | | | | |
|---|--|---|--|---|--|
| | Sector Average | For Existing Facilities | | Overall for Sector | |
| | Estimated Fixed Process Emissions (% of Total Emissions) | Estimated % Reduction from Year 2006 Emission Intensity | Estimated Mt Reduction from Projected 2020 Emission Levels | Estimated % Reduction from Year 2006 Emission Intensity | Estimated Mt Reduction from Projected 2020 Emission Levels |
| TOTAL (% reductions are a weighted average) | 10% | 31% | ~ 77 Mt | 31% | ~ 88 Mt |
| Electricity | 0% | 38% | 28.0 | 41% | 29.9 |
| Upstream Oil and Gas | 0% | 33% | 8.4 | 33% | 8.4 |
| Petroleum Refining | 5% | 31% | 16.3 | 31% | 16.3 |
| Oil Sands | 6% | 31% | 7.0 | 23% | 15.5 |
| Natural Gas Pipelines | 0% | 33% | 4.3 | 33% | 4.3 |
| Pulp and Paper | 1% | 33% | 2.0 | 33% | 2.0 |
| Iron & Steel, Titanium | 35% | 23% | 1.9 | 21% | 1.9 |
| Chemicals | 18% | 28% | 4.3 | 27% | 4.3 |
| Aluminum & Alumina | 33% | 22% | 1.2 | 22% | 1.2 |
| Base Metal Smelting | 5% | 31% | 0.6 | 31% | 0.6 |
| Mining | 16% | 28% | 1.1 | 28% | 1.1 |
| Cement | 68% | 11% | 1.6 | 11% | 1.6 |
| Lime | 66% | 11% | 0.3 | 11% | 0.3 |



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Air Pollutants



Air pollutant targets are aligned with the best in the world

- Benchmarking to other jurisdictions
 - Examined the most stringent standards for each pollutant in each sector in Canada (provinces), in the U.S., and internationally
 - Where no benchmark exists, targets developed based on specific activities and equipment in similar sub-sectors (e.g.: oil sands)
 - Adjustment to Canadian circumstances where appropriate
- Identified sectoral targets based on these stringent regulatory emissions requirements
- Calculated national caps for the four main smog-forming pollutants

Air pollutant emission targets

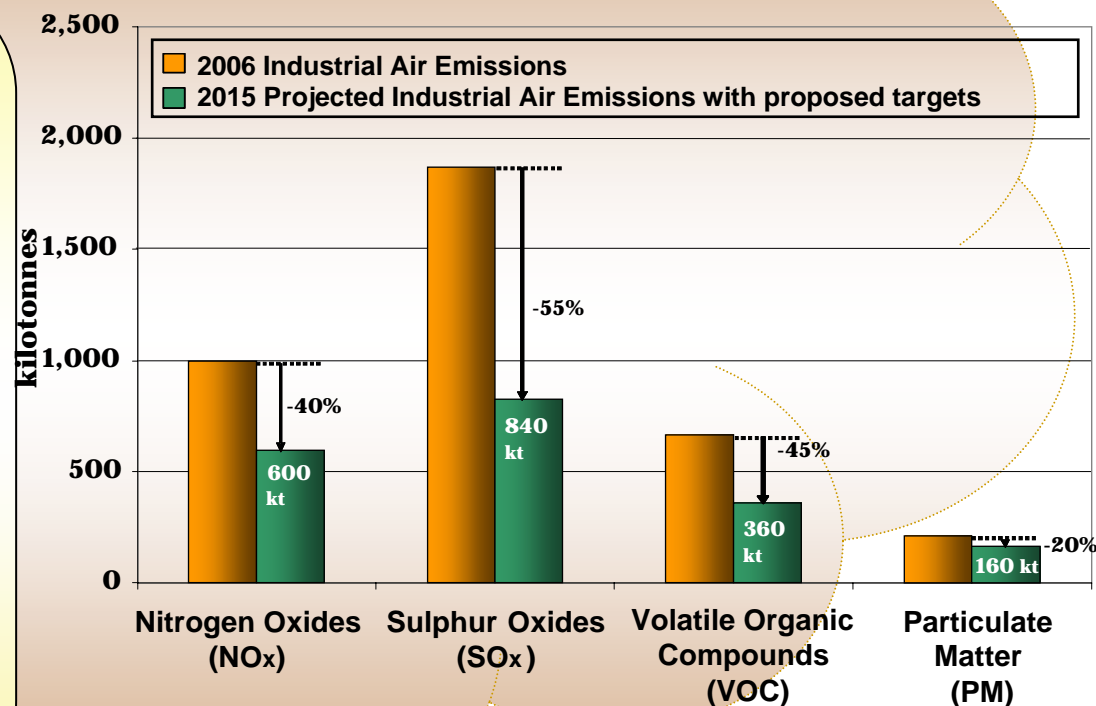
Targets

NATIONAL CAPS for 2012 to 2015
(% reduction from
2006 emissions)

- NO_x – 600 kt Cap (~40%)
- SO_x – 840 kt Cap (~55%)
- VOCs – 360 kt Cap (~45%)
- PM – 160 kt Cap (~20%)

+
SECTOR SPECIFIC CAPS
for 2012 to 2015

ALL TO BE VALIDATED BY JUNE
2007, INCLUDING THE DATE OF
COMING INTO FORCE



Air pollutant compliance options

Ways to comply



In-house Reductions

- Fuel switching
- Equipment and process upgrades
- Control technologies

Domestic Trading for NO_x and SO_x

- Cap and trade system
- Feasibility of offsets will be assessed

Pursue discussions on Canada-US trading for NO_x and SO_x

Air Pollutants Targets – Alumina and Aluminum Sectors

Alumina

| | 2006 Estimated Emissions (tonnes) | 2015 Projected Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|-----------------------|--|--|---|--|-------------------------------------|
| SO_x | 6,084 | 6,084 | 2,950 | -52% | Canada |
| PM | 454 | 454 | 256 | -44% | Canada |

Aluminum

| | 2006 Estimated Emissions (tonnes) | 2015 Projected Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|-----------------------|--|--|---|--|-------------------------------------|
| SO_x | 62,022 | 65,000 | 62,000 | 0% | Quebec |
| PM | 9,698 | 8,500 | 9,365 | -3% | Quebec & EU OSPAR * |
| Fluorides | 2,618 | | 2,600 | 0% | Quebec |
| PAHs | 393 | | 113 | -71% | Quebec |

* OSPAR: Oslo-Paris Convention



Air Pollutants Targets – Base Metal Smelters and Cement Sectors

Base Metal Smelters

| | 2006 Estimated Emissions (tonnes) | 2006 Estimated Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|-----------------------|--|--|---|--|-------------------------------------|
| SO_x | 667,822 | 621,396 | 220,000 | -67% | CEPA P2 Plan, * April 2006 |
| PM | 7,222 | 7,315 | 3,600 | -50% | CEPA P2 Plan |
| Mercury | 1.80 | | 0.80 | -56% | CEPA P2 Plan / CCME ** |

* CEPA P2 Plan: *Canadian Environmental Protection Act* Pollution Prevention Plan

** CCME: Canadian Council of Ministers of the Environment

Cement

| | 2006 Estimated Emissions (tonnes) | 2015 Projected Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|-----------------------|--|--|---|--|-------------------------------------|
| NO_x | 46,188 | 51,020 | 26,266 | -44% | GVRD * |
| SO_x | 40,564 | 44,808 | 21,451 | -45% | GVRD |
| PM | 4,732 | 5,227 | 865 | -82% | GVRD |

* GVRD: Greater Vancouver Regional District



Air Pollutants Targets – Chemicals and Electricity Sectors

Chemicals (including Fertilizers)

| | 2006 Estimated Emissions (tonnes) | 2015 Projected Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|-----------------------|--|--|---|--|-------------------------------------|
| NO_x | 27,895 | 32,670 | 24,503 | -12% | U.S. |
| SO_x | 25,360 | 29,961 | 25,300 | 0% | Canada |
| VOC | 14,281 | 17,228 | 14,280 | 0% | U.S. |
| Ammonia | 9,914 | 12,167 | 8,716 | -12% | Australia |

Electricity Generation Produced by Combustion

| | 2006 Estimated Emissions (tonnes) | 2015 Projected Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|-----------------------|--|--|---|--|-------------------------------------|
| NO_x | 258,000 | 267,000 | 105,000 | -59% | U.S. |
| SO_x | 518,000 | 489,000 | 206,000 | -60% | U.S. |
| PM | 33,000 | 35,000 | 15,000 | -55% | U.S. |
| Mercury | 2.073 | | 1.078 | -48% | U.S. Clean Air Mercury Rule |

Air Pollutants Targets – Forest Products Sectors

Pulp and Paper

| | 2006 Estimated Emissions (tonnes) | 2015 Projected Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|-----------------------|--|--|---|--|-------------------------------------|
| SO_x | 61,500 | 59,853 | 41,700 | -32% | PPAQF * |
| PM | 28,900 | 31,572 | 23,000 | -20% | PPAQF |

* PPAQF: Pulp and Paper Air Quality Forum

Wood Products

| | 2006 Estimated Emissions (tonnes) | 2015 Projected Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|------------|--|--|---|--|-------------------------------------|
| VOC | 48,547 | 53,516 | 40,500 | -17% | U.S. |
| PM | 75,950 | 85,007 | 57,000 | -25% | Quebec |

Air Pollutants Targets – Iron and Steel and Iron Ore Pelletizing Sectors

Iron and Steel (including Titanium)

| | 2006 Estimated Emissions (tonnes) | 2015 Projected Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|-----------------------|--|--|---|--|-------------------------------------|
| NO_x | 11,946 | 11,946 | 4,181 | -65% | U.S. |
| SO_x | 29,137 | 29,137 | 5,827 | -80% | U.S. |
| VOC | 1,868 | 1,868 | 560 | -70% | CCME * |
| PM | 8,611 | 8,611 | 2,583 | -70% | Canada/U.S. |
| Benzene | 315 | | 95 | -70% | Federal Code of Practice |

* CCME: Canadian Council of Ministers of the Environment

Iron Ore Pelletizing

| | 2006 Estimated Emissions (tonnes) | 2015 Projected Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|-----------------------|--|--|---|--|-------------------------------------|
| NO_x | 8,903 | 8,903 | 6,200 | -30% | World Bank/EU |
| SO_x | 16,431 | 16,431 | 4,100 | -75% | EU |
| PM | 9,956 | 9,956 | 3,500 | -65% | U.S. EPA * / UN ECE ** |

* EPA: Environmental Protection Agency

** ECE: Economic Commission for Europe



Air Pollutants Targets – Lime Sector

Lime

| | 2006 Estimated Emissions (tonnes) | 2015 Projected Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|-----------------------|--|--|---|--|-------------------------------------|
| NO_x | 3,587 | 3,587 | 3,309 | -8% | Various |
| SO_x | 3,439 | 3,439 | 2,757 | -20% | Various |
| PM | 1,814 | 1,814 | 270 | -85% | Various |

Air Pollutants Targets – Oil and Gas Sectors

Upstream Oil and Gas (excluding Oil Sands)

| | 2006 Estimated Emissions (tonnes) | 2015 Projected Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|-----------------------|--|--|---|--|-------------------------------------|
| NO_x | 424,000 | 428,000 | 235,000 | -45% | U.S. & technology |
| SO_x | 195,000 | 170,000 | 145,000 | -25% | Canada |
| VOC | 495,000 | 400,000 | 160,000 | -65% | Alberta |
| Benzene | 1,998 | | 1,300 | -35% | Alberta |

Oil Sands

| | 2006 Estimated Emissions (tonnes) | 2015 Projected Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|-----------------------|--|--|---|--|-------------------------------------|
| NO_x | 76,000 | 132,000 | 80,000 | +5% | U.S./Alberta |
| SO_x | 158,000 | 108,000 | 70,000 | -55% | U.S./ Alberta |
| VOC | 63,000 | 200,000 | 100,000 | +60% | U.S./ Alberta |

Air Pollutants Targets – Oil and Gas Sectors

Petroleum Refining

| | 2006 Estimated Emissions (tonnes) | 2015 Projected Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|-----------------------|--|--|---|--|-------------------------------------|
| NO_x | 31,045 | 30,247 | 18,100 | -40% | U.S |
| SO_x | 98,651 | 94,957 | 29,000 | -70% | U.S. |
| VOC | 14,000 | 23,486 | 14,000 | 0% | Canada |
| Benzene | 100 | | 85 | -15% | U.S. average performance |

Pipelines

| | 2006 Estimated Emissions (tonnes) | 2015 Projected Emissions (tonnes) | 2015 Emissions Target (with reduction) (tonnes) | % Emission Change in 2015 from 2006 with Target | Basis for Target or Jurisdiction |
|-----------------------|--|--|---|--|-------------------------------------|
| NO_x | 47,000 | 50,000 | 28,500 | -40% | CCME * & technology |

* CCME: Canadian Council of Ministers of the Environment



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“Business-As-Usual” Projection



“Business-As-Usual” projection

- Developing targets for air emissions requires a projection of emissions and, in the case of emissions intensity targets, of the output, that would have occurred in the absence of the regulations – which is referred to as a “business-as-usual” (BAU) projection.
- The key document for the BAU projection is *Canada’s Energy Outlook: The Reference Case 2006* (CEO 2006).
- CEO 2006 provides “business-as-usual” production and greenhouse gas emission projections for Canada as a whole and for various sectors of the economy.



“Business-As-Usual” projection

- The production projections were used as the basis for both greenhouse gas and air pollutant targets.
- Additional sources of information were needed to complement it for purposes of greenhouse gas emission projections because the CEO 2006 projections are not sufficiently disaggregated by industrial sector, especially for the mining and manufacturing sectors.
- A separate but consistent BAU projection of air pollutant emissions was developed because CEO 2006 does not include air pollutant emissions.

BAU GHG emissions projection

- The CEO 2006 projections of both emissions and production were used as a basis for the assessment of the greenhouse gas targets for electricity and most oil and gas sectors, with some minor modifications due to differences in coverage.
- For the majority of the remaining sectors, the CEO 2006 emission projections were combined with production growth and emission intensity improvement estimates from Environment Canada to provide the basis for assessment.

BAU GHG emissions projection (cont'd)

- In addition, adjustments were made to the CEO 2006 projections to reflect information that has become available since its publication.
- Projected emissions from the cement, lime, pulp and paper, and iron and steel sectors were adjusted downward to reflect the most recent production and emissions intensity data.

BAU GHG emissions projection

| Sector | CEO 2006 (Mt) | | | BAU used in setting the targets (Mt) | | |
|--|---------------|------------|------------|--------------------------------------|------------|------------|
| | 2010 | 2015 | 2020 | 2010 | 2015 | 2020 |
| Power Generation | 131 | 127 | 125 | 131 | 127 | 125 |
| Oil and Gas | | | | | | |
| Upstream oil and gas | 82 | 75 | 61 | 82 | 75 | 61 |
| Upstream oil and gas, subtract unintentional fugitives ¹ | | | | 45 | 41 | 33 |
| Refineries | 31 | 35 | 38 | 31 | 35 | 38 |
| Oil sands | 64 | 80 | 93 | 64 | 80 | 93 |
| Pipelines ² | 9 | 9 | 9 | 9 | 9 | 9 |
| Pipelines, add intentional fugitives | | | | 11 | 11 | 10 |
| Total | 186 | 199 | 201 | 150 | 165 | 174 |
| Mining and Manufacturing | | | | | | |
| Pulp and paper ³ | 9 | 9 | 9 | 8 | 8 | 8 |
| Iron and steel ³ | 16 | 16 | 16 | 14 | 13 | 12 |
| Chemicals | 17 | 18 | 19 | 17 | 18 | 19 |
| Aluminum | 10 | 9 | 9 | 10 | 9 | 9 |
| Smelting and refining | 4 | 4 | 4 | 4 | 4 | 4 |
| Mining | 4 | 4 | 4 | 4 | 4 | 4 |
| Cement and lime ³ | 15 | 16 | 17 | 15 | 16 | 16 |
| Total | 74 | 76 | 78 | 72 | 72 | 73 |
| TOTAL Industry | 391 | 402 | 404 | 352 | 365 | 372 |

Sums may not match totals due to rounding.

¹ Unintentional fugitive emissions will be addressed separately.

² The BAU used for target setting includes intentional fugitive emissions.

³ The BAU projection reflects more recent production and emission intensity information.



BAU air pollutant emissions projection

- The emissions projections used to develop the 2015 targets for air pollutants are based on the Canadian Criteria Air Contaminants (CAC) Emissions Outlook, adjusted in most cases to reflect the projected production numbers from CEO 2006 or other factors described below.
- The CAC Emissions Outlook provided “business-as-usual” projections for each of the ten provinces and three territories (Northwest Territories and Nunavut are treated as one region) for all industrial and non-industrial sources of emissions.

BAU air pollutant emissions projection (cont'd)

- The CAC Emissions Outlook was developed using the 2000 CAC Emissions Inventory, and *Canada's Emissions Outlook*, published in December 1999 by NRCan (CEO 1999).
- The projections also include sector-specific adjustments based on input from interested stakeholders, industry and government (federal, provincial and territorial) experts, and industry associations.

BAU air pollutant emissions projection

- The projections in the CAC Emissions Outlook have been adjusted in most cases to incorporate information provided by Environment Canada sector experts. These adjustments were made:
 - to take into account the most recent production data from the CEO 2006 or the most recent data from other sources on emissions of air pollutants;
 - to incorporate improvements in emission estimation methodologies in order to ensure consistency with the 2006 baseline emission estimates; or
 - to account for differences in sector definitions and covered sources for targeted sectors when compared with the published CAC Emissions Outlook.

BAU air pollutant emissions projection

| Sector | CAC Emissions Outlook | | | | BAU used in setting the targets | | | |
|-----------------------------------|-----------------------|-----------------|-----|-----|---------------------------------|-----------------|-----|----|
| | 2015 Emissions (kt) | | | | 2015 Emissions (kt) | | | |
| | NO _x | SO _x | VOC | PM | NO _x | SO _x | VOC | PM |
| Power Generation | 267 | 489 | 4 | 35 | 267 | 489 | 4 | 35 |
| Oil and Gas | | | | | | | | |
| Upstream oil and gas ¹ | 436 | 269 | 756 | 5 | 428 | 170 | 400 | 9 |
| Refineries | 30 | 95 | 23 | 8 | 30 | 95 | 23 | 8 |
| Oil sands | 196 | 164 | 303 | 36 | 132 | 108 | 200 | 24 |
| Pipelines ¹ | N/A | N/A | N/A | N/A | 50 | - | - | - |
| Mining and Manufacturing | | | | | | | | |
| Pulp and paper | 60 | 70 | 24 | 55 | 49 | 60 | 23 | 32 |
| Wood products | 18 | 2 | 47 | 111 | 13 | 2.5 | 54 | 85 |
| Iron and steel | 15 | 29 | 22 | 24 | 12 | 29 | 1.9 | 9 |
| Chemicals ² | 49 | 11 | 41 | 10 | 33 | 30 | 17 | 5 |
| Aluminum | 1 | 66 | 2 | 14 | 1 | 65 | 2 | 9 |
| Alumina | N/A | N/A | N/A | N/A | 1 | 6 | - | - |
| Base metal smelting ³ | 3 | 621 | - | 23 | 3 | 621 | - | 7 |
| Iron ore pelletizing ³ | 18 | 23 | 4 | 51 | 9 | 16 | 2 | 10 |
| Cement ³ | 36 | 33 | - | 15 | 51 | 45 | - | 5 |
| Lime | N/A | N/A | N/A | N/A | 4 | 3 | - | 2 |

¹ The Upstream oil and gas and Pipelines values for VOCs include unintentional fugitive emissions.

² The Chemicals sector includes the following four sub-categories of the CAC Emissions Outlook: chemicals industry; paint and varnish manufacturing; petrochemical industry; and plastics and synthetic resins fabrication.

³ A difference in emissions exists due to a difference in coverage because the BAU used in setting the targets was adjusted to address only the part of the sector for which targets are set. For example, cement only, not cement and concrete.



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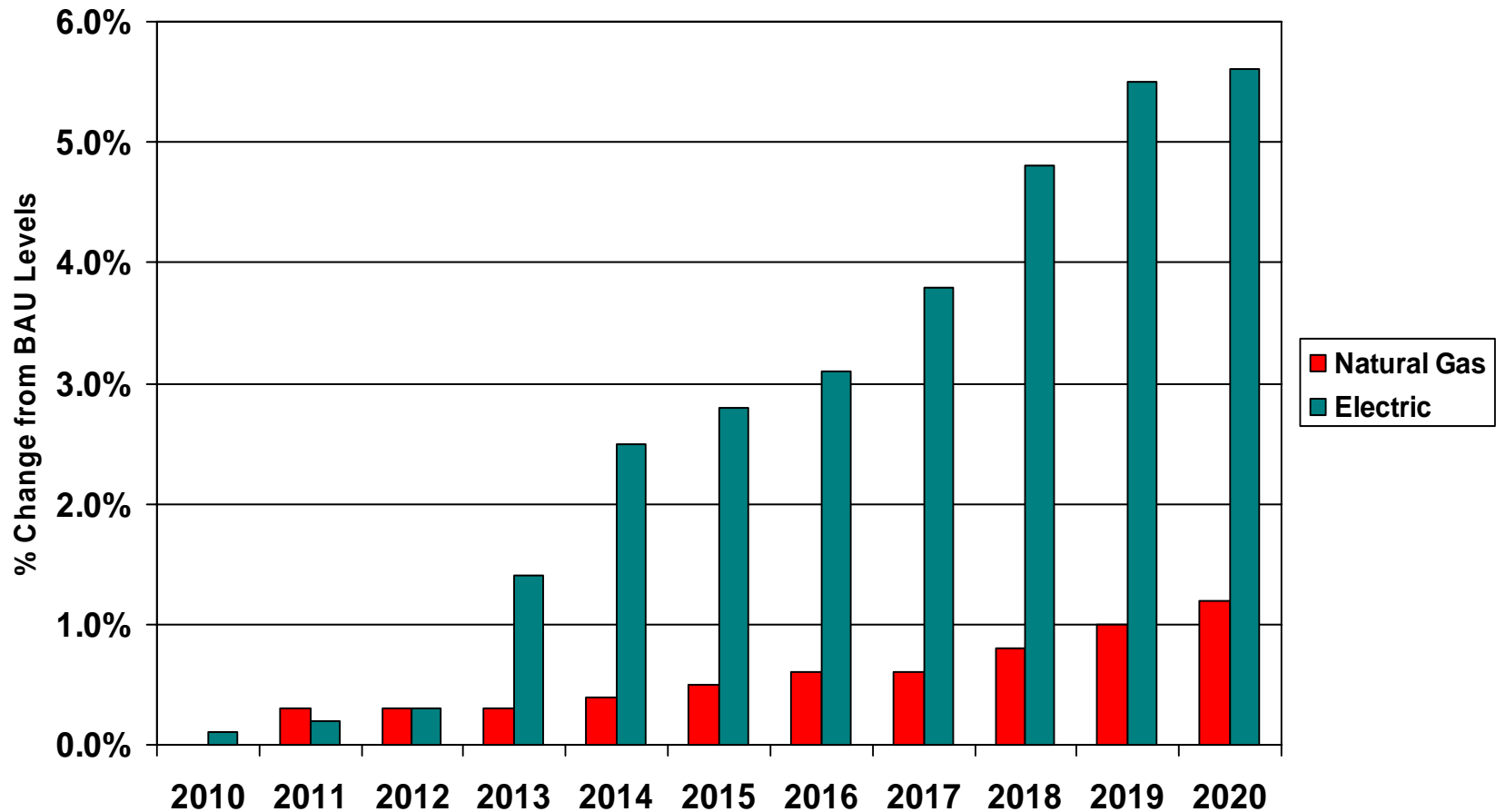
Anticipated Impacts & Benefits of Regulating Industry



National economic impacts will be manageable

- Total package (regulations and ecoACTION initiatives) has impacts that are below -0.5% of GDP for any given year throughout the forecast period.
 - Costs are highest in post-2015 period when package is mature.
 - Regulatory package for climate change and air pollutants is the largest contributor to GDP impacts.
- Compliance options provide the time and flexibility to meet targets through technology improvements rather than output changes.
 - Complements normal capital turnover cycles.
 - Permits relatively cost-effective roll-out of major technologies such as carbon capture and sequestration by 2016 or so.
- As a result, GDP impacts in the pre-2015 period in particular are somewhat offset by increased investment activity.
 - Energy efficiency savings dampen cost impacts throughout the forecast period.

Energy price changes will be a significant driver of overall economic impacts



No discernible impacts expected on national transportation fuel prices.



Health Benefits will be significant

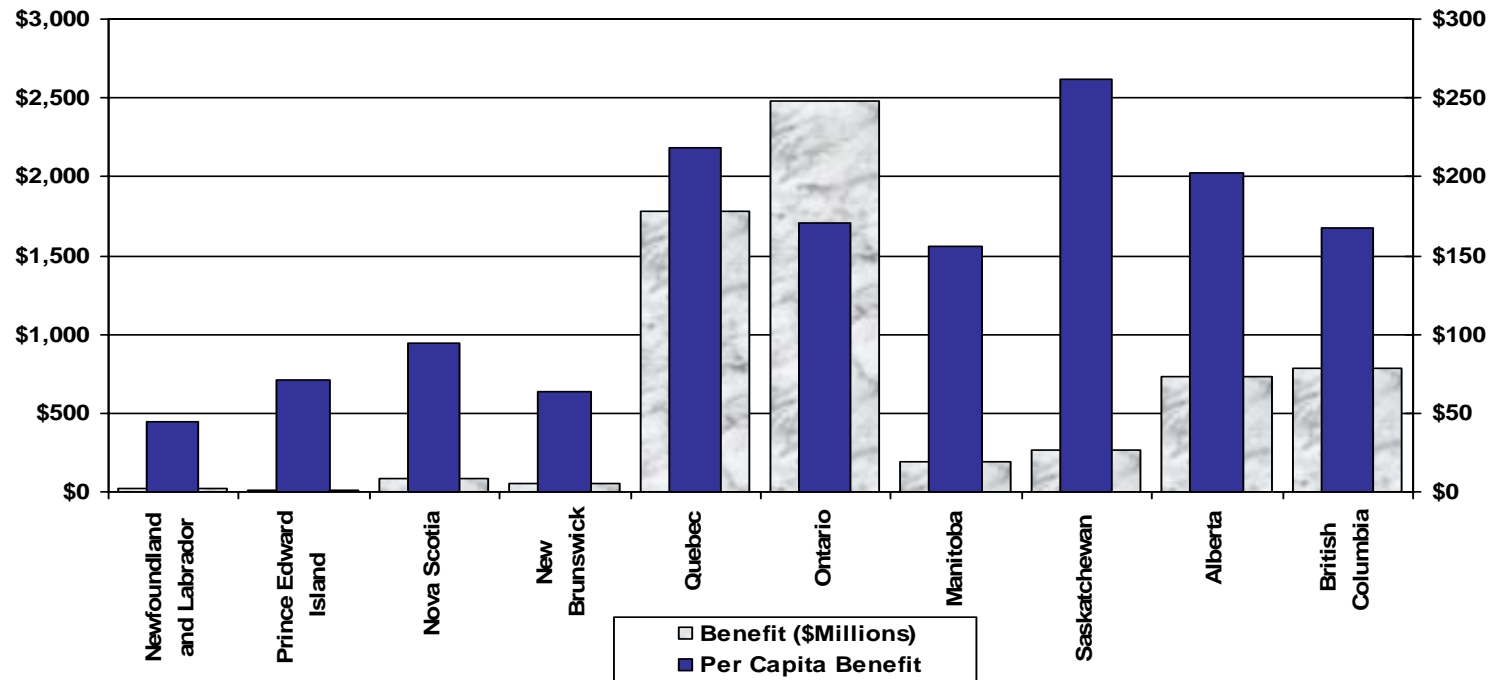
| | Health Benefits (2015) | Value (2006 millions) |
|--|---------------------------|-----------------------|
| Deaths | 1,200 | \$6,000 |
| Chronic Bronchitis Cases | 920 | \$330 |
| Hospital Admissions and Emergency Visits | 1,260 | \$3 |
| Child Acute Bronchitis Episodes | 5,600 | \$2 |
| Asthma Days | 170,000 | \$10 |
| Restricted Activity Days | 1,000,000 | \$57 |
| Minor Restricted Activity Days | 210,000 | \$5 |
| Minor Symptom Days | 3,400,000 | \$34 |
| | TOTAL | \$6,400 |

- Estimated health impacts indicate that benefits will occur across a range of health conditions sensitive to air quality.
- These benefits include an estimated 1,200 fewer premature deaths per year as a result of the air pollution reductions foreseen under regulations.
- Avoided deaths also account for the lion's share of the \$6.4 billion in monetized benefits of regulating clean air, with an expected annual value of \$6 billion by 2015.



Health Benefits follow regional differences in population and air quality

Health Benefits 2015



- Total health benefits generally follow the distribution of population across provinces.
- On a per capita basis, benefits are highest for residents of Quebec (about \$225), Saskatchewan (\$260) and Alberta (\$200).

Next steps for cost and benefit analysis

- Focus will now shift from support for policy development to Regulatory Impact Assessment (RIAS) under the *Canadian Environmental Protection Act, 1999*.
- Will be looking to stakeholders for information to assist in defining sector-specific costs as the basis for RIAS.
 - This will also assist provincial governments in determining impacts within their respective jurisdictions.
- On the RIAS benefits side, Environment Canada will work with industry and other jurisdictions to develop more comprehensive understanding of the broader range of benefits.
 - Including, e.g. benefits for forest productivity, fisheries, tourism and recreation, infrastructure erosion, biodiversity and ecosystems.





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Next Steps



Section 71 notice

- To support the development and implementation of regulations, comprehensive and consistent baseline data for 2006 will be required from facilities in the regulated sectors.
- To this end, the government will require facilities in those sectors that will be covered by the regulations to report 2006 emissions and other relevant data under a notice issued under section 71 of the *Canadian Environmental Protection Act, 1999*.



Continued engagement

- Series of meetings over the next several months
 - Sectoral discussions to
 - Validate air pollutant targets, including timeframe for their entry into force
 - Implement the GHG target structure by sector
 - Discussions on cross-cutting regulatory provisions
 - Trading
 - Offsets
 - Credit for early action
 - Technology fund
- Materials will be available online