III. Template to facilitate the submission of examples/good practices of strategies, policies and measures employed to implement obligations under any of the Protocols to the Convention

Country: Canada	**Sector:** Environment, Industry, Cement Sector
Type of strategy, policy or measure: Regulations	**Level:** National

What is the main objective of the strategy, policy or measure? When has it been implemented/or will be implemented?

The *Multi-Sector Air Pollutants Regulations* (the Regulations) set mandatory national performance standards for the cement sector and two equipment types: gaseous-fossil-fuel-fired boilers and heaters and stationary spark-ignition gaseous-fuel-fired engines used in several industrial sectors. The performance standards limit the quantity of nitrogen oxide (NO_X) and sulphur dioxide (SO_2) that can be emitted from cement manufacturing facilities, and it limits the rate at which NO_X can be emitted from the two equipment types. The Regulations were published on June 29th, 2016 in the Government of Canada official publication, the *Canada Gazette*.

Background and driving forces:

In 2012, under the auspices of the Canadian Council of Ministers of the Environment (CCME), the federal, provincial and territorial governments agreed to begin the implementation of the Air Quality Management System. (AQMS). The AQMS provides a comprehensive approach for governments to work collaboratively and improve air quality in Canada to protect the health of Canadians and the environment.

Starting in 2011 and then through the implementation of the AQMS, federal, provincial and territorial governments, industry, non-government organizations and other interested parties undertook an unprecedented, multi-stakeholder and intergovernmental dialogue to develop industrial emissions requirements to address the diversity of air pollutants of concern.

Industrial emissions requirements were developed for many major industrial sectors and specific equipment types, including: aluminium and alumina, base metal smelting, cement, chemicals, electricity, fertilizers, iron ore pellets, iron and steel, oil sands, petroleum refining, pipelines, potash, pulp and paper, and upstream oil and gas sectors, as well as gaseous-fuel fired boilers and heaters, stationary spark-ignition gaseous-fuel-fired engines, and natural gas-fuelled stationary combustion turbines equipment.

The Government of Canada is implementing the industrial emissions requirements using a mix of regulatory and non-regulatory instruments. The *Multi-Sector Air Pollutant Regulations* are implemented under the *Canadian Environmental Protection Act, 1999* (CEPA) and are Canada's first mandatory national air pollutant standards for industrial facilities.

A regulatory approach was chosen for engines, boilers and heaters and cement because it is a cost-effective way to ensure consistency and fairness. Moreover, it is broadly supported by industry as it provides policy certainty and is sensitive to industry costs and competitiveness concerns. Implementation of the AQMS is supported by provinces, which see it as a model of effective federal/provincial cooperation where each level of government takes distinct, coordinated actions within their authorities that are mutually reinforcing. Other key stakeholders, such as several major

health and environmental non-governmental organizations, are also supportive.

Description of the strategy, policy or measure:

The Regulations establish mandatory national performance standards limiting emissions of nitrogen oxide (NOx) and sulphur dioxide (SO_2) from cement manufacturing facilities. Currently, 1 5 cement manufacturing facilities are operating in Canada.

The Regulations also establish mandatory national performance standards limiting NOx from stationary gaseous fuel-fired engines and industrial boilers and heaters used by several industrial sectors across Canada. The regulated boilers and heaters generate steam and thermal energy for various purposes in industrial process applications (e.g. extraction of bitumen in oil sands operations using steam-assisted gravity drainage). An emission intensity limit of 26 g/GJ must be achieved, within prescribed timelines, for pre-existing equipment and redesigned equipment with an emission intensity of 70 g/GJ and 80 g/GJ (all sizes) and transitional equipment generating ≥10.5 GJ/h to ≤105 GJ/h. Transitional equipment generating ≥105 GJ/h must achieve an emission intensity limit of 40 g/GJ at commissioning. All sizes of modern (new) boilers must meet the emission intensity limit of 16 to 23 g/GJ at commissioning.

The regulated engines are primarily used for compression, electric power generation and pumping in *Canadian* industrial facilities. Modern (new) engines, that meet the size threshold (≥ 75 kW for regular use engines and ≥ 100kW for low-use engines) must meet the emission intensity limit of 2.7 g/kWh output at commissioning. Pre-existing engines of a size greater or equal to 250 kW must meet the emission intensity limit of 4 g/kWh within prescribed timelines.

Canadian facilities manufacturing grey cement through long dry and wet cement kilns must meet the per calendar year prescribed NO_x release limits of 2.55 kg/tonne of clinker or 30% reduction in emission intensity from calendar year 2006. Canadian grey cement manufacturing facilities using preheater and precalciner kilns must meet the release limit of 2.25 kg/tonne of clinker. The SO_2 release limit per calendar year for all kiln types is 3.0 kg/tonne of clinker.

Costs, Funding and Revenue allocation:

The Regulations are funded through Canada's national budget. The costs to the Government for implementing the Regulations fall into two principal categories: enforcement costs and administration costs. Training of enforcement officers and information management requirements will require a one-time amount of $239,000. The annual enforcement costs for the period 2018-2035, are estimated to be about $98,000. Administration costs are expected for the development of electronic reporting infrastructure and to support submissions from regulatees on an ongoing basis. The estimated administrative cost over the period 2016 to 2035 is $1.4M.

The present value (PV) of the costs of the Regulations is estimated to be around $90M for boilers and heaters, $394M for engines, and close to $9M for cement. These costs are largely due to the incremental expense of adopting technologies required to reduce emissions, including retrofitting. Due to the provision of flexible compliance options, and differing requirements for new versus existing capital, virtually all capital investments involve "add-on" technologies or the purchase of lower-emitting models at the time of natural capital stock turnover, rather than early retirement of capital stock. Costs are not expected to be directly passed on to consumers given the competitive positions of the affected sectors.

As with all regulations, a cost-benefit analysis was completed for the publication of the Regulations. The analysis was done for each sector/equipment group covered by the Regulations. For boilers and heaters, the net present value (NPV) of the Regulations is estimated to be about $320 million (M) resulting in a benefit-to-cost ratio of 5:1. For engines, the NPV is estimated to be around $6 billion (B), resulting in a benefit-to-cost ratio of 16:1. For cement, impacts are expected

to be low given recent emission performance improvements by the sector, and as such only a qualitative analysis of benefits is provided. However, health and environmental benefits are expected to exceed costs.

Effect and impacts on air pollution abatement:

Over the first 19 years of implementation (i.e. 2016-2035), it is estimated that the Regulations will result in reductions of more than 2,000 kilotonnes (kt) of NOx from thousands of industrial sources across Canada. The Regulations will reduce harmful air pollutants that contribute to smog and acid rain, equivalent to taking all passenger cars and trucks in Canada off the road for about 12 years. The resulting health and environmental benefits over the same period is estimated to be $410 million for boilers and heaters and more than $6 billion for engines, arising from fewer premature deaths and emergency room visits, and other health and environmental impacts. The benefits occur across Canada, with the largest share of benefits accruing in the province of Alberta.

In addition, the Regulations will also help reduce transboundary pollution flows from Canada to the United States.

References/Further information:

The Multi-Sector Air Pollutants Regulations:

http://www.ec.gc.ca/lcpe-cepa/eng/regulations/detailReg.cfm?intReg=220

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Additional comments: