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- [Treaties, laws and regulations \(https://www.canada.ca/en/government/system/laws.html\)](https://www.canada.ca/en/government/system/laws.html)
- [Canada Gazette \(/accueil-home-eng.html\)](#) → [Publications \(/rp-pr/publications-eng.html\)](#)
- [Part I: Vol. 153 \(2019\) \(/rp-pr/p1/2019/index-eng.html\)](#)
- [January 19, 2019 \(/rp-pr/p1/2019/2019-01-19/html/index-eng.html\)](#)

# Canada Gazette, Part I, Volume 153, Number 3: GOVERNMENT NOTICES

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January 19, 2019

## DEPARTMENT OF THE ENVIRONMENT

### CANADIAN ENVIRONMENTAL PROTECTION ACT, 1999

#### ***Notice with respect to reporting of greenhouse gases (GHGs) for 2018***

Notice is hereby given, pursuant to subsection 46(1) of the *Canadian Environmental Protection Act, 1999* (the Act), that, with respect to emissions of GHGs identified in Schedule 1 to this notice and for the purpose of conducting research, creating an inventory of data, formulating objectives and codes of practice, issuing guidelines or assessing or reporting on the state of the environment, any person who operates a facility described in Schedule 3 to this notice during the 2018 calendar year, and who possesses or who may reasonably be expected to have access to information described in Schedules 4 through 18 to this notice, shall provide the Minister of the Environment with this information no later than June 1, 2019.

Persons subject to this notice shall address responses or enquiries to the following address:

Greenhouse Gas Reporting Program  
Pollutant Inventories and Reporting Division  
Environment and Climate Change Canada  
Place Vincent Massey, 7th Floor  
351 Saint-Joseph Boulevard  
Gatineau, Quebec  
K1A 0H3  
Telephone: 819-938-3258 or 1-877-877-8375  
Email: [ec.ges-ghg.ec@canada.ca](mailto:ec.ges-ghg.ec@canada.ca) (<mailto:ec.ges-ghg.ec@canada.ca>)

This notice applies to the calendar year 2018. Pursuant to subsection 46(8) of the Act, persons subject to this notice shall keep copies of the information required under this notice, together with any calculations, measurements and other data on which the information is based, at the facility to which the calculations, measurements and other data relate, or at the facility's parent company, located in Canada, for a period of three years from the date the information is required to be submitted. Where the person chooses to keep the information required under the notice, together with any calculations, measurements and other data, at the facility's parent company in Canada, that person shall inform the Minister of the civic address of that parent company.

If a person who operates a facility with respect to which information was submitted in response to the *Notice with respect to reporting of greenhouse gases (GHGs) for 2017* determines that the facility does not meet the criteria set out in Schedule 3 of this notice, the person shall notify the Minister of the Environment that the facility does not meet those

criteria no later than June 1, 2019.

The Minister of the Environment intends to publish information on greenhouse gas emission totals by gas per facility submitted in response to this notice. Pursuant to section 51 of the Act, any person who provides information in response to this notice may submit, with their information and no later than the deadline for submission, a written request that the information be treated as confidential based on the reasons set out in section 52 of the Act. The person requesting confidential treatment of the information shall indicate which of the reasons stipulated in section 52 of the Act applies to their request. Nevertheless, the Minister may decide to disclose the information submitted in response to this notice, in accordance with subsection 53(3) of the Act. Every person to whom this notice is directed shall comply with the notice. A person who fails to comply with the requirements of the notice will be liable under the applicable offence provisions of the Act.

### Jacqueline Gonçalves

Director General

Science and Risk Assessment Directorate

On behalf of the Minister of the Environment

## SCHEDULE 1

### Greenhouse Gases

**Table 1: Greenhouse gases subject to mandatory reporting**

	<b>Greenhouse Gas</b>	<b>Formula</b>	<b>CAS Registry Number</b> <b>1</b>	<b>100-year Global Warming Potential (GWP)</b> <b>2</b>
1.	Carbon dioxide	CO <sub>2</sub>	124-38-9	1
2.	Methane	CH <sub>4</sub>	74-82-8	25
3.	Nitrous oxide	N <sub>2</sub> O	10024-97-2	298
4.	Sulphur hexafluoride	SF <sub>6</sub>	2551-62-4	22 800
<i>Hydrofluorocarbons (HFCs)</i>				
5.	HFC-23	CHF <sub>3</sub>	75-46-7	14 800
6.	HFC-32	CH <sub>2</sub> F <sub>2</sub>	75-10-5	675
7.	HFC-41	CH <sub>3</sub> F	593-53-3	92
8.	HFC-43-10mee	C <sub>5</sub> H <sub>2</sub> F <sub>10</sub>	138495-42-8	1 640
9.	HFC-125	C <sub>2</sub> HF <sub>5</sub>	354-33-6	3 500

<sup>1</sup> The Chemical Abstracts Service (CAS) Registry Number is the property of the American Chemical Society, and any use or redistribution, except as required in supporting regulatory requirements and/or for reports to the Government of Canada when the information and the reports are required by law or administrative policy, is not permitted without the prior, written permission of the American Chemical Society.

<sup>2</sup> United Nations Framework Convention on Climate Change (UNFCCC), 2014. FCCC/CP/2013/10/Add.3. Decision 24/CP.19. Revision of the UNFCCC Reporting on annual inventories for Parties included in Annex I to the Convention, November 2013.

Greenhouse Gas	Formula	CAS Registry Number <sup>1</sup>	100-year Global Warming Potential (GWP) <sup>2</sup>
10. HFC-134	C <sub>2</sub> H <sub>2</sub> F <sub>4</sub> (Structure: CHF <sub>2</sub> CHF <sub>2</sub> )	359-35-3	1 100
11. HFC-134a	C <sub>2</sub> H <sub>2</sub> F <sub>4</sub> (Structure: CH <sub>2</sub> FCF <sub>3</sub> )	811-97-2	1 430
12. HFC-143	C <sub>2</sub> H <sub>3</sub> F <sub>3</sub> (Structure: CHF <sub>2</sub> CH <sub>2</sub> F)	430-66-0	353
13. HFC-143a	C <sub>2</sub> H <sub>3</sub> F <sub>3</sub> (Structure: CF <sub>3</sub> CH <sub>3</sub> )	420-46-2	4 470
14. HFC-152a	C <sub>2</sub> H <sub>4</sub> F <sub>2</sub> (Structure: CH <sub>3</sub> CHF <sub>2</sub> )	75-37-6	124
15. HFC-227ea	C <sub>3</sub> HF <sub>7</sub>	431-89-0	3 220
16. HFC-236fa	C <sub>3</sub> H <sub>2</sub> F <sub>6</sub>	690-39-1	9 810
17. HFC-245ca	C <sub>3</sub> H <sub>3</sub> F <sub>5</sub>	679-86-7	693
<i>Perfluorocarbons (PFCs)</i>			
18. Perfluoromethane	CF <sub>4</sub>	75-73-0	7 390
19. Perfluoroethane	C <sub>2</sub> F <sub>6</sub>	76-16-4	12 200
20. Perfluoropropane	C <sub>3</sub> F <sub>8</sub>	76-19-7	8 830
21. Perfluorobutane	C <sub>4</sub> F <sub>10</sub>	355-25-9	8 860
22. Perfluorocyclobutane	c-C <sub>4</sub> F <sub>8</sub>	115-25-3	10 300
23. Perfluoropentane	C <sub>5</sub> F <sub>12</sub>	678-26-2	9 160
24. Perfluorohexane	C <sub>6</sub> F <sub>14</sub>	355-42-0	9 300

<sup>1</sup> The Chemical Abstracts Service (CAS) Registry Number is the property of the American Chemical Society, and any use or redistribution, except as required in supporting regulatory requirements and/or for reports to the Government of Canada when the information and the reports are required by law or administrative policy, is not permitted without the prior, written permission of the American Chemical Society.

<sup>2</sup> United Nations Framework Convention on Climate Change (UNFCCC), 2014. FCCC/CP/2013/10/Add.3. Decision 24/CP.19. Revision of the UNFCCC Reporting on annual inventories for Parties included in Annex I to the Convention, November 2013.

## SCHEDULE 2

### Definitions

The following definitions apply to this notice and its schedules:

“2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines” means the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, prepared by the Intergovernmental Panel on Climate Change National Greenhouse Gas Inventories Program. [*Lignes directrices 2006 du Groupe intergouvernemental d’experts sur l’évolution du climat (GIEC) pour les inventaires nationaux de gaz à effet de serre*]

“*aluminium production*” means primary processes that are used to manufacture aluminium from alumina, including electrolysis in prebake and Søderberg cells, anode and cathode baking for prebake cells, and green coke calcination. (*production d’aluminium*)

“*ammonia production*” means processes in which ammonia is manufactured from fossil-based feedstock produced by steam reforming of a hydrocarbon. This also includes processes where ammonia is manufactured through the gasification of solid and liquid raw material. (*production d’ammoniac*)

“*base metal production*” means the primary and secondary production processes that are used to recover copper, nickel, zinc, lead, and cobalt. Primary production includes the smelting or refining of base metals from feedstock that comes primarily from ore. Secondary production processes includes the recovery of base metals from various feedstock materials, such as recycled metals. Process activities may include the removal of impurities using carbonate flux reagents, the use of reducing agents to extract metals or slag cleaning, and the consumption of carbon electrodes. (*production de métaux communs*)

“*biomass*” means plants or plant materials, animal waste or any product made of either of these, including wood and wood products, charcoal, and agricultural residues; biologically derived organic matter in municipal and industrial wastes, landfill gas, bio-alcohols, black liquor, sludge digestion gas and animal- or plant-derived oils. (*biomasse*)

“*bone dry tonnes*” means biomass solids that contain zero percent (0%) moisture. (*tonnes de matières sèches*)

“*Canada’s Greenhouse Gas Quantification Requirements*” means Canada’s Greenhouse Gas Quantification Requirements, Greenhouse Gas Reporting Program, Environment and Climate Change Canada, 2018. (*Exigences relatives à la quantification des gaz à effet de serre du Canada*)

“*carbon dioxide equivalent (CO<sub>2</sub> eq.)*” means a unit of measure for comparison between greenhouse gases that have different global warming potentials (GWPs). <sup>1</sup> [*équivalent en dioxyde de carbone (éq. CO<sub>2</sub>)*]

“*CAS Registry Number*” means the Chemical Abstracts Service Registry Number. (*numéro d’enregistrement CAS*)

“*cement production*” means all processes used to manufacture portland, ordinary portland, masonry, pozzolanic or other hydraulic cements. (*production de ciment*)

“*CEMS*” means Continuous Emission Monitoring Systems. (*SMECE*)

“*CKD*” means cement kiln dust. (*PFC*)

“*CO<sub>2</sub> capture*” means the capture of CO<sub>2</sub> at an integrated facility that would otherwise be directly released to the atmosphere. (*capture de CO<sub>2</sub>*)

“*CO<sub>2</sub> emissions from biomass decomposition*” means releases of CO<sub>2</sub> resulting from aerobic decomposition of biomass and from the fermentation of biomass. (*émissions de CO<sub>2</sub> provenant de la décomposition de la biomasse*)

“*CO<sub>2</sub> injection*” means an activity that places captured CO<sub>2</sub> into a long-term geological storage site or an enhanced fossil fuel recovery operation. (*injection de CO<sub>2</sub>*)

“*CO<sub>2</sub> recovered*” means the recovery/capture of CO<sub>2</sub> at a hydrogen plant that would typically be delivered for downstream use in other manufacturing industries, used in on-site production or sent to permanent storages. (*CO<sub>2</sub> récupéré*)

“*CO<sub>2</sub> storage*” means a long-term geological formation where CO<sub>2</sub> is stored. (*stockage de CO<sub>2</sub>*)

“*CO<sub>2</sub> transport system*” means transport of captured CO<sub>2</sub> by any mode. (*système de transport de CO<sub>2</sub>*)

“*cogeneration unit*” means a fuel combustion device which simultaneously generates electricity and either heat or steam. (*unité de cogénération*)

“*Continuous Emission Monitoring Systems*” means the complete equipment for sampling, conditioning, and analyzing emissions or process parameters and for recording data. (*Systèmes de mesure et d’enregistrement en continu des émissions*)

“CSM” means cyclohexane-soluble matter. (*MSC*)

“*electricity generating unit*” means any device that combusts solid, liquid, or gaseous fuel for the purpose of producing electricity either for sale or for use on-site. This includes cogeneration units, but excludes portable or emergency generators that have less than 50 kW in nameplate generating capacity or that generate less than 2 MWh during the reporting year. (*unité de production d'électricité*)

“*emissions*” means direct releases to the atmosphere from sources that are located at the facility. (*émissions*)

“*enhanced fossil fuel recovery operation*” means enhanced oil recovery, enhanced natural gas recovery and enhanced coal bed methane recovery. (*opération améliorée de récupération des combustibles fossiles*)

“*ethanol production*” means processes that produce grain ethanol for the use in industrial applications or as a fuel. (*production d'éthanol*)

“*facility*” means an integrated facility, a pipeline transportation system, or an offshore installation. (*installation*)

“*flaring emissions*” means controlled releases of gases from industrial activities, from the combustion of a gas or liquid stream produced at the facility, the purpose of which is not to produce useful heat or work. This includes releases from waste petroleum incineration; hazardous emission prevention systems (in pilot or active mode); well testing; natural gas gathering systems; natural gas processing plant operations; crude oil production; pipeline operations; petroleum refining; chemical fertilizer production; steel production. (*émissions de torchage*)

“*fossil fuel production and processing*” means the exploration, extraction, processing including refining and upgrading, transmission, storage and use of solid, liquid or gaseous petroleum, coal or natural gas fuels, or any other fuels derived from these sources. (*production et transformation de combustibles fossiles*)

“*fugitive emissions*” means releases from venting, flaring or leakage of gases from fossil fuel production and processing; iron and steel coke oven batteries; CO<sub>2</sub> capture, transport, injection and storage infrastructure. (*émissions fugitives*)

“*GHGs*” means greenhouse gases. (*GES*)

“*GWP*” means global warming potential. (*PRP*)

“*HFCs*” means hydrofluorocarbons. (*HFC*)

“*hydrogen production*” means processes that produce hydrogen gas by steam hydrocarbon reforming, partial oxidation of hydrocarbons, or other transformation of hydrocarbon feedstock. This activity may occur at bitumen upgraders; petroleum refineries; chemical plants; fertilizer plants; stand-alone industrial gas producers and, where needed, for purification or synthesis of substances. (*production d'hydrogène*)

“*industrial process emissions*” means releases from an industrial process that involves a chemical or physical reaction the primary purpose of which is to produce a product, as opposed to useful heat or work. This does not include venting from hydrogen production associated with fossil fuel production and processing. (*émissions liées aux procédés industriels*)

“*industrial product use emissions*” means releases from the use of a product, in an industrial process, that is not involved in a chemical or physical reaction and does not react in the process. This includes releases from the use of SF<sub>6</sub>, HFCs and PFCs as cover gases, and the use of HFCs and PFCs in foam blowing. This does not include releases from PFCs and HFCs in refrigeration, air conditioning, semiconductor production, fire extinguishing, solvents, aerosols and SF<sub>6</sub> in explosion protection, leak detection, electronic applications and fire extinguishing. (*émissions associées à l'utilisation de produits industriels*)

“*integrated facility*” means all buildings, equipment, structures, on-site transportation machinery, and stationary items that are located on a single site, on multiple sites or between multiple sites that are owned or operated by the same person or persons and that function as a single integrated site. “Integrated facility” excludes public roads. (*installation intégrée*)

“*iron and steel production*” means primary iron and steel production processes, secondary steelmaking processes, iron production processes, coke oven battery production processes, iron ore pellet firing processes, or iron and steel powder processes. (*production de fer et d'acier*)

“*leakage emissions*” means accidental releases and leaks of gases from fossil fuel production and processing, transmission and distribution; iron and steel coke oven batteries; CO<sub>2</sub> capture, transport, injection and storage infrastructure. (*émissions dues aux fuites*)

“*lime production*” means all processes that are used to manufacture a lime product by calcination of limestone or other calcareous materials. (*production de chaux*)

“*mining*” means the mining, beneficiating or otherwise preparing metallic and non-metallic minerals, including coal. (*exploitation minière*)

“*NAICS*” means the North American Industry Classification System. (*SCIAN*)

“*nitric acid production*” means the use of one or more trains to produce weak nitric acid that is 30 to 70 percent in strength. A nitric acid train produces weak nitric acid through the catalytic oxidation of ammonia followed by the absorption of nitrogen oxides by water. The absorber tail gas contains unabsorbed nitrogen oxides, including nitrous oxide emissions of which may be reduced by abatement technologies. (*production d'acide nitrique*)

“*offshore installation*” means an offshore drilling unit, production platform or ship, or sub-sea installation that is attached or anchored to the continental shelf of Canada in connection with the exploitation of oil or natural gas. (*installation extracôtière*)

“*on-site transportation emissions*” means releases from machinery used for the transport or movement of substances, materials, equipment or products that are used in the production process at an integrated facility. This includes releases from vehicles without public road licences. (*émissions liées au transport sur le site*)

“*petroleum refineries*” means processes used to produce gasoline, aromatics, kerosene, distillate fuel oils, residual fuel oils, lubricants, asphalt, or other products through the distillation of petroleum or through redistillation, cracking, rearrangement or reforming of unfinished petroleum derivatives. This includes catalytic cracking units; fluid coking units; delayed coking units; catalytic reforming units; coke calcining units; asphalt blowing operations; blowdown systems; storage tanks; process equipment components (i.e. compressors, pumps, valves, pressure relief devices, flanges, and connectors) in gas service; marine vessel, barge, tanker truck, and similar loading operations; flares; sulphur recovery plants; and non-merchant hydrogen plants that are owned or under the direct control of the refinery owner and operator. This does not include facilities that distill only pipeline transmix. (*raffineries de pétrole*)

“*PFCs*” means perfluorocarbons. (*PFC*)

“*pipeline transportation system*” means all pipelines that are owned or operated by the same person within a province or territory that transport/distribute CO<sub>2</sub> or processed natural gas and their associated installations, including meter sets and storage installations but excluding straddle plants or other processing installations. (*gazoducs*)

“*pulp and paper production*” means separating cellulose fibres from other materials in fibre sources to produce pulp, paper and paper products. This includes converting paper into paperboard products, or operating coating and laminating processes. (*production de pâtes et papiers*)

“*reporting company*” means a person who operates one or more facilities that meet the reporting criteria as set out in Schedule 3 of this notice. (*société déclarante*)

“*stationary fuel combustion emissions*” means releases from stationary fuel combustion sources, in which fuel is burned for the purpose of producing useful heat or work. This includes releases from the combustion of waste fuels to produce useful heat or work. (*émissions de combustion stationnaire de combustible*)

“*stationary fuel combustion sources*” means devices that combust solid, liquid, gaseous, or waste fuel for the purpose of producing useful heat or work. This includes boilers, electricity generating units, cogeneration units, combustion turbines, engines, incinerators, process heaters, and other stationary combustion devices, but does not include emergency flares. (*sources de combustion stationnaires*)

“*surface leakage*” means CO<sub>2</sub> emitted from geological formations used for long-term storage of CO<sub>2</sub>. (*fuites en surface*)

“*venting emissions*” means controlled releases of a process or waste gas, including releases of CO<sub>2</sub> associated with carbon capture, transport, injection and storage; from hydrogen production associated with fossil fuel production and processing; of casing gas; of gases associated with a liquid or a solution gas; of treater, stabilizer or dehydrator off-gas; of blanket gases; from pneumatic devices which use natural gas as a driver; from compressor start-ups, pipelines and other blowdowns; from metering and regulation station control loops. (*émissions d'évacuation*)

“*waste emissions*” means releases that result from waste disposal activities at a facility including landfilling of solid waste, flaring of landfill gas, and waste incineration. This does not include releases from the combustion of waste fuels to produce useful heat or work. (*émissions des déchets*)

“*wastewater emissions*” means releases resulting from wastewater and wastewater treatment at a facility. (*émissions des eaux usées*)

“Weights and Measures Act” means the *Weights and Measures Act*. (Loi sur les poids et mesures)

## SCHEDULE 3

### Reporting criteria

1. This notice applies to any person who operates

(a) a facility that emits 10 000 t of carbon dioxide equivalent (10 kt CO<sub>2</sub> eq.) or more (the “reporting threshold”) of the GHGs listed in Table 1 of Schedule 1 in the 2018 calendar year;

(b) a facility that emits 10 000 t of carbon dioxide equivalent (10 kt CO<sub>2</sub> eq.) or more (the “reporting threshold”) of the GHGs listed in Table 1 of Schedule 1 in the 2018 calendar year, is classified under the North American Industry Classification System (NAICS) codes listed in Table 2 of Schedule 3 and is engaged in any of the following:

- (i) mining,
- (ii) ethanol production,
- (iii) lime production,
- (iv) cement production,
- (v) aluminium production,
- (vi) iron and steel production,
- (vii) electricity and heat generation,
- (viii) ammonia production,
- (ix) nitric acid production,
- (x) hydrogen production,
- (xi) petroleum refineries,
- (xii) pulp and paper production, or
- (xiii) base metal production; or

(c) a facility engaged in CO<sub>2</sub> capture, CO<sub>2</sub> transport, CO<sub>2</sub> injection or CO<sub>2</sub> storage in the 2018 calendar year.

2. Any person who operates a facility described in this notice shall determine whether a facility meets or exceeds the reporting threshold using the following equation:

$$\begin{aligned}
 \text{Total Emissions} = & \sum_1^i (E_{CO_2} \times GWP_{CO_2})_i + \sum_1^i (E_{CH_4} \times GWP_{CH_4})_i + \sum_1^i (E_{N_2O} \times GWP_{N_2O})_i + \\
 & \sum_1^i (E_{PFC} \times GWP_{PFC})_i + \sum_1^i (E_{HFC} \times GWP_{HFC})_i + \sum_1^i (E_{SF_6} \times GWP_{SF_6})_i
 \end{aligned}$$

Where:

E = total emissions of a particular gas or gas species in calendar year 2018, expressed in tonnes

GWP = global warming potential of the particular gas or gas species, in Table 1 of Schedule 1

i = each emission source

(a) determine the quantity of CO<sub>2</sub> eq. by multiplying the GWP of a particular GHG or GHG species listed in Table 1 of Schedule 1 by the quantity of a particular GHG or GHG species;

(b) exclude CO<sub>2</sub> emissions from the combustion of biomass in the determination of total emissions;

(c) exclude CO<sub>2</sub> emissions from biomass decomposition in the determination of total emissions.

3. Any person who operates a facility that is engaged in more than one activity described in paragraph 1(b) shall report emissions for each activity separately.

4. If the person who operates a facility described in section 1 changes during the 2018 calendar year, the facility operator on December 31, 2018, shall report for the entire 2018 calendar year. If facility operations terminate during the 2018 calendar year, the last facility operator shall report for the portion of the year during which the operations occurred.

**Table 2: North American Industry Classification System (NAICS) codes under which facilities are subject to mandatory reporting**

212	324110	327410
221112	325120	331110
221119	325190	331313
221330	325313	331410
322	327310	

## SCHEDULE 4

### Reportable administrative information

1. Any person who operates a facility described in Schedule 3 of this notice shall, for each facility, report the

(a) reporting company's legal and trade name (if any) and federal business number (assigned by the Canada Revenue Agency) and its Dun and Bradstreet (D-U-N-S) number (if any);

(b) facility name (if any) and the address of its physical location;

(c) latitude and longitude coordinates of the facility, other than a pipeline transportation system and CO<sub>2</sub> transport system;

(d) six-digit North American Industry Classification System (NAICS) Canada code;

(e) National Pollutant Release Inventory (NPRI) identification number (if any);



- (f) name, position, mailing and civic address, email address and telephone number of the person submitting the information that is required under this notice;
- (g) name, position, mailing address, email address and telephone number of the public contact (if any);
- (h) name, position, mailing and civic address, email address and telephone number of the authorized signing officer signing the Statement of Certification; and
- (i) legal names of the Canadian parent companies (if any), their civic addresses, their percentage of ownership of the reporting company (where available), their federal business number and their Dun and Bradstreet (D-U-N-S) number (if any).

2. The reported information required by this notice is to include a Statement of Certification, signed by an authorized signing officer, indicating that the information submitted is true, accurate and complete.

## SCHEDULE 5

### Reporting requirements

1. This schedule applies to any person who operates a facility described in paragraph 1(a) or 1(b) of Schedule 3 of this notice.
2. Any person subject to this schedule shall, for each of the GHGs listed in Table 1 of Schedule 1, report
  - (a) the total quantity of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions expressed in tonnes in each of the following source categories: stationary fuel combustion emissions, industrial process emissions, industrial product use emissions, venting emissions, flaring emissions, leakage emissions, on-site transportation emissions, waste emissions, and wastewater emissions listed in Table 3 of Schedule 5;
  - (b) the total quantity of CH<sub>4</sub> and N<sub>2</sub>O emissions expressed in tonnes from biomass combustion under stationary fuel combustion emissions if the biomass is being burned to produce energy, or under waste emissions in the case of waste incineration and landfill gas flaring processes;
  - (c) the total quantity of CO<sub>2</sub> emissions expressed in tonnes from biomass combustion; and
  - (d) the total quantity of SF<sub>6</sub> and each HFC and PFC emissions expressed in tonnes under industrial process emissions and industrial product use emissions.
3. Any person subject to this schedule shall
  - (a) not account for CO<sub>2</sub> emissions from biomass combustion in the total reported facility emissions;
  - (b) not report CO<sub>2</sub> emissions from biomass decomposition;
  - (c) report emissions from coke oven batteries in iron and steel manufacturing under stationary fuel combustion (fuel use for the production of coke), flaring and/or leakage emissions; <sup>2</sup> and
  - (d) report emissions from hydrogen production as part of fossil fuel production and processing under venting emissions. <sup>3</sup>
4. Any person subject to this schedule, and to whom any of Schedules 6 through 18 of this notice apply, shall use the methods described in the applicable schedules to quantify the information that the person must report under this schedule. Where methods are not described in the applicable schedules for a specific emission source, methods described in section 5 shall be used.
5. Any person subject to this schedule, and to whom none of Schedules 6 through 18 of this notice apply, shall
  - (a) use methods that are consistent with the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines to quantify the information that the person reports under this schedule; and

(b) report the methods used to determine the quantities reported under paragraphs 2(a), 2(b), 2(c) and 2(d) of this schedule, chosen from monitoring or direct measurement, mass balance, emission factors, or engineering estimates.

**Table 3: Table for reporting selected GHGs by source category**

Greenhouse Gas	Emission Source Categories								
	Stationary Fuel Combustion Emissions	Industrial Process Emissions	Industrial Product Use Emissions	Fugitive			On-site Transportation Emissions	Waste Emissions	Waste-water Emissions
				Venting Emissions	Flaring Emissions	Leakage Emissions			
Carbon dioxide (excluding CO <sub>2</sub> emissions from biomass combustion, which is to be reported separately)			N/A						
Methane			N/A						
Nitrous oxide			N/A						
Sulphur hexafluoride	N/A			N/A	N/A	N/A	N/A	N/A	N/A
Hydrofluorocarbons	N/A	by species	by species	N/A	N/A	N/A	N/A	N/A	N/A
Perfluorocarbons	N/A	by species	by species	N/A	N/A	N/A	N/A	N/A	N/A
<i>Total</i>									

## SCHEDULE 6

### CO<sub>2</sub> capture, CO<sub>2</sub> transport, CO<sub>2</sub> injection and CO<sub>2</sub> storage reporting requirements

1. This schedule applies to any person who operates a facility described in paragraph 1(c) of Schedule 3 of this notice.
2. Any person subject to this schedule shall use the quantification methods for carbon capture, transport and storage described in section 1 of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of CO<sub>2</sub>:
  - (a) exiting each CO<sub>2</sub> capture site, expressed in tonnes (t);
  - (b) captured domestically within Canada, entering each CO<sub>2</sub> transport system, expressed in tonnes (t);
  - (c) imported from outside Canada, entering each CO<sub>2</sub> transport system, expressed in tonnes (t);
  - (d) exiting each CO<sub>2</sub> transport system, expressed in tonnes (t);
  - (e) entering each long-term geologic storage site, expressed in tonnes (t);
  - (f) injected at each long-term geologic storage site, expressed in tonnes (t);
  - (g) entering each enhanced fossil fuel recovery operation, expressed in tonnes (t); and
  - (h) injected at each enhanced fossil fuel recovery operation, expressed in tonnes (t).

3. Any person subject to this schedule shall use section 1 of Canada's Greenhouse Gas Quantification Requirements to report the

- (a) annual mass of material transferred, expressed in tonnes (t), if using the mass flow method;
- (b) annual weighted average density of volumetric flow of material transferred with density expressed in kilograms per cubic metre ( $\text{kg/m}^3$ ), temperature expressed in degrees Celsius ( $^{\circ}\text{C}$ ) and pressure expressed in kilopascals (kPa), if using the volumetric flow method;
- (c) annual weighted average  $\text{CO}_2$  concentration in the volumetric flow or mass flow, expressed as a mass fraction; and
- (d) method used to determine the quantities and parameters reported under section 2.

4. Any person subject to this schedule shall use section 1 of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity, expressed in tonnes of  $\text{CO}_2$  fugitive emissions from equipment and infrastructure used for

- (a)  $\text{CO}_2$  capture;
- (b)  $\text{CO}_2$  transport;
- (c)  $\text{CO}_2$  injection at long-term geological storage site;
- (d)  $\text{CO}_2$  injection at enhanced fossil fuel recovery operations; and
- (e) method used to determine the quantities and parameters reported under paragraphs 4(a), (b), (c) and (d).

5. Any person subject to this schedule shall report the total annual quantity, expressed in tonnes, of  $\text{CO}_2$  surface leakage from each long-term geological storage site and enhanced fossil fuel recovery operation.

6. Any person subject to this schedule shall use section 1 of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity, expressed in tonnes of  $\text{CO}_2$  venting emissions from equipment and infrastructure used for

- (a)  $\text{CO}_2$  capture;
- (b)  $\text{CO}_2$  transport;
- (c)  $\text{CO}_2$  injection at long-term geological storage site; and
- (d)  $\text{CO}_2$  injection at enhanced fossil fuel recovery operations.

## **SCHEDULE 7**

### **Fuel combustion and flaring reporting requirements**

1. This schedule applies to any person who operates a facility described in paragraph 1(b) of Schedule 3 of this notice.

2. Any person subject to this schedule and whose facility is classified under NAICS 221112 shall use section 2 of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity, expressed in tonnes (t), of  $\text{CO}_2$ ,  $\text{CH}_4$  and  $\text{N}_2\text{O}$  emissions, by fuel type and source, from

- (a) each electricity generating unit;
- (b) heat and steam generation;
- (c) all other stationary fuel combustion;
- (d) on-site transportation; and
- (e) flaring.

3. Any person subject to this schedule who is not subject to section 2 above shall use section 2 of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity, expressed in tonnes (t), of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions, by fuel type and source, from

- (a) electricity generation;
- (b) heat and steam generation;
- (c) all other stationary fuel combustion;
- (d) on-site transportation; and
- (e) flaring.

4. Any person subject to this schedule shall report the methods used to quantify each greenhouse gas under section 2 and section 3 of this schedule, by fuel type and source.

5. Any person subject to this schedule who operates a facility with stacks monitored by CEMS may use the annual emissions data from CEMS to report the total emissions by CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O. The person shall report their fuel information by fuel type, in accordance with sections 6 and 7 below.

6. Any person subject to this schedule shall, for each fuel used under section 2 and section 3, report the

- (a) gaseous quantities, expressed in cubic metres (m<sup>3</sup>) or in megajoules (MJ);
- (b) solid quantities, expressed in tonnes (t), for coal by rank and by country, province and state; and
- (c) liquid quantities, expressed in kilolitres (kl) or in megajoules (MJ).

7. Any person subject to this schedule shall, for each fuel used under section 2 and section 3, report the annual measured and weighted

- (a) higher heating value following Equation 2-26 in section 2 of Canada's Greenhouse Gas Quantification Requirements, expressed in megajoules (MJ) higher heating value per unit of fuel consumed for all methods, except when applying Equation 2-2, Equation 2-4, Equation 2-11, Equation 2-19 or Equation 2-21;
- (b) carbon content following Equation 2-27 in section 2 of Canada's Greenhouse Gas Quantification Requirements, expressed in kilograms of carbon per unit of fuel consumed, when using CEMS or the variable fuels or flaring methods (except when applying Equation 2-9, Equation 2-11, Equation 2-20 and for fuels identified in Table 2-3);
- (c) temperature, expressed in degrees Celsius (°C) and pressure, expressed in kilopascals (kPa), for gaseous quantities;
- (d) moisture content, expressed as a percentage (%), for solid quantities; and
- (e) CH<sub>4</sub> and N<sub>2</sub>O emission factors, when using the facility-specific emission factors measured directly or provided by the fuel supplier or equipment manufacturers, expressed in grams per unit of fuel.

8. Any person subject to this schedule shall, for each fuel used under section 2 and section 3, report the default CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emission factors, when using values presented in Table 2-1 to Table 2-11 and in Equation 2-20, Equation 2-22 and Equation 2-23 of Canada's Greenhouse Gas Quantification Requirements.

9. Any person subject to this schedule shall report, for each fuel, the combustion oxidation factor when applied and provide supporting documentation used in its derivation.

10. Any person subject to this schedule shall, for steam used to quantify emissions under section 2 and section 3 above, report the

- (a) steam quantities expressed in tonnes (t);
- (b) quantity and type of each biomass fuel combusted expressed in tonnes (t);

(c) CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emission factors expressed in kilograms of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O/megajoules (MJ) of steam or kilograms of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O /tonnes (t) of steam; and

(d) measured temperature, expressed in degrees Celsius (°C), the measured pressure expressed in kilopascals (kPa) and the ratio of the boiler's design rated heat input capacity to its design rated steam output capacity, expressed in megajoules (MJ)/tonnes of steam, if using the steam default emission factor method.

11. Any person subject to this schedule and whose facility is classified under NAICS 221112 shall report the annual quantities of

(a) gross electricity generated on-site by each electricity generating unit, expressed in megawatt hours (MWh);

(b) electricity sold off-site, expressed in megawatt hours (MWh);

(c) electricity lost on-site, expressed in megawatt hours (MWh); and

(d) electricity purchased, expressed in megawatt hours (MWh).

12. Any person subject to this schedule who is not subject to section 2 above shall report the annual quantities of

(a) gross electricity generated on-site, expressed in megawatt hours (MWh);

(b) electricity sold off-site, expressed in megawatt hours (MWh);

(c) electricity lost on-site, expressed in megawatt hours (MWh); and

(d) electricity purchased, expressed in megawatt hours (MWh).

13. Any person subject to this schedule shall, for heat and steam generation, report the annual quantities of

(a) gross steam and heat generated on-site, expressed in megajoules (MJ);

(b) gross steam and heat used to generate electricity on-site, expressed in megajoules (MJ);

(c) steam and heat sold off-site, expressed in megajoules (MJ);

(d) steam and heat purchased, expressed in megajoules (MJ); and

(e) steam or heat lost on-site, expressed in megajoules (MJ).

14. Any person subject to section 11, section 12 and section 13 of this schedule shall use methods conforming to the *Weights and Measures Act* to measure the reported annual quantities purchased and sold.

15. Any person subject to this schedule shall submit documentation describing the methodology used, when

(a) developing equipment-specific on-site transportation emission factors, as directed in section 2.A.1a(3) or 2.B(3)(B) of Canada's Greenhouse Gas Quantification Requirements;

(b) determining the mass of biomass combusted for premixed fuels containing biomass and fossil fuels, as directed in section 2.A.4 of Canada's Greenhouse Gas Quantification Requirements; or

(c) developing facility-specific CH<sub>4</sub> and N<sub>2</sub>O emission factors, as directed in section 2.B(1) of Canada's Greenhouse Gas Quantification Requirements.

16. Any person subject to this schedule, who obtains from a supplier or performs fuel sampling, analysis and consumption measurement, as outlined in section 2.D of Canada's Greenhouse Gas Quantification Requirements, shall submit a fuel quantity, carbon content and higher heating value for all sampling and measurement periods.

17. Any person subject to this schedule is not required to report fuels and their associated emissions when the sum of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions (excluding CO<sub>2</sub> from biomass), in CO<sub>2</sub> eq., from the combustion of one or more of these fuels does not exceed 0.5% of the total facility GHG emissions from all fuels combusted (excluding CO<sub>2</sub> from biomass combustion).

## SCHEDULE 8

### Lime production reporting requirements

1. This schedule applies to any person who operates a facility described in subparagraph 1(b)(iii) of Schedule 3 of this notice. For fuel combustion and flaring emissions, the person shall report using Schedule 7 of this notice. For lime kilns at pulp and paper facilities, the person shall report using Schedule 17 of this notice.

2. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 3 of Canada's Greenhouse Gas Quantification Requirements to report the

- (a) total annual quantity of CO<sub>2</sub> emissions from lime production, expressed in tonnes (t);
- (b) total monthly quantity of lime, by lime type, expressed in tonnes (t);
- (c) monthly plant-specific emission factor, by lime type, expressed in tonnes of CO<sub>2</sub>/tonnes of lime;
- (d) monthly calcium oxide (CaO) content of lime, by lime type, expressed in tonnes of CaO/tonnes of lime;
- (e) monthly magnesium oxide (MgO) content of lime, by lime type, expressed in tonnes of MgO/tonnes of lime;
- (f) total quarterly quantity of calcined by-products/wastes, by by-product/waste type, expressed in tonnes (t);
- (g) quarterly plant-specific emission factor of calcined by-products/wastes, by calcined by-product/waste type, expressed in tonnes of CO<sub>2</sub>/tonnes of by-product/waste;
- (h) quarterly weighted average calcium oxide (CaO) content of calcined by-products/wastes, by calcined by-product/waste type, expressed in tonnes of CaO/tonnes of by-product/waste; and
- (i) quarterly weighted average magnesium oxide (MgO) content of calcined by-products/wastes, by calcined by-product/waste type, expressed in tonnes of MgO/tonnes of by-product/waste.

3. Any person described in this schedule who operates a facility with stacks monitored by CEMS may use the annual emissions data from CEMS to report the emissions and production quantities under paragraphs 2(a), (b), and (f). This shall not include the emissions information specified for CEMS in Schedule 7 of this notice. The person shall indicate where CEMS is being used to calculate emissions.

## SCHEDULE 9

### Cement production reporting requirements

1. This schedule applies to any person who operates a facility described in subparagraph 1(b)(iv) of Schedule 3 of this notice. For fuel combustion and flaring emissions, the person shall report using Schedule 7 of this notice.

2. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 4 of Canada's Greenhouse Gas Quantification Requirements to report the

- (a) total annual quantity of CO<sub>2</sub> emissions from clinker production, expressed in tonnes (t);
- (b) total monthly quantity of clinker, expressed in tonnes (t);
- (c) monthly plant-specific emission factor of clinker, expressed in tonnes of CO<sub>2</sub>/tonnes of clinker;
- (d) monthly calcium oxide (CaO) content of clinker, expressed in tonnes of CaO/tonnes of clinker;
- (e) monthly magnesium oxide (MgO) content of clinker, expressed in tonnes of MgO/tonnes of clinker;
- (f) monthly non-calcined calcium oxide (CaO) content of clinker, expressed in tonnes of CaO/tonnes of clinker;
- (g) monthly non-calcined magnesium oxide (MgO) content of clinker, expressed in tonnes of MgO/tonnes of clinker;
- (h) monthly quantity of non-carbonate raw materials entering the kiln, expressed in tonnes (t);

- (i) total annual quantity of CO<sub>2</sub> emissions from organic carbon oxidation, expressed in tonnes (t);
- (j) total annual quantity of raw material consumption, expressed in tonnes (t);
- (k) annual weighted average carbon content in raw material consumption, expressed in tonnes of C/tonnes of raw material consumption;
- (l) total annual quantity of CO<sub>2</sub> emissions from cement kiln dust (CKD) not recycled back to the kiln, expressed in tonnes (t);
- (m) total quarterly quantity of CKD not recycled back to the kiln, expressed in tonnes (t);
- (n) quarterly plant-specific emission factor of CKD not recycled back to the kiln, expressed in tonnes of CO<sub>2</sub>/tonnes of CKD.
- (o) quarterly calcium oxide (CaO) content of CKD not recycled back to the kiln, expressed in tonnes of CaO/tonnes of CKD;
- (p) quarterly magnesium oxide (MgO) content of CKD not recycled back to the kiln, expressed in tonnes of MgO/tonnes of CKD;
- (q) quarterly non-calcined calcium oxide (CaO) content of CKD not recycled back to the kiln, expressed in tonnes of CaO/tonnes of CKD; and
- (r) quarterly non-calcined magnesium oxide (MgO) content of CKD not recycled back to the kiln, expressed in tonnes of MgO/tonnes of CKD.

3. Any person subject to this schedule who operates a facility with stacks monitored by CEMS may use the annual emissions data from CEMS to report the emissions and production information under paragraphs 2(a), (b), (h), (i), (l) and (m). This shall not include the emissions information specified for CEMS in Schedule 7 of this notice. The person shall indicate where CEMS is being used to calculate emissions.

## **SCHEDULE 10**

### **Aluminium production reporting requirements**

1. This schedule applies to any person who operates a facility described in subparagraph 1(b)(v) of Schedule 3 of this notice. For fuel combustion and flaring emissions, the person shall report using Schedule 7 of this notice.
2. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 5.A.1 of Canada's Greenhouse Gas Quantification Requirements to report the
  - (a) total annual quantity of CO<sub>2</sub> emissions from prebaked anode consumption, expressed in tonnes (t);
  - (b) annual anode consumption, expressed in tonnes of anodes/tonnes of liquid aluminium production;
  - (c) annual sulphur content of prebaked anodes, expressed in kilograms of S/kilograms of prebaked anodes; and
  - (d) annual ash content of prebaked anodes, expressed in kilograms of ash/kilograms of prebaked anodes.
3. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 5.A.2 of Canada's Greenhouse Gas Quantification Requirements to report the
  - (a) total annual quantity of CO<sub>2</sub> emissions from anode consumption from Søderberg electrolysis cells, expressed in tonnes (t);
  - (b) total annual quantity of CSM emissions, expressed in tonnes, or the International Aluminium Institute factor used, expressed in kilograms of CSM/tonnes of liquid aluminium;
  - (c) total annual anode paste consumption, expressed in tonnes of paste/tonnes of liquid aluminium;

- (d) annual average content of pitch or other binding agent in paste, expressed in kilograms of pitch or other binding agent/kilograms of paste;
- (e) annual sulphur content in pitch or other binding agent, expressed in kilograms of S/kilograms of pitch or other binding agent;
- (f) annual ash content in pitch or other binding agent, expressed in kilograms of ash/kilograms of pitch or other binding agent;
- (g) annual hydrogen content in pitch or other binding agent, expressed in kilograms of H<sub>2</sub>/kilograms of pitch or other binding agent, or the International Aluminium Institute factor used;
- (h) annual sulphur content in calcinated coke, expressed in kilograms of S/kilograms of calcinated coke;
- (i) annual ash content in calcinated coke, expressed in kilograms of ash/kilograms of calcinated coke; and
- (j) annual carbon content in dust from Søderberg electrolysis cells, expressed in kilograms of C/kilograms of liquid aluminium, or a value of 0.

4. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 5.A.3 of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of CO<sub>2</sub> emissions from anode and cathode baking, expressed in tonnes (t).

5. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 5.A.4 of Canada's Greenhouse Gas Quantification Requirements to report the

- (a) total annual quantity of CO<sub>2</sub> emissions from packing material consumption, expressed in tonnes (t);
- (b) annual packing material consumption, expressed in tonnes of packing material/tonnes of baked anodes or cathodes;
- (c) total annual quantity of baked anodes and cathodes removed from furnace, expressed in tonnes (t);
- (d) annual weighted average ash content of packing material, expressed in kilograms of ash/kilograms of packing material; and
- (e) annual weighted average sulphur content of packing material, expressed in kilograms of S/kilograms of packing material.

6. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 5.A.5 of Canada's Greenhouse Gas Quantification Requirements to report the

- (a) total annual quantity of CO<sub>2</sub> emissions from coking of pitch or other binding agent, expressed in tonnes (t);
- (b) total annual quantity of green anodes or cathodes put into furnace, expressed in tonnes (t);
- (c) total annual quantity of baked anodes or cathodes removed from furnace, expressed in tonnes (t);
- (d) annual weighted average hydrogen content of pitch or other binding agent, or the International Aluminium Institute factor used, expressed in kilograms of H<sub>2</sub>/kilograms of pitch or other binding agent;
- (e) annual weighted average pitch content of green anodes or cathodes, expressed in kilograms of pitch or other binding agent/kilograms of anodes or cathodes; and
- (f) total annual quantity of recovered tar, expressed in tonnes (t).

7. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 5.A.6 of Canada's Greenhouse Gas Quantification Requirements to report the

- (a) total annual quantity of CO<sub>2</sub> emissions from green coke calcination, expressed in tonnes (t);
- (b) total annual quantity of CO<sub>2</sub> emissions from coke dust, expressed in tonnes (t);
- (c) total annual quantity of green coke consumption, expressed in tonnes (t);



- (d) total annual quantity of calcinated coke production, expressed in tonnes (t);
- (e) total annual quantity of under-calcinated coke production, expressed in tonnes (t);
- (f) annual water content in green coke, expressed in kilograms of H<sub>2</sub>O/kilograms of green coke;
- (g) annual volatile materials content in green coke, expressed in kilograms of volatile materials/kilograms of green coke;
- (h) annual sulphur content in green coke, expressed in kilograms of S/kilograms of green coke; and
- (i) annual sulphur content in calcinated coke, expressed in kilograms of S/kilograms of calcinated coke.

8. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 5.A.7 of Canada's Greenhouse Gas Quantification Requirements to report the

- (a) total annual quantity of CF<sub>4</sub> emissions from anode effects, expressed in tonnes (t);
- (b) annual slope, if using the slope method, by a series of pots, expressed in tonnes of CF<sub>4</sub>/tonnes of liquid aluminium/anode effect minute/pot-day/year;
- (c) annual anode effect duration, if using the slope method, expressed in anode effect minutes/pot-day calculated per year and obtained by multiplying the anode effects frequency, in number of anode effects per pot-day, by the average duration of anode effects in minutes;
- (d) overvoltage coefficient, if using the overvoltage coefficient method, expressed in tonnes of CF<sub>4</sub>/tonnes of liquid aluminium/millivolt;
- (e) annual anode effect overvoltages, if using the overvoltage coefficient method, expressed in millivolts/pot;
- (f) current efficiency of the aluminium production process, if using the overvoltage coefficient method, expressed as a fraction; and
- (g) method used to determine the quantities reported under paragraph (a).

9. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 5.A.7 of Canada's Greenhouse Gas Quantification Requirements to report the

- (a) total annual quantity of C<sub>2</sub>F<sub>6</sub> emissions, expressed in tonnes (t); and
- (b) weight fraction of C<sub>2</sub>F<sub>6</sub> to CF<sub>4</sub> or selected from Table 5-2, expressed in kilograms of C<sub>2</sub>F<sub>6</sub>/kilograms of CF<sub>4</sub>.

10. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 5.A.8 of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of emissions from SF<sub>6</sub> used as a cover gas, expressed in tonnes (t).

11. Any person subject to this schedule shall report the total annual quantity of liquid aluminium production, expressed in tonnes (t).

12. Any person subject to this schedule who operates a facility with stacks monitored by CEMS may use the annual emissions data from CEMS to report the emissions under sections 2 to 7 of this schedule. This shall not include the emissions information specified for CEMS in Schedule 7 of this notice. The person shall indicate where CEMS is being used to calculate emissions.

## SCHEDULE 11

### Iron and steel production reporting requirements

1. This schedule applies to any person who operates a facility described in subparagraph 1(b)(vi) of Schedule 3 of this notice. For fuel combustion and flaring emissions, the person shall report using Schedule 7 of this notice.

2. Any person subject to this schedule shall report the

(a) total annual quantity of biomass consumed, by biomass type, expressed in tonnes (t); and

(b) type of use for biomass (such as flux material, reducing agent).

3. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 6.A.1 of Canada's Greenhouse Gas Quantification Requirements for an induction furnace to report the

(a) total annual quantity of CO<sub>2</sub> emissions, expressed in tonnes (t);

(b) total annual quantity of green pellets consumption, expressed in tonnes, if using equation 6-1;

(c) annual weighted average carbon content of green pellets consumption, expressed in tonnes of C/tonnes of green pellets, if using equation 6-1;

(d) total annual quantity of additive material consumption, by material type, expressed in tonnes, if using equation 6-2;

(e) annual weighted average carbon content of additive material consumption, expressed in tonnes of C/tonnes of additive material, if using equation 6-2;

(f) total annual quantity of iron ore concentrate fed to the furnace, expressed in tonnes, if using equation 6-2;

(g) annual weighted average carbon content of iron ore concentrate fed to the furnace, expressed in tonnes of C/tonnes of iron ore concentrate;

(h) total annual quantity of fired pellet production, expressed in tonnes (t);

(i) annual weighted average carbon content of fired pellet production, expressed in tonnes of C/tonnes of fired pellets;

(j) annual quantity of air pollution control residue collected, expressed in tonnes (t);

(k) annual weighted average carbon content of air pollution control residue collected, expressed in tonnes of C/tonnes of residue; and

(l) method used to determine the quantities under paragraph (a) above.

4. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 6.A.2 of Canada's Greenhouse Gas Quantification Requirements for a basic oxygen furnace to report the

(a) total annual quantity of CO<sub>2</sub> emissions, expressed in tonnes (t);

(b) total annual quantity of molten iron charged to the furnace, expressed in tonnes (t);

(c) annual weighted average carbon content of molten iron charged to the furnace, expressed in tonnes of C/tonnes of molten iron;

(d) total annual quantity of ferrous scrap charged to the furnace, expressed in tonnes (t);

(e) annual weighted average carbon content of ferrous scrap charged to the furnace, expressed in tonnes of C/tonnes of ferrous scrap;

(f) total annual quantity of carbonaceous material consumption, by material type, expressed in tonnes (t);

(g) annual weighted average carbon content of non-biomass carbonaceous material consumption, by material type, expressed in tonnes of C/tonnes of carbonaceous material;

(h) total annual quantity of non-biomass flux material charged to the furnace, by material type, expressed in tonnes (t);

(i) annual weighted average carbon content of non-biomass flux material charged to the furnace, expressed in tonnes of C/tonnes of flux;

(j) total annual quantity of molten raw steel production, expressed in tonnes (t);

(k) annual weighted average carbon content of molten raw steel production, expressed in tonnes of C/tonnes of molten raw steel;

- (l) total annual quantity of slag production, expressed in tonnes (t);
- (m) annual weighted average carbon content of slag production, expressed in tonnes of C/tonnes of slag;
- (n) total annual quantity of furnace gas transferred off-site, expressed in tonnes (t);
- (o) annual weighted average carbon content of furnace gas transferred off-site, expressed in tonnes of C/tonnes of furnace gas transferred;
- (p) total annual quantity of air pollution control residue collected, expressed in tonnes (t); and
- (q) annual weighted average carbon content of air pollution control residue collected, expressed in tonnes of C/tonnes of residue.

5. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 6.A.3 of Canada's Greenhouse Gas Quantification Requirements for coke oven battery to report the

- (a) total annual quantity of CO<sub>2</sub> emissions, expressed in tonnes (t);
- (b) total annual quantity of coking coal charged to battery, expressed in tonnes (t);
- (c) annual weighted average carbon content of non-biomass coking coal charged to battery, expressed in tonnes of C/tonnes of coking coal;
- (d) total annual quantity of non-biomass carbonaceous material consumption, other than coking coal charged to battery, by material type, expressed in tonnes (t);
- (e) annual weighted average carbon content of non-biomass carbonaceous material consumption, other than coking coal charged to battery, by material type, expressed in tonnes of C/tonnes of carbonaceous material;
- (f) total annual quantity of coke produced, expressed in tonnes (t);
- (g) annual weighted average carbon content of coke produced, expressed in tonnes of C/tonnes of coke;
- (h) total annual quantity of coke oven gas transferred off-site, expressed in tonnes (t);
- (i) annual weighted average carbon content of coke oven gas transferred off-site, expressed in tonnes of C/tonnes of coke oven gas;
- (j) total annual quantity of by-product from coke oven battery, expressed in tonnes (t);
- (k) annual weighted average carbon content of non-biomass by-product from coke oven battery, expressed in tonnes of C/tonnes of by-product;
- (l) total annual quantity of air pollution control residue collected, expressed in tonnes (t); and
- (m) annual weighted average carbon content of air pollution control residue collected, expressed in tonnes of C/tonnes of residue.

6. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 6.A.4 of Canada's Greenhouse Gas Quantification Requirements for sinter production to report the

- (a) total annual quantity of CO<sub>2</sub> emissions, expressed in tonnes (t);
- (b) total annual quantity of non-biomass carbonaceous material consumption, by material type, expressed in tonnes (t);
- (c) annual weighted average carbon content of non-biomass carbonaceous material consumption, by material type, expressed in tonnes of C/tonnes of carbonaceous material;
- (d) total annual quantity of sinter feed material, expressed in tonnes (t);
- (e) annual weighted average carbon content of sinter feed material, expressed in tonnes of C/tonnes of sinter feed;
- (f) total annual quantity of sinter production, expressed in tonnes (t);

(g) annual weighted average carbon content of sinter production, expressed in tonnes of C/tonnes of sinter production;

(h) total annual quantity air pollution control residue collected, expressed in tonnes (t); and

(i) annual weighted average carbon content of air pollution control residue collected, expressed in tonnes of C/tonnes of residue.

7. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 6.A.5 of Canada's Greenhouse Gas Quantification Requirements for an electric arc furnace to report the

(a) total annual quantity of CO<sub>2</sub> emissions, expressed in tonnes (t);

(b) total annual quantity of direct reduced iron charged to furnace, expressed in tonnes (t);

(c) annual weighted average carbon content of direct reduced iron charged to furnace, expressed in tonnes of C/tonnes of direct reduced iron;

(d) total annual quantity of ferrous scrap charged to furnace, expressed in tonnes (t);

(e) annual weighted average carbon content of ferrous scrap charged to furnace, expressed in tonnes of C/tonnes of ferrous scrap;

(f) total annual quantity of carbonaceous material consumption, by material type, expressed in tonnes (t);

(g) annual weighted average carbon content of non-biomass carbonaceous material consumption, by material type, expressed in tonnes of C/tonnes of carbonaceous material;

(h) total annual quantity of carbon electrode consumption, expressed in tonnes (t);

(i) annual weighted average carbon content of non-biomass carbon electrode consumption, expressed in tonnes of C/tonnes of carbon electrode;

(j) total annual quantity of flux material charged to the furnace, by material type, expressed in tonnes (t);

(k) annual weighted average carbon content of non-biomass flux material charged to the furnace, expressed in tonnes of C/tonnes of flux;

(l) total annual quantity of molten raw steel production, expressed in tonnes (t);

(m) annual weighted average carbon content of molten raw steel production, expressed in tonnes of C/tonnes of molten raw steel;

(n) total annual quantity of slag production, expressed in tonnes (t);

(o) annual weighted average carbon content of slag production, expressed in tonnes of C/tonnes of slag;

(p) total annual quantity air pollution control residue collected, expressed in tonnes (t); and

(q) annual weighted average carbon content of air pollution control residue collected, expressed in tonnes of C/tonnes of residue.

8. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 6.A.6 of Canada's Greenhouse Gas Quantification Requirements for an argon-oxygen decarburization vessel to report the

(a) total annual quantity of CO<sub>2</sub> emissions, expressed in tonnes (t);

(b) total annual quantity of molten steel charged to the vessel, expressed in tonnes (t);

(c) annual weighted average carbon content of molten steel charged to the vessel, expressed in tonnes of C/tonnes of molten raw steel;

(d) annual weighted average carbon content of molten steel before decarburization, expressed in tonnes of C/tonnes of molten steel;

- (e) annual weighted average carbon content of molten steel after decarburization, expressed in tonnes of C/tonnes of molten steel;
- (f) total annual quantity of air pollution control residue collected, expressed in tonnes (t); and
- (g) annual weighted average carbon content of air pollution control residue collected, expressed in tonnes of C/tonnes of residue.

9. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 6.A.7 of Canada's Greenhouse Gas Quantification Requirements for a direct reduction furnace to report the

- (a) total annual quantity of CO<sub>2</sub> emissions, expressed in tonnes (t);
- (b) total annual quantity of iron ore or iron ore pellets consumption, expressed in tonnes (t);
- (c) annual weighted average carbon content of iron ore or iron ore pellets consumption, expressed in tonnes of C/tonnes of iron ore or iron ore pellets;
- (d) total annual quantity of consumed raw material, other than carbonaceous material and ore, by material type, expressed in tonnes (t);
- (e) annual weighted average carbon content of raw material, other than carbonaceous material and ore, by material type, expressed in tonnes of C/tonnes of raw material;
- (f) total annual quantity of carbonaceous material consumption, by material type, expressed in tonnes (t);
- (g) annual weighted average carbon content of non-biomass carbonaceous material consumption, by material type, expressed in tonnes of C/tonnes of carbonaceous material;
- (h) total annual quantity of iron production, expressed in tonnes (t);
- (i) annual weighted average carbon content of iron production, expressed in tonnes of C/tonnes of iron;
- (j) total annual quantity of non-metallic material production, expressed in tonnes (t);
- (k) annual weighted average carbon content of non-metallic material production, expressed in tonnes of C/tonnes of non-metallic material;
- (l) total annual quantity of air pollution control residue collected, expressed in tonnes (t); and
- (m) annual weighted average carbon content of air pollution control residue collected, expressed in tonnes of C/tonnes of residue.

10. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 6.A.8 of Canada's Greenhouse Gas Quantification Requirements for a blast furnace to report the

- (a) total annual quantity of CO<sub>2</sub> emissions, expressed in tonnes (t);
- (b) total annual quantity of iron ore or iron ore pellets consumption, expressed in tonnes (t);
- (c) annual weighted average carbon content of iron ore or iron ore pellets consumption, expressed in tonnes of C/tonnes of iron ore or iron ore pellets;
- (d) total annual quantity of consumed raw material, other than carbonaceous material and ore, by material type, expressed in tonnes (t);
- (e) annual average carbon content of consumed raw material, other than carbonaceous material and ore, by material type, expressed in tonnes of C/tonnes of raw material;
- (f) total annual quantity of carbonaceous material consumption, by material type, expressed in tonnes (t);
- (g) annual weighted average carbon content of non-biomass carbonaceous material consumption, by material type, expressed in tonnes of C/tonnes of carbonaceous material;
- (h) total annual quantity of flux material charged to the furnace, by material type, expressed in tonnes (t);

- (i) annual weighted average carbon content of non-biomass flux material charged to the furnace, expressed in tonnes of C/tonnes of flux;
- (j) total annual quantity of iron production, expressed in tonnes (t);
- (k) annual weighted average carbon content of iron production, expressed in tonnes of C/tonnes of iron;
- (l) total annual quantity of non-metallic material production, expressed in tonnes (t);
- (m) annual weighted average carbon content of non-metallic material production, expressed in tonnes of C/tonnes of non-metallic material;
- (n) total annual quantity of blast furnace gas transferred off-site, expressed in tonnes (t);
- (o) annual weighted average carbon content of blast furnace gas transferred off-site, expressed in tonnes of C/tonnes of blast furnace gas;
- (p) total annual quantity of air pollution control residue collected, expressed in tonnes (t); and
- (q) annual weighted average carbon content of air pollution control residue collected, expressed in tonnes of C/tonnes of residue.

11. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 6.A.9 of Canada's Greenhouse Gas Quantification Requirements for the ladle furnace to report the

- (a) total annual quantity of CO<sub>2</sub> emissions, expressed in tonnes (t);
- (b) total annual quantity of molten steel fed to the furnace, expressed in tonnes (t);
- (c) annual weighted average carbon content of molten steel fed to the furnace, expressed in tonnes of C/tonnes of molten steel;
- (d) total annual quantity of additive material consumed by the furnace, by material type, expressed in tonnes (t);
- (e) annual weighted average carbon content of additive material consumed by the furnace, by material type, expressed in tonnes of C/tonnes of additive material;
- (f) total annual carbon electrodes consumed by the furnace, expressed in tonnes (t);
- (g) annual weighted average carbon content of carbon electrodes consumed by the furnace, expressed in tonnes of C/tonnes of carbon electrodes;
- (h) total annual quantity of molten steel production, expressed in tonnes (t);
- (i) annual weighted average carbon content of molten steel production, expressed in tonnes of C/tonnes of molten steel;
- (j) total annual quantity of slag production, expressed in tonnes (t);
- (k) annual weighted average carbon content of slag production, or a default value of 0, expressed in tonnes of C/tonnes of slag;
- (l) total annual quantity of air pollution control residue collected, expressed in tonnes (t);
- (m) annual weighted average carbon content of air pollution control residue collected, expressed in tonnes of C/tonnes of residue;
- (n) total annual quantity of other residue produced, expressed in tonnes (t); and
- (o) annual weighted average carbon content of other residue produced or a default value of 0, expressed in tonnes of C/tonnes of residue.

12. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 6.B.1 of Canada's Greenhouse Gas Quantification Requirements for the atomization of molten cast iron to report the

- (a) total annual quantity of CO<sub>2</sub> emissions, expressed in tonnes (t);
- (b) total annual quantity of molten cast iron fed into the process, expressed in tonnes (t);
- (c) annual weighted average carbon content of molten cast iron fed into the process, expressed in tonnes of C/tonnes of molten cast iron;
- (d) total annual quantity of other material used in the process, by material type, expressed in tonnes (t);
- (e) annual weighted average carbon content of other material used in the process, by material type, expressed in tonnes of C/tonnes of other material;
- (f) total annual quantity of atomized cast iron production, expressed in tonnes (t);
- (g) annual weighted average carbon content of atomized cast iron production, expressed in tonnes of C/tonnes of atomized cast iron;
- (h) total annual quantity of by-products, by by-product type, expressed in tonnes (t); and
- (i) annual weighted average carbon content of by-products, reported by by-product type, expressed in tonnes of C/tonnes of by-product.

13. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 6.B.2 of Canada's Greenhouse Gas Quantification Requirements for the decarburization of iron powder to report the

- (a) total annual quantity of CO<sub>2</sub> emissions, expressed in tonnes (t);
- (b) total annual quantity of iron powder fed into the process, expressed in tonnes (t);
- (c) annual weighted average carbon content of iron powder fed into the process, expressed in tonnes of C/tonnes of iron powder;
- (d) total annual quantity of decarburized iron powder production, expressed in tonnes (t);
- (e) annual weighted average carbon content of decarburized iron powder production, expressed in tonnes of C/tonnes of decarburized iron powder production;
- (f) total annual quantity of by-product, by by-product type, expressed in tonnes (t); and
- (g) annual weighted average carbon content of by-product, by by-product type, expressed in tonnes of C/tonnes of by-product.

14. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 6.B.3 of Canada's Greenhouse Gas Quantification Requirements for steel grading to report the

- (a) total annual quantity of CO<sub>2</sub> emissions, expressed in tonnes (t);
- (b) total annual quantity of molten steel fed into the process, expressed in tonnes (t);
- (c) annual weighted average carbon content of molten steel fed into the process, expressed in tonnes of C/tonnes of molten steel;
- (d) total annual quantity of additive used in the process, expressed in tonnes (t);
- (e) annual weighted average carbon content of additive used in the process, by additive type, expressed in tonnes of C/tonnes of additive;
- (f) total annual quantity of carbon electrode consumption, expressed in tonnes (t);
- (g) annual weighted average carbon content of carbon electrode consumption, expressed in tonnes of C/tonnes of carbon electrode consumption;
- (h) total annual quantity of molten steel production, expressed in tonnes (t);

- (i) annual weighted average carbon content of molten steel production, expressed in tonnes of C/tonnes of molten steel production;
- (j) total annual quantity of slag production, expressed in tonnes (t);
- (k) annual weighted average carbon content of slag production, expressed in tonnes of C/tonnes of slag production;
- (l) total annual quantity of air pollution control residue collected, expressed in tonnes (t);
- (m) annual weighted average carbon content of air pollution control residue collected, expressed in tonnes of C/tonnes of residue;
- (n) total annual quantity of other residue production, expressed in tonnes (t); and
- (o) annual weighted average carbon content of other residue production, expressed in tonnes of C/tonnes of other residue.

15. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 6.B.4 of Canada's Greenhouse Gas Quantification Requirements for steel powder annealing to report the

- (a) total annual quantity of CO<sub>2</sub> emissions, expressed in tonnes (t);
- (b) total annual quantity of steel powder fed into the process, expressed in tonnes (t);
- (c) annual weighted average carbon content of steel powder fed into the process, expressed in tonnes of C/tonnes of steel powder;
- (d) total annual quantity of steel powder production, expressed in tonnes (t);
- (e) annual weighted average carbon content of steel powder production, expressed in tonnes of C/tonnes of steel powder;
- (f) total annual quantity of by-product, by by-product type, expressed in tonnes (t); and
- (g) annual weighted average carbon content of by-product, by by-product type, expressed in tonnes of C/tonnes of by-product.

16. Any person subject to this schedule who operates a facility with stacks monitored by CEMS shall use the greenhouse gas quantification methods in section 6.A of Canada's Greenhouse Gas Quantification Requirements for iron and steel production to report

- (a) CO<sub>2</sub> emissions information under sections 3 to 15 of this schedule separately from CO<sub>2</sub> emissions information specified for CEMS in Schedule 7 of this notice; and
- (b) production information specified under paragraphs 3(h), 4(j), 4(l), 5(d), 6(f), 7(l), 7(n), 8(b), 9(h), 9(j), 10(j), 10(l), 11(h), 11(j), 12(f), 13(d), 14(h), 14(j) and 15(d).

## **SCHEDULE 12**

### **Electricity and heat generation**

1. This schedule applies to any person who operates a facility described in subparagraph 1(b)(vii) of Schedule 3 of this notice. For fuel combustion and flaring emissions, the person shall report using Schedule 7 of this notice.

2. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 7 of Canada's Greenhouse Gas Quantification Requirements to report the

- (a) total annual quantity of CO<sub>2</sub> emissions from acid gas scrubbing, expressed in tonnes (t); and
- (b) total annual consumption of limestone or other sorbent, by sorbent type, expressed in tonnes (t).

## **SCHEDULE 13**



## Ammonia production

1. This schedule applies to any person who operates a facility described in subparagraph 1(b)(viii) of Schedule 3 of this notice. For fuel combustion and flaring emissions, the person shall report using Schedule 7 of this notice.
2. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 8.A of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of feedstock consumption, by feedstock type, expressed in
  - (a) cubic metres (m<sup>3</sup>), for gaseous quantities;
  - (b) kilolitres (kl), for liquid quantities; and
  - (c) tonnes (t), for solid quantities.
3. Any person subject to this schedule shall, for each feedstock type used under section 3, report the annual weighted average carbon content expressed in
  - (a) kilograms (kg) of C/kilograms (kg) of feedstock, for gaseous quantities;
  - (b) kilograms (kg) of C/kilolitres (kl) of feedstock, for liquid quantities; and
  - (c) kilograms (kg) of C/kilograms (kg) of feedstock, for solid quantities.
4. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 8.A of Canada's Greenhouse Gas Quantification Requirements to report the
  - (a) total annual quantity of urea, expressed in tonnes (t);
  - (b) total annual quantity of ammonia, expressed in tonnes (t);
  - (c) total annual quantity of CO<sub>2</sub> emissions from ammonia production, expressed in tonnes (t); and
  - (d) total annual quantity of CO<sub>2</sub> consumed in urea production, expressed in tonnes (t).
5. Any person subject to this schedule who operates a facility with stacks monitored by CEMS may use the annual emissions data from CEMS to report the emissions under paragraph 4(c). This shall not include the emissions information specified for CEMS in Schedule 7 of this notice. The person shall indicate where CEMS is being used to calculate emissions.

## SCHEDULE 14

### Nitric acid production

1. This schedule applies to any person who operates a facility described in subparagraph 1(b)(ix) of Schedule 3 of this notice. For fuel combustion and flaring emissions, the person shall report using Schedule 7 of this notice.
2. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 9.A of Canada's Greenhouse Gas Quantification Requirements to report the
  - (a) total annual quantity of N<sub>2</sub>O emissions, expressed in tonnes (t); and
  - (b) total annual quantity of nitric acid produced, expressed in tonnes (t).
3. Any person subject to this schedule who operates a facility where there is abatement downtime shall report the
  - (a) annual weighted average N<sub>2</sub>O emission factor, expressed in kilograms (kg) of N<sub>2</sub>O/tonnes (t) of nitric acid, 100% acid base;
  - (b) annual weighted average abatement factor of N<sub>2</sub>O abatement technology per acid train, expressed as a fraction of annual nitric acid production per train in which abatement technology is operating; and

(c) destruction efficiency of N<sub>2</sub>O abatement technology used on nitric acid train, expressed as percent of N<sub>2</sub>O removed from air stream, by type of abatement technology. Documentation demonstrating how process knowledge was used to estimate destruction efficiency shall be provided, if not specified by the manufacturer or estimated using Equation 9-3 of Canada's Greenhouse Gas Quantification Requirements.

4. Any person subject to this schedule who operates a facility where the NO<sub>x</sub> abatement is integrated within the operating process and cannot be bypassed shall report the annual weighted average N<sub>2</sub>O emission factor, expressed in kilograms (kg) of N<sub>2</sub>O/tonnes (t) of nitric acid, 100% acid base.
5. Any person subject to this schedule who operates a facility with stacks monitored by CEMS may use the annual emissions data from CEMS to report the emissions under paragraph 2(a). The person shall indicate where CEMS is being used to calculate emissions.

## SCHEDULE 15

### Hydrogen production

1. This schedule applies to any person who operates a facility described in subparagraph 1(b)(x) of Schedule 3 of this notice. For fuel combustion and flaring emissions, the person shall report using Schedule 7 of this notice. For ammonia production, the person shall report using Schedule 13 of this notice.
2. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 10.A of Canada's Greenhouse Gas Quantification Requirements to report the
  - (a) total annual quantity of CO<sub>2</sub> emissions, expressed in tonnes (t);
  - (b) total annual quantity of CO<sub>2</sub> recovered/captured, expressed in tonnes (t);
  - (c) total annual quantity of hydrogen production, expressed in tonnes (t); and
  - (d) total annual quantity of hydrogen purchased, expressed in tonnes (t).
3. Any person subject to this schedule shall for paragraph 2(b) indicate if the CO<sub>2</sub> that is recovered or captured is for downstream use, on-site production or for permanent storage.
4. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 10.A of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of feedstock charged, reported by feedstock type, expressed in
  - (a) cubic metres (m<sup>3</sup>), for gaseous quantities;
  - (b) litres (l), for liquid quantities;
  - (c) tonnes (t), for non-biomass solid quantities; and
  - (d) bone-dry tonnes (t), for biomass-derived solid fuel quantities.
5. Any person subject to this schedule shall, for each feedstock type used under section 3, report the annual weighted average carbon content expressed in
  - (a) kilograms (kg) of C/kilograms (kg) of feedstock, for gaseous quantities;
  - (b) kilograms (kg) of C/kilograms (kg) of feedstock or kilograms (kg) of C/cubic metres (m<sup>3</sup>) of feedstock, for liquid quantities; and
  - (c) kilograms (kg) of C/kilograms (kg) of feedstock, for solid quantities.
6. Any person subject to this schedule who operates a facility with stacks monitored by CEMS may use the annual emissions data from CEMS to report the emissions under paragraphs 2(a) and (b). This shall not include the emissions information specified for CEMS in Schedule 7 of this notice. The person shall indicate where CEMS are used to calculate emissions.

## SCHEDULE 16

### Petroleum refineries

1. This schedule applies to any person who operates a facility described in subparagraph 1(b)(xi) of Schedule 3 of this notice. For fuel combustion and flaring emissions, the person shall report using Schedule 7 of this notice. For hydrogen production emissions, the person shall report using Schedule 15 of this notice.
2. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 11.A of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions from catalyst regeneration, expressed in tonnes (t).
3. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 11.B of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions from process vents, expressed in tonnes (t).
4. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 11.C of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions from asphalt production, expressed in tonnes (t).
5. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 11.D of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of CO<sub>2</sub> emissions from sulphur recovery units, expressed in tonnes (t). Any person subject to this schedule shall provide documentation of the methodology if they are using a source-specific molar fraction of CO<sub>2</sub> in sour gas in Equation 11-14.
6. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 11.F of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of CH<sub>4</sub> emissions from above-ground storage tanks, expressed in tonnes (t).
7. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 11.G of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of CH<sub>4</sub> and N<sub>2</sub>O emissions from wastewater treatment plants, expressed in tonnes (t).
8. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 11.H of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of CH<sub>4</sub> emissions from oil-water separators, expressed in tonnes (t).
9. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 11.I of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of CH<sub>4</sub> emissions from equipment leaks at refineries, expressed in tonnes (t).
10. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 11.J of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions from coking calcining units, expressed in tonnes (t).
11. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 11.K of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions from uncontrolled blowdown systems, expressed in tonnes (t).
12. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 11.L of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of CH<sub>4</sub> emissions from loading operations, expressed in tonnes (t).
13. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 11.M of Canada's Greenhouse Gas Quantification Requirements to report the total annual quantity of CH<sub>4</sub> emissions from delayed coking units, expressed in tonnes (t).

14. Any person subject to this schedule shall, for each of crude oil, propane, butane and ethanol brought into the facility for input into the refining process, report the

(a) total annual quantities

(i) of crude oil and ethanol expressed in kilolitres (kl), and

(ii) of propane and butane expressed in cubic metres (m<sup>3</sup>);

(b) annual higher heating value, expressed in megajoules (MJ) per unit; and

(c) annual average carbon content, expressed in kilograms (kg) of carbon per unit.

15. Any person subject to this schedule shall, for each feedstock used under sections 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13 report the total annual

(a) gaseous quantities, expressed in cubic metres (m<sup>3</sup>);

(b) solid quantities, expressed in tonnes (t);

(c) liquid quantities, expressed in kilolitres (kl); and

(d) biomass-derived solid quantities, expressed in bone-dry tonnes (t).

16. Any person subject to this schedule who operates a facility with stacks monitored by CEMS may use the annual emissions data from CEMS to report the emissions and production information under section 2 through section 13. This shall not include the emissions information specified for CEMS in Schedule 7 and Schedule 15 of this notice. The person shall indicate where emissions calculations use CEMS.

## SCHEDULE 17

### Pulp and paper production

1. This schedule applies to any person who operates a facility described in subparagraph 1(b)(xii) of Schedule 3 of this notice. For fuel combustion and flaring emissions, the person shall report using Schedule 7 of this notice.

2. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 12.A of Canada's Greenhouse Gas Quantification Requirements to report the

(a) total annual quantity of CO<sub>2</sub> emissions from the addition of carbonates in the chemical recovery of chemical pulp mills, expressed in tonnes (t);

(b) total annual CH<sub>4</sub> and N<sub>2</sub>O emissions from on-site wastewater treatment plants, expressed in tonnes (t);

(c) total annual quantity of pulp, expressed in tonnes (t) of air dried pulp;

(d) total annual quantity of input carbonate material, by carbonate type, expressed in tonnes (t);

(e) annual weighted average carbon content of input carbonate material, by carbonate type, expressed in tonnes of C/tonnes of carbonate material, if using equation 12-2 in section 12 of Canada's Greenhouse Gas Quantification Requirements;

(f) total annual quantity of carbon-containing process output material, by material type, expressed in tonnes (t), if using equation 12-2 in section 12 of Canada's Greenhouse Gas Quantification Requirements;

(g) annual weighted average carbon content of carbon-containing process output material, by material type, expressed in tonnes of C/tonnes of material, if using equation 12-2 in section 12 of Canada's Greenhouse Gas Quantification Requirements; and

(h) annual weighted average of fraction of calcination achieved, by type of carbonate used, if using equation 12-3 in section 12 of Canada's Greenhouse Gas Quantification Requirements. If not using the default value, the method used must be provided.

3. Any person subject to this schedule who operates a facility with stacks monitored by CEMS may use the annual emissions data from CEMS to report the emissions information under paragraphs 2(a) and (b). This shall not include the emissions information specified for CEMS in Schedule 7 of this notice. The person shall indicate where CEMS is being used to calculate emissions.

## SCHEDULE 18

### Base metal production

1. This schedule applies to any person who operates a facility described in subparagraph 1(b)(xiii) of Schedule 3 of this notice. For fuel combustion and flaring emissions, the person shall report using Schedule 7 of this notice.

2. Any person subject to this schedule shall use the greenhouse gas quantification methods in section 13.A of Canada's Greenhouse Gas Quantification Requirements to report the

- (a) total annual CO<sub>2</sub> emissions from base metal production, by type of base metal, expressed in tonnes (t);
- (b) total annual quantity of carbon-containing process input material (e.g. flux reagents, reducing agents or electrode consumption), by material type, expressed in tonnes (t);
- (c) annual weighted average carbon content of carbon-containing process input (e.g. flux reagents, reducing agents or electrode consumption) by material type, expressed in tonnes of C/tonnes of carbon containing process input material;
- (d) total annual quantity of carbon-containing process output material, by material type, expressed in tonnes (t);
- (e) annual weighted average carbon content of carbon-containing process output, by material type, expressed in tonnes of C/tonnes of material; and
- (f) total annual quantity of individual base metal or nickel matte produced, by type, expressed in tonnes (t).

## EXPLANATORY NOTE

*(This note is not part of the notice.)*

In March of 2004, the Government of Canada established the Greenhouse Gas Reporting Program (GHGRP) to collect greenhouse gas (GHG) emissions information annually from the largest emitting Canadian facilities. Under this mandatory reporting program, a notice is issued in accordance with section 46 of the Act and published annually in the *Canada Gazette*, outlining the reporting requirements. Operators of facilities that meet the criteria specified in the notice are required to submit their information to Environment and Climate Change Canada by June 1 of each year. The GHGRP is part of Canada's ongoing effort to develop, through a collaborative process with provinces and territories, a harmonized and efficient reporting system that will meet the information needs of all levels of government, provide Canadians with reliable and timely information on greenhouse gas emissions and support regulatory initiatives.

In December 2016, the Government of Canada published the [Notice of intent to inform stakeholders of upcoming consultations on proposed changes to the Greenhouse Gas Reporting Program \(http://www.gazette.gc.ca/rp-pr/p1/2016/2016-12-10/html/notice-avis-eng.php#na2\)](http://www.gazette.gc.ca/rp-pr/p1/2016/2016-12-10/html/notice-avis-eng.php#na2). It is pursuing this expansion to the GHGRP in order to

- enable direct use of the reported data in Canada's National Greenhouse Gas Inventory;
- increase the consistency and comparability of GHG data across jurisdictions; and
- obtain a more comprehensive picture of emissions by Canadian facilities.

The notice requiring the reporting of 2017 GHG information, published in December 2017, represented Phase 1 of the expansion. In this phase, the reporting threshold was lowered to require all facilities emitting 10 kt or more of GHGs (in CO<sub>2</sub> eq. units) to report. Specific industry sectors were also required to report additional information, using prescribed methods. These sectors were cement, lime, aluminium, iron and steel producers as well as facilities engaged in CO<sub>2</sub> capture, transport, and storage activities.

As part of Phase 2 of the GHGRP expansion, a proposed set of expanded reporting requirements and methods, applicable to the 2018 calendar year, was circulated and consultations were undertaken with respect to these changes in 2018. More information about these consultations, including a response document issued by the GHGRP, is available on the program's [Consultations web page \(https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting/consultations.html\)](https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting/consultations.html).

This notice represents the second year of the phased expansion to the GHG reporting requirements for industrial facilities in Canada. It contains the following key changes:

- (1) Requirements to apply specific quantification methods to determine emissions, and provide additional data for selected sectors. These requirements are specific to facilities engaged in mining, ethanol production, electricity and heat generation, ammonia production, nitric acid production, hydrogen production, petroleum refineries, pulp and paper production, and base metal production.
- (2) Modifications to certain requirements under Schedules 7 and 10 that were issued in Phase 1 through the notice with respect to reporting of GHGs for 2017.

The GHGRP will continue to allow facilities subject to the expanded reporting requirements issued under Phases 1 and 2 of the expansion to upload provincial reports for those who are already reporting the same or similar data to provincial programs (in British Columbia, Ontario, Quebec, Nova Scotia and Newfoundland and Labrador).

Information required to be reported as outlined in this notice will continue to be collected via Environment and Climate Change Canada's (ECCC) Single Window (SW) system. This system currently collects data for ECCC's GHGRP and for British Columbia, Alberta, Ontario and New Brunswick, to support provincial GHG reporting regulations; the National Pollutant Release Inventory and its partners and various other partner programs. Further information on the GHGRP and step-by-step instructions on how to navigate the SW system are available on the [Program website \(https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting/reporting.html\)](https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting/reporting.html).

Compliance with the Act is mandatory and specific offences are established by subsection 272.1(1) of the Act. Subsections 272.1(2), (3) and (4) of the Act set the penalties for persons who contravene section 46 of the Act. Offences include the offence of failing to comply with an obligation arising from the present notice and the offence of providing false or misleading information. Penalties include fines, and the amount of the fine can range from a maximum of \$25,000 for an individual convicted following summary proceedings to a maximum of \$500,000 for a large corporation convicted on indictment. The maximum fines are double for second or subsequent offences.

The current text of the [Act \(http://laws-lois.justice.gc.ca/eng/acts/C-15.31/\)](http://laws-lois.justice.gc.ca/eng/acts/C-15.31/), including the most recent amendments, is available on Justice Canada's website.

The Act is enforced in accordance with the [Compliance and Enforcement Policy \(https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/publications/compliance-enforcement-policy.html\)](https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/publications/compliance-enforcement-policy.html) for the *Canadian Environmental Protection Act, 1999*. Suspected violations under the Act can be reported to the Enforcement Branch by email at [ec.enviroinfo.ec@canada.ca](mailto:ec.enviroinfo.ec@canada.ca) (<mailto:ec.enviroinfo.ec@canada.ca>).

For more information on the GHGRP, including guidance documents, annual summary reports, and access to reported data, please visit the [GHGRP website \(https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting.html\)](https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/facility-reporting.html).

## DEPARTMENT OF THE ENVIRONMENT DEPARTMENT OF HEALTH

### CANADIAN ENVIRONMENTAL PROTECTION ACT, 1999

***Publication after screening assessment of 10 substances in the Ketones Group specified on the Domestic Substances List (paragraphs 68(b) and (c) or subsection 77(1) of the Canadian***

## **Environmental Protection Act, 1999)**

Whereas eight of the substances identified in the annex are substances identified under subsection 73(1) of the *Canadian Environmental Protection Act, 1999*;

Whereas a summary of the draft screening assessment conducted on eight substances pursuant to section 74 of the Act and on the remaining two substances pursuant to paragraphs 68(b) and (c) of the Act is annexed hereby;

Whereas it is proposed to conclude that methyl ethyl ketone, methyl isobutyl ketone, and 2,4-pentanedione meet one or more of the criteria set out in section 64 of the Act;

And whereas it is proposed to conclude that the remaining substances do not meet any of the criteria set out in section 64 of the Act,

Notice therefore is hereby given that the Minister of the Environment and the Minister of Health (the ministers) propose to recommend to Her Excellency the Governor in Council that methyl ethyl ketone, methyl isobutyl ketone, and 2,4-pentanedione be added to Schedule 1 to the Act.

Notice is further given that the ministers propose to take no further action on methyl propyl ketone, methyl isoamyl ketone, diacetone alcohol, diacetyl, acetoin, and mesityl oxide at this time under section 77 of the Act.

Notice is also given that the ministers propose to take no further action on 2,3-pentanedione at this time.

Notice is furthermore given that the ministers have released a risk management scope document for methyl ethyl ketone, methyl isobutyl ketone, and 2,4-pentanedione to initiate discussions with stakeholders on the development of risk management actions.

## **Public comment period**

Any person may, within 60 days after publication of this notice, file with the Minister of the Environment written comments on the measure the ministers propose to take and on the scientific considerations on the basis of which the measure is proposed. More information regarding the scientific considerations may be obtained from the [Canada.ca \(Chemical Substances\) website \(https://www.canada.ca/en/health-canada/services/chemical-substances.html\)](https://www.canada.ca/en/health-canada/services/chemical-substances.html). All comments must cite the *Canada Gazette*, Part I, and the date of publication of this notice and be sent to the Executive Director, Program Development and Engagement Division, Department of the Environment, Gatineau, Quebec K1A 0H3, by fax to 819-938-5212, or by email to [eccc.substances.eccc@canada.ca \(mailto:eccc.substances.eccc@canada.ca\)](mailto:eccc.substances.eccc@canada.ca). Comments can also be submitted to the Minister of the Environment using the online reporting system available through [Environment and Climate Change Canada's Single Window \(https://ec.ss.ec.gc.ca\)](https://ec.ss.ec.gc.ca).

In accordance with section 313 of the *Canadian Environmental Protection Act, 1999*, any person who provides information in response to this notice may submit with the information a request that it be treated as confidential.

### **Jacqueline Gonçalves**

Director General  
Science and Risk Assessment Directorate  
On behalf of the Minister of the Environment

### **Gwen Goodier**

Acting Director General  
Industrial Sectors, Chemicals and Waste Directorate  
On behalf of the Minister of the Environment

### **David Morin**

Director General  
Safe Environments Directorate  
On behalf of the Minister of Health

# ANNEX

## Summary of the draft screening assessment of 10 substances in the Ketones Group

Pursuant to section 68 or 74 of the *Canadian Environmental Protection Act, 1999* (CEPA), the Minister of the Environment and the Minister of Health have conducted a screening assessment of 10 substances referred to collectively as the Ketones Group. Substances in this group were identified as priorities for assessment, as they met categorization criteria under subsection 73(1) of CEPA or were considered a priority on the basis of other human health concerns. The Chemical Abstracts Service Registry Numbers (CAS RN <sup>a</sup>) of the substances, their *Domestic Substances List* (DSL) names and their common names and acronyms are listed in the table below.

### Substances in the Ketones Group

CAS RN	Subgroup	<i>Domestic Substances List</i> name	Common name (acronym)
78-93-3	1	2-Butanone	Methyl ethyl ketone (MEK)
107-87-9	1	2-Pentanone	Methyl propyl ketone (MPK)
108-10-1	2	4-Methyl-2-pentanone	Methyl isobutyl ketone (MIBK)
110-12-3	2	2-Hexanone, 5-methyl	Methyl isoamyl ketone (MIAK)
123-42-2	2	4-Hydroxy-4-methyl-2-pentanone	Diacetone alcohol (DAA)
431-03-8	3	2,3-Butanedione	Diacetyl
513-86-0	3	2-Butanone, 3-hydroxy	Acetoin
600-14-6 <sup>a</sup>	3	2,3-Pentanedione	2,3-Pentanedione (2,3-PD)
123-54-6 <sup>a</sup>	Individual	2,4-Pentanedione	2,4-Pentanedione (2,4-PD)
141-79-7	Individual	4-Methyl-3-penten-2-one	Mesityl oxide (MO)

<sup>a</sup> This substance was not identified under subsection 73(1) of CEPA but was included in this assessment, as it was considered a priority on the basis of other human health concerns.

All 10 substances in the Ketones Group are commercially produced and are also naturally present in the environment in various plants and/or food items or produced by microbes and other organisms. Several of the ketones are also produced endogenously in humans, including MEK, diacetyl and acetoin. MEK, MPK and MIBK have been detected in breast milk. According to information reported in response to surveys conducted under section 71 of CEPA, only DAA (23 000 kg) and 2,3-PD (1 200 kg) were reported to be manufactured in Canada in 2011. Reported imports in Canada for these ketones ranged between 100 kg (for acetoin) and 6 000 000 kg (for MEK) in 2011. In the same year, no Canadian manufacturing or importing activities were reported for MO above the reporting threshold of 100 kg.

In general, ketones are primarily used as solvents in various products, including products available to consumers, such as paints, coatings and adhesives, and as chemical intermediates and solvents among others in numerous industrial applications. They may also be used as food flavouring agents, in cosmetics and as formulants in pest control products.



The ecological risks of the substances in the Ketones Group were characterized using the ecological risk classification of organic substances (ERC). The ERC is a risk-based approach that employs multiple metrics for both hazard and exposure based on weighted consideration of multiple lines of evidence for determining risk classification. Hazard profiles are established based principally on metrics regarding mode of toxic action, chemical reactivity, food web-derived internal toxicity thresholds, bioavailability, and chemical and biological activity. Metrics considered in the exposure profiles include potential emission rate, overall persistence, and long-range transport potential. A risk matrix is used to assign a low, moderate or high level of potential concern for substances based on their hazard and exposure profiles. The ERC identified the 10 substances in the assessment as having a low potential to cause ecological harm.

Considering all available lines of evidence presented in the draft screening assessment, there is a low risk of harm to the environment from MEK, MPK, MIBK, MIAK, DAA, diacetyl, acetoin, 2,3-PD, 2,4-PD, and MO. It is proposed to conclude that MEK, MPK, MIBK, MIAK, DAA, diacetyl, acetoin, 2,3-PD, 2,4-PD, and MO do not meet the criteria under paragraph 64(a) or (b) of CEPA, as they are not entering the environment in a quantity or concentration or under conditions that have or may have an immediate or long-term harmful effect on the environment or its biological diversity or that constitute or may constitute a danger to the environment on which life depends.

Several of these ketones have been previously reviewed internationally; these reviews and assessments were used to inform the health effects characterization in the screening assessment.

For the human health risk assessment, eight of the substances in this group have been addressed under three subgroups, with the remaining two substances addressed individually. For subgroup 1, the critical health effects include developmental effects for MEK and decreased body weight gain for both MEK and MPK. The general population in Canada is exposed to MEK and MPK from air and from food (primarily natural occurrence), and from products available to consumers, including cosmetics, paints and do-it-yourself products for MEK and paint products for MPK. A comparison of levels of MEK and MPK to which Canadians can be exposed in environmental media and food with levels associated with adverse effects in laboratory studies results in margins that are considered adequate to address uncertainties in exposure and health effects data used to characterize risk. However, the margins between exposure to MEK in some products available to consumers, namely lacquer and adhesive remover, paint products and PVC cement/primer, and critical health effect levels, are considered potentially inadequate to account for uncertainties in the exposure and health data used to characterize risk. Given the low acute toxicity of MPK and the absence of developmental effects via inhalation, there are no concerns related to the presence of MPK in products available to consumers.

For subgroup 2 (MIBK, MIAK and DAA), the International Agency for Research on Cancer (IARC) considers MIBK to be in group 2B ("possibly carcinogenic to humans"), with "sufficient evidence" of carcinogenicity in laboratory animals. For non-cancer effects, effects on the liver and kidney as well as developmental effects were observed in laboratory studies. The general population of Canada may be exposed to MIBK, MIAK and DAA from environmental media and food (primarily from their natural occurrence), and from the use of products available to consumers, including cosmetics, markers, paints and do-it-yourself products. A comparison of estimated levels of exposure to MIAK and DAA and critical effect levels results in margins that are considered to be adequate to address uncertainties in exposure and health effects data used to characterize risk. However, for MIBK, the resulting margins associated with the use of various paint and wood lacquer products are considered to be potentially inadequate.

For subgroup 3 (diacetyl, 2,3-PD and acetoin), diacetyl was carcinogenic in laboratory studies. Non-cancer effects have also been observed, such as effects on the respiratory tract for diacetyl. The general population of Canada is primarily exposed to diacetyl, 2,3-PD and acetoin from food (due to natural occurrence and use as a flavouring agent), and to diacetyl and 2,3-PD from use of a limited number of products available to consumers, including cosmetics and air fresheners, respectively. A comparison of estimated levels of exposure to diacetyl, 2,3-PD and acetoin and critical effect levels results in margins that are considered to be adequate to address uncertainties in exposure and health effects data used to characterize risk.

The available health effects information on 2,4-PD indicates general systemic toxicity and developmental effects. 2,4-PD has shown some potential for genotoxicity, but it is not expected to be carcinogenic. The general population of Canada may be exposed to 2,4-PD from food (natural occurrence) and from the use of a limited number of products available to consumers, such as specialty coating products. Margins for levels of 2,4-PD in food are considered adequate. A

comparison of estimated levels of exposure to 2,4-PD from use of a coating applied to a large surface area, such as a trailer or a boat, and critical effect levels results in margins that are considered potentially inadequate to address uncertainties in exposure and health effects data used to characterize risk.

Canadians may be exposed to MO from its presence in air and food. MO is not expected to be carcinogenic or genotoxic. General systemic toxicity has been associated with exposure to MO in laboratory studies. Comparison of estimated levels of exposure to MO in environmental media and food and critical effect levels results in margins that are considered to be adequate to address uncertainties in exposure and health effects data used to characterize risk.

Therefore, on the basis of the information presented in the draft screening assessment, it is proposed to conclude that MEK, MIBK, and 2,4-PD meet the criteria under paragraph 64(c) of CEPA, as they are entering the environment in a quantity or concentration or under conditions that constitute or may constitute a danger in Canada to human life or health.

However, it is proposed to conclude that MPK, MIAK, DAA, diacetyl, 2,3-PD, acetoin and MO do not meet the criteria under paragraph 64(c) of CEPA, as they are not entering the environment in a quantity or concentration or under conditions that constitute or may constitute a danger in Canada to human life or health.

## Proposed conclusion

It is proposed to conclude that MEK, MIBK, and 2,4-PD meet one or more of the criteria set out in section 64 of CEPA.

It is proposed to conclude that MPK, MIAK, DAA, diacetyl, 2,3-PD, acetoin and MO do not meet any of the criteria set out in section 64 of CEPA.

It is proposed to conclude that MEK and 2,4-PD meet the persistence criteria but not the bioaccumulation criteria, as set out in the *Persistence and Bioaccumulation Regulations* of CEPA.

It is proposed to conclude that MIBK does not meet the persistence or bioaccumulation criteria, as set out in the *Persistence and Bioaccumulation Regulations* of CEPA.

The draft screening assessment for the Ketones Group and the risk management scope document for methyl ethyl ketone, methyl isobutyl ketone, and 2,4-pentanedione are available on the [Canada.ca \(Chemical Substances\) website](http://www.canada.ca/Chemical Substances) (<http://www.canada.ca/en/health-canada/services/chemical-substances.html>).

## DEPARTMENT OF INDUSTRY

### TELECOMMUNICATIONS ACT

#### **Notice No. TIPB-001-2019 — Petition to the Governor in Council concerning Telecom Regulatory Policy CRTC 2018-377**

Notice is hereby given that a petition from SouthWestern Integrated Fibre Technology Inc. (SWIFT) has been received by the Governor in Council (GIC) under section 12 of the *Telecommunications Act* with respect to a decision issued by the Canadian Radio-television and Telecommunications Commission (CRTC) concerning the development of the CRTC's broadband fund.

Subsection 12(1) of the *Telecommunications Act* provides that, within one year after a decision by the CRTC, the GIC may, on petition in writing presented to the GIC within 90 days after the decision, or on the GIC's own motion, by order, vary or rescind the decision or refer it back to the CRTC for reconsideration of all or a portion of it.

In its petition dated December 19, 2018, SWIFT requested that the GIC vary Telecom Regulatory Policy CRTC 2018-377, *Development of the Commission's Broadband Fund*. The reasons for this request are included in the petition.

Submissions regarding this petition should be filed within 30 days of the publication of this notice in the *Canada Gazette*. All comments received will be posted on the Innovation, Science and Economic Development Canada [Spectrum Management and Telecommunications website](http://www.ic.gc.ca/spectrum) (<http://www.ic.gc.ca/spectrum>).

## Submitting comments

Submissions should be addressed to the Clerk of the Privy Council and Secretary to the Cabinet, 80 Wellington Street, Ottawa, Ontario K1A 0A3.

A copy of all submissions should also be sent to the Director General, Telecommunications and Internet Policy Branch, Innovation, Science and Economic Development Canada, preferably in electronic format (Microsoft Word or Adobe PDF) to the following email address: [ic.telecomsubmission-soumissiontelecom.ic@canada.ca](mailto:ic.telecomsubmission-soumissiontelecom.ic@canada.ca) (<mailto:ic.telecomsubmission-soumissiontelecom.ic@canada.ca>). Written copies can be sent to the Director General, Telecommunications and Internet Policy Branch, Innovation, Science and Economic Development Canada, 235 Queen Street, 10th Floor, Ottawa, Ontario K1A 0H5.

All submissions should cite the *Canada Gazette*, Part I, the publication date, the title and the notice reference number (TIPB-001-2019).

## Obtaining copies

A copy of the petition filed by SWIFT, as well as copies of all relevant petitions and submissions received in response, may be obtained electronically on the [Spectrum Management and Telecommunications website](http://www.ic.gc.ca/spectrum) (<http://www.ic.gc.ca/spectrum>), under “Gazette Notices and Petitions.” It is the responsibility of interested parties to check the public record from time to time to keep abreast of submissions received.

Official versions of notices can be viewed on the [Canada Gazette website](http://www.gazette.gc.ca/rp-pr/publications-eng.html) (<http://www.gazette.gc.ca/rp-pr/publications-eng.html>).

January 10, 2019

**Pamela Miller**

Director General

Telecommunications and Internet Policy Branch

# ENVIRONMENT AND CLIMATE CHANGE CANADA

## ***Notice to interested parties — Clean Fuel Standard regulatory design paper***

### **1. Introduction**

The Government of Canada is developing a Clean Fuel Standard to reduce Canada’s greenhouse gas emissions through the increased use of lower carbon fuels, energy sources and technologies. The objective of the Clean Fuel Standard is to achieve 30 million tonnes of annual reductions in greenhouse gas emissions by 2030, making an important contribution to the achievement of Canada’s target of reducing national emissions by 30% below 2005 levels by 2030. The Clean Fuel Standard will complement carbon pollution pricing by reducing greenhouse gas emissions throughout the lifecycle of fuels and by driving investments in cleaner fuels and in clean technology in Canada.

The Clean Fuel Standard regulations will set separate requirements for liquid, gaseous and solid fossil fuels. The regulations for the liquid stream will be developed first, with the draft regulations for the liquid stream planned for publication in the *Canada Gazette*, Part I, in spring/summer 2019 and the final regulations in 2020.

This document presents key elements of the design of the Clean Fuel Standard regulations, building on the features described in the [Clean Fuel Standard regulatory framework \(http://gazette.gc.ca/rp-pr/p1/2017/2017-12-23/html/notice-avis-eng.html\)](http://gazette.gc.ca/rp-pr/p1/2017/2017-12-23/html/notice-avis-eng.html) that was published in December 2017. As the liquid stream regulations will be published first, they focus on requirements for this stream, but they also provide some information on the gaseous and solid streams.

Key design elements covered in this paper include

- **Requirement for the liquid stream:** the carbon intensity of liquid fuels will have to be reduced by 10 grams (g) of carbon dioxide equivalent (CO<sub>2</sub>e) per megajoule (MJ) below their reference carbon intensity by 2030. This corresponds to a carbon intensity reduction of approximately 11% and up to 23 megatonnes (Mt) of incremental emissions reductions in 2030.
- **Actions that generate credits, including fuel switching by end-users in the liquid stream:** credits can be generated when some fuel users switch from a higher carbon intensity fuel to a lower carbon intensity fuel by changing or retrofitting combustion devices when a liquid transportation fuel is displaced by natural gas, propane or a non-carbon energy carrier (e.g. electricity, hydrogen) or when fuels are switched along the production chain of a fossil fuel.
- **Early action credits** will be allowed for actions taken in all three fuel streams after the publication of final regulations for the liquid stream, which is expected to occur in 2020.
- **Trading of credits between fuel streams:** 10% of a company's carbon intensity compliance obligation for any stream will be allowed to be met with credits from other streams.
- **Indirect land-use changes** will not be accounted for in calculating the lifecycle carbon intensity of a fuel at this time. However, we are considering using proxies to account for some of these indirect land-use impacts.

## 2. Application of the Clean Fuel Standard

The Clean Fuel Standard will apply to all those who produce, import and in some cases distribute fossil fuels in Canada. Regulated parties that have a carbon intensity compliance obligation will be referred to as fossil fuel primary suppliers in this paper.

Liquid fossil fuel primary suppliers will be required to reduce the carbon intensity of their fuels and will have a carbon intensity compliance obligation based on the amount of liquid fossil fuel they produce and import in Canada.

The carbon intensity requirements for gaseous and solid fossil fuels primary suppliers will be set at a later date. Parties that are not fossil fuel primary suppliers will be able to participate in the Clean Fuel Standard as voluntary credit generators.

## Parties regulated under the Clean Fuel Standard

### ***Fossil fuel primary supplier***

The ***fossil fuel primary supplier*** is the party responsible for meeting carbon intensity requirements for the fossil fuels they supply. These parties can also generate credits.

For liquid fossil fuels, the fossil fuel primary suppliers will be

- Persons who produce liquid fossil fuels; and
- Persons who import liquid fossil fuels.

For gaseous fuels, the fossil fuel primary suppliers will be <sup>5</sup>

- Persons who process or import natural gas; <sup>6</sup>
- Persons who produce or import propane; <sup>7</sup> and
- Persons who deliver pipeline quality natural gas to end-users. <sup>8</sup>

For solid fuels, the fossil fuel primary suppliers will be

- Persons who produce solid fossil fuels; and

- Persons who import solid fossil fuels.

### ***Voluntary credit generator***

A ***voluntary credit generator*** is a party other than a fossil fuel primary supplier (i.e., does not have an obligation to reduce carbon intensity) that chooses to generate credits under the Clean Fuel Standard by

- lowering the carbon intensity of a fossil fuel throughout its lifecycle;
- producing or importing renewable or low-carbon fuels for use in Canada; or
- supporting or undertaking a specified form of end-use fuel switching.

## **Fuels subject to the Clean Fuel Standard**

All fossil fuel supplied for use in Canada will be covered by the Clean Fuel Standard, with a few exemptions.

### ***Covered fuels***

For liquid fuels, these include gasoline, diesel fuel, jet fuel, kerosene and light and heavy fuel oils. For gaseous fuels, these include natural gas (including liquefied natural gas and compressed natural gas) and propane.

For solid fuels, these include coal, petroleum coke and coke.

Non-fossil fuels will not have a carbon intensity compliance obligation under the Clean Fuel Standard.

### ***Exemptions***

The Clean Fuel Standard will not apply to

- non-combustion end-uses of fossil fuels (e.g. solvents or diluents);
- fossil fuels used primarily as feedstocks in industrial processes (e.g. steel production);
- fossil fuels that are exported from Canada;
- fossil fuels that are in transit through Canada;
- fossil aviation gasoline;
- fossil fuels used for scientific research;
- fossil fuel being imported in a fuel tank that supplies the engine of a conveyance that is used for transportation by water, land or air (e.g. the fuel tank of a car); and
- coal combusted at facilities that are covered by the federal coal-fired electricity greenhouse gas emission regulations.

The Clean Fuel Standard may set record-keeping or reporting requirements for some of these exemptions.

### ***Aviation fuels***

Jet fuel that is used domestically will be subject to the Clean Fuel Standard but jet fuel that is used for international flights will not. Renewable or other low-carbon intensity aviation fuel produced and imported will be eligible to generate credits under the Clean Fuel Standard. Consideration is being given to the use of a multiplying factor for low-carbon aviation fuel credits.

### ***Self-produced and used fuels***

Fossil fuels are sometimes produced and used on-site by fossil fuel producers in the process to produce a finished fuel or in their facility operations. This fuel is referred to as “self-produced and used fuel.” The Clean Fuel Standard will set a separate carbon intensity reduction requirement for some self-produced and used fuels:

- In the liquid fuel stream, these include commercial fuels (including diesel fuels, gasolines and light and heavy fuel oils) produced at refineries and upgraders.

- In the gaseous fuel stream, self-produced and used fuels will not have separate carbon intensity reduction requirements. The lifecycle carbon intensities of the fossil fuels produced from these fuels will account for their emissions. These include the associated gases produced from crude oil and bitumen production and refinery and upgrader still gas.
- In the solid fuel stream, some self-produced and used fuels will have a separate carbon intensity compliance obligation. These include coal used at coal mines and petroleum coke produced at refineries and upgraders. The carbon produced at refineries and upgraders from catalyst regeneration will not have a separate carbon intensity reduction requirement.
- Industrial self-produced and used fuels (by non-fossil fuel primary suppliers) will not have carbon intensity reduction requirements.

### 3. Calculating carbon intensity

For renewable fuels and other low-carbon fuels and energy sources, carbon intensity values will be differentiated by type and origin of the fuel to reflect the greenhouse gas emissions associated with different feedstocks and production processes.

A Canadian average carbon intensity value will be determined for each fossil fuel produced or imported in Canada. As set out in the [Clean Fuel Standard regulatory framework \(http://gazette.gc.ca/rp-pr/p1/2017/2017-12-23/html/notice-avis-eng.html\)](http://gazette.gc.ca/rp-pr/p1/2017/2017-12-23/html/notice-avis-eng.html), the regulation will not differentiate among crude oil types, or on whether the crude oil is produced in or imported into Canada. An average carbon intensity value of crude oil used in Canada will be used.

For natural gas-derived fuels, the Clean Fuel Standard will not differentiate between sweet and sour gas, or by origin of the gas. A Canadian average carbon intensity value for natural gas and propane produced and imported and consumed in Canada will be determined. The treatment of liquefied natural gas and compressed natural gas remains to be established.

#### ***Indirect land-use change***

Direct land-use change happens when a particular parcel of land is converted to grow crops for biofuel production. Indirect land-use changes occur in response to land or crops being diverted for biofuel production elsewhere in the global agricultural system. Indirect land-use change represents changes that would not have happened without an increase in biofuel demand. Carbon intensity values will not include an estimate of the impact of indirect land-use change on greenhouse gas emissions at this time, but will include direct land-use change.

Consideration is being given to including criteria designed to protect against significant adverse indirect land-use impacts. These could include, for example

- Ineligibility or limits on certain types of feedstock that take into account biodiversity and critical species habitat, land type (virgin or cultivated) and footprint, the conversion of land with high carbon stock or other adverse land-use impacts;
- Ineligibility or limits on feedstock from jurisdictions that do not have strong anti-deforestation and other measures to limit cultivated land expansion; and
- Mandatory tracking of feedstock, including the jurisdiction of origin, to enable verification of limitations on feedstock types permitted and to inform future policy decisions.

The Clean Fuel Standard will include a requirement for a five-year review in 2025. Among other things, that review will consider whether to account for indirect land-use change and, if so, what appropriate methodologies that could be used to account for indirect land-use change.

## **Fuel Life Cycle Assessment Modelling Tool**

Environment and Climate Change Canada is developing a new Fuel Life Cycle Assessment Modelling Tool to support the Clean Fuel Standard. <sup>9</sup> This tool will be used to determine the carbon intensity of fuels used in Canada. Environment and Climate Change Canada will make the modelling tool available at no cost. Periodic updates to the background data sets in the model are expected (considering every three to five years).

## **Fossil fuel carbon intensity values**

The Canadian average carbon intensity values for fossil fuels will be expressed in grams of carbon dioxide equivalents (g CO<sub>2</sub>e) per unit of energy in megajoules (MJ), and will account for greenhouse gas emissions over the lifecycle of a given fuel. The Canadian average carbon intensity of the fuels will be calculated from the Fuel Life Cycle Assessment Modelling Tool under development by Environment and Climate Change Canada, based on 2016 data. These values will be used as the baseline for setting the carbon intensity reductions that fossil fuel primary suppliers will have to meet for the fuels they supply.

Imported liquid fossil fuels, such as gasoline or other refined petroleum products, and the petroleum portion of blended fossil fuels (e.g. E10) will be assigned the same carbon intensity value as the calculated Canadian average values.

The national crude slate carbon intensity value will be reviewed every three to five years.

## **Carbon intensity values of renewable and other low-carbon intensity fuels**

Producers of renewable and other low-carbon fuels will be able to generate Clean Fuel Standard compliance credits. The regulations will require the use of the Fuel Life Cycle Assessment Modelling Tool to calculate facility-specific carbon intensity values and their submission to Environment and Climate Change Canada for approval, along with supporting data and verification by a third party.

The same requirements will apply to imported renewable or other low-carbon fuels, imported neat or the portion imported in a blend with petroleum fuel (e.g. E10). For imported fuels, there will also be requirements to submit data, including about feedstock and energy inputs that do not originate in Canada.

### ***Carbon intensity values***

Upon approval by Environment and Climate Change Canada, a carbon intensity value will be valid until criteria specified in the regulations requiring a review or update of the value are triggered. Carbon intensity values will also be a part of a credit generator's annual third-party verification requirements. The input data supporting each fuel's carbon intensity (e.g. feedstock type, energy requirements) will be verified and carbon intensity values could be revoked or updated if there are changes noted that increase the carbon intensity of the fuel or if input data is found to be incorrect, out of date or missing. Carbon intensity values will also be subject to review by Environment and Climate Change Canada.

### ***Minimum threshold requirements***

Process changes that reduce the carbon intensity of a renewable or low-carbon fuel could trigger an updated carbon intensity request. A minimum threshold of an improvement of 1g CO<sub>2</sub>e/MJ or 5% difference between the current value and the proposed new value, whichever is greater, will be required in order to submit a request for a new carbon intensity value.

### ***Energy effectiveness ratio***

The energy efficiency ratio measures the relative efficiency with which a vehicle or engine uses a specific fuel. The higher the energy effectiveness ratio is, the more efficient the use of the fuel or energy. Some energy effectiveness ratios may be developed for credits generated from specified end-use fuel switching, for example from displacing gasoline with electricity to power light-duty and heavy-duty vehicles.

## **4. Carbon intensity reduction requirements**

Liquid fossil fuel primary suppliers will have carbon intensity reduction requirements for each fuel they produce and import, for each annual compliance period (from January 1 to December 31). Carbon intensity reduction requirements will be expressed in grams of carbon dioxide equivalents (g CO<sub>2</sub>e) per unit of energy in megajoules (MJ), and will account for greenhouse gas emissions over the lifecycle of a fuel. The carbon intensity reduction requirements will become more stringent over time. Non-fossil fuels will not have a carbon intensity reduction requirement.

## Liquid fossil fuel primary supplier annual compliance obligation

The Clean Fuel Standard will set an annual maximum standard (or limit) carbon intensity for each fossil fuel produced and imported in Canada. The carbon intensity standard for 2030 will require a 10 g of CO<sub>2</sub>e per MJ reduction from the Canadian average carbon intensity of each fossil liquid fuel in 2016, as determined by the Fuel Life Cycle Assessment Modelling Tool. This represents a decrease of 10% to 12% in carbon intensity below 2016 fossil fuel carbon intensity values, depending on the fuel type.

Fossil fuel primary suppliers will generate CO<sub>2</sub>e exceedances annually based on the amount (expressed in MJ of energy) of each fossil fuel they produce and import for use in Canada. The sum of the CO<sub>2</sub>e exceedances from each fuel will be their annual carbon intensity compliance obligation. Each CO<sub>2</sub>e exceedance will represent one tonne of carbon dioxide equivalent (t CO<sub>2</sub>e).

At the end of each compliance period, each fossil fuel primary supplier will need to cancel the number of credits equal to their carbon intensity compliance obligation for that year plus any CO<sub>2</sub>e exceedances carried forward from previous years.

Annex 1 presents the methodology for calculating the annual carbon intensity obligation.

### 5. Credit generation

The Clean Fuel Standard will allow three methods for generating credits:

1. actions that reduce the carbon intensity of the fossil fuel throughout its lifecycle;
2. the supply of renewable and other low-carbon intensity fuels; and
3. some end-use fuel switching.

Credits may be generated by fossil fuel primary suppliers or by voluntary credit generators that undertake these actions.

Fuels that can be used in more than one fuel stream will generate credits in the stream where they are actually used (e.g., natural gas used to displace liquid fuels in the transportation sector would generate credits in the liquid stream).

### Compliance Category 1: Actions that reduce the carbon intensity of the fossil fuel throughout its lifecycle

The Clean Fuel Standard will recognize actions that reduce greenhouse gas emissions at any point in the lifecycle of the fossil fuel. These may include actions such as process improvements, electrification, switching from a higher carbon intensity fuel to a lower carbon intensity fuel and carbon capture and storage (i.e., actions that reduce the lifecycle carbon intensity of the obligated fuel). These actions can be taken by fossil fuel primary suppliers and by others upstream or downstream of a refinery.

A project or action that reduces emissions throughout the fuel lifecycle in only one stream will generate credits in that stream. If the carbon intensity of fuels is reduced in more than one stream (e.g., at refineries that produce liquid, solid and gaseous fuels), the credit generator will be allowed to select which stream the credits are generated in.

The ability of an action or type of project to generate a credit will be governed by protocols, some of which may be developed by Environment and Climate Change Canada. The Clean Fuel Standard regulations will also allow parties to submit a protocol to Environment and Climate Change Canada if the existing protocols do not apply to their project. The regulations will specify the requirements for developing and obtaining approval of a protocol.

Once a protocol has been approved, parties wishing to obtain credits by undertaking a project covered by the protocol will be required to submit the information specified in that protocol. This information will need to be accompanied by third-party verification. An application for a project may include an aggregate of emission reductions from multiple facilities owned or operated by the fossil fuel primary supplier or the voluntary credit generator. The project must yield measurable greenhouse gas emission reductions above an annual threshold.

Each protocol will define, among other things:

- Information to be submitted (i.e., reporting requirements);



- Methodology to quantify and calculate carbon intensity reductions, emission reductions and credits generated;
- Verification methodology;
- Credit generation threshold (a minimum threshold of 10 kt/year by project type, aggregated at a company level, is being considered); and
- Time limits (Environment and Climate Change Canada is considering limiting the number of years during which a project can generate credits before the project approval needs to be renewed).

The Clean Fuel Standard will recognize the following projects as eligible for credit generation, as long as the project is compliant with the criteria set in the relevant protocol:

- projects that allow compliance with, or generate credits in, a federal, provincial or territorial carbon pricing system; and
- projects that receive funding under federal, provincial, territorial or municipal mechanisms.

However, the Clean Fuel Standard will not allow the generation of credits for the following:

- actions that are legally required under federal, provincial, territorial or municipal laws, or regulations; and
- projects that begin before the publication of the final regulations.

There will be no limitations for using credits generated under Compliance Category 1 in the credit and trading market (i.e., the credits would be tradeable or could be used to balance deficits).

## **Compliance Category 2: Supplying low-carbon fuels**

The Clean Fuel Standard will allow producers and importers of renewable or other low-carbon fuels to generate credits based on the amount (energy in MJ) of renewable or other low-carbon fuel they supply to the Canadian market annually.

Eligible fuels must have a carbon intensity lower than the fuel stream credit reference carbon intensity value and may include (but are not limited to) renewable natural gas, ethanol and renewable diesel, biodiesel, hydro-treated vegetable oil, alternative jet fuel, hydrogen, biogas, synthetic fuels, renewable propane, biomass, wood pellets, biochar, municipal solid waste, and forestry and agricultural residues.

### ***Credit generation***

Credits will be generated based on the difference between the carbon intensity of the renewable or low-carbon fuel and the credit reference carbon intensity value of the fuel stream in which it is used. All renewable or other low-carbon fuel supplied to the Canadian market will be able to generate credits under the Clean Fuel Standard, including fuel used to comply with existing renewable fuel mandates.

### ***Renewable fuel volumetric mandate***

The federal *Renewable Fuels Regulations* require 5% renewable content in gasoline and 2% renewable content in diesel fuel and heating distillate oil. The Clean Fuel Standard will incorporate the volumetric mandate of the *Renewable Fuels Regulations* when the liquid fuel regulations under the Clean Fuel Standard come into force, in 2022. Fossil fuel primary suppliers will be required to demonstrate that they meet the requirements for 5% renewable content in gasoline and 2% renewable content in diesel fuel and heating distillate oil. This could be done through the credit trading system. The Clean Fuel Standard will not set renewable volumetric requirements for natural gas.

### ***Point of credit generation***

Credits for renewable and low-carbon fuels will be generated by the producer and importer of those fuels. For renewable fuels that are imported in a blended product (e.g. E10), the credit will go to the importer of the blended fuel. Environment and Climate Change Canada is considering allowing the transfer of the credit generation to parties downstream of production and importation to points of blending, and is seeking feedback on this option.

Annex 1 provides the calculations for credit generation from renewable or low-carbon fuels.

## Compliance Category 3: Specified end-use fuel switching

The Clean Fuel Standard will allow some end-use fuel switching to generate credits. End-use fuel switching occurs when an end-user of fuel changes or retrofits their combustion devices (e.g. an engine) to be powered by another fuel or energy source. End-use fuel switching does not reduce the carbon intensity of the fossil fuel. Instead, it reduces greenhouse gas emissions by displacing the fossil fuel with a fuel or energy with lower carbon intensity.

In the liquid stream, end-use fuel switching from a higher carbon intensity fossil fuel used for transportation to the following lower carbon intensive fuels will be eligible for credit generation: natural gas, propane and non-carbon energy carriers, such as electricity or hydrogen. For the gaseous and the solid fuel streams, the type of end-use fuel switching that may be recognized for credit generation is still to be determined.

### *End-use fuel switching to electricity*

Electricity used by light-duty and heavy-duty electric vehicles will generate credits proportional to the avoided emissions when factoring lifecycle emissions of the fossil fuels being displaced and of the electricity being used to charge the electric vehicles. Credits for light-duty passenger electric vehicles and on-road heavy-duty electric vehicles will be calculated as a substitute to gasoline and diesel, respectively. A baseline of existing electric vehicles and the estimated associated electricity use in Canada in a reference year (e.g. 2016) will be deducted from future electricity use for electric vehicle charging in the calculations for credits.

The Clean Fuel Standard will allow credits to be generated by the following parties:

- distribution utilities will generate credits for home charging of electric vehicles;
- electric vehicle charging network operators will generate credits for public charging of electric vehicles; and
- site hosts will generate credits for private/commercial charging of electric vehicles.

Environment and Climate Change Canada is considering whether the Clean Fuel Standard should allow other actors (other than distribution utilities, site hosts and network operators) to generate credits, and who should be the credit generator for the charging of heavy-duty electric vehicles.

The regulations will allow credits to be generated relating to electric off-road vehicles and hydrogen fuel cell vehicles in a similar manner as on-road electric vehicles, with credit calculations based on the fuel being displaced and the energy efficiency ratio for the type of vehicle being displaced.

A requirement for recipients of these credits (utilities, network operators and site hosts) to recycle all or a minimum percentage of the revenues generated from electric vehicle charging credits to further incent the adoption of zero-emission vehicles is being considered.

## Early credit generation

The Clean Fuel Standard will allow credits to be generated from each fuel stream (liquid, gaseous and solid) beginning on the date of publication of the final regulations for the liquid fuel stream, which is expected in 2020. All solid or gaseous fuel credits generated before the solid or gaseous fuel stream regulations come into effect can be banked for future compliance.

## Trading between fuel streams

When requirements for the liquid fuel stream come into effect, a fossil fuel primary supplier will be able to meet up to 10% of its liquid fuel stream obligation with credits from the gaseous or solid fuel streams.

After all three fuel stream requirements are in effect, the Clean Fuel Standard will allow fossil fuel primary suppliers in each stream to discharge a modest percentage of their carbon intensity compliance obligation using credits from the other fuel streams. Environment and Climate Change Canada is considering setting this limit at 10%.

## 6. Credit trading system

## **Participation in the credit trading system**

Participants in the credit trading system include fossil fuel primary suppliers and voluntary credit generators. These participants will be able to generate, own and acquire credits. Environment and Climate Change Canada is considering whether other parties should be permitted to participate in the system under limited conditions for the purpose of acting on behalf of smaller credit generating parties or aggregating credits.

A voluntary credit generator will be able to end its participation in the Clean Fuel Standard trading system (i.e., be relieved of reporting requirements) with appropriate record keeping and reporting requirements for cancelling banked credits or ending ownership of these credits.

## **Provisions to ensure the integrity of the credit and trading system**

The Clean Fuel Standard will set requirements to ensure the integrity of the credit and trading system. These will include:

- A unique identification number will be assigned to each credit.
- Everyone who registers as a participant in the credit trading system will have to complete credit transfer forms and have their forms verified annually by a third party verifier.
- Environment and Climate Change Canada is considering requirements to put credits on hold for specified reasons.

## **Provisions to support the liquidity of the credit and trading system**

The Clean Fuel Standard will include various provisions to support the liquidity of the credit and trading system:

- Credits will not expire.
- There will be no limit to the number of credits that can be transferred among parties.
- There will be no limit to the number of times a single credit can be transferred.
- Credits may be generated on a quarterly basis or annually, at the preference of the credit generator.
- Credits can be banked, with no limit on the number of credits that can be banked.

## **Other provisions related to the credit market system**

### ***Reporting and issuance of credits***

Credit generators will be required to submit a Fuel Transaction Report once a year, on February 28, or quarterly if they want to generate credits on a quarterly basis. Environment and Climate Change Canada will endeavour to deposit credits into each party's account within 10 working days of the receipt of the report. Credits may then be traded, banked or used for compliance.

A diagram showing the credit life-cycle (i.e. all the steps between undertaking an action that generates a credit and submitting the annual report) is included in Annex 2.

### ***Transparency***

While protecting confidential information, Environment and Climate Change Canada may publish the following information publicly:

- Number of credits generated in a given period;
- Number of credits used to meet compliance;
- Number of credits traded in a given period; and
- Average credit price for a given period.

### **Credits cancelled for exported renewable and other low-carbon fuels**

Credits generated for renewable and low-carbon fuels that are exported from Canada will be required to be cancelled. A mechanism will be developed under the Clean Fuel Standard that will require the cancellation of credits for all exported renewable and low-carbon fuels by the party that exports them.

## 7. Meeting obligations

Each fossil fuel primary supplier must meet its carbon intensity compliance obligation for the compliance period by demonstrating through submission of its annual compliance report that it has retired a number of credits from its account that is equal to its carbon intensity compliance obligation for the compliance period plus any CO<sub>2</sub>e exceedances carried forward. Fossil fuel primary suppliers may not borrow or use anticipated credits from future projected or planned carbon intensity reductions for compliance.

### Credits generated under the federal output-based pricing system and other programs

Fossil fuel primary suppliers may not use credits that have been generated under another federal, provincial or territorial program or regulations, such as credits from the federal Output-Based Pricing System, for compliance under the Clean Fuel Standard.

However, as mentioned in section 5, the Clean Fuel Standard will allow the generation of credits for actions that also generate credits or comply with federal, provincial or territorial carbon pricing systems as long as these actions are otherwise compliant with the Clean Fuel Standard. For example, a refinery that undertakes a process improvement that reduces the carbon intensity of its facility may be entitled to surplus credits under the federal Output Based Pricing System. That same process improvement might also reduce the carbon intensity of the fuel it supplies. Credits would be allowed under the Clean Fuel Standard for that process improvement.

### Calculation of the credit balance

The credit balance for fossil fuel primary suppliers will be calculated separately for each of the three fuel streams.

### Additional compliance flexibilities

In addition to generating or acquiring credits from other participants in the credit trading system, a primary fossil fuel supplier will have additional compliance flexibilities:

- **CO<sub>2</sub>e exceedance carry-forward:** 10% of a company's annual carbon intensity compliance obligation (CO<sub>2</sub>e exceedances) will be allowed to be carried forward into the next compliance period, with a maximum carry-over of 2 years and a 20% annual interest penalty.
- **Market stability:** Environment and Climate Change Canada is considering including mechanisms to reinforce market and investment certainty. These could include allowing fossil fuel primary suppliers to discharge a specified amount of their obligation by payment into an emissions reduction fund at a specified price level that will have a mandate to invest in actions that will reduce greenhouse gas emissions. Consideration is also being given to a market-clearing mechanism, which would be activated if a fossil fuel primary supplier has insufficient credits for compliance. Parties with credits would be able to pledge credits for sale in this market with a specified price limit.

## 8. Audit and verification

The Clean Fuel Standard will include audit and verification requirements. These will require an independent, accredited third-party verification body to provide assurance that the information submitted to Environment and Climate Change Canada is accurate and complete, and compliant with the requirements of the regulations.

The regulations will require independent third-party verification of compliance reports submitted to Environment and Climate Change Canada by fossil fuel primary suppliers and participants in the credit and trading system. The regulations will define the level of assurance required. The regulations will also include accreditation requirements for the third-party verifiers, including requirements respecting independence and conflict of interest.

## 9. Review and update

The Canadian Fuel Lifecycle Assessment Modelling Tool and the carbon intensity values will be updated and revised periodically.

The Clean Fuel Standard will include a requirement for a five-year review (i.e., in 2025). The review will consider whether and how the impacts of indirect land-use change should be accounted for and treatment of renewable fuel minimum renewable content requirements.

## 10. Next steps

### Timing of regulations

Draft regulations for the liquid fuel stream are planned for publication in the *Canada Gazette*, Part I in spring/summer 2019, with final regulations in 2020 and coming into force in 2022.

The draft regulations for the gaseous and solid fuel streams are targeted for publication in the *Canada Gazette*, Part I, in late 2020, with final regulations in 2021 and coming into force in 2023.

### Emission-intensive and trade-exposed sectors

Emission-intensive and trade-exposed sectors have expressed concerns that the cumulative cost impacts from the Clean Fuel Standard combined with carbon pricing could impact their competitiveness. In July 2018, Environment and Climate Change Canada announced that the timing of the compliance obligations under the gaseous and solid stream regulations would be postponed by approximately 18 months to allow for more time to assess these impacts for gaseous and solid fuels and to take the time necessary to design the policy effectively.

Environment and Climate Change Canada has established a multistakeholder task group on emission-intensive and trade-exposed sectors under the Clean Fuel Standard consultations. This task group will provide a forum to better understand the concerns of these sectors and to consider options that could be integrated in the Clean Fuel Standard to mitigate competitiveness impacts sectors while meeting the Clean Fuel Standard's 2030 emissions reduction goal.

### Comments

Interested parties may submit comments by email or mail, on or before February 1, 2019, to the address below.

Clean Fuel Standard Regulatory Design Paper  
Oil, Gas and Alternative Energy Division  
Energy and Transportation Directorate  
Environment and Climate Change Canada  
351 Saint-Joseph Boulevard  
Gatineau, Quebec  
K1A 0H3  
Email: [ec.cfsncp.ec@canada.ca](mailto:ec.cfsncp.ec@canada.ca) (<mailto:ec.cfsncp.ec@canada.ca>)

## Annex I — Methodology for calculation of carbon intensity compliance obligation and credits

### Calculation of carbon intensity compliance obligation

- Step 1: Calculate the volume of each type of liquid fuel in the fossil fuel primary supplier's pool.

$$\text{Volume (m}^3\text{)} = \text{Volume}_{\text{Imported}} + \text{Volume}_{\text{Produced}} - \text{Volume}_{\text{Exported}} - \text{Volume}_{\text{Exempted}}$$

- Step 2: Calculate energy in megajoules (MJ) by multiplying the volume of fuel (Step 1) by the energy density of the fuel.

$$\text{Energy (MJ)} = \text{Volume (m}^3\text{)} * \text{Energy Density } \left(\frac{\text{MJ}}{\text{m}^3}\right)$$

- Step 3: Calculate grams of carbon dioxide equivalent by multiplying the energy (Step 2) by the absolute carbon intensity reduction requirement.

$$\text{g CO}_2\text{e} = \text{Energy (MJ)} * \text{CI}_{\text{Absolute}} \left(\frac{\text{g CO}_2\text{e}}{\text{MJ}}\right)$$

- Step 4: Calculate the CO<sub>2</sub>e exceedances generated in tonnes of carbon dioxide equivalent by dividing the grams of carbon dioxide equivalent (Step 3) by 1 000 000 grams per tonne.

$$\text{CO}_2\text{e Exceedances}_{\text{Generated}} \text{ (t CO}_2\text{e)} = \frac{\text{g CO}_2\text{e}}{1\,000\,000 \text{ grams/t}}$$

- Step 5: Calculate the compliance obligation for a given compliance period, based on the CO<sub>2</sub>e exceedances generated in the current compliance period (Step 4, CO<sub>2</sub>e Exceedances<sub>Generated</sub>) plus any CO<sub>2</sub>e exceedances carried over from the previous compliance period (CO<sub>2</sub>e Exceedances<sub>Carried Over</sub>).

$$\text{Compliance Obligation} = \text{CO}_2\text{e Exceedances}_{\text{Generated}} + \text{CO}_2\text{e Exceedances}_{\text{Carried Over}}$$

### Credit generation: Calculation of a credit for supplying low-carbon fuels

- Step 1: Calculate the volume of the fuel.

(a) Applicable to solid fuels, liquid fuels, and gaseous fuel other than a gaseous fuel delivered via gas distribution systems

$$\text{Volume (m}^3\text{)} = \text{Volume}_{\text{Imported}} + \text{Volume}_{\text{Produced}} - \text{Volume}_{\text{Exported}} - \text{Volume}_{\text{Excluded}}$$

(b) Applicable to a gaseous fuel delivered via gas distribution systems

$$\text{Volume (m}^3\text{)} = \text{Volume}_{\text{Imported}} + \text{Volume}_{\text{Distributed}} - \text{Volume}_{\text{Exported}} - \text{Volume}_{\text{Excluded}}$$

Step 2: Calculate the energy of the low-carbon fuel in megajoules (MJ) by multiplying the volume of fuel by the energy density of the fuel (as specified in the regulations).

$$\text{Energy (MJ)} = \text{Volume (m}^3\text{)} * \text{Energy Density } \left(\frac{\text{MJ}}{\text{m}^3}\right)$$

Step 3: Calculate the carbon intensity difference (CI<sub>Difference</sub>) by subtracting the carbon intensity of the low-carbon fuel (CI<sub>Low Carbon Fuel</sub>) from the stream credit reference (CI<sub>Stream Credit Reference</sub>) of the compliance period for the fuel stream.

$$\text{CI}_{\text{Difference}} \left(\frac{\text{g CO}_2\text{e}}{\text{MJ}}\right) = \text{CI}_{\text{Stream Credit Reference}} - \text{CI}_{\text{Low-carbon Fuel}}$$

Step 4: Calculate grams of carbon dioxide equivalent by multiplying the energy (Step 2) by the carbon intensity difference (Step 3).

$$\text{g CO}_2\text{e} = \text{Energy (MJ)} * \text{CI}_{\text{Difference}} \left(\frac{\text{g CO}_2\text{e}}{\text{MJ}}\right)$$

Step 5: Calculate the credits generated in metric tons of carbon dioxide equivalent by dividing the grams of carbon dioxide equivalent (Step 4) by 1 000 000 grams per tonne.

$$\text{Credits}_{\text{Generated}} (\text{t CO}_2\text{e}) = \frac{\text{g CO}_2\text{e}}{1\,000\,000 \text{ grams/t}}$$

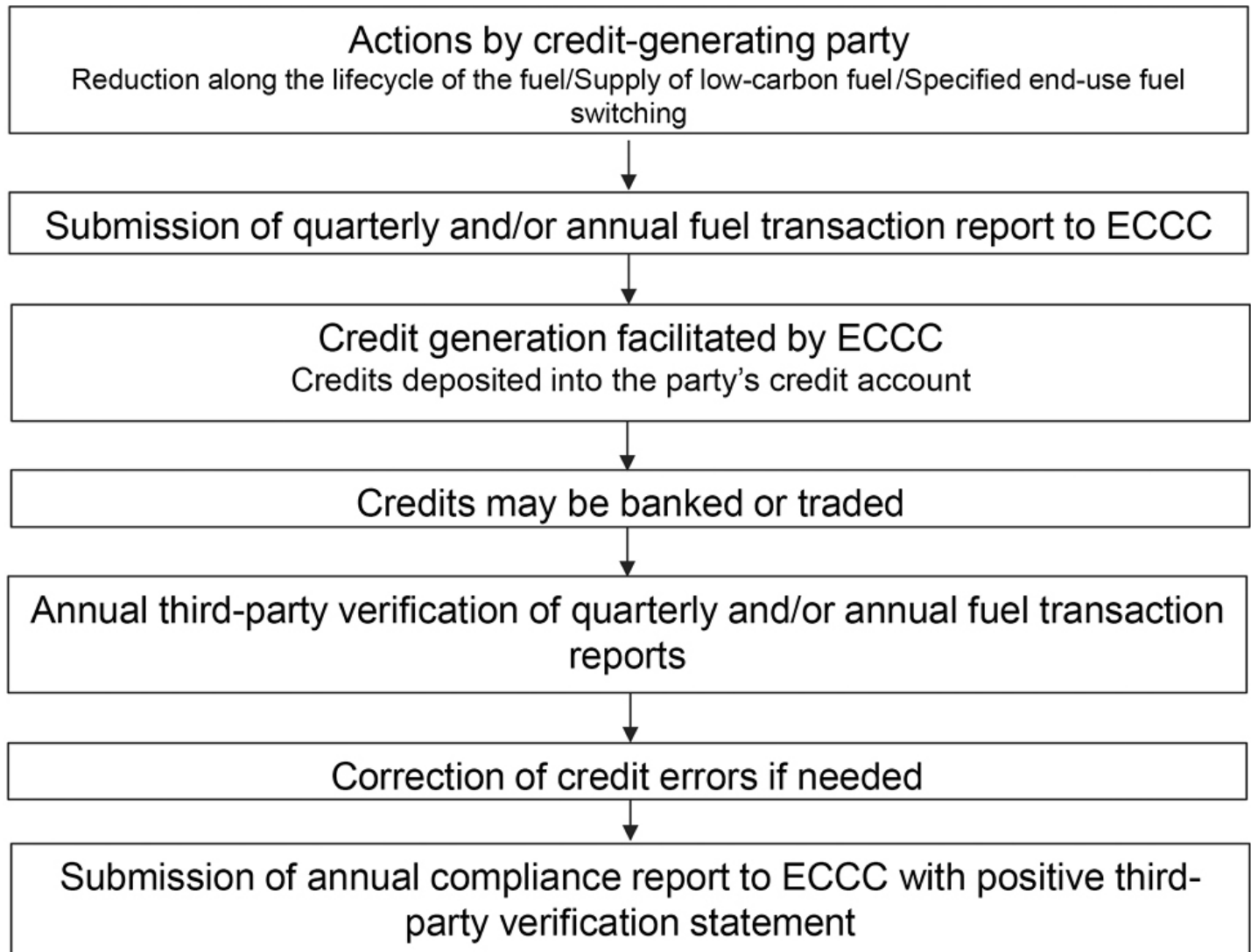
### Calculation of the stream credit reference carbon intensity value

Environment and Climate Change Canada will calculate the stream credit reference carbon intensity value for each compliance year (the stream credit reference).

- Step 1: Calculate the average carbon intensity of
  - each fossil fuel in the liquid stream supplied to Canada in 2016 using the Fuel Life Cycle Assessment Modelling Tool; and
  - each renewable and low-carbon fuel supplied to Canada in 2016.
- Step 2: Determine the energy in megajoules (MJ) of
  - each fossil fuel supplied to Canada in 2016 for combustion purposes, based on the 2017 reference case from the Energy, Emissions and Economy Model for Canada; and
  - each renewable and low-carbon fuel supplied to Canada in 2016 from data reported to the federal *Renewable Fuels Regulations*.
- Step 3: Calculate the weighted average carbon intensity of the liquid stream ( $CI_{\text{WAverage}}$ ), based on the energy in megajoules (MJ) of each fuel supplied in Canada in 2016 for combustion purposes.
- Step 4: Calculate the stream credit reference ( $CI_{\text{Stream Credit Reference}}$ ) based on
  - the weighted average carbon intensity of the liquid stream ( $CI_{\text{WAverage}}$ );
  - the absolute carbon intensity reduction requirement ( $CI_{\text{Absolute}}$ ) for a given compliance year (e.g., 10 g/MJ in 2030);
  - total energy in megajoules (MJ) of fossil fuels ( $TMJ_{\text{Fossil}}$ );
  - total energy in megajoules (MJ) of renewable and low-carbon fuels ( $TMJ_{\text{Renewable}}$ ) supplied in Canada in 2016 for combustion purposes.

$$CI_{\text{Stream Credit Reference}} \left( \frac{\text{g CO}_2\text{e}}{\text{MJ}} \right) = CI_{\text{WAverage}} \left( \frac{\text{g CO}_2\text{e}}{\text{MJ}} \right) - CI_{\text{Absolute}} \left( \frac{\text{g CO}_2\text{e}}{\text{MJ}} \right) * \frac{TMJ_{\text{fossil}}}{(TMJ_{\text{Fossil}} + TMJ_{\text{Renewable}})}$$

## Annex II — Clean Fuel Standard Credit Lifecycle



## INNOVATION, SCIENCE AND ECONOMIC DEVELOPMENT CANADA

### RADIOCOMMUNICATION ACT

#### **Notice No. SMSE-017-18 — Release of ICES-005, issue 5**

Notice is hereby given that Innovation, Science and Economic Development Canada (ISED) has published the following standard:

- Interference-Causing Equipment Standard ICES-005, issue 5, *Lighting Equipment* (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11152.html>).

This standard will come into force upon publication on the [official publications section](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01841.html) ([http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h\\_sf01841.html](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01841.html)) of the [Spectrum Management and Telecommunications website](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/home?OpenDocument) (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/home?OpenDocument>).

#### **General information**

The [Interference-Causing Equipment Standards list](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf06127.html) ([http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h\\_sf06127.html](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf06127.html)) will be amended accordingly.



## Submitting comments

Comments and suggestions for improving this standard may be submitted online using the [Standard Change Request form](http://www.ic.gc.ca/eic/site/ceb-bhst.nsf/frm-eng/EABV-9VCLQJ) (<http://www.ic.gc.ca/eic/site/ceb-bhst.nsf/frm-eng/EABV-9VCLQJ>).

## Obtaining copies

Copies of this notice and of documents referred to herein are available electronically on the [Spectrum Management and Telecommunications website](http://www.ic.gc.ca/spectrum) (<http://www.ic.gc.ca/spectrum>).

Official versions of notices can be viewed on the [Canada Gazette website](http://www.gazette.gc.ca/rp-pr/publications-eng.html) (<http://www.gazette.gc.ca/rp-pr/publications-eng.html>).

December 17, 2018

**Martin Proulx**

Director General

Engineering, Planning and Standards Branch

## PRIVY COUNCIL OFFICE

### *Appointment opportunities*

*We know that our country is stronger — and our government more effective — when decision-makers reflect Canada's diversity. The Government of Canada has implemented an appointment process that is transparent and merit-based, strives for gender parity, and ensures that Indigenous peoples and minority groups are properly represented in positions of leadership. We continue to search for Canadians who reflect the values that we all embrace: inclusion, honesty, fiscal prudence, and generosity of spirit. Together, we will build a government as diverse as Canada.*

*We are equally committed to providing a healthy workplace that supports one's dignity, self-esteem and the ability to work to one's full potential. With this in mind, all appointees will be expected to take steps to promote and maintain a healthy, respectful and harassment-free work environment.*

*The Government of Canada is currently seeking applications from diverse and talented Canadians from across the country who are interested in the following positions.*

### Current opportunities

The following opportunities for appointments to Governor in Council positions are currently open for applications. Every opportunity is open for a minimum of two weeks from the date of posting on the [Governor in Council Appointments website](http://www.appointments-nominations.gc.ca/slctnPrCs.asp?menu=1&lang=eng) (<http://www.appointments-nominations.gc.ca/slctnPrCs.asp?menu=1&lang=eng>).

Position	Organization	Closing date
Chief Administrator	Administrative Tribunals Support Service of Canada	
Chairperson	Asia-Pacific Foundation of Canada	
Director	Asia-Pacific Foundation of Canada	February 11, 2019
Director	Business Development Bank of Canada	

Director	Canada Council for the Arts
Chairperson	Canada Foundation for Sustainable Development Technology
Chairperson	Canada Lands Company Limited
President and Chief Executive Officer	Canada Lands Company Limited
Chairperson (joint federal Governor in Council and provincial Lieutenant Governor appointment)	Canada–Newfoundland and Labrador Offshore Petroleum Board
President and Chief Executive Officer	Canada Post Corporation
Chairperson	Canada Science and Technology Museum
Vice-Chairperson	Canada Science and Technology Museum
President and Chief Executive Officer	Canadian Commercial Corporation
Chairperson, Vice-Chairperson and Director	Canadian Energy Regulator
Lead Commissioner, Deputy Lead Commissioner and Commissioner	Canadian Energy Regulator
Chairperson	Canadian Institutes of Health Research
Vice-Chairperson	Canadian Museum for Human Rights
Vice-Chairperson	Canadian Museum of Immigration at Pier 21
Vice-Chairperson	Canadian Museum of Nature
Regional Member (Quebec)	Canadian Radio-television and Telecommunications Commission
Chairperson and Member	Canadian Statistics Advisory Council
President (Chief Executive Officer)	Canadian Tourism Commission
Chairperson	Civilian Review and Complaints Commission for the Royal Canadian Mounted Police
President and Chief Executive Officer	Defense Construction (1951) Limited
President and Chief Executive Officer	Export Development Canada
Chairperson	Farm Credit Canada
President and Chief Executive Officer	Farm Credit Canada
Vice-Chairperson	Farm Products Council of Canada
Chief Executive Officer	The Federal Bridge Corporation Limited
Commissioner	Financial Consumer Agency of Canada
Chairperson	First Nations Financial Management Board
Chief Commissioner	First Nations Tax Commission

Deputy Chief Commissioner	First Nations Tax Commission	
Director	Freshwater Fish Marketing Corporation	
Director (Federal)	Hamilton Port Authority	
Commissioner and Chairperson	International Joint Commission	
Member (appointment to roster)	International Trade and International Investment Dispute Settlement Bodies	
Chief Executive Officer	The Jacques Cartier and Champlain Bridges Incorporated	
Director	The Jacques Cartier and Champlain Bridges Incorporated	February 7, 2019
Librarian and Archivist of Canada	Library and Archives of Canada	
President and Chief Executive Officer	Marine Atlantic Inc.	
Chairperson	National Arts Centre Corporation	
Vice-Chairperson	National Arts Centre Corporation	
Chief Executive Officer	National Capital Commission	
Member	National Capital Commission	
Government Film Commissioner	National Film Board	
Director	National Gallery of Canada	
Chairperson	National Research Council of Canada	
President	Natural Sciences and Engineering Research Council of Canada	
Canadian Ombudsperson	Office of the Canadian Ombudsperson for Responsible Enterprise	
Commissioner of Competition	Office of the Commissioner of Competition	
Ombudsperson	Office of the Ombudsperson for National Defence and Canadian Forces	
Director (Federal)	Oshawa Port Authority	
Chairperson	Pacific Pilotage Authority	
Chief Executive Officer	Parks Canada	
Vice-Chairperson and Member	Patented Medicine Prices Review Board	
Panel Member	Payment in Lieu of Taxes Dispute Advisory Panel	
Master of the Mint	Royal Canadian Mint	
Chairperson and Vice-Chairperson	Royal Canadian Mounted Police External Review Committee	

Principal	Royal Military College of Canada
Director (Federal)	Saguenay Port Authority
Chairperson	Telefilm Canada
Member (Marine and Medical)	Transportation Appeal Tribunal of Canada
President and Chief Executive Officer	VIA Rail Canada Inc.

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## Footnotes

- 1 Since many greenhouse gases (GHGs) exist and their GWPs vary, the emissions are added in a common unit, CO<sub>2</sub> equivalent. To express GHG emissions in units of CO<sub>2</sub> equivalent, the quantity of a given GHG (expressed in units of mass) is multiplied by its GWP. GWPs are listed in Table 1 of this notice.
  - 2 This distinction is in accordance with that provided by the Intergovernmental Panel on Climate Change (IPCC). Source: IPCC 2006, *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (<http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>).
  - 3 Ibid.
  - 4 The Chemical Abstracts Service Registry Number (CAS RN) is the property of the American Chemical Society, and any use or redistribution, except as required in supporting regulatory requirements and/or for reports to the Government of Canada when the information and the reports are required by law or administrative policy, is not permitted without the prior, written permission of the American Chemical Society.
  - 5 The carbon intensity requirements for gaseous and solid fossil fuel primary suppliers are planned to come into effect in 2023.
  - 6 Natural gas includes liquefied natural gas and compressed natural gas.
  - 7 Propane producers include natural gas processors with fractionating capacity, straddle plants, stand-alone fractionators, refiners and upgraders that produce propane.
  - 8 Natural gas distributors include transmission pipeline companies for direct sales and distribution companies.
  - 9 The contract for the development of the Fuel Life Cycle Assessment Modelling Tool was awarded to EarthShift Global. The Government of Canada Technical Advisory Committee, led by Environment and Climate Change Canada with representatives from Agriculture and Agri-Food Canada, Natural Resources Canada, and the National Research Council of Canada, is supporting this work.
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## Government of Canada activities and initiatives

### [#YourBudget2018 – Advancement](#)



([https://www.budget.gc.ca/2018/docs/themes/advancement-advancement-en.html?utm\\_source=CanCa&utm\\_medium=Activities\\_e&utm\\_content=Advancement&utm\\_campaign=CAbdgt18](https://www.budget.gc.ca/2018/docs/themes/advancement-advancement-en.html?utm_source=CanCa&utm_medium=Activities_e&utm_content=Advancement&utm_campaign=CAbdgt18))  
Advancing our shared values

### **#YourBudget2018 – Reconciliation**



([https://www.budget.gc.ca/2018/docs/themes/reconciliation-reconciliation-en.html?utm\\_source=CanCa&utm\\_medium=%20Activities\\_e&utm\\_content=Reconciliation&utm\\_campaign=CAbdgt18](https://www.budget.gc.ca/2018/docs/themes/reconciliation-reconciliation-en.html?utm_source=CanCa&utm_medium=%20Activities_e&utm_content=Reconciliation&utm_campaign=CAbdgt18))  
Advancing reconciliation with Indigenous Peoples

### **#YourBudget2018 – Progress**



([https://www.budget.gc.ca/2018/docs/themes/progress-progres-en.html?utm\\_source=CanCa&utm\\_medium=Activities\\_e&utm\\_content=Progress&utm\\_campaign=CAbdgt18](https://www.budget.gc.ca/2018/docs/themes/progress-progres-en.html?utm_source=CanCa&utm_medium=Activities_e&utm_content=Progress&utm_campaign=CAbdgt18))  
Supporting Canada's researchers to build a more innovative economy