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ENERGY CONSERVATION ACT
(CHAPTER 92C)

ENERGY CONSERVATION
(GREENHOUSE GAS MEASUREMENT
AND REPORTING) REGULATIONS 2017

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In exercise of the powers conferred by section 78 of the Energy Conservation Act, the Minister for the Environment and Water Resources makes the following Regulations:

PART 1**PRELIMINARY****Citation and commencement**

1. These Regulations are the Energy Conservation (Greenhouse Gas Measurement and Reporting) Regulations 2017 and come into operation on 1 January 2018.

Definitions

2. In these Regulations, unless the context otherwise requires —

“activity data” means data that —

- (a) is about the amount of materials (including fuels and feedstock) consumed or produced by a process or activity; and
- (b) is used or to be used to compute direct GHG emissions;

“Agency’s website” means the website of the Agency at <http://www.nea.gov.sg>;

“base calendar year”, in relation to a reportable business, means 2016 or any subsequent year during which the direct GHG emissions of a business activity or premises at a single site first exceed the prescribed threshold;

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- “business activity or premises” includes part of a business activity or premises;
- “carbon dioxide equivalent” means the carbon dioxide equivalent of a greenhouse gas obtained by multiplying the mass of the gas by the global warming potential that is specified in the third column of the Schedule against that gas;
- “chief executive” has the same meaning as in the Energy Conservation (Energy Management Practices) Regulations 2013 (G.N. No. S 246/2013);
- “conversion factor” means a conversion quantity, conversion ratio or conversion fraction used to compute direct GHG emissions from activity data;
- “direct GHG emissions”, in relation to a business activity or premises at a single site, means the greenhouse gases that are released into the atmosphere from the business activity or premises;
- “energy” has the same meaning as in the Energy Conservation (Registrable Corporations) Order 2013 (G.N. No. S 248/2013);
- “feedstock” means any fuel or energy commodity that is used as raw material to produce products containing carbon;
- “fuel” means any of the fuels mentioned in the First Schedule of the Energy Conservation (Registrable Corporations) Order 2013;
- “greenhouse gas” or “GHG” means a greenhouse gas mentioned in the first column of the Schedule having the chemical formula mentioned in the second column of that Schedule against that gas;
- “monitoring plan” includes a monitoring plan that is revised under regulation 7;
- “prescribed biomass and fuel derived from biomass” means any biomass and fuel derived from biomass mentioned under item 7 in Part I of the First Schedule to the Energy Conservation (Registrable Corporations) Order 2013;

“prescribed period” means the relevant period prescribed in regulation 10;

“prescribed threshold” means the threshold prescribed in regulation 3(1);

“reportable business”, for a registered corporation, has the meaning given by regulation 4.

Prescribed threshold

3.—(1) The prescribed threshold for the purposes of sections 26C(1) and 27(2) of the Act is the total direct GHG emissions having a carbon dioxide equivalent of 25,000 tonnes from any business activity or premises at a single site under the operational control of a registered corporation, in a calendar year.

(2) In determining whether the prescribed threshold has been exceeded, emissions of the following greenhouse gases are excluded:

- (a) nitrogen trifluoride;
- (b) carbon dioxide from any prescribed biomass and fuel derived from biomass.

Reportable businesses

4.—(1) For the purposes of these Regulations, a business activity or premises at a single site under the operational control of a registered corporation becomes a reportable business of the registered corporation immediately after the end of the year in which the total direct GHG emissions from the business activity or premises exceeds the prescribed threshold.

(2) For the purposes of these Regulations, a business activity or premises at a single site under the operational control of a registered corporation ceases to be a reportable business of the registered corporation at the earliest of the following:

- (a) the day the registered corporation ceases to have operational control over the business activity or premises;

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- (b) where the direct GHG emissions from the business activity or premises do not exceed the prescribed threshold for 3 continuous years, the end of the last of those years;
- (c) where —
- (i) any modification (including by way of any addition or removal) to any work process of the business activity or premises or to any building or infrastructure at the business premises or part is completed;
 - (ii) the total direct GHG emissions from the business activity or premises in the year in which the modification is completed does not exceed the prescribed threshold; and
 - (iii) the Director-General is satisfied that the total direct GHG emissions from the business activity or premises will not exceed the prescribed threshold in each of the 2 consecutive years immediately following,

the end of the year in which the modification is completed.

(3) In order to be satisfied of the matters mentioned in paragraph (2)(c), the Director-General may require the registered corporation concerned to provide to the Director-General such information and documents in relation to those matters as are specified by the Director-General.

(4) To avoid doubt, any business activity or premises of a registered corporation which ceases under paragraph (2) to be a reportable business can become a reportable business of the registered corporation again under paragraph (1).

PART 2
MONITORING PLANS

Monitoring plans of reportable businesses

5. For the purpose of section 26C (read with section 31A) of the Act, a registered corporation must ensure that a separate monitoring plan is prepared in accordance with this Part for each of its reportable businesses.

Content of monitoring plans

- 6.—(1) For the purposes of regulation 5, a monitoring plan must —
- (a) be in the form specified by the Director-General;
 - (b) set out all the processes and activities that result in direct GHG emissions from the reportable business;
 - (c) set out —
 - (i) every primary method, step and procedure used or to be used to compute the total direct GHG emissions from the reportable business; and
 - (ii) every alternative method, step or procedure that is used or to be used if any primary method, step or procedure is no longer suitable or available in any particular circumstances that arise;
 - (d) set out a quality management framework to ensure the integrity of the process of, and the computation of, the total direct GHG emissions from the reportable business; and
 - (e) include all supporting documents to substantiate the matters in sub-paragraphs (b), (c) and (d).
- (2) Every method, step and procedure mentioned in paragraph (1)(c) must —
- (a) be appropriate for the reportable business;
 - (b) enable the total direct GHG emissions from the reportable business to be accurately computed; and

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- (c) be based on technical or scientific considerations that establish the appropriateness, accuracy and completeness of the method, step and procedure.

(3) The quality management framework mentioned in paragraph (1)(d) must include procedures to ensure all of the following:

- (a) that all direct GHG emissions sources and streams from the reportable business are reported and all direct GHG emissions from the reportable business are computed;
- (b) that every method, step and procedure mentioned in paragraph (1)(c) is appropriate, and periodically reviewed to ensure its continued appropriateness;
- (c) that all data (including activity data) is accurately collected and checked;
- (d) that the data submitted in the enhanced emissions reports of the registered corporation under regulation 11 is accurate and complete;
- (e) that every measurement system, equipment, tool or device used by the registered corporation to compute the total direct GHG emissions from the reportable business is properly maintained and calibrated;
- (f) that there is no conflict of interest between the person computing the total direct GHG emissions from the reportable business and the person checking the computation;
- (g) that proper records are kept of any changes to any methods, steps or procedures for the collection of data (including activity data) and the computation of the total direct GHG emissions from the reportable business.

(4) The supporting documents mentioned in paragraph (1)(e) must include —

- (a) diagrams showing —
 - (i) the location of the processes and activities mentioned in paragraph (1)(b);

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- (ii) the location of any equipment, system, metering instrument and measurement and sampling point used in such process or activity; and
 - (iii) the flow of any material consumed or produced in such process or activity;
 - (b) documents that substantiate every method, step and procedure mentioned in paragraph (1)(c);
 - (c) where the monitoring plan specifies a conversion factor that is not a default conversion factor determined by the Director-General, documents showing that the conversion factor so specified enables the direct GHG emissions from the reportable business to be more accurately computed; and
 - (d) where the monitoring plan specifies a net calorific value of a fuel used by the registered corporation in its reportable business that is not a default net calorific value determined by the Director-General, a report confirming the net calorific value of the fuel so specified based on a test conducted by a laboratory in accordance with —
 - (i) the relevant standard of the ASTM International;
 - (ii) the relevant standard of the International Organization for Standardization (ISO); or
 - (iii) any other similar testing standard specified by the Director-General.
- (5) The monitoring plan and its supporting documents must be endorsed by the chief executive or an equivalent person of the registered corporation.

Revision of monitoring plan

7.—(1) A registered corporation must revise its monitoring plan or any supporting document for a monitoring plan, or both, if there is any change in any of the matters set out in the monitoring plan or supporting document.

(2) Where the change mentioned in paragraph (1) is a significant change, the monitoring plan and its supporting documents, as revised, must be endorsed by the chief executive or an equivalent person of the registered corporation.

(3) In paragraph (2), “significant change”, for a monitoring plan relating to a reportable business, means any of the following:

- (a) a change (including an addition) in any process or activity that results in any direct GHG emission that was not previously emitted from a source or stream being emitted, or any new direct GHG emissions source or stream, from the reportable business;
- (b) a change in any materials (including fuels and feedstock) consumed or produced in any process or activity of the reportable business;
- (c) a change in any primary or alternative method, step or procedure mentioned in regulation 6(1)(c) that is set out in the monitoring plan; but not if the change is, in a case where the default conversion factor determined by the Director-General is being used, the Director-General changes the default conversion factor.

Submission of monitoring plans

8.—(1) A registered corporation must submit every monitoring plan and its supporting documents to the Director-General for the Director-General’s approval —

- (a) through the Agency’s website, or in such other manner as the Director-General may allow in any particular case; and
- (b) by the applicable time in paragraph (2) or (3).

(2) Where the submission is of a monitoring plan and its supporting documents, neither of which has been revised under regulation 7, the applicable time is —

- (a) subject to sub-paragraph (b), not later than 31 December of the year immediately following the base calendar year of the reportable business; or

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- (b) not later than 30 June 2018, if the registered corporation is required to submit a report under section 27(1) of the Act (as in force before 1 January 2018) in respect of the year 2016.
- (3) Where the submission is of a monitoring plan and its supporting documents, either or both of which have been revised under regulation 7, the applicable time is —
- (a) if the revision was for a change other than a significant change (as defined in regulation 7(3)), not later than 31 January of the year immediately following the year after the change occurred; and
- (b) if the revision was for such significant change, within 30 days after the change occurred.

Independent third party assessment of monitoring plans

- 9.—(1) An independent third party appointed by a registered corporation pursuant to section 26C(5) of the Act must have, to the Director-General's satisfaction, sufficient knowledge in and experience with pertinent matters to —
- (a) assess a monitoring plan and its supporting documents for a reportable business under paragraph (3); and
- (b) submit a report on an assessment of the monitoring plan and its supporting documents under paragraph (4).
- (2) The pertinent matters for the purpose of paragraph (1) are —
- (a) the measurement, reporting and verification of energy and greenhouse gas emissions in an industry relevant to the reportable business;
- (b) these Regulations; and
- (c) any other matter specified by the Director-General that is relevant to the assessment of monitoring plans and submission of reports on such assessments.
- (3) The assessment required by paragraph (1)(a) is an assessment as to whether —

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- (a) the monitoring plan and its supporting documents are in compliance with these Regulations;
 - (b) the supporting documents are complete and consistent with the monitoring plan; and
 - (c) the monitoring plan has any material omission or misstatement in relation to any primary or alternative method, step or procedure used or to be used to compute the total direct GHG emissions from the reportable business.
- (4) The report on an assessment required by paragraph (1)(b) must include —
- (a) the objectives and scope of the assessment;
 - (b) the criteria used by the independent third party to assess the monitoring plan, where applicable;
 - (c) the description of any non-conformity with any actual process or activity of the reportable business, and how it is resolved;
 - (d) the dates when visits to the registered corporation's premises were made and by whom;
 - (e) any recommendation for any improvement to be made by the registered corporation; and
 - (f) a statement as to whether —
 - (i) the monitoring plan accurately reflects the processes and activities of the reportable business; and
 - (ii) the monitoring plan and its supporting documents comply with these Regulations.

PART 3

ENHANCED EMISSIONS REPORTS

Prescribed periods for enhanced emissions reports

10.—(1) For the purpose of section 27(2) of the Act, the prescribed period in respect of which an enhanced emissions report for a

reportable business of a registered corporation must be submitted in each year, beginning with —

- (a) subject to paragraph (2), where regulation 8(2)(a) applies, the second year after the base calendar year of the reportable business; and
- (b) where regulation 8(2)(b) applies, the calendar year 2019.

(2) Despite paragraph (1)(a), if the Director-General approves the monitoring plan of the registered corporation in the second year after the base calendar year of the reportable business, then the prescribed period is the remainder of the second calendar year after the date of the Director-General's approval.

Illustration

Assuming a base calendar year to be 2019, then the monitoring plan must be submitted by 31 December 2020 (under regulation 8(2)(a)), and the first prescribed period is 2021. However, if the monitoring plan is only approved in 2021, for example, on 3 February 2021, then the first prescribed period is 4 February 2021 to 31 December 2021, both dates inclusive (with subsequent prescribed periods being a calendar year each from 2022).

Content of enhanced emissions reports

11.—(1) An enhanced emissions report for a prescribed period must —

- (a) be in the form specified by the Director-General;
- (b) set out all activity data for the reportable business;
- (c) set out the computation for each direct GHG emission from the reportable business based on the monitoring plan approved for the prescribed period, and specify whether the computation is based on a primary or an alternative method, step or procedure;
- (d) specify the total direct GHG emissions from the reportable business;
- (e) comply with all other requirements specified by the Director-General; and

(f) include supporting documents in relation to sub-paragraphs (b) to (e).

(2) For the purpose of paragraph (1)(c), subject to paragraph (3), an alternative method, step or procedure may be used in the computation of direct GHG emissions on any one or more days, and if on more than one day, whether or not the days are continuous, in the prescribed period.

(3) The total number of days under paragraph (2) must not exceed 90.

(4) The enhanced emissions report and its supporting documents must be endorsed by the chief executive or an equivalent person of the registered corporation.

Submission of enhanced emissions reports

12. A registered corporation must submit every enhanced emissions report and its supporting documents to the Director-General for the Director-General's approval —

- (a) through the Agency's website, or in such other manner as the Director-General may allow in any particular case; and
- (b) no later than 30 June of the year immediately following the end of the prescribed period to which the enhanced emissions report relates.

PART 4

MISCELLANEOUS

Records to be kept

13.—(1) A registered corporation must keep and maintain complete and accurate records of the following information and documents in relation to each of its reportable businesses:

- (a) all monitoring plans and enhanced emissions reports, and their supporting documents, that are approved by the Director-General for the reportable business;

(b) all information (including data) and documents that the registered corporation relied on in preparing any monitoring plan or enhanced emissions report for the reportable business.

(2) For the purpose of section 29(2)(a) of the Act, the prescribed period for which the information and documents must be kept is at least 5 years after the date on which the information in question is received or the document in question is received or created, as the case may be.

(3) The registered corporation may keep and maintain the information and documents mentioned in paragraph (1) in electronic form.

Errors or omissions in monitoring plans and enhanced emissions reports

14.—(1) Where a registered corporation discovers any error or omission in any monitoring plan or enhanced emissions report prepared by it (whether or not already approved by the Director-General), the registered corporation must, within 7 working days after the discovery, give notice to the Director-General containing the following:

- (a) a description of the error or omission, and the correction that is to be made or, where applicable, that has been made;
- (b) the circumstances that led to the error or omission;
- (c) where applicable, an estimate of the direct GHG emissions represented by the error or omission.

(2) The Director-General may in writing direct the registered corporation to, within the time period specified in the direction (or such longer time as the Director-General may allow in any particular case), resubmit for the Director-General's approval a monitoring plan or enhanced emissions report which is revised to incorporate the corrections specified by the Director-General in the direction; and the registered corporation must comply with the direction.

(3) A registered corporation that fails to comply with a direction under paragraph (2) shall be guilty of an offence and shall be liable on conviction to a fine not exceeding \$10,000.

Appointment of GHG manager

15.—(1) A registered corporation must appoint at least one individual as a GHG manager for each of its reportable businesses.

(2) Paragraph (1) does not prevent the same individual from being appointed as a GHG manager for more than one reportable business of the registered corporation.

(3) The GHG manager must have any of the following qualifications or experience:

- (a) Singapore Certified Energy Manager (certified by the Institution of Engineers, Singapore);
- (b) qualifications or at least 3 years' experience in any of the following fields, where the Director-General is satisfied that such qualifications or experience will enable the GHG manager to properly carry out the duties of the GHG manager:
 - (i) energy management;
 - (ii) energy auditing;
 - (iii) GHG emissions computation;
 - (iv) GHG accounting;
 - (v) any standard of ISO 14064;
 - (vi) any standard of ISO 50001;
- (c) at least 3 years' experience in the operational processes and activities of the reportable business, where the Director-General is satisfied that such experience will enable the GHG manager to properly carry out the duties of a GHG manager.

(4) The registered corporation must, within 30 days after appointing a GHG manager, provide the following to the Director-General:

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- (a) the name and contact details of the GHG manager, and the position of the GHG manager within the registered corporation;
 - (b) a copy of the certification of the GHG manager as a Singapore Certified Energy Manager, or evidence of the GHG manager's qualification or experience mentioned in paragraph (3)(b) or (c);
 - (c) such other evidence or particulars as the Director-General considers necessary to determine that the GHG manager is able to properly carry out the duties of a GHG manager.
- (5) The GHG manager must —
- (a) prepare the monitoring plans, enhanced emissions reports, and their supporting documents for each reportable business in accordance with these Regulations;
 - (b) submit the monitoring plans, enhanced emissions reports, and their supporting documents for a reportable business in accordance with these Regulations, together with a statement that the same are, to the best of the knowledge of the GHG manager, complete and accurate for the reportable business;
 - (c) assist the registered corporation in complying with these Regulations; and
 - (d) provide such information and documents to the Director-General as the Director-General may require in relation to the monitoring plans, enhanced emissions reports, and their supporting documents.
- (6) If the registered corporation has appointed only one individual as a GHG manager for a reportable business and that individual ceases to be so appointed for any reason, the registered corporation —
- (a) must appoint another individual as a replacement GHG manager within 3 months after the firstmentioned individual ceases to be appointed as a GHG manager; and
 - (b) may, pending the appointment of the replacement GHG manager, designate any employee of the registered

corporation to undertake the duties of a GHG manager mentioned in paragraph (5) (whether or not the employee has the qualifications or experience mentioned in paragraph (3)).

Measurement systems, equipment, tools and devices

16.—(1) A registered corporation must, in relation to any measurement system, equipment, tool or device used by it to compute the direct GHG emissions from a reportable business of the registered corporation —

- (a) maintain the same in good working order for optimal operation during the operating hours of the registered corporation; and
- (b) make the same available for physical inspection if required by the Director-General or any authorised officer.

(2) A registered corporation that fails to comply with paragraph (1) shall be guilty of an offence and shall be liable on conviction to a fine not exceeding \$10,000.

THE SCHEDULE

Regulation 2

GLOBAL WARMING POTENTIAL

<i>First column</i>	<i>Second column</i>	<i>Third column</i>
<i>Name of greenhouse gas</i>	<i>Chemical formula of greenhouse gas</i>	<i>Global warming potential of greenhouse gas</i>
1. Carbon dioxide	CO ₂	1
2. Methane	CH ₄	21
3. Nitrous oxide	N ₂ O	310
4. Sulphur hexafluoride	SF ₆	23900
5. Nitrogen trifluoride	NF ₃	17200
6. The following hydrofluorocarbons (HFCs):		

THE SCHEDULE — *continued*

<i>First column</i>	<i>Second column</i>	<i>Third column</i>
<i>Name of greenhouse gas</i>	<i>Chemical formula of greenhouse gas</i>	<i>Global warming potential of greenhouse gas</i>
(a) HFC-23	CHF ₃	11700
(b) HFC-32	CH ₂ F ₂	650
(c) HFC-41	CH ₃ F	150
(d) HFC-125	CHF ₂ CF ₃	2800
(e) HFC-134	CHF ₂ CHF ₂	1000
(f) HFC-134a	CH ₂ FCF ₃	1300
(g) HFC-143	CH ₂ FCHF ₂	300
(h) HFC-143a	CH ₃ CF ₃	3800
(i) HFC-152	CH ₂ FCH ₂ F	53
(j) HFC-152a	CH ₃ CHF ₂	140
(k) HFC-161	CH ₃ CH ₂ F	12
(l) HFC-227ea	CF ₃ CHFCF ₃	2900
(m) HFC-236cb	CH ₂ FCF ₂ CF ₃	1340
(n) HFC-236ea	CHF ₂ CHFCF ₃	1370
(o) HFC-236fa	CF ₃ CH ₂ CF ₃	6300
(p) HFC-245ca	CH ₂ FCF ₂ CHF ₂	560
(q) HFC-245fa	CHF ₂ CH ₂ CF ₃	1030
(r) HFC-365mfc	CH ₃ CF ₂ CH ₂ CF ₃	794
(s) HFC-43-10mee	CF ₃ CHFCHFCF ₂ CF ₃	1300
7. The following perfluorocarbons (PFCs):		
(a) PFC-14	CF ₄	6500
(b) PFC-116	C ₂ F ₆	9200
(c) PFC-218	C ₃ F ₈	7000
(d) PFC-318	c-C ₄ F ₈	8700

THE SCHEDULE — *continued*

<i>First column</i>	<i>Second column</i>	<i>Third column</i>
<i>Name of greenhouse gas</i>	<i>Chemical formula of greenhouse gas</i>	<i>Global warming potential of greenhouse gas</i>
(e) PFC-3-1-10	C ₄ F ₁₀	7000
(f) PFC-4-1-12	C ₅ F ₁₂	7500
(g) PFC-5-1-14	C ₆ F ₁₄	7400

Made on 11 December 2017.

ALBERT CHUA
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Ministry of the Environment and
Water Resources,
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