Environmental Guidelines

318-2

Energy Measurement and Conservation

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ENVIRONMENTAL GUIDELINES (EG) – ENERGY MEASUREMENT AND CONSERVATION

PRIMARY GOALS

To reduce the emissions of gases that have a global warming potential [CO_2].

To contribute, through energy efficiency, to cost savings, to the conservation of natural resources and to the reduction of atmospheric releases associated with energy production and use.

SPECIFIC OBJECTIVES

To promote effective and responsible management of energy consumption in Correctional Service of Canada's institutions through CSC's Energy Monitoring Protocol, a program to track energy use on a regular basis.

To reduce the harmful environmental impacts of using energy in building and equipment at CSC institutions. The principal impacts are: the climate change caused by CO_2 emissions, the smog caused by emissions of NO_x and particulate matter, and the acid rain caused by SO_x and NO_x emissions.

To implement a system for the monitoring of energy consumption in institutions. The system will make it possible to:

- gather, record and save reliable, auditable energy data on a regular and ongoing basis;
- formally manage this environmental aspect of the Sustainable Development Strategy;
- monitor results and hence obtain an ongoing measure of environmental performance.

AUTHORITIES

Correctional Service of Canada Commissioner's Directive 318 – Environmental Programs.

Sustainable Development Strategy (SDS) of the Correctional Service of Canada.

*G*overnment of Canada Action Plan 2000 on Climate Change*,* 2000.

Kyoto Protocol on the reduction of atmospheric emissions which contribute to climate changes, 1997.

National Action Program on Climate Change, 1995.

Federal Action Program on Climate Change, 1995.

United Nations Framework Convention on Climate Change (UNFCCC), 1992.

SECTION 1 – DEFINITIONS, RESPONSIBILITIES AND SCOPE

DEFINITIONS / ACRONYMS

For the purpose of these Environmental Guidelines:

CO_2 – a gas [carbon monoxide] contributing to global warming (climate change).

HVAC systems – Heating, ventilation and air conditioning systems.

m^2 – Square meter.

MJ – Megajoule, an energy unit.

NO_x – A set of compounds [nitrogen oxydes] contributing to acid rain and smog.

SO_x – A set of compounds [sulfur oxydes] contributing to acid rain.

RESPONSIBILITIES

The Institutional Head, his or her assistants and the Corcan Operations Managers are accountable to ensure compliance with these Environmental Guidelines.

The Chief, Plant Maintenance (CPM) will normally be the person responsible for implementing and monitoring these Environmental Guidelines, so that energy consumption may be managed using the Energy Monitoring Protocol (see the example in Annex A) from a central point in the institution.

SCOPE

All Correctional Service of Canada's institutions and other buildings owned by CSC are subject to these Environmental Guidelines.

SECTION 2 – GENERAL REQUIREMENTS

1. The CPM should put in place mechanisms and procedures that will allow for the monitoring of energy consumption and hence energy-efficient practices.

SECTION 3 – SPECIFIC REQUIREMENTS

ENERGY MONITORING

1. The CPM should ensure that the energy data from various sources (electricity, natural gas, heating oil, propane, diesel oil) is entered in the Energy Monitoring Protocole as soon as possible after the invoices are available. The most effective way to accomplish this is likely to be at the time the invoices have to be verified by the CPM and approved for payment.

Note: The Protocol tracks the total amount of energy, except for vehicle fuel, that is purchased by each institution or complex. Where two or more institutions' use of energy is reported on a common bill, metered data should be used to prorate the relative portions of the total energy purchased that is used by each institution. The timing of the meter readings used for prorating should correspond with the timings reported on the utility bills.

2. To allow better control of an institution's energy use, the CPM, should identify the institution's principal energy-using areas or functions and, to the extent practical, ensure that the main type of energy used in each area is metered. The officer having custody (the custodian) of each separately metered function or area should be formally identified.

Note: Examples of areas that should be separately metered: a large Corcan compost facility, a large multi-institution laundry, a water or sewage treatment facility, a cogeneration installation, a set of barns, an abattoir, a large warehouse, or a large central kitchen serving an adjacent institution.

3. The CPM will report the energy performance results and action plans at the quarterly meetings of the Environmental Management Committee.

ENERGY CONSERVATION

4. In accordance with the results obtained through use of the Protocol, an institutional action plan for energy conservation must be drawn up, implemented and maintained.

5. At least once annually, the CPM will cause a review of the institution's energy systems to take place in order to ensure that they are being properly maintained. An annual tune-up of each boiler will provide updated data concerning its CO_2 emissions and efficiency characteristics.

6. It is a good and cost-effective practice to ensure that capital projects undertaken by the institution are energy-efficient. Such reviews should be kept as part of the Environmental Management System (EMS) records.

7. Buildings and spaces that are not currently required should be "mothballed" (shutdown) in a manner that reduces their energy use to practical limits.

8. The CPM should ensure that, where available for an acceptable price, the institution uses low-sulfur no. 2 oil and diesel fuel, or diesel oil blended with alcohol.

SECTION 4 – DATA MANAGEMENT AND REPORTING

1. Every month, at a time when all invoices for the previous month are deemed to have come in and been logged, the CPM or his or her representative should examine the spreadsheets in the Energy Monitoring Protocol and compare the institution's total energy use for the current year with that for the comparable period in the previous year.

2. The CPM should establish a communication program whereby results are regularly posted for the benefit of staff. This could take the form of a chart showing progress over time (see example in Annex B).

3. On-site records of source documents (i.e. invoices, meter readings) must be kept and be integrated into the appropriate section of the institution's Environmental Management System (EMS).

4. All the documents required in these Environmental Guidelines (data on energy consumption, energy-saving projects, records) must be kept on site for at least ten years.

SECTION 5 – REFERENCES

1. Government of Canada **Climate Change** home page at: http://climatechange.gc.ca/english/index.shtml.

2. Environment Canada infonet site (The Green Lane) on **Climate Change** at: http://www.ec.gc.ca/climate/home-e.html.

3. Environment Canada infonet site on the **Kyoto Protocol** at: http://www.ec.gc.ca/climate/kyoto-e.html.

4. Environment Canada infonet site on **Greenhouse Gases (GHG)** at: http://www.ec.gc.ca/pdb/ghg/ghg_home_e.cfm.

5. Natural Resources Canada **[Energy Sector]** infonet site at: http://www.nrcan.gc.ca/es/main_e.htm.

6. Natural Resources Canada **[CANMET – Energy Technology Branch]** infonet site at: http://www.nrcan.gc.ca/es/etb/index.html.

7. Natural Resources Canada **[CANMET – Federal Industrial Boiler Program]** infonet site at: http://www.nrcan.gc.ca/es/etb/cetc/cetc01/htmldocs/programs_fibp_e.html.

8. Natural Resources Canada **[CANMET – Renewable Energy Technologies Group]** infonet site at: http://www.nrcan.gc.ca/es/etb/cetc/cetc01/htmldocs/programs_ret_e.html.

9. Natural Resources Canada **[Office of Energy Efficiency]** infonet site at: http://oee.nrcan.gc.ca/english/.

10. National Action Program on Climate Change, see: http://www.ec.gc.ca/climate/resource/cnapcc/.

11. Federal Action Program on Climate Change, see: http://www.ec.gc.ca/climate/resource/fapcc/index.html.

12. Government of Canada Action Plan 2000 on Climate Change, see: http://www.climatechange.gc.ca/english/whats_new/pdf/gofcdaplan_eng2.pdf.

13. Environment Canada's **Oil, Gas and Energy Branch** infonet site at: http://www.ec.gc.ca/oged-dpge/level1e/what_we_doe.htm.

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ANNEX A

Energy Monitoring Protocol:
Sample Institutional Results for One Year

Institution:			Energy Performance FY 1999-00				
			Q1	Q2	Q3	Q4	Year
	Building Area [from HQ]	m^2	37 780	37 780	37 780	37 780	
Energy Use per Unit Area	Electricity	MJ/m^2	133,4	132,3	154,6	155,1	**575,5**
	Fuel oil	MJ/m^2	223,6	174,9	366,1	316,5	**1 081,1**
	Natural gas	MJ/m^2	-	-	-	-	**-**
	Propane	MJ/m^2	1,6	1,5	1,8	0,6	**5,6**
	Diesel fuel	MJ/m^2	2,2	6,7	21,3	-	**30,2**
	Total for FY 1999-00	MJ/m^2	**360,9**	**315,4**	**543,8**	**472,3**	**1 692,4**

ANNEX B

Sample Institutional Report – Energy Consumption

Month (2001-2002)	Average energy consumption (megajoules/m^2)
January	195
February	180
March	165
April	155
May	130
June	75
July	100
August	90
September	125
October	145
November	155
December	170

Energy Consumption / 2001-2002
Institution X