

KNOWLEDGE INFRASTRUCTURE PROGRAM

WORK SHEET FOR SUBSTANTIAL COMPLETION CARBON EMISSIONS REPORTING

Work Sheet for Calculating Carbon Emissions Renovations, Repairs and Maintenance (RRM) Projects

Purpose: To collect carbon, or greenhouse gas (GHG), emission avoidance information as part of final "Project Close-Out Report" for Industry Canada regarding the Federal Economic Stimulus Program – Knowledge Infrastructure Program (KIP). This form applies only to Renovation, Repair and Maintenance projects.

Instructions: Please complete each field as required on this worksheet. The most appropriate person to complete this document is the Mechanical Engineer or Architect. Provide calculations to support the results provided as an attachment to the KIP Project Close-Out Report. Please complete the appropriate section of the KIP Close-Out Report using information from this worksheet.

GREENHOUSE GAS (GHG) EMISSIONS REDUCTIONS

In order to create consistency between the GHG calculations provided in the KIP Close-Out Reports for each project, it is requested that the GHG emission factors provided in this document be used.

GHG EMISSION FACTORS

GHG emissions are produced from energy consumed in order to provide lighting, heating, cooling, and power for equipment within facilities. For the purpose of this project two basic categories of buildings-related GHG emissions must be tracked, as summarized below:

1. Direct emissions from consuming fossil and biomass fuels burned in furnaces, boilers, and other stationary combustion equipment;
2. Indirect emissions through the consumption of purchased electricity and steam

The emission factors¹ for direct emissions are summarized in Table 1, and for indirect emissions associated with electricity and purchased steam are summarized in Table 2 and Table 3 respectively.

Table 1: Direct Emissions GHG Emission Factors

Fuel Type	Emission Factor	
	tCO ₂ e/GJ	tCO ₂ e/GWh
Natural Gas	0.0503	181
Propane	0.0610	220
Light Fuel Oil	0.0705	254
Heavy Fuel Oil	0.0740	266
Kerosene	0.0675	243
Diesel Fuel	0.0728	262
Gasoline	0.0675	243
Wood/Wood Waste	0.0531	191

¹ Source: "Emission Factors for Use in Reporting Public Sector Greenhouse Gas Emissions, version 2.0, Prepared for Climate Action Secretariat, MOE, by Shared Services BC, dated September 15, 2009"

Table 2: Indirect Emission Factors - Electricity

Public Utility	Emission Factor	
	tCO ₂ e/GJ	tCO ₂ e/GWh
BC Hydro	0.0072	26
FortisBC	0.0017	6
City of Grand Forks	0.0017	6
City of Kelowna	0.0017	6
Nelson Hydro	0.0008	3
City of New Westminster	0.0072	26
City of Penticton	0.0017	6
City of Summerland	0.0017	6

Table 3: Indirect Emission Factors – Purchased Steam

Steam Production Fuel Source	Emission Factor	
	tCO ₂ e/GJ	tCO ₂ e/GWh
Natural Gas	0.0774	279
Light Fuel Oil	0.1084	390
Heavy Fuel Oil	0.1138	410
Diesel Fuel	0.1121	403
Wood Waste	0.0818	295
*Based on an assumed 65 percent steam boiler efficiency.		

Greenhouse Gas (GHG) Emissions Reductions

In order to create consistency between the GHG calculations provided in the KIP Close-Out Reports for each project, it is requested that the GHG emission factors provided in this worksheet be used. Provide an estimate of greenhouse gas emissions reductions in Tonnes of equivalent carbon dioxide per year (Tonnes CO₂e/year) that will be achieved, including a breakdown as follows:

	GHG Emission Reductions Tonnes CO ₂ e/year	Comments / Instructions
Direct		Direct emissions reductions from fossil fuel and/or biomass savings.
Indirect		Indirect emissions reductions from electricity and/or steam savings.
Total		Total estimate of greenhouse gas emissions reductions (sum of above)