MODULE	ENERGY
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)
WORKSHEET	1-2 STEP BY STEP CALCULATIONS
SHEET	4 OF 16 MANUFACTURING INDUSTRIES AND CONSTRUCTION

	STEP 4			STEP 5		STEP 6
	G	H	I	J	K	L
Manufacturing Industries and Construction	Fraction of Carbon Stored[a]	Carbon Stored (Gg C)[a]	Net Carbon Emissions (Gg C)	Fraction of Carbon Oxidised	Actual Carbon Emissions (Gg C)	Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(K x [44/12])
Crude Oil						
Natural Gas Liquids						
Gasoline						
Jet Kerosene						
Other Kerosene						
Gas/Diesel Oil		(b)				
Residual Fuel Oil						
LPG		(b)				
Ethane		(b)				
Naphtha		(b)				
Lubricants	(c)					
Petroleum Coke						
Refinery Gas						
Anthracite						
Coking Coal						
Other Bituminous Coal						
Sub-Bituminous Coal						
Lignite						
Peat						
Patent Fuel						
Brown Coal Briquettes						
Coke Oven Coke						
Gas Coke						
Gas Works Gas						
Coke Oven Gas						
Blast Furnace Gas						
Natural Gas		(b)				
Municipal Solid Waste						
Industrial Waste						
					Total	
Memo items:						
Wood/Wood Waste						
Charcoal						
Other Solid Biomass						
Liquid Biomass						
Gaseous Biomass						
					Total Biomass	

(a) For naphtha, natural gas, gas/diesel oil, LPG and any other fuels used as feedstocks, do not fill out Column G. Complete Column H, using Auxiliary Worksheet 1-2.

(b) Use Auxiliary Worksheet 1-2 to fill out the cells for these products.

(c) Use a value of 0.5 for lubricants.

MODULE	ENERGY					
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)					
WORKSHEET	1-2 STEP BY STEP CALCULATIONS					
SHEET	5 OF 16 TRANSPORT					
	STEP 1	STEP 2		STEP 3		
Transport	A Consumption	B Conversion Factor (TJ/unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E x 10^{-3})
Domestic Aviation[(a)]						
Gasoline						
Jet Kerosene						
		Subtotal				
Road Transport						
Natural Gas						
LPG						
Gasoline						
Gas/Diesel Oil						
		Subtotal				
Rail Transport						
Gas/Diesel Oil						
Residual Fuel Oil						
Anthracite						
Other Bituminous Coal						
Coke Oven Coke						
		Subtotal				
National Navigation[(a)]						
Gasoline						
Gas/Diesel Oil						
Residual Fuel Oil						
Lubricants						
Sub-Bituminous Coal						
		Subtotal				
Pipeline Transport						
Natural Gas						
		Subtotal				
		Total Transport[(a)]				
Memo items:						
Liquid Biomass						
		Total Biomass				

(a) Excluding international bunkers.

MODULE	ENERGY					
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)					
WORKSHEET	1-2 STEP BY STEP CALCULATIONS					
SHEET	6 OF 16 TRANSPORT					
	STEP 4			STEP 5		STEP 6
Transport	G Fraction of Carbon Stored	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(K x [44/12])
Domestic Aviation						
Gasoline						
Jet Kerosene						
					Subtotal	
Road Transport						
Natural Gas						
LPG						
Gasoline						
Gas/Diesel Oil						
					Subtotal	
Rail Transport						
Gas/Diesel Oil						
Residual Fuel Oil						
Anthracite						
Other Bituminous Coal						
Coke Oven Coke						
					Subtotal	
National Navigation						
Gasoline						
Gas/Diesel Oil						
Residual Fuel Oil						
Lubricants	(a)					
Sub-Bituminous Coal						
					Subtotal	
Pipeline Transport						
Natural Gas						
Subtotal						
					Total Transport	
Memo items:						
Liquid Biomass						
					Total Biomass	

(a) Use a value of 0.5 for lubricants.

MODULE	ENERGY					
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)					
WORKSHEET	1-2 STEP BY STEP CALCULATIONS					
SHEET	7 OF 16 MEMO ITEMS: INTERNATIONAL BUNKERS					
	STEP 1	**STEP 2**		**STEP 3**		
Memo Items: International Bunkers	A Consumption	B Conversion Factor (TJ/unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E x 10^{-3})
Intl. Marine Bunkers						
Gasoline						
Gas/Diesel Oil						
Residual Fuel Oil						
Lubricants						
Sub-Bituminous Coal						
		Total				
Intl. Aviation Bunkers						
Gasoline						
Jet Kerosene						
		Total				

Note: Emissions of international bunkers are excluded from national totals and are reported for informational purposes only.

MODULE	ENERGY
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)
WORKSHEET	1-2 STEP BY STEP CALCULATIONS
SHEET	8 OF 16 MEMO ITEMS: INTERNATIONAL BUNKERS

	STEP 4			STEP 5		STEP 6
Memo Items: International Bunkers	G Fraction of Carbon Stored	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(K x [44/12])
Intl. Marine Bunkers						
Gasoline						
Gas/Diesel Oil						
Residual Fuel Oil						
Lubricants	(a)					
Sub-Bituminous Coal						
					Total	
Intl. Aviation Bunkers						
Gasoline						
Jet Kerosene						
					Total	

(a) Use a value of 0.5 for lubricants.

MODULE	ENERGY					
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)					
WORKSHEET	1-2 STEP BY STEP CALCULATIONS					
SHEET	9 OF 16 COMMERCIAL / INSTITUTIONAL SECTOR					
	STEP 1	**STEP 2**		**STEP 3**		
Commercial/ Institutional Sector	A Consumption	B Conversion Factor (TJ/unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E x 10^{-3})
Gasoline						
Jet Kerosene						
Other Kerosene						
Gas/Diesel Oil						
Residual Fuel Oil						
LPG						
Anthracite						
Other Bituminous Coal						
Lignite						
Brown Coal Briquettes						
Coke Oven Coke						
Gas Works Gas						
Coke Oven Gas						
Natural Gas						
		Total				
Memo items:						
Wood/Wood Waste						
Charcoal						
Other Solid Biomass						
Liquid Biomass						
Gaseous Biomass						
		Total Biomass				

Note: To separately identify emissions associated with autogeneration from those associated with process heat, photocopy Sheets 9 and 10, clearly indicating the source of the emissions.

MODULE	ENERGY
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)
WORKSHEET	1-2 STEP BY STEP CALCULATIONS
SHEET	10 OF 16 COMMERCIAL / INSTITUTIONAL SECTOR

	STEP 4			STEP 5		STEP 6
Commercial/ Institutional Sector	G Fraction of Carbon Stored	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(K x [44/12])
Gasoline						
Jet Kerosene						
Other Kerosene						
Gas/Diesel Oil						
Residual Fuel Oil						
LPG						
Anthracite						
Other Bituminous Coal						
Lignite						
Brown Coal Briquettes						
Coke Oven Coke						
Gas Works Gas						
Coke Oven Gas						
Natural Gas						
					Total	
Memo items:						
Wood/Wood Waste						
Charcoal						
Other Solid Biomass						
Liquid Biomass						
Gaseous Biomass						
					Total Biomass	

MODULE	ENERGY					
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)					
WORKSHEET	1-2 STEP BY STEP CALCULATIONS					
SHEET	11 OF 16 RESIDENTIAL SECTOR					
	STEP 1	STEP 2		STEP 3		
Residential Sector	A Consumption	B Conversion Factor (TJ/unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	$F=(E \times 10^{-3})$
Gasoline						
Other Kerosene						
Gas/Diesel Oil						
Residual Fuel Oil						
LPG						
Anthracite						
Other Bituminous Coal						
Sub-Bituminous Coal						
Lignite						
Peat						
Patent Fuel						
Brown Coal Briquettes						
Coke Oven Coke						
Gas Works Gas						
Coke Oven Gas						
Natural Gas						
		Total				
Memo items:						
Wood/Wood Waste						
Charcoal						
Other Solid Biomass						
Liquid Biomass						
Gaseous Biomass						
		Total Biomass				

MODULE	ENERGY					
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)					
WORKSHEET	1-2 STEP BY STEP CALCULATIONS					
SHEET	12 OF 16 RESIDENTIAL SECTOR					
	STEP 4			STEP 5		STEP 6
Residential Sector	G Fraction of Carbon Stored	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(K x [44/12])
Gasoline						
Other Kerosene						
Gas/Diesel Oil						
Residual Fuel Oil						
LPG						
Anthracite						
Other Bituminous Coal						
Sub-Bituminous Coal						
Lignite						
Peat						
Patent Fuel						
Brown Coal Briquettes						
Coke Oven Coke						
Gas Works Gas						
Coke Oven Gas						
Natural Gas						
					Total	
Memo items:						
Wood/Wood Waste						
Charcoal						
Other Solid Biomass						
Liquid Biomass						
Gaseous Biomass						
					Total Biomass	

MODULE	ENERGY
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)
WORKSHEET	1-2 STEP BY STEP CALCULATIONS
SHEET	13 OF 16 AGRICULTURE / FORESTRY / FISHING

	STEP 1	STEP 2		STEP 3		
Agriculture/Forestry/ Fishing	A Consumption	B Conversion Factor (TJ/unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E x 10^{-3})
Mobile						
Gasoline						
Jet Kerosene						
Other Kerosene						
Gas/Diesel Oil						
Residual Fuel Oil						
LPG						
		Total				
Stationary						
Gasoline						
Other Kerosene						
Gas/Diesel Oil						
Residual Fuel Oil						
Liquefied Petroleum Gas						
Anthracite						
Coking Coal						
Other Bituminous Coal						
Lignite						
Patent Fuel						
Brown Coal Briquettes						
Coke Oven Coke						
Gas Works Gas						
Natural Gas						
		Total				
Memo items:						
Mobile						
Liquid Biomass						
Stationary						
Wood/Wood Waste						
Charcoal						
Other Solid Biomass						
Liquid Biomass						
Gaseous Biomass						
		Total Biomass				

Note: To separately identify emissions associated with autogeneration from those associated with process heat, photocopy Sheets 13 and 14, clearly indicating the source of the emissions.

MODULE	ENERGY
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)
WORKSHEET	1-2 STEP BY STEP CALCULATIONS
SHEET	14 OF 16 AGRICULTURE / FORESTRY / FISHING

	STEP 4			STEP 5		STEP 6
Agriculture/Forestry/ Fishing	G Fraction of Carbon Stored[a]	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(K x [44/12])
Mobile						
Gasoline						
Jet Kerosene						
Other Kerosene						
Gas/Diesel Oil						
Residual Fuel Oil						
LPG						
					Total	
Stationary						
Gasoline						
Other Kerosene						
Gas/Diesel Oil						
Residual Fuel Oil						
Liquefied Petroleum Gas						
Anthracite						
Coking Coal						
Other Bituminous Coal						
Lignite						
Patent Fuel						
Brown Coal Briquettes						
Coke Oven Coke						
Gas Works Gas						
Natural Gas						
					Total	
Memo items:						
Mobile						
Liquid Biomass						
Stationary						
Wood/Wood Waste						
Charcoal						
Other Solid Biomass						
Liquid Biomass						
Gaseous Biomass						
					Total Biomass	

(a) Use a value of 0.5 for lubricants.

MODULE	ENERGY
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)
WORKSHEET	1-2 STEP BY STEP CALCULATIONS
SHEET	15 OF 16 OTHER (NOT ELSEWHERE SPECIFIED)

	STEP 1	STEP 2		STEP 3		
Other (not elsewhere specified)	A Consumption	B Conversion Factor (TJ/unit)	C Consumption (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)
			C=(AxB)		E=(CxD)	F=(E x 10^{-3})
Crude Oil	(a)					
Natural Gas Liquids						
Gasoline						
Jet Kerosene						
Other Kerosene						
Gas/Diesel Oil						
Residual Fuel Oil						
LPG						
Ethane						
Naphtha						
Lubricants						
Petroleum Coke						
Refinery Gas						
Anthracite						
Coking Coal						
Other Bituminous Coal						
Sub-Bituminous Coal						
Lignite						
Peat						
Patent Fuel						
Brown Coal Briquettes						
Coke Oven Coke						
Gas Coke						
Gas Works Gas						
Coke Oven Gas						
Blast Furnace Gas						
Natural Gas						
Municipal Solid Waste						
Industrial Waste						
		Total				
Memo items:						
Wood/Wood Waste						
Charcoal						
Other Solid Biomass						
Liquid Biomass						
Gaseous Biomass						
		Total Biomass				

Note: To separately identify emissions associated with autogeneration from those associated with process heat, photocopy Sheets 15 and 16, clearly indicating the source of the emissions.

(a) Include only consumption of crude oil that is burned, not crude oil which is refined into petroleum products.

MODULE	ENERGY					
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)					
WORKSHEET	1-2 STEP BY STEP CALCULATIONS					
SHEET	16 OF 16 OTHER (NOT ELSEWHERE SPECIFIED)					
	STEP 4			STEP 5		STEP 6
Other (not elsewhere specified)	G Fraction of Carbon Stored	H Carbon Stored (Gg C)	I Net Carbon Emissions (Gg C)	J Fraction of Carbon Oxidised	K Actual Carbon Emissions (Gg C)	L Actual CO_2 Emissions (Gg CO_2)
		H=(FxG)	I=(F-H)		K=(IxJ)	L=(K x [44/12])
Crude Oil						
Natural Gas Liquids						
Gasoline						
Jet Kerosene						
Other Kerosene						
Gas/Diesel Oil						
Residual Fuel Oil						
LPG						
Ethane						
Naphtha						
Lubricants	(a)					
Petroleum Coke						
Refinery Gas						
Anthracite						
Coking Coal						
Other Bituminous Coal						
Sub-Bituminous Coal						
Lignite						
Peat						
Patent Fuel						
Brown Coal Briquettes						
Coke Oven Coke						
Gas Coke						
Gas Works Gas						
Coke Oven Gas						
Blast Furnace Gas						
Natural Gas						
Municipal Solid Waste						
Industrial Waste						
					Total	
Memo items:						
Wood/Wood Waste						
Charcoal						
Other Solid Biomass						
Liquid Biomass						
Gaseous Biomass						
					Total Biomass	

(a) Use a value of 0.5 for lubricants.

MODULE	**ENERGY**
SUBMODULE	**CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)**
WORKSHEET	**AUXILIARY WORKSHEET 1-2: ESTIMATING CARBON STORED IN PRODUCTS**
SHEET	**1**

	A Feedstock Use	B Conversion Factor (TJ/Units)	C Feedstock Use (TJ)	D Carbon Emission Factor (t C/TJ)	E Carbon Content (t C)	F Carbon Content (Gg C)	G Fraction of Carbon Stored	H Carbon Stored[(a)] (Gg C)
FUEL TYPES			C=(AxB)		E=(CxD)	F=(Ex10^{-3})		H=(FxG)
Gas/Diesel Oil							0.5	
LPG							0.8	
Ethane							0.8	
Naphtha							0.8	
Natural Gas							0.33	
Other Fuels[(b)]								

(a) Enter the result of this calculation in Worksheet 1-2 Step by Step Calculation, Sheet 4, in the cells marked with (b).

(b) Please specify.

MODULE	ENERGY
SUBMODULE	CO_2 FROM FUEL COMBUSTION BY SOURCE CATEGORIES (TIER I)
WORKSHEET	1-2 OVERVIEW
SHEET	1 OF 8

			A Crude Oil	B Orimulsion	C Natural Gas Liquids	D Gasoline	E Jet Kerosene	F Other Kerosene
FUEL CONSUMPTION (TJ)								
Energy Industries								
Manufacturing Industries and Construction								
Transport	Domestic Aviation[(a)]							
	Road							
	Railways							
	National Navigation[(a)]							
Other Sectors	Commercial/Institutional							
	Residential							
	Agriculture/Forestry/ Fishing	Stationary						
		Mobile						
Other (not elsewhere specified)								
Total[(a)]								
Memo: International Marine Bunkers								
Memo: International Aviation Bunkers								
CO_2 EMISSIONS (Gg)								
Energy Industries								
Manufacturing Industries and Construction								
Transport	Domestic Aviation[(a)]							
	Road							
	Railways							
	National Navigation[(a)]							
Other Sectors	Commercial/Institutional							
	Residential							
	Agriculture/Forestry/ Fishing	Stationary						
		Mobile						
Other (not elsewhere specified)								
Total[(a)]								
Memo: International Marine Bunkers								
Memo: International Aviation Bunkers								

(a) Excludes International Bunkers.