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Physical Flow Accounts: Energy

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Joe St. Lawrence

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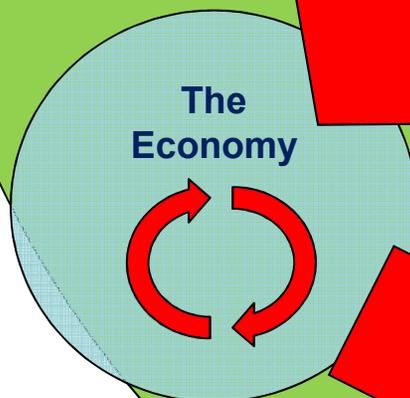
The Economy and The Environment

- Natural Resources
- Ecosystem Services

Stocks

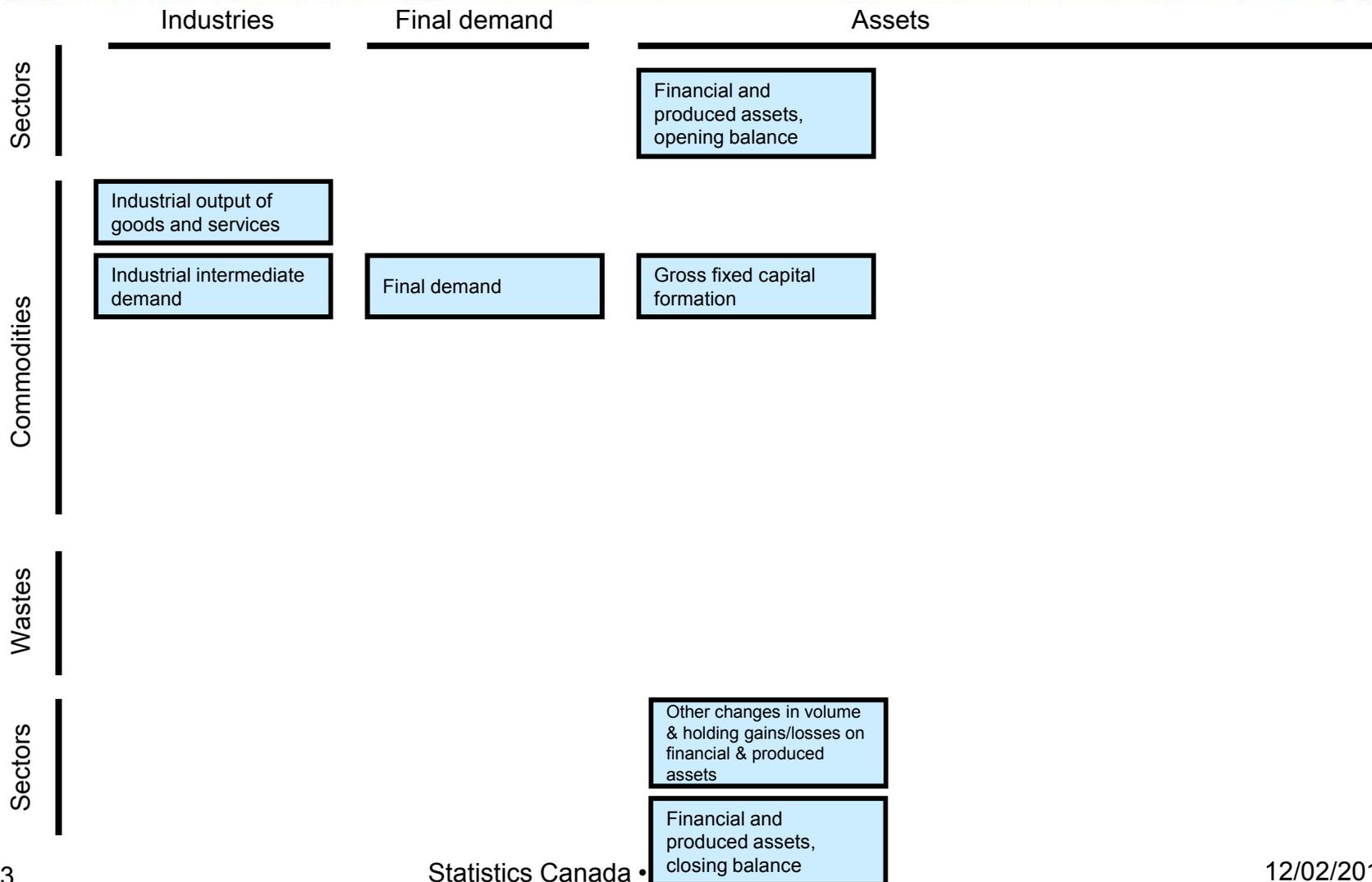
Flows

Expenditures

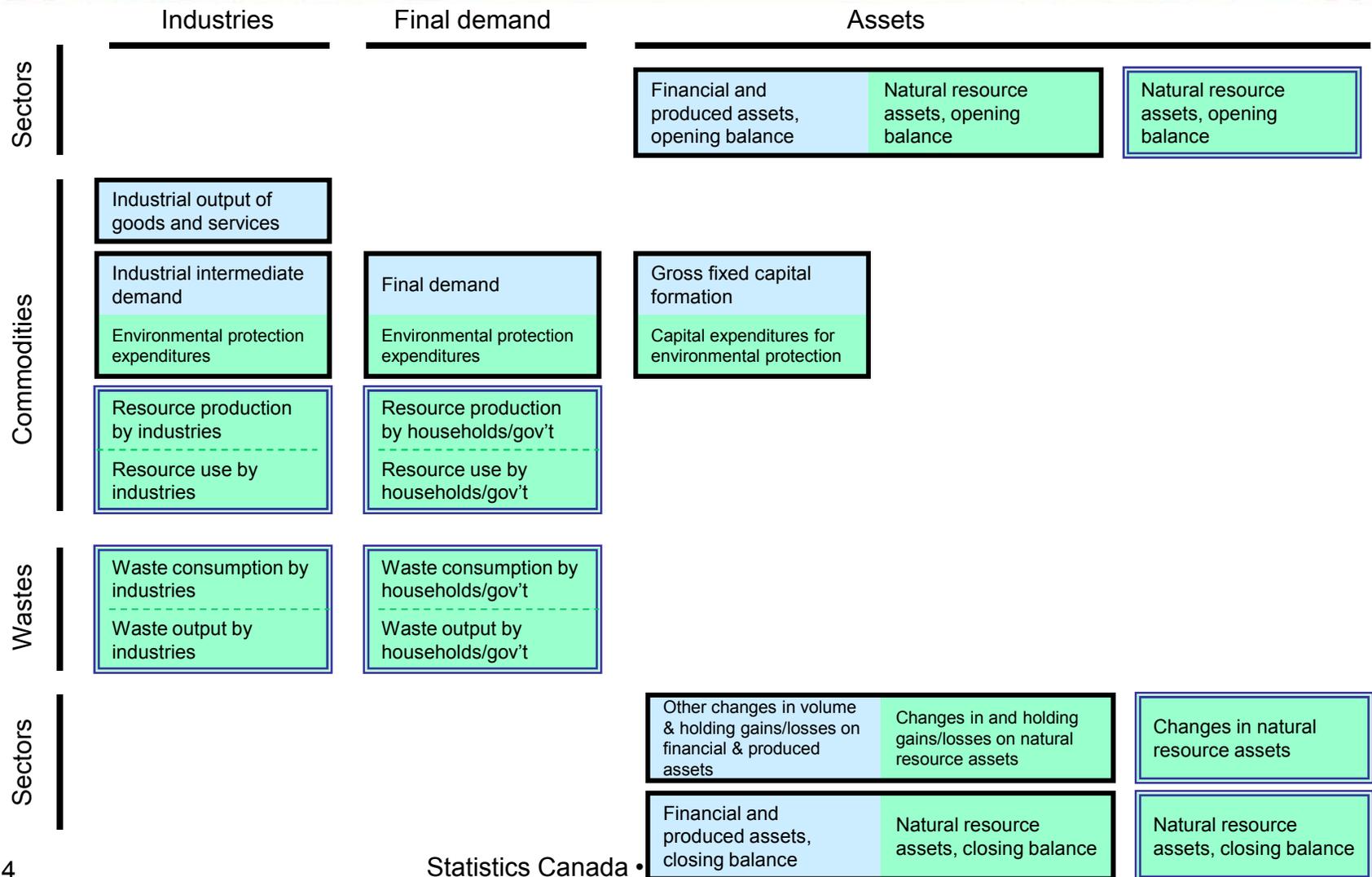


-Residuals

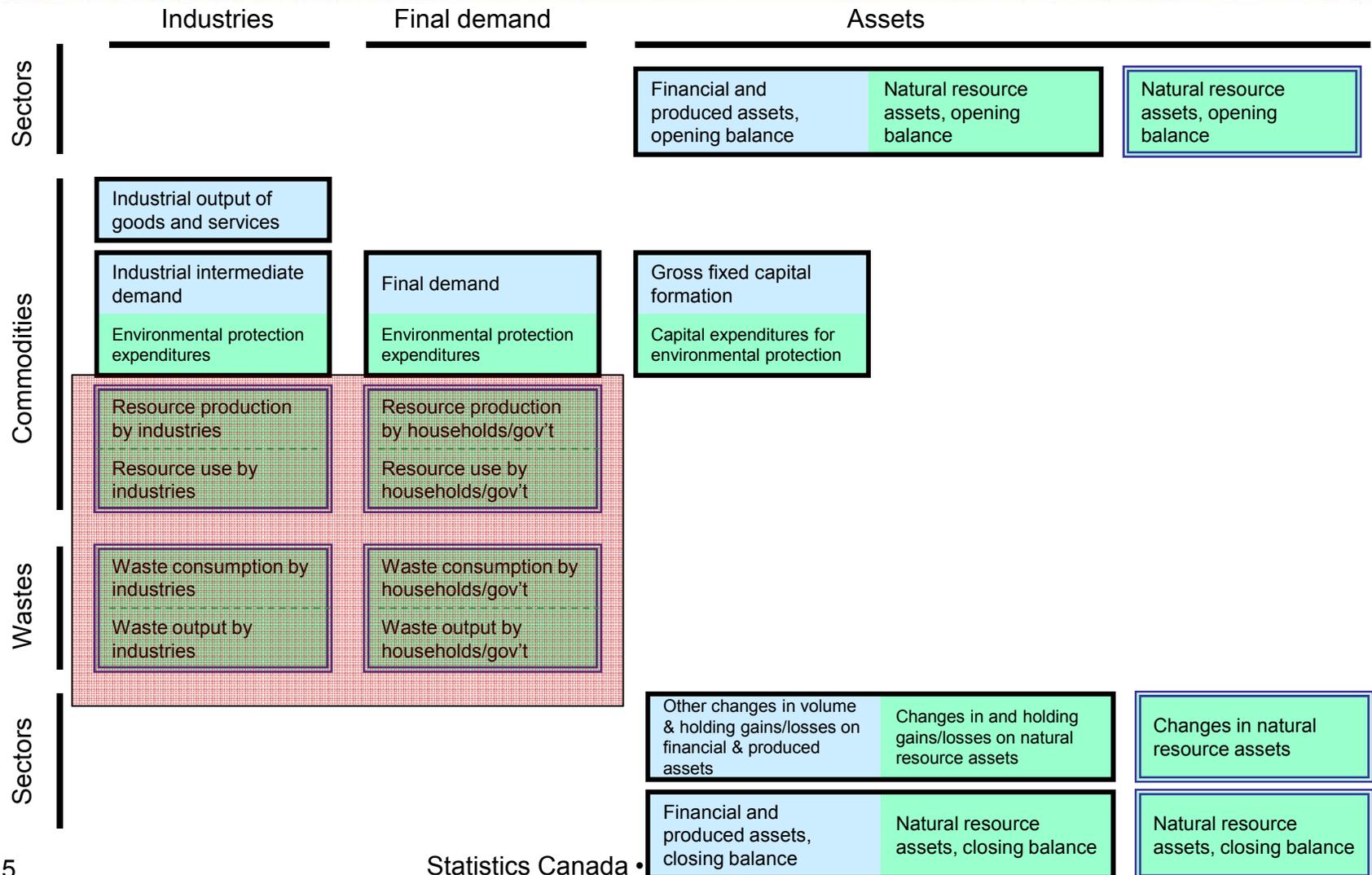
System of National Accounts framework



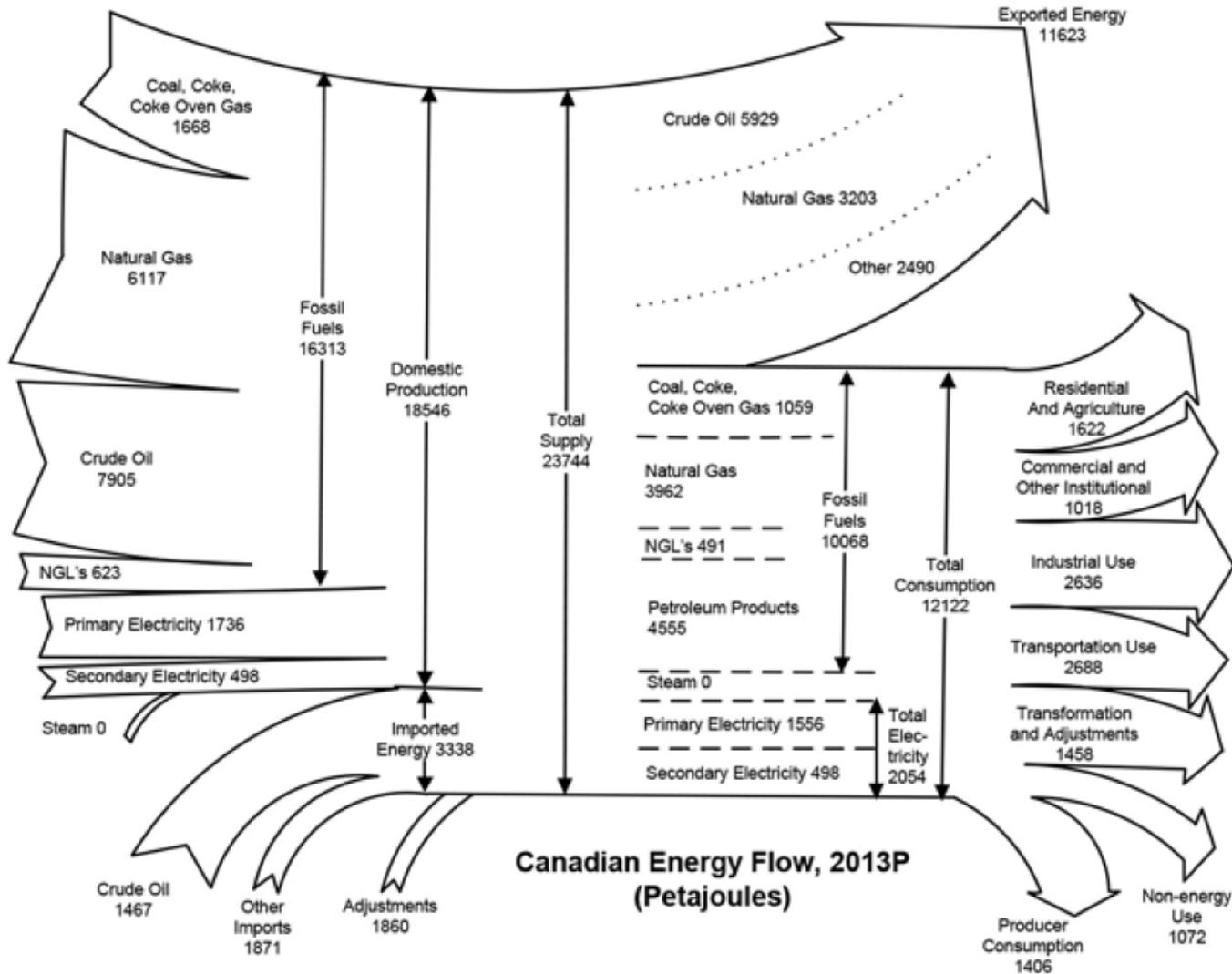
System of Environmental-Economic Accounts (SEEA) framework



Physical Flow Accounting



Energy Supply and Demand: Flow Diagram



Physical Flow Accounts: Basic Tables

Table 3.1
General physical supply and use table

Supply table						
Production; generation of residuals			Accumulation			
	Production; generation of residuals by industries (including household production on own account), classified by ISIC	Generation of residuals by households	Industries—classified by ISIC	Flows from the rest of the world	Flows from the environment	Total
Natural inputs					A. Flows from the environment (including natural resource residuals)	Total supply of natural inputs (TSNI)
Products	C. Output (including sale of recycled and reused products)			D. Imports of products		Total supply of products (TSP)
Residuals	I1. Residuals generated by industry (including natural resource residuals)	J. Residuals generated by household final consumption	K1. Residuals from scrapping and demolition of produced assets	L. Residuals received from rest of the world	M. Residuals recovered from the environment	Total supply of residuals (TSR)
	I2. Residuals generated following treatment		K2. Emissions from controlled landfill sites			
Total supply						
Use table						
Intermediate consumption of products; use of natural inputs; collection of residuals		Final consumption ^a	Accumulation			
	Industries—classified by ISIC	Households	Industries—classified by ISIC	Flows to the rest of the world	Flows to the environment	Total
Natural inputs	B. Extraction of natural inputs B1. Extraction used in production B2. Natural resource residuals					Total use of natural inputs (TUNI)
Products	E. Intermediate consumption (including purchase of recycled and reused products)	F. Household final consumption (including purchase of recycled and reused products)	G. Gross capital formation (including fixed assets and inventories)	H. Exports of products		Total use of products (TUP)
Residuals	N. Collection and treatment of residuals (excluding accumulation in controlled landfill sites)		O. Accumulation of waste in controlled landfill sites	P. Residuals sent to the rest of the world	Q. Residual flows to the environment	Total use of residuals (TUR)
					Q1. Direct from industry and households (including natural resource residuals and landfill emissions)	
					Q2. Following treatment	
Total use						

^a No entries for government final consumption are recorded in physical terms. All government intermediate consumption, production and generation of residuals is recorded against the relevant industry in the first column of the PSUT.

Energy Accounts in the SEEA: Supply

Table 3.5
Physical supply and use table for energy (joules: net calorific units)

Physical supply table for energy

	Production (Including household production on own account); generation of residuals							Flows from the rest of the world		Total supply
	Agriculture, forestry and fishing ISIC A	Mining and quarrying ISIC B	Manufacturing ISIC C	Electricity, gas, steam and air conditioning supply ISIC D	Transportation and storage ISIC H	Other Industries	Households	Imports	Flows from the environment	
Energy from natural inputs										
Natural resource Inputs										
Mineral and energy resources									1 161.0	1 161.0
Timber resources									5.0	5.0
Inputs of energy from renewable sources										
Solar									20.0	20.0
Hydro									100.0	100.0
Wind									4.0	4.0
Wave and tidal										
Geothermal										
Other heat and electrical										
Other natural Inputs										
Energy inputs to cultivated biomass									2.0	2.0
Total energy from natural Inputs									1 292.0	1 292.0

[United Nations, 2012, System of Environmental-Economic Accounting: Central Framework, New York.](#)

Energy Accounts in the SEEA: Supply

	Production (including household production on own account); generation of residuals							Flows from the rest of the world		Total supply	
	Agriculture, forestry and fishing	Mining and quarrying	Manufacturing	Electricity, gas, steam and air conditioning supply	Transportation and storage	Other industries	Households	Imports	Flows from the environment		
	ISIC A	ISIC B	ISIC C	ISIC D	ISIC H						
Energy products											
Production of energy products by SIEC class											
Coal								225.0		225.0	
Peat and peat products											
Oil shale/oil sands											
Natural gas (extracted)		395.0								395.0	
Natural gas (distributed)				369.1						369.1	
Oil (e.g., conventional crude oil)		721.0								721.0	
Oil (oil products)			347.0					930.0		1 277.0	
Biofuels	5.3		0.2	1.5						7.0	
Waste	39.0		54.5					16.9		110.4	
Electricity				212.0				22.0		234.0	
Heat				78.5						78.5	
Nuclear fuels and other fuels n.e.c.											
Total energy products	44.3	1 116.0	401.7	661.1				1 193.9		3 417.0	
Energy residuals											
Losses during extraction		45.0								45.0	
Losses during distribution				12.0						12.0	
Losses during storage			6.0							6.0	
Losses during transformation			7.0	204.4						211.4	
Other energy residuals	50.3	3.2	418.7	90.6	632.0	96.0	240.0			1 530.8	
Total energy residuals	50.3	48.2	431.7	307.0	632.0	96.0	240.0			1 805.2	
Other residual flows											
Residuals from end use for non-energy purposes			51.0							51.0	
Energy from solid waste							93.5			93.5	
Total supply	94.6	1 164.2	884.4	968.1	632.0	96.0	240.0	93.5	1 193.9	1 292.0	6 658.7

Energy Accounts in the SEEA: Use

Table 3.5
Physical supply and use table for energy (joules: net calorific units) (cont'd.)

Physical use table for energy

	Intermediate consumption; use of energy resources; receipt of energy losses					Final consumption		Flows to the rest of the world		Total use	
	Agriculture, forestry and fishing ISIC A	Mining and quarrying ISIC B	Manufacturing ISIC C	Electricity, gas, steam and air conditioning supply ISIC D	Transportation and storage ISIC H	Other industries	Households	Accumulation	Exports		Flows to the environment
Energy from natural inputs											
Natural resource inputs	5.0	1 161.0									1 166.0
Inputs of energy from renewable sources				124.0							124.0
Other natural inputs	0.3		0.2	1.5							2.0
Total energy from natural inputs	5.3	1 161.0	0.2	225.5							1 292.0
Energy products											
Transformation of energy products by SIEC class											
Coal				223.0							223.0
Peat and peat products											
Oil shale/oil sands											
Natural gas (extracted)				395.0							395.0
Natural gas (distributed)				87.0							87.0
Oil (e.g., conventional crude oil)			360.0								360.0
Oil (oil products)				16.0							16.0
Biofuels											
Waste				31.0							31.0
Electricity											
Heat											
Nuclear fuels and other fuels n.e.c.											
Total transformation of energy products			360.0	752.0							1 112.0

Energy Accounts in the SEEA: Use

	Intermediate consumption; use of energy resources; receipt of energy losses						Final consumption		Flows to the rest of the world		Total use
	Agriculture, forestry and fishing ISIC A	Mining and quarrying ISIC B	Manufacturing ISIC C	Electricity, gas, steam and air conditioning supply ISIC D	Transportation and storage ISIC H	Other industries	Households	Accumulation	Exports	Flows to the environment	
Energy products (cont'd)											
End-use of energy products by SIEC class											
Coal	2.0	0.1	17.0				1.0	-21.0	1.9		1.0
Peat and peat products											
Oil shale/ oil sands											
Natural gas (extracted)											
Natural gas (distributed)	2.0		39.0	0.1		12.0	26.0	2.0	201.0		282.1
Oil (e.g. conventional crude oil)									361.0		361.0
Oil (oil products)	34.0	2.0	326.0		621.0	49.0	102.0	-3.0	80.0		1 211.0
Biofuels	0.3		0.2	1.5			5.0				7.0
Waste	3.0	0.1	4.0	37.0		1.0	33.0	0.3	1.0		79.4
Electricity	7.0	1.0	22.0	50.0	10.0	15.0	29.0		100.0		234.0
Heat	2.0		10.5	2.0	1.0	19.0	44.0				78.5
Nuclear fuels and other fuels n.e.c.											0.0
Total end-use for energy purposes	50.3	3.2	418.7	90.6	632.0	96.0	240.0	-21.7	744.9		2 254.0
End-use of energy products for non-energy purposes			51.0								51.0
Energy residuals											
Losses during extraction										45.0	45.0
Losses during distribution										12.0	12.0
Losses during storage										6.0	6.0
Losses during transformation										211.4	211.4
Other energy residuals										1 530.8	1 530.8
Total energy residuals										1 805.2	1 805.2
Other residual flows											
Residuals from end use for non-energy purposes								51.0			51.0
Energy from solid waste	39.0		54.5								93.5
Total use	94.6	1 164.2	884.4	968.1	632.0	96.0	240.0	29.3	744.9	1 805.2	6 658.7

Note: Dark grey cells are null by definition.

Energy Accounts in Canada

Physical use table for energy

	Intermediate consumption; Use of energy resources; Receipt of energy losses						Final consumption Households	Accumulation	Flows to the rest of the world Exports	Flows to the environment	Total use
	Agriculture, forestry and fishing	Mining and quarrying	Manufacturing	Electricity, gas, steam and air conditioning supply	Transportation and storage	Other industries					
	ISIC 01	ISIC 02	ISIC 03	ISIC 04	ISIC 08						
Energy from natural inputs											
Natural resource inputs		5.0	1 161.0								1 166.0
Inputs of energy from renewable sources					124.0						124.0
Other natural inputs		0.3		0.2	1.5						2.0
Total energy from natural inputs		5.3	1 161.0	0.2	225.5						1 292.0
Energy products											
Transformation of energy products by SIEC class											
Coal					223.0						223.0
Peat and peat products											
Oil shale/ oil sands											
Natural gas (extracted)					395.0						395.0
Natural gas (distributed)					87.0						87.0
Oil (e.g. conventional crude oil)			360.0								360.0
Oil (oil products)					16.0						16.0
Biofuels											
Waste					31.0						31.0
Electricity											
Heat											
Nuclear fuels and other fuels nec											
Total transformation of energy products			360.0		752.0						1 112.0
End-use of energy products by SIEC class											
Coal		2.0	0.1	17.0			1.0	-21.0	1.9		1.0
Peat and peat products											
Oil shale/ oil sands											
Natural gas (extracted)											
Natural gas (distributed)		2.0		39.0	0.1		12.0	2.0	201.0		282.1
Oil (e.g. conventional crude oil)									361.0		361.0
Oil (oil products)		34.0	2.0	326.0		621.0	49.0	-3.0	80.0		1 211.0
Biofuels		0.5		0.2	1.5		5.0				7.0
Waste		3.0	0.1	4.0	37.0		33.0	0.3	1.0		79.4
Electricity		7.0	1.0	22.0	50.0	10.0	15.0		100.0		234.0
Heat		2.0		10.5	2.0	1.0	19.0				78.5
Nuclear fuels and other fuels nec											0.0
Total end-use for energy purposes		50.3	3.2	418.7	90.6	632.0	96.0	-21.7	744.9		2 254.0
End-use of energy products for non-energy purposes				51.0							51.0
Energy residuals											
Losses during extraction										45.0	45.0
Losses during distribution										12.0	12.0
Losses during storage										6.0	6.0
Losses during transformation										211.4	211.4
Other energy residuals										1 530.8	1 530.8
Total energy residuals										1 805.2	1 805.2
Other residual flows											
Residuals from end-use for non-energy purposes								51.0			51.0
Energy from solid waste		39.0		54.5							93.5
Total use		94.6	1 164.2	884.4	968.1	632.0	96.0	29.3	744.9	1 805.2	6 658.7

Note: Dark grey cells are null by definition.

Energy Accounts in Canada: Basic table

Energy Use by Sector and Fuel Type													Spent				
		Coal	Natural gas	Motor gasoline	Jet fuel	Diesel fuel	Light fuel oil	Heavy fuel oil	Liquified petroleum gases	Electricity	Coke	Wood	Liquor	Purchased Steam	Total		
		terajoules															
BS11A00	Crop and animal production																
BS11300	Forestry and logging																
BS11400	Fishing, hunting and trapping																
BS11500	Support activities for agriculture and forestry																
BS21100	Oil and gas extraction																
BS21210	Coal mining																
BS21220	Metal ore mining																
BS21230	Non-metallic mineral mining and quarrying																
BS21300	Support activities for mining and oil and gas extraction																
BS22110	Electric power generation, transmission and distribution																
BS221A0	Natural gas distribution, water, sewage and other systems																
BS23A00	Residential building construction																
BS23B00	Non-residential building construction																
BS23C10	Transportation engineering construction																
BS23C20	Oil and gas engineering construction																
BS23C30	Electric power engineering construction																
BS23C40	Communication engineering construction																
BS23C50	Other engineering construction																
BS23D00	Repair construction																
BS23E00	Other activities of the construction industry																
BS31110	Animal food manufacturing																
BS31130	Sugar and confectionery product manufacturing																
BS31140	Fruit and vegetable preserving and specialty food manufacturing																
BS31150	Dairy product manufacturing																
BS31160	Meat product manufacturing																
BS31170	Seafood product preparation and packaging																
BS311A0	Miscellaneous food manufacturing																
BS31211	Soft drink and ice manufacturing																
BS31212	Breweries																
BS3121A	Wineries and distilleries																
BS31220	Tobacco manufacturing																
BS31A00	Textile and textile product mills																
BS31B00	Clothing and leather and allied product manufacturing																
BS32100	Wood product manufacturing																
BS32210	Pulp, paper and paperboard mills																
BS32220	Converted paper product manufacturing																
BS32300	Printing and related support activities																
BS32400	Petroleum and coal product manufacturing																
BS32510	Basic chemical manufacturing																



Overview of main data sources

Energy Supply and Demand Balances

Control totals, producer consumption, non-energy use etc.

Industrial Consumption of Energy Survey

Fuel use in manufacturing.

Annual Census of Mines

Fuel use in mining industries.

Transportation Surveys

Fuel use in transportation industries.

Input-output Tables

Fuel input expenditures for energy users not surveyed above

Energy Supply and Demand Balances

Report on Energy Supply and Demand in Canada – 2013 Preliminary

Table 1-1
Primary and secondary energy, natural units — Canada

	Total coal, primary energy	Crude oil, primary energy	Natural gas, primary energy	Gas plant natural gas liquids (NGLs), primary energy	Primary electricity, hydro and nuclear, primary energy	Steam, primary energy	Coke, secondary energy	Coke oven gas, secondary energy	Total refined petroleum products, secondary energy	Secondary electricity, thermal, secondary energy
	kilotonnes	megajoules	gigajoules	megajoules	GWh	kilotonnes	gigajoules	megajoules	GWh	
Supply and demand characteristics										
Production	68,675.4	200,882.5	157,445.4	28,475.5	482,212.9	..	2,479.6	1,307.2	x	138,231.4
Exports	x	150,682.0	82,448.8	6,891.3	67,114.1	..	..	29,040.3	..	..
Imports	x	37,272.1	26,696.4	716.5	17,111.3	..	672.9	..	..	..
Inter-regional transfers	..	-5.6	0.0	..	..	..	..	0.0	..	..
Stock variation	-466.2	8.9	-3,893.9	769.0	..	..	-137.4	-443.7	..	..
Inter-product transfers	..	..	-2,632.2	..	..	..	..	-2,606.7	..	..
Other adjustments	440.0	17,728.8	-966.0	2,076.4	..	..	..	23,651.0	..	..
Availability	41,411.2	106,192.9	101,888.7	29,808.1	482,210.2	..	3,288.8	1,807.2	122,276.9	138,231.4
Stock change, utilities and industry	..	..	..	..	..	..	..	..	..	..
Transformed to other fuels										
Electricity by utilities	x	..	9,996.1	..	..	..	..	1,295.3	..	..
Electricity by industry	..	..	5,294.8	..	..	..	..	15.9	..	..
Coke and manufactured gases	3,634.8	..	1,036.7	2,779.2	..	..	..	..	..	..
Refined petroleum products	..	106,696.7	810.6	..	-9,776.9	..	3.3	4.1	..	..
Steam generation	1.9	..	..	..	..	..	..	..	..	..
Net supply	1,840.9	86,188.6	20,828.8	482,210.2	8,778.8	3,288.8	1,288.0	120,471.4	138,231.4	
Producer consumption	0.2	15,974.3	632.7	56,325.7	..	..	..	14,161.2	..	..
Non-energy use	272.6	4,287.9	17,120.9	..	..	..	..	14,338.2	..	..
Energy use, final demand	2,090.2	66,613.7	22,812.1	481,617.4	8,778.8	2,624.4	1,307.2	87,487.6		
Total Industrial	1,914.7	84,797.4	2,794.4	296,744.2	8,781.3	2,624.4	1,307.2	7,900.1		
Total mining and oil and gas extraction	x	16,287.0	1,991.8	39,784.8	..	..	..	3,158.1	..	..
Total manufacturing	x	19,250.0	x	169,859.4	9,761.3	2,491.0	1,307.2	17,488.6	..	..
Pulp and paper manufacturing	..	2,087.1	..	36,864.0	578.6	..	..	373.1	..	..
Iron and steel manufacturing	x	..	x	..	..	x	1,307.2	x	..	..
Aluminum and non-ferrous metal manufacturing	x	..	..	..	..	x	..	..	x	..
Cement manufacturing	635.3	..	214.4	..	2,051.3	..	..	..	..	..
Refined petroleum products manufacturing	..	..	1,646.3	..	5,247.1	..	..	..	x	..
Chemicals and fertilizers manufacturing	..	5,144.5	..	16,615.2	x	..	..	147.4	..	..
Al other manufacturing	x	4,459.3	x	48,755.6	x	x	..	625.9	..	..
Forestry and logging and support activities for forestry	..	..	..	..	..	..	..	551.3	..	..
Construction	..	..	450.5	..	..	..	..	1,842.1	..	..
Total transportation	..	8,006.4	412.0	4,706.7	..	..	..	88,467.8		
Railways	..	..	..	..	..	..	..	2,454.6	..	..
Total airlines	..	..	..	..	..	..	..	6,599.9	..	..
Canadian airlines	..	..	..	..	..	..	..	5,633.1	..	..
Foreign airlines	..	..	..	..	..	..	..	966.8	..	..
Total marine	..	..	..	..	..	..	..	2,221.9	..	..
Domestic marine	..	..	..	..	..	..	..	1,764.6	..	..
Foreign marine	..	..	..	..	..	..	..	457.3	..	..
Pipelines	..	3,262.2	..	3,495.4	..	..	..	12.0	..	..
Road transport and urban transit	..	38.3	412.0	1,210.3	..	..	..	11,072.9	..	..
Retail pump sales	..	..	..	..	..	..	..	47,296.6	..	..
Agriculture	..	991.9	324.3	9,987.9	0.0	..	..	5,238.6	..	..
Residential	42.3	17,639.1	577.9	167,333.4	0.0	..	..	1,870.9	..	..
Public administration	..	537.5	..	15,197.2	0.0	..	..	1,371.4	..	..
Commercial and other institutional	x	12,247.3	1,382.6	84,578.9	15.5	..	..	1,958.9	..	..
Statistical difference	x	..	0.0	..	0.0	..	..	..	x	..

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

Report on Energy Supply and Demand in Canada – 2013 Preliminary

Table 3-1
Refined petroleum products, natural units — Canada

	Refinery liquefied petroleum gases (LPG), secondary energy	Bitu gas, secondary energy	Motor gas, secondary energy	Kerosene and stove oil, secondary energy	Diesel fuel oil, secondary energy	Light fuel oil, secondary energy	Heavy fuel oil, secondary energy	Petroleum coke, secondary energy	Aviation turbine fuel, secondary energy	Aviation turbine fuel, secondary energy	Non-energy products, secondary energy	Total refined petroleum products, secondary energy
	gigajoules	gigajoules	gigajoules	gigajoules	gigajoules	gigajoules	gigajoules	gigajoules	gigajoules	gigajoules	gigajoules	gigajoules
Supply and demand characteristics												
Production	2,713.9	9,392.8	x	x	x	x	x	2,542.8	x	x	14,681.7	x
Exports	1,107.7	..	x	x	4,448.0	x	x	x	x	x	..	29,040.3
Imports	636.0	..	x	x	x	x	x	..	0.3	x	1,520.6	x
Inter-regional transfers	..	0.0	0.0	0.0	0.0	x	0.0	..	..	..	0.0	0.0
Stock variation	-77.3	-256.2	x	-325.9	x	-43.2	+1.5	..	..	..	-443.7	..
Inter-product transfers	-39.0	..	542.0	x	365.1	x	-253.4	0.4	x	x	-3,113.5	-2,806.7
Other adjustments	1,227.2	393.4	9,722.8	37.4	3,771.4	239.2	535.9	117.5	6.5	348.7	7,251.1	23,651.0
Availability	3,958.0	8,788.2	44,441.6	642.0	30,760.9	2,684.2	5,891.6	4,246.8	81.1	7,246.1	16,634.3	122,276.9
Stock change, utilities and industry	..	..	..	..	..	..	..	..	..	..	..	..
Transformed to other fuels												
Electricity by utilities	..	125.3	27.2	..	108.5	36.8	390.9	606.5	..	..	..	1,295.3
Electricity by industry	..	268.1	..	..	107.1	0.7	74.5	54.8	..	..	..	505.1
Coke and manufactured gases	..	..	..	..	..	..	..	..	..	..	..	..
Refined petroleum products	..	..	..	..	..	..	..	..	..	..	..	..
Steam generation	..	0.2	..	..	..	..	0.3	..	..	..	..	..
Net supply	3,958.0	8,882.8	44,414.3	642.0	30,636.4	2,648.4	5,162.7	3,684.5	81.1	7,246.1	16,634.3	120,471.4
Producer consumption	..	94.8	9,392.8	0.7	..	638.0	3.5	213.0	2,133.7	0.1	0.0	14,161.2
Non-energy use	..	..	..	..	..	..	..	..	..	..	..	14,338.2
Energy use, final demand	..	..	44,211.2	238.2	29,880.6	2,790.2	2,483.7	666.2	86.8	7,238.6	..	87,487.6
Total Industrial	..	..	1,006.1	48.2	4,464.2	428.2	750.2	686.2	x	x	..	7,900.1
Total mining and oil and gas extraction	..	..	x	21.8	2,238.9	67.3	185.6	4.4	x	x	..	3,158.1
Total manufacturing	..	..	x	16.2	306.6	311.8	440.4	590.7	x	x	..	17,488.6
Pulp and paper manufacturing	..	..	x	x	x	x	215.1	x	..	..	..	373.1
Iron and steel manufacturing	..	..	x	x	x	x	x	x	x	x	..	x
Aluminum and non-ferrous metal manufacturing	..	..	x	x	x	x	x	x	x	x	..	x
Cement manufacturing	..	..	x	x	x	x	x	x	x	x	..	x
Refined petroleum products manufacturing	..	..	x	x	x	x	x	x	x	x	..	x
Chemicals and fertilizers manufacturing	..	..	x	x	x	x	x	x	x	x	..	x
Al other manufacturing	..	..	x	x	x	x	x	x	x	x	..	x
Forestry and logging and support activities for forestry	..	..	x	13.5	228.6	100.5	123.9	89.6	x	x	..	525.9
Construction	..	..	x	1.9	1,441.4	43.1	72.8	..	..	..	..	1,842.1
Total transportation	..	..	40,829.8	20,747.4	x	1,888.9	x	8,888.3	x	8,888.3	..	88,467.8
Railways	..	..	x	2,429.5	..	..	..	..	..	..	..	2,454.6
Total airlines	..	..	x	..	..	..	..	..	..	..	..	6,599.9
Canadian airlines	..	..	x	..	..	..	..	..	..	..	..	5,633.1
Foreign airlines	..	..	x	..	..	..	..	..	..	..	..	966.8
Total marine	..	..	x	773.4	x	1,366.8	x	..	..	..	..	2,221.9
Domestic marine	..	..	x	736.9	x	955.8	x	..	..	..	..	1,764.6
Foreign marine	..	..	x	36.5	x	411.0	x	..	..	..	..	457.3
Pipelines	..	..	x	..	..	..	..	..	..	..	..	12.0
Road transport and urban transit	..	..	x	1,821.3	x	3,028.5	x	..	..	..	..	11,072.9
Retail pump sales	..	..	x	38,868.8	x	8,418.4	x	..	..	..	..	47,296.6
Agriculture	..	..	..	0.2	3,163.6	61.6	265.1	..	x	x	..	5,238.6
Residential	..	..	..	69.6	x	1,894.2	7.1	..	..	..	..	1,870.9
Public administration	..	..	..	287.3	15.3	723.3	153.2	..	..	0.5	..	1,371.4
Commercial and other institutional	..	..	..	341.8	112.9	785.1	233.5	..	..	37.3	..	1,958.9
Statistical difference	..	..	..	202.4	x	x	x	x	x	x	..	..

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

Energy Supply and Demand Balances: Source Surveys

Coke Monthly
Coal Monthly
Monthly Oil Pipeline Transport
Gas Utilities/Transportation and Distribution Systems (Monthly)
Monthly Refined Petroleum Products
Monthly Electricity
Natural Gas Disposition – Annual
End-Use of Refined Petroleum Products – Annual
Monthly Oil Pipeline Statement
Electricity Supply and Disposition – Annual
Electric Power Thermal Generating Station Fuel Consumption
Monthly Crude Oil and Natural Gas
Annual Industrial Consumption of Energy Survey
Annual Survey of Secondary Distributors of Refined Petroleum Products

Energy Supply and Demand: Classification 1

Availability⁷

Transformed to electricity by utilities

Transformed to electricity by industry

Transformed to refined petroleum products

Transformed to steam generation

Net supply⁸

Producer consumption⁹

Non-energy use¹⁰

Energy Supply and Demand: Classification 2

Energy use, final demand¹¹

Total industrial

Total mining and oil and gas extraction¹²

Total manufacturing

Pulp and paper manufacturing¹³

Iron and steel manufacturing¹⁴

Aluminum and non-ferrous metal manufacturing¹⁵

Cement manufacturing¹⁶

Refined petroleum products manufacturing¹⁷

Chemicals and fertilizers manufacturing¹⁸

All other manufacturing¹⁹

Forestry and logging and support activities for forestry²⁰

Construction²¹

Total transportation²²

Pipelines²⁵

Road transport and urban transit²⁶

Retail pump sales

Agriculture²⁷

Residential²⁸

Public administration²⁹

Commercial and other institutional³⁰

Statistical difference

Energy Supply and Demand: Control total

Table 128-0016^{1, 2, 3}

Supply and demand of primary and secondary energy in terajoules
annual (terajoules)

[Data table](#) [Add/Remove data](#) [Manipulate](#) [Download](#) [Related information](#) [Help](#)

The data below is a part of CANSIM table 128-0016. Use the [Add/Remove data](#) tab to customize your table.

Selected items [\[Add/Remove data\]](#)

Geography= Canada

Fuel type= Natural gas

Supply and demand characteristics	2009	2010	2011	2012	2013
Production	6,229,253	6,020,842	6,082,288	6,054,359	6,116,753
Exports	3,660,092	3,682,104	3,575,422	3,420,358	3,203,174
Imports	793,925	871,342	1,208,000	1,213,086	1,037,235
Inter-regional transfers ⁴	0	0	..	0	0
Stock variation	-215,170	-311,315	-118,073	-46,644	-151,279
Inter-product transfers ⁵	-91,271	-89,948	-90,276	-107,538	-102,263
Other adjustments ⁶	2,882	155,043	118,924	-30,941 ^f	-37,527
Availability⁷	3,489,867	3,586,489	3,861,588	3,755,252^d	3,962,302
Transformed to electricity by utilities	290,681	367,657	432,667	414,665	375,526
Transformed to electricity by industry	136,008	141,405	147,551	180,640 ^f	205,315
Transformed to refined petroleum products	27,255	37,199	39,500	42,147 ^f	40,353
Transformed to steam generation	18,277	18,208	20,927	29,307 ^f	31,491
Net supply⁸	3,017,647	3,022,021	3,220,943	3,088,492^f	3,309,617
Producer consumption ⁹	553,242	537,204	545,454	578,877 ^f	620,601
Non-energy use ¹⁰	138,248	138,799	158,259	161,627 ^f	166,586
Energy use, final demand¹¹	2,326,394	2,345,928	2,518,002	2,541,994^f	2,700,607

Final Output: Energy Use

Table 153-0113^{1, 2, 3}

Physical flow account for energy use
annual (terajoules)

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The data below is a part of CANSIM table 153-0113. Use the [Add/Remove data](#) tab to customize your table.

Selected items [[Add/Remove data](#)]

Geography= Canada

Sector	2009	2010	2011
Total, industries and households	10,796,554	11,028,558	11,270,959
Total, industries	8,222,637	8,498,566	8,674,591
Crop and animal production	207,799	242,016	266,477
Forestry and logging	20,359	23,025	22,028
Fishing, hunting and trapping	7,154	8,723	9,529
Support activities for agriculture and forestry	12,815	13,233	12,368
Oil and gas extraction	1,406,705	1,459,208	1,484,357
Coal mining	17,716	22,949	21,442
Metal ore mining	73,703	80,354	82,968
Non-metallic mineral mining and quarrying	39,477	45,131	61,332
Support activities for mining and oil and gas extraction	102,202	07,750	102,002

Final Output: Energy Intensity

Table 153-0115^{1, 2, 3, 4, 5, 6}

Direct plus indirect energy and greenhouse gas emissions intensity, by industry
annual (data in thousands)

Data table

Add/Remove data

Manipulate

Download

Related information

Help

The data below is a part of CANSIM table 153-0115. Use the [Add/Remove data](#) tab to customize your table.

Selected items [[Add/Remove data](#)]

Geography= Canada

Intensity= Direct plus indirect energy intensity (gigajoules per thousand current dollars of production)

Sector	2009	2010
Total, industries	5.24	5.11
Crop and animal production	12.00	12.60
Forestry and logging	8.26	8.47
Fishing, hunting and trapping	8.33	8.67
Support activities for agriculture and forestry	10.92	10.76
Oil and gas extraction	17.29	15.27
Coal mining	6.57	6.81
Metal ore mining	11.57	6.03
Non-metallic mineral mining and quarrying	7.00	5.99
Support activities for mining and oil and gas extraction	9.14	6.94
Electric power generation, transmission and distribution	28.32	27.37

Final Output: Demand-based perspective

Table 153-0129^{1, 2, 5}

Physical flows by final demand category

annual

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The data below is a part of CANSIM table 153-0129. Use the [Add/Remove data](#) tab to customize your table.

Selected items [\[Add/Remove data\]](#)

Geography= Canada

Flow= Energy use by final demand category (terajoules)²

Sector	2009	2010	2011
Total, industries and households	10,353,292	10,547,712	10,780,442
Personal expenditure (households)⁴	4,902,659	4,888,088	4,965,688
Non-profit institutions serving households' consumption expenditure	122,127	113,261	121,665
Government net current expenditure	796,762	824,216	841,656
Gross fixed capital formation	991,948	1,086,842	1,093,907
International exports	3,539,796	3,635,304	3,757,526

Challenges

- **Integration of data from many sources/providers**
 - Concepts and definitions may be different: be careful of double counting.
 - *Some data include foreign purchases of domestic fuel.*
 - *Some data include producer consumption, some do not.*
 - Source data are not all collected using the same classification systems.
 - Input data are not always in a useful format.

- **Data gaps**
 - Improve household and services sectors (less surveyed).
 - Supplementary information required when two sources yield different pictures.

Quality control – Analysis

Coherence, time series, etc.

- % changes in energy use from current year to previous year, per industry, per fuel.
- Implicit price (\$ paid/TJ) and intensity (TJ/\$ output), per industry, per fuel.

GHG account output

- Coherence analysis of the GHG account provides feedback to the energy account.

Bridge tables

- to explain visually how we go from the total energy consumed to the energy flow account.

Quality control - Bridge Tables

Line #	MEFA fuel #3 - Natural gas, 2006p (TJ)	RESO fuel type	MEFA fuel type	ICE (fuel use)	ICE (non-fuel use)	Pet Report and I/O Prov	Thermal Plants Survey	Census of Mines	Transportation Surveys	Input-Output expenditure allocation	Net adjustment due to other data sources	Energy transformation	Producer consumption	Transportation	Foreign use of fuels	Stock change	Other adjustments	Total final adjustment	Benchmark	Final MEFA Energy Use Account	
1	Production	7,190,199	7,190,199																		
2	Exports	3,898,248	3,898,248																		
3	Imports	368,569	368,569																		
4	Inter-regional transfers	0	0																		
5	Stock variation	-28,499	-28,499																		
6	Inter-product transfers	-75,367	-75,367																		
7	Other adjustments	-213,857	-213,857																		
8	Availability	3,399,789	3,399,789		-157,044															3,210,867	
9	Stock change	0	0																		
10	Transformed to electricity by utilities	233,518	233,518																	233,518	233,518
11	Transformed to electricity by industry	82,028	82,028							-82,028	-82,028									-82,028	
12	Transformed to coke and manufactured gases	0	0																		
13	Transformed to refined petroleum products	29,308	29,308																	-29,308	
14	Transformed to steam generation	19,547	19,547																	-19,547	
15	Net supply	3,035,367	3,035,367																		
16	Producer consumption	629,691	629,691																		
17	Non-energy use	157,044	157,044																		
18	Energy use, final demand	2,248,657	2,248,657		-157,044																
19	Total industrial	952,876	952,876																		
20	Total mining and oil and gas extraction	258,814	258,814	10,294				-185,063	-107	109,101	-65,782		629,691							563,909	822,723
21	Total manufacturing	675,344	675,344																		
22	Pulp and paper manufacturing	63,954	63,954	11,830							11,830									11,830	75,384
23	Iron and steel manufacturing	64,192	64,192	8,492							8,492									8,492	72,684
24	Aluminum and non-ferrous metal manufacturing	25,944	25,944	10,991							10,991									10,991	36,935
25	Cement manufacturing	2,471	2,471	186							186									186	2,658
26	Refined petroleum products manufacturing	49,455	49,455	63							63									63	49,518
27	Chemicals and fertilizers manufacturing	120,968	120,968	26,299							26,299									26,299	147,149
28	All other manufacturing	348,860	348,860	-122,646							-122,646									-122,646	226,214
29	Forestry and logging and support activities for forests	0	0	5							5									5	81
30	Construction	18,718	18,718	267							267									267	3,966
31	Total transportation	190,299	190,299																		
32	Railways	0	0	37							37									37	572
33	Total airlines	0	0																		
34	Canadian airlines	0	0	256							256									256	3,973
35	Foreign airlines	0	0																		
36	Total marine	0	0																		
37	Domestic marine	0	0	233							233									233	3,622
38	Foreign marine	0	0																		
39	Pipelines	188,420	188,420	555							555									555	8,627
40	Road transport and urban transit	1,878	1,878	1,384							1,384									1,384	14,667
41	Retail pump sales	0	0								581									581	22,097
42	Agriculture	20,474	20,474	2,317							2,317									2,317	15,526
43	Residential	617,441	617,441																		
44	Public administration	21,822	21,822	10,309							10,309									10,309	138,363
45	Commercial and other institutional	445,745	445,745	31,498							31,498									31,498	43,670
46	Statistical difference	-6	-6	7,649							7,649									-6	7,813
Balanced totals																			3,210,867	3,210,867	



Energy Accounts Uses

Calculation of GHG emissions accounts

Impact analysis for International Trade

CGE modelling

Input-Output modelling

Energy use and intensity analysis

Etc...



Questions?

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