

**Appendix A: Integrating economic, energy and energy emissions data**

<b>Sectors in the energy IO table</b>	<b>Sectors in the national energy balance</b>
Agriculture	Agriculture from <b>other sectors</b>
Coal and lignite products	15% of mining and quarrying from the <b>industrial sector</b> <sup>3</sup>
Crude oil	Oil production from the <b>energy transformation sector</b>
Nuclear Energy	Negligible energy input
Renewable Energy	Negligible energy input
Natural gas	Natural Gas production from the <b>energy transformation sector</b>
Biomass	No energy input
Gold & other mining	Mining and quarrying from <b>industrial sector</b>
Food & Textiles	Food, tobacco, textiles and leather from <b>industrial sector</b>
Wood & Paper	Wood, wood products, paper, pulp, print from <b>industrial sector</b>
Petroleum products	Petroleum production from <b>energy transformation</b> + petrochemicals from <b>industrial sector</b>
Chemicals	10% of Chemicals and petrochemicals from <b>industrial sector</b> <sup>4</sup>
Iron & metals	Iron, steel, non-ferrous metals, non-metallic minerals from <b>industrial sector</b>
Machinery & Equipment	Machinery and equipment from <b>industrial sector</b>
Other manufacturing	Other industry from <b>industrial sector</b>
Electricity	Electricity production from <b>energy transformation sector</b>
Water	Water from <b>industrial sector</b>
Construction & Accommodation	Construction from <b>industrial sector</b>
Transport & Communications	Transport from <b>transport sector</b>
Financial Services	Commerce, public services and unspecified sectors from <b>other sectors</b>
Residential Services	Residential services from <b>other sectors</b>

<sup>3</sup> Coal accounted for 15% of total mining output in South Africa in 2000 (Mbendi, 2002).

<sup>4</sup> Petrochemicals have been highlighted separately as energy required for petroleum feedstock. The chemicals sector is separated from this to produce separate accounts for chemicals and for petroleum products.

## Appendix B: Energy Data and Conversion Factors

### B1: Aggregated Energy balance for South Africa in energy units

Supply and Consumption (2000)	Coal (TJ)	Crude Oil (TJ)	Natural Gas (TJ)	Nuclear Energy (TJ)	Renewable Energy (TJ)	Biomass (TJ)	Total (TJ)	Petroleum Products (TJ)	Electricity (TJ)	Total (TJ)
Indigenous Production	5301907.52	0.00	65024.10	141927.27	4834.80	237400.00	5751093.69	0.00	0.00	0.00
Import	34390.22	781529.03	0.00	0.00	0.00	0.00	815919.25	20290.99	16988.40	37279.39
Export	-1957457.01	-7598.21	0.00	0.00	0.00	0.00	-1965055.22	-259997.49	-14425.20	-274422.69
Intl. Marine Bunkers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-113478.57	0.00	-113478.57
Stock Changes	46884.15	0.00	0.00	0.00	0.00	0.00	46884.15	0.00	0.00	0.00
<b>Total Primary Energy Supply</b>	<b>3425724.88</b>	<b>773930.82</b>	<b>65024.10</b>	<b>141927.27</b>	<b>4834.80</b>	<b>237400.00</b>	<b>4648841.87</b>	<b>-353185.07</b>	<b>2563.20</b>	<b>-350621.87</b>
<b>Total Primary Energy Consumed</b>	<b>3425724.88</b>	<b>773930.82</b>	<b>65024.10</b>	<b>141927.27</b>	<b>4834.80</b>	<b>237400.00</b>	<b>-4648841.87</b>	<b>353185.07</b>	<b>-2563.20</b>	<b>350621.87</b>
Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Statistical Differences	31097.46	0.00	0.00	0.00	0.00	0.00	31097.46	0.00	-63593.12	-63593.12
Public Electricity Plant	-1886290.61	0.00	0.00	-141927.27	-4834.80	0.00	-2033052.68	0.00	727052.40	727052.40
Auto producer Electricity Plant	-116046.00	0.00	0.00	0.00	0.00	0.00	-116046.00	0.00	20926.80	20926.80
Public CHP Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer CHP Plant	0.00	0.00	0.00	0.00	0.00	0.00	-47000.00	0.00	1105.20	1105.20
Public Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heat pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electric boilers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gas Works	-133407.00	0.00	39856.63	0.00	0.00	0.00	-93550.37	0.00	0.00	0.00
Oil Refineries	0.00	-1113149.76	-26.52	0.00	0.00	0.00	-1113176.28	1084625.84	-47992.95	1036632.89
Coal Transformation	-12158.72	0.00	0.00	0.00	0.00	0.00	-12158.72	0.00	0.00	0.00
Liquefaction	-654328.20	339218.94	-65024.10	0.00	0.00	0.00	-380133.36	0.00	0.00	0.00
Non-specified (Transformation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Own Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1589.83	-1589.83
Distribution Losses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-61392.21	-61392.21
<b>Total Final Consumption</b>	<b>654591.81</b>	<b>0.00</b>	<b>39830.11</b>	<b>0.00</b>	<b>0.00</b>	<b>190400.00</b>	<b>884821.92</b>	<b>731440.78</b>	<b>577079.49</b>	<b>1308520.27</b>

<b>Industry Sector</b>	<b>590320.68</b>	<b>0.00</b>	<b>39532.22</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>629852.91</b>	<b>48760.64</b>	<b>358930.72</b>	<b>407691.36</b>
Iron and Steel	178886.20	0.00	10147.25	0.00	0.00	0.00	189033.45	0.00	75288.06	75288.06
Chemical	31855.03	0.00	12349.18	0.00	0.00	0.00	44204.21	0.00	9505.58	9505.58
Petrochemical Feedstock	221292.00	0.00	0.00	0.00	0.00	0.00	221292.00	0.00	0.00	0.00
Non-Ferrous Metals	0.00	0.00	2255.99	0.00	0.00	0.00	2255.99	0.00	54135.76	54135.76
Non-Metallic Minerals	33688.93	0.00	5681.76	0.00	0.00	0.00	39370.69	0.00	4153.28	4153.28
Transport Equipment	0.00	0.00	367.86	0.00	0.00	0.00	367.86	0.00	249.30	249.30
Machinery	0.00	0.00	789.46	0.00	0.00	0.00	789.46	0.00	191.41	191.41
Mining and Quarrying	3916.11	0.00	378.46	0.00	0.00	0.00	4294.56	21927.06	104537.19	126464.25
Food and Tobacco	0.00	0.00	1251.13	0.00	0.00	0.00	1251.13	0.00	2300.72	2300.72
Paper Pulp and Print	0.00	0.00	2967.23	0.00	0.00	0.00	2967.23	0.00	5377.07	5377.07
Wood and Wood Products	0.00	0.00	68.45	0.00	0.00	0.00	68.45	0.00	1484.53	1484.53
Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10548.86	122.44	10671.29
Textile and Leather	0.00	0.00	18.06	0.00	0.00	0.00	18.06	0.00	1354.82	1354.82
Non-specified (Industry)	120682.42	0.00	3257.40	0.00	0.00	0.00	123939.82	16284.73	100230.55	116515.27
										0.00
<b>Transport Sector</b>	<b>0.00</b>	<b>0.00</b>	<b>28.91</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>28.91</b>	<b>584476.41</b>	<b>19479.63</b>	<b>603956.04</b>
International Civil Aviation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40646.81	0.00	40646.81
Domestic Air Transport	0.00	0.00	28.91	0.00	0.00	0.00	28.91	27933.11	112.61	28045.71
Road	0.00	0.00	0.00	0.00	0.00	0.00	0.00	507318.23	121.46	507439.69
Rail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8282.60	12359.38	20641.97
Pipeline Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	224.14	224.14
Internal Navigation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.28	22.28
Non-specified (Transport)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	295.66	6639.76	6935.42
<b>Other Sectors</b>	<b>64271.12</b>	<b>0.00</b>	<b>268.98</b>	<b>0.00</b>	<b>0.00</b>	<b>190400.00</b>	<b>254940.10</b>	<b>75851.84</b>	<b>198669.14</b>	<b>274520.98</b>
Agriculture	1864.43	0.00	0.00	0.00	0.00	0.00	1864.43	48008.95	14235.74	62244.69
Commerce and Public Services	20802.23	0.00	230.63	0.00	0.00	0.00	21032.87	151.29	61790.43	61941.72
Residential	41604.46	0.00	0.00	0.00	0.00	190400.00	232004.46	25214.12	103248.00	128462.13
<b>Non-Energy Use</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Memo: Non-Energy Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: DME, 2002

**B2: Aggregated energy balance for South Africa in native units of volume**

Supply and Consumption (2000)	Coal (tonnes)	Crude Oil (tonnes)	Natural Gas (TJ)	Nuclear Energy MWh	Renewable Energy MWh	Biomass (TJ)	Petroleum Products (kl)	Electricity (MWh)
Indigenous Production	228232317.92	270747.57	65024.10	0.00	0.00	237400.00	29541152.51	210670000.00
Import	1109362.00	18319949.05	0.00	0.00	0.00	0.00	536934.46	4719000.00
Export	-69909179.00	-178110.88	0.00	0.00	0.00	0.00	-6718949.88	-4007000.00
Intl. Marine Bunkers	0.00	0.00	0.00	0.00	0.00	0.00	-2757063.07	0.00
Stock Changes	1736450.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total Primary Energy Supply</b>	<b>161168950.92</b>	<b>18412585.73</b>	<b>65024.101</b>	<b>0.00</b>	<b>0.00</b>	<b>237400</b>	<b>20602074.02</b>	<b>211382000</b>
<b>Total Primary Energy Consumed</b>	<b>161168950.92</b>	<b>18412585.73</b>	<b>65024.101</b>	<b>0.00</b>	<b>0.00</b>	<b>237400</b>	<b>20602074.02</b>	<b>211382000</b>
Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Statistical Differences <sup>5</sup>	-140198.00	0.00	0.00	0.00	0.00	0.00	0.01	17664755.00
Public Electricity Plant	93845304.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer Electricity Plant	4298000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Public CHP Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer CHP Plant	0.00	0.00	0.00	0.00	0.00	47000.00	0.00	0.00
Public Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heat pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electric boilers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gas Works	7510428.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oil Refineries	777.07	26364272.15	0.00	0.00	0.00	0.00	0.00	1450.00
Coal Transformation	664710.00	0.00	0.00	0.00	0.00	0.00	0.00	13331966.00
Liquefaction	29878000.00	-7951686.42	65024.10	0.00	0.00	0.00	0.00	0.00
Non-specified (Transformation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Own Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	269710.00
Distribution Losses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2760870.00
<b>Total Final Consumption</b>	<b>25111929.86</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>190400.00</b>	<b>20602074.01</b>	<b>160299858.00</b>

<sup>5</sup> Statistical differences are used to balance the energy balance and are only noticed in the coal sector for primary energy but this is transferred to the electricity sector. This difference is thought to arise from uncertainty regarding the consumption of coal during electricity production.

<b>Industry Sector</b>	<b>22722789.74</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>1392458.36</b>	<b>99702977.00</b>
Iron and Steel	6628381.94	0.00	0.00	0.00	0.00	0.00	0.00	20913350.00
Chemical and Petrochemical	1225347.40	0.00	0.00	0.00	0.00	0.00	0.00	2640440.00
Petrochemical Feedstock	8512299.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Non-Ferrous Metals	66100.5949	0.00	0.00	0.00	0.00	0.00	0.00	15037710
Non-Metallic Minerals	1414213.57	0.00	0.00	0.00	0.00	0.00	0.00	1153690.00
Transport Equipment	10778.36	0.00	0.00	0.00	0.00	0.00	0.00	69250.00
Machinery	23131.15	0.00	0.00	0.00	0.00	0.00	0.00	53170.00
Mining and Quarrying	156129.79	0.00	0.00	0.00	0.00	0.00	578072.78	29038108.00
Food and Tobacco	36657.99	0.00	0.00	0.00	0.00	0.00	0.00	639090.00
Paper Pulp and Print	86939.69	0.00	0.00	0.00	0.00	0.00	0.00	1493630.00
Wood and Wood Products	2005.64	0.00	0.00	0.00	0.00	0.00	0.00	412370.00
Construction	0.00	0.00	0.00	0.00	0.00	0.00	278290.59	34010.00
Textile and Leather	529.158	0.00	0.00	0.00	0.00	0.00	0.00	376340
Non-specified (Industry)	4560274.82	0.00	0.00	0.00	0.00	0.00	536094.99	27841819.00
<b>Transport Sector</b>	<b>847.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>16595413.20</b>	<b>5411009.00</b>
International Civil Aviation	0.00	0.00	0.00	0.00	0.00	0.00	1185038.32	0.00
Domestic Air Transport	847.00	0.00	0.00	0.00	0.00	0.00	814663.59	31280.00
Road	0.00	0.00	0.00	0.00	0.00	0.00	14369767.95	33740.00
Rail	0.00	0.00	0.00	0.00	0.00	0.00	217391.05	3433160.00
Pipeline Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62260.00
Internal Navigation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6190.00
Non-specified (Transport)	0.00	0.00	0.00	0.00	0.00	0.00	8552.29	1844379.00
<b>Other Sectors</b>	<b>2388293.11</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>190400.00</b>	<b>2079303.99</b>	<b>55185872.00</b>
Agriculture	69053.00	0.00	0.00	0.00	0.00	0.00	1272005.61	3954372.00
Commerce and Public Services	777210.58	0.00	0.00	0.00	0.00	0.00	4211.36	17164007.00
Residential	1540906.00	0.00	0.00	0.00	0.00	190400.00	712866.58	28680001.00
Non-specified other	1123.54	0.00	0.00	0.00	0.00	0.00	90220.44	5387492.00
<b>Non-Energy Use</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>534898.46</b>	<b>0.00</b>
Memo: Non-Energy Use	0.00	0.00	0.00	0.00	0.00	0.00	534898.46	0.00

Source: DME (2002)

**Table 6-3: Macro-economic scenario analysis**

	GDP	Employment	Value added			Household consumption	Final Demand			Energy Use		Energy Emissions	
			Taxes less subsidies	Gross Operating Surplus	Imports		Government expenditure	Investment and Savings	Exports	Primary	Secondary	Primary	Secondary
Baseline scenario	888057.00	424958.00	100005.49	363093.51	229469.99	556652.00	166330.00	140589.00	253956.00	4679939.33	3108069.20	329841653.94	453195935.04
Carbon dioxide tax on coal	879906.31	421420.20	99277.24	359306.56	226407.23	552015.91	165314.71	139650.99	249518.13	2680433.99	2770909.15	185376323.37	398230996.28
Carbon dioxide tax on oil	886344.01	424202.35	99857.71	362309.51	228579.25	555661.00	166109.02	140744.39	252276.90	4263100.77	2996569.62	302761851.20	442405523.23
Carbon dioxide tax on electricity	881061.66	421667.53	99292.41	360149.12	227170.32	552800.98	165046.15	141052.31	249382.74	4498785.46	3042642.66	317833805.07	443684783.67
Carbon dioxide tax on petroleum products	884686.67	423549.25	99779.41	361446.36	228019.90	554621.35	166062.44	139383.05	252620.52	4657579.86	3050241.93	328287352.88	447579647.46
Energy subsidy reform	882514.01	422607.52	99505.86	360458.18	227773.02	553474.97	165686.35	139286.71	252301.55	3027451.11	2886642.94	206457666.10	408099416.33

**Table 6-4: Decrease between baseline and scenario macro-economic variables**

	GDP	Employment	Value added			Household consumption	Final Demand			Energy Use		Energy Emissions	
			Taxes less subsidies	Gross Operating Surplus	Imports		Government expenditure	Investment and Savings	Exports	Primary	Secondary	Primary	Secondary
Carbon dioxide tax on coal	8150.70	3537.80	728.25	3786.95	3062.76	4636.10	1015.29	938.01	4437.87	1999505.34	337160.04	144465330.57	54964938.76
Carbon dioxide tax on oil	1712.99	755.66	147.78	784.00	890.74	991.00	220.98	-155.39	1679.10	416838.56	111499.58	27079802.74	10790411.81
Carbon dioxide tax on electricity	6995.34	3290.48	713.09	2944.39	2299.68	3851.02	1283.85	-463.31	4573.26	181153.86	65426.53	12007848.87	9511151.37
Carbon dioxide tax on petroleum products	3370.34	1408.75	226.08	1647.15	1450.09	2030.65	267.56	1205.95	1335.48	22359.47	57827.27	1554301.06	5616287.58
Energy subsidy reform	5542.99	2350.49	499.64	2635.33	1696.97	3177.04	643.65	1302.29	1654.45	1652488.22	221426.26	123383987.85	45096518.71

**B3: Physical energy input-output data in native units of volume**

	Primary Energy						Secondary Energy	
	Coal	Crude Oil	Natural Gas	Nuclear Energy	Renewable Energy	Biomass	Petroleum Products	Electricity
	tonnes	tonnes	terrajoules	MWh	MWh	terrajoules	kilolitre	MWh
Agriculture	69053.00	0.00	0.00	0.00	0.00	0.00	1272005.61	3954372.00
Coal	249684.59	0.00	0.00	0.00	0.00	0.00	91913.57	7561365.88
Crude Oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Natural gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nuclear Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewable Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biomass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gold & other mining	1320658.76	0.00	0.00	0.00	0.00	0.00	486159.21	25391302.12
Food & Textiles	37187.15	0.00	0.00	0.00	0.00	0.00	0.00	1015430.00
Wood & paper	88945.34	0.00	0.00	0.00	0.00	0.00	0.00	1906000.00
Petroleum	38053915.07	18412585.73	65024.10	0.00	0.00	0.00	0.00	13333416.00
Chemicals	9737647.03	0.00	0.00	0.00	0.00	0.00	0.00	2640440.00
Iron & Metal	6694482.54	0.00	0.00	0.00	0.00	0.00	0.00	35951060.00
Machinery & Equipment	33909.51	0.00	0.00	0.00	0.00	0.00	0.00	122420.00
Other Manufacturing	3420206.12	0.00	0.00	0.00	0.00	0.00	402071.24	20881364.25
Electricity	98143304.00	0.00	0.00	0.00	0.00	47000.00	0.00	17323101.00
Water	1140068.71	0.00	0.00	0.00	0.00	0.00	134023.75	6960454.75
Buildings & Accommodation	0.00	0.00	0.00	0.00	0.00	0.00	278290.59	34010.00
Transport & Communication	847.00	0.00	0.00	0.00	0.00	0.00	16595413.20	5411009.00
Financial & Community	778334.11	0.00	0.00	0.00	0.00	0.00	94431.80	22551499.00
Household consumption	1540906.00	0.00	0.00	0.00	0.00	190400.00	712866.58	28680001.00
Non-energy use	0.00	0.00	0.00	0.00	0.00	0.00	534898.46	0.00
Statistical diff	-140198.00	0.00	0.00	0.00	0.00	0.00	0.01	17664755.00
<b>Total</b>	<b>161168950.92</b>	<b>18412585.73</b>	<b>65024.10</b>	<b>0.00</b>	<b>0.00</b>	<b>237400.00</b>	<b>20602074.02</b>	<b>211382000.00</b>

**Appendix C: Energy emissions data and conversion factors****C1: IPCC emission default factors**

<b>Energy Type</b>	Carbon dioxide emission co- efficients (ton C/TJ)	Carbon dioxide emission co- efficients (ton CO <sub>2</sub> /TJ)	Methane emission co- efficients (ton CH <sub>4</sub> /TJ)	Nitrous oxide emission co- efficients (ton N <sub>2</sub> O/TJ)
<b>Coal</b>				
Hard Coal	25.80	94.61	0.001	0.0020
Lignite/Brown	26.90	98.64		
Sub bituminous	26.90	98.64		
Coking coal	25.80	94.61		
Other bituminous	26.30	96.44		
Anthracite	26.30	96.44		
Peat	28.90	105.98		
Coke oven and lignite coke	29.50	108.18		
Coke oven gas	13.00	47.67		
Gas works gas	66.00	242.02		
Blast furnace gas	66.00	242.02		
<b>Crude oil</b>	20.00	73.34	0.0030	0.0006
<b>Natural gas</b>	15.30	56.11	0.0012	0.0005
<b>Nuclear energy</b>	0.0000025	0.000009	0.0000	0.0000
<b>Renewable energy</b>	0.0000005	0.000002	0.0000	0.0000
<b>Biomass (fuelwood)</b>	0.00	0.00	0.2500	0.0040
Solid biomass	29.90	109.64		
Liquid biomass	20.00	73.34		
Gas biomass	30.60	112.21		
<b>Petroleum products</b>			0.008	0.0040
Crude oil	20.00	63.07		
Natural gas liquids	17.20	61.61		
Ethane	16.80	63.07		
LPG	17.20	73.34		
Naphtha	20.00	69.31		
Aviation gasoline	18.90	69.31		
Motor gasoline	18.90	69.31		
Jet gasoline	18.90	71.51		
Jet kerosene	19.50	71.87		
Other kerosene	19.60	74.07		
Gas/Diesel oil	20.20	73.34		
Residuel fuel	20.00	73.34		
Lubricants	20.00	73.34		
White spirit	20.00	80.67		
Bitumen	22.00	80.67		
Paraffin waxes	22.00	100.84		
Petroleum coke	27.50	73.34		
Other petroleum products	20.00	63.07		
<b>Electricity</b>	62.80	230.29	0.001	0.0030

Source: IPCC, 1996



**C2: Carbon dioxide emission factors for coal**

	Energy Balance, DME 2002			Blignaut and King, 2002				
	Coal (t)	Coal (TJ)	Coal (TJ/t)	Coal (t)	Coal (TJ)	CO2 (t)	t CO2/t coal	t CO2/TJ
<b>Supply and Consumption</b>								
Indigenous Production	228232317.92	5301907.52	0.0232					73.97
Import	1109362.00	34390.22	0.0310					73.97
Export	-69909179.00	-1957457.01	0.0280					73.97
Intl. Marine Bunkers	0.00	0.00	0.0000					73.97
Stock Changes	1736450.00	46884.15	0.0270					73.97
<b>Total Primary Energy Supply</b>	<b>161168950.92</b>	<b>3425724.88</b>	<b>0.0213</b>	<b>160633756.00</b>	<b>2174411.46</b>	<b>252344938.00</b>	<b>1.57</b>	73.97
<b>Total Primary Energy Consumed</b>	<b>161168950.92</b>	<b>3425724.88</b>	<b>0.0213</b>	<b>160633756.00</b>	<b>2174411.46</b>	<b>252344938.00</b>	<b>1.57</b>	
Transfers	0.00	0.00	0.0000					0.00
Statistical Differences	-140198.00	31097.46	-0.2218					73.91
Public Electricity Plant	93845304.00	-1886290.61	-0.0201	92300000.00	1855230.00	161200000.00	1.75	86.89
Auto producer Electricity Plant	4298000.00	-116046.00	-0.0270	1556304.00	42020.21	2425240.00	1.56	57.72
Public CHP Plant	0.00	0.00	0.0000					0.00
Auto producer CHP Plant	0.00	0.00	0.0000					0.00
Public Heat Plant	0.00	0.00	0.0000					0.00
Auto producer Heat Plant	0.00	0.00	0.0000					0.00
Heat pumps	0.00	0.00	0.0000					0.00
Electric boilers	0.00	0.00	0.0000					0.00
Gas Works	7510428.00	-133407.00	-0.0178	8354558.62	148401.21	9308236.33	1.11	62.72
Oil Refineries	777.07	0.00	0.0000	864.40	0.00	963.08	1.11	0.00
Coal Transformation	664710.00	-12158.72	-0.0183	739419.73	13525.29	823824.92	1.11	60.91
Liquefaction	29878000.00	-654328.20	-0.0219	33236122.16	727871.08	37030044.75	1.11	50.87
Non-specified (Transformation)	0.00	0.00	0.0000					0.00
Own Use	0.00	0.00	0.0000					0.00
Distribution Losses	0.00	0.00	0.00					86.89
<b>Total Final Consumption</b>	<b>25111929.85</b>	<b>654591.81</b>	0.0261	<b>24446487.09</b>	<b>612636.32</b>	<b>41556628.93</b>	1.70	

<b>Industry Sector</b>	<b>22722789.74</b>	<b>590320.68</b>	0.0260	<b>20457193.09</b>	<b>504925.39</b>	<b>33268178.93</b>	1.63	<b>65.89</b>
Iron and Steel	6628381.94	178886.20	0.0270	4465206.00	120506.60	9124511.00	2.04	75.72
Chemical and Petrochemical	1225347.40	31855.03	0.0260	1080816.00	28097.69	2208196.00	2.04	78.59
Petrochemical Industry	8512299.63	221292.00	0.0260	9469035.088	246164.00	10549930.93	1.11	42.86
Non-Ferrous Metals	66100.59	0.00	0.0000	1272014.00	0.00	2964507.00	2.33	76.32
Non-Metallic Minerals	1414213.57	33688.93	0.0238					80.26
Transport Equipment	10778.36	0.00	0.0000					76.32
Machinery	23131.15	0.00	0.0000					76.32
Mining and Quarrying	156129.79	3916.11	0.0251	145041.00	3637.97	291968.00	2.01	80.26
Food and Tobacco	36657.99	0.00	0.0000					76.32
Paper Pulp and Print	86939.69	0.00	0.0000					76.32
Wood and Wood Products	2005.64	0.00	0.0000					76.32
Construction	0.00	0.00	0.0000					76.32
Textile and Leather	529.16	0.00	0.0000					76.32
Non-specified (Industry)	4560274.82	120682.42	0.0265	4025081.00	106519.13	8129066.00	2.02	76.32
<b>Transport Sector</b>	<b>847.00</b>	<b>0.00</b>	<b>0.0000</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
International Civil Aviation	0.00	0.00	0.0000			0.00		0.00
Domestic Air Transport	847.00	0.00	0.0000			0.00		0.00
Road	0.00	0.00	0.0000			0.00		0.00
Rail	0.00	0.00	0.0000			0.00		0.00
Pipeline Transport	0.00	0.00	0.0000			0.00		0.00
Internal Navigation	0.00	0.00	0.0000			0.00		0.00
Non-specified (Transport)	0.00	0.00	0.0000			0.00		0.00
<b>Other Sectors</b>	<b>2388293.11</b>	<b>64271.12</b>	<b>0.0269</b>	<b>3989294.00</b>	<b>107710.94</b>	<b>8288450.00</b>	<b>2.08</b>	<b>76.95</b>
Agriculture	69053.00	1864.43	0.0270	69053.00	1864.43	142447.00	2.06	76.40
Commerce and Public Services	777210.58	20802.23	0.0268					76.96
Residential	1540906.00	41604.46	0.0270	3920241.00	105846.51	8146003.00	2.08	76.96
Non-specified other	1123.54	0.00	0.0000					76.96
<b>Non-Energy Use</b>	<b>0.00</b>	<b>0.00</b>	<b>0.0000</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Memo: Non-Energy Use Industry/ Transfer	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00

Source: DME, 2000; Bignaut and King, 2002

**C3: Carbon dioxide emission factors for aggregated energy balance**

Supply and Consumption	Carbon dioxide emission factors (t CO <sub>2</sub> /TJ)								
	Coal	Crude Oil	Natural Gas	Nuclear Energy	Renewable Energy	Total	Petroleum Products	Electricity	Total
Indigenous Production	73.97	73.34	56.11	0.00	0.00		73.34	236.11	
Import	73.97	73.34	56.11	0.00	0.00		73.34	236.11	
Export	73.97	73.34	56.11	0.00	0.00		73.34	236.11	
Intl. Marine Bunkers	73.97	73.34	56.11	0.00	0.00		73.34	236.11	
Stock Changes	73.97	73.34	56.11	0.00	0.00		73.34	236.11	
<b>Total Primary Energy Supply</b>									
<b>Total Primary Energy Consumed</b>									
Transfers	0.00	73.34	56.11	0.00	0.00		73.34	236.11	
Statistical Differences	73.91	73.34	56.11	0.00	0.00		73.34	236.11	
Public Electricity Plant	86.89	73.34	56.11	0.00	0.00		73.34	236.11	
Auto producer Electricity Plant	57.72	73.34	56.11	0.00	0.00		73.34	236.11	
Public CHP Plant		73.34	56.11	0.00	0.00		73.34	236.11	
Auto producer CHP Plant		73.34	56.11	0.00	0.00		73.34	236.11	
Public Heat Plant		73.34	56.11	0.00	0.00		73.34	236.11	
Auto producer Heat Plant		73.34	56.11	0.00	0.00		73.34	236.11	
Heat pumps		73.34	56.11	0.00	0.00		73.34	236.11	
Electric boilers		73.34	56.11	0.00	0.00		73.34	236.11	
Gas Works	62.72	73.34	56.11	0.00	0.00		73.34	236.11	
Oil Refineries	0.00	73.34	56.11	0.00	0.00		73.34	236.11	
Coal Transformation	60.91	73.34	56.11	0.00	0.00		73.34	236.11	
Liquefaction	50.87	73.34	56.11	0.00	0.00		73.34	236.11	
Non-specified (Transformation)	0.00	73.34	56.11	0.00	0.00		73.34	236.11	
Own Use	0.00	73.34	56.11	0.00	0.00		73.34	236.11	
Distribution Losses	86.89	73.34	56.11	0.00	0.00		73.34	236.11	
<b>Total Final Consumption</b>									

<b>Industry Sector</b>								
Iron and Steel	75.72	73.34	56.11	0.00	0.00		73.34	236.11
Chemical and Petrochemical	78.59	73.34	56.11	0.00	0.00		73.34	236.11
Petrochemical Industry	42.86	73.34	56.11	0.00	0.00		73.34	236.11
Non-Ferrous Metals	76.32	73.34	56.11	0.00	0.00		73.34	236.11
Non-Metallic Minerals	80.26	73.34	56.11	0.00	0.00		73.34	236.11
Transport Equipment	76.32	73.34	56.11	0.00	0.00		73.34	236.11
Machinery	76.32	73.34	56.11	0.00	0.00		73.34	236.11
Mining and Quarrying	80.26	73.34	56.11	0.00	0.00		73.34	236.11
Food and Tobacco	76.32	73.34	56.11	0.00	0.00		73.34	236.11
Paper Pulp and Print	76.32	73.34	56.11	0.00	0.00		73.34	236.11
Wood and Wood Products	76.32	73.34	56.11	0.00	0.00		73.34	236.11
Construction	76.32	73.34	56.11	0.00	0.00		73.34	236.11
Textile and Leather	76.32	73.34	56.11	0.00	0.00		73.34	236.11
Non-specified (Industry)	76.32	73.34	56.11	0.00	0.00		73.34	236.11
<b>Transport Sector</b>	0.00	73.34	56.11	0.00	0.00		73.34	236.11
International Civil Aviation	0.00	73.34	56.11	0.00	0.00		73.34	236.11
Domestic Air Transport	0.00	73.34	56.11	0.00	0.00		73.34	236.11
Road	0.00	73.34	56.11	0.00	0.00		73.34	236.11
Rail	0.00	73.34	56.11	0.00	0.00		73.34	236.11
Pipeline Transport	0.00	73.34	56.11	0.00	0.00		73.34	236.11
Internal Navigation	0.00	73.34	56.11	0.00	0.00		73.34	236.11
Non-specified (Transport)	0.00	73.34	56.11	0.00	0.00		73.34	236.11
<b>Other Sectors</b>								
Agriculture	76.40	73.34	56.11	0.00	0.00		73.34	236.11
Commerce and Public Services	76.96	73.34	56.11	0.00	0.00		73.34	236.11
Residential	76.96	73.34	56.11	0.00	0.00		73.34	236.11
Non-specified other	76.96	73.34	56.11	0.00	0.00		73.34	236.11
<b>Non-Energy Use</b>								
Memo: Non-Energy Use Industry/ Transfer	0.00	0.00	0.00	0.00	0.00		73.34	236.11

Source: IPCC, 1996; Blignaut and King, 2002

**C4: Carbon dioxide emissions for aggregated energy balance**

Supply and Consumption	Carbon dioxide emissions (t CO <sub>2</sub> )									
	Coal	Crude Oil	Natural Gas	Nuclear Energy	Renewable Energy	Biomass	Total	Petroleum Products	Electricity	Total
Indigenous Production	392181810.08	0.00	3648183.69	0.00	0.00	0.00	39582993.77	0.00	0.00	0.00
Import	2543842.85	57317338.79	0.00	0.00	0.00	0.00	59861181.63	1488141.22	4011131.12	5499272.34
Export	-144792988.42	-557252.73	0.00	0.00	0.00	0.00	-145350241.15	-19068215.59	-3405933.97	-22474149.56
Intl. Marine Bunkers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-8322518.47	0.00	-8322518.47
Stock Changes	3468018.02	0.00	0.00	0.00	0.00	0.00	3468018.02	0.00	0.00	0.00
<b>Total Primary Energy Supply</b>	<b>253400682.53</b>	<b>56760086.06</b>	<b>3648183.69</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>313808952.28</b>	<b>-25902592.85</b>	<b>605197.15</b>	<b>-25297395.69</b>
<b>Total Primary Energy Consumed</b>	<b>-253400682.53</b>	<b>-56760086.06</b>	<b>-3648183.69</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>-313808952.28</b>	<b>25902592.85</b>	<b>-605197.15</b>	<b>25297395.69</b>
Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Statistical Differences	2298413.15	0.00	0.00	0.00	0.00	0.00	2298413.15	-0.02	-15014971.09	-15014971.11
<b>Transformation sector</b>	<b>-212993482.09</b>	<b>-56760086.06</b>	<b>-1413511.27</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>-271167079.42</b>	<b>79546459.41</b>	<b>150664012.04</b>	<b>230210471.45</b>
Public Electricity Plant	-163898840.79	0.00	0.00	0.00	0.00	0.00	-163898840.79	0.00	171664342.16	171664342.16
Auto producer Electricity Plant	-6697715.56	0.00	0.00	0.00	0.00	0.00	-6697715.56	0.00	4941026.75	4941026.75
Public CHP Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer CHP Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	260948.77	260948.77
Public Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heat pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electric boilers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gas Works	-8367747.71	0.00	2236160.38	0.00	0.00	0.00	-6131587.33	0.00	0.00	0.00
Oil Refineries	0.00	-81638403.31	-1487.96	0.00	0.00	0.00	-81639891.28	79546459.41	-11331616.27	68214843.14
Coal Transformation	-740587.03	0.00	0.00	0.00	0.00	0.00	-740587.03	0.00	0.00	0.00
Liquefaction	-33288591.00	24878317.26	-3648183.69	0.00	0.00	0.00	-12058457.44	0.00	0.00	0.00
Non-specified (Transformation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Own Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-375375.23	-375375.23
Distribution Losses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-14495314.14	-14495314.14
<b>Total Final Consumption</b>	<b>42705613.59</b>	<b>0.00</b>	<b>2234672.42</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>44940286.01</b>	<b>53643866.55</b>	<b>136254238.10</b>	<b>189898104.65</b>

<b>Industry Sector</b>	37760325.55	0.00	2217959.38	0.00	0.00	0.00	39978284.93	3576105.47	84747131.64	88323237.10
Iron and Steel	13544894.44	0.00	569312.36	0.00	0.00	0.00	14114206.81	0.00	17776263.85	17776263.85
Chemical and Petrochemical	2503485.54	0.00	692852.09	0.00	0.00	0.00	3196337.63	0.00	2244363.44	2244363.44
Petrochemical Industry	9483983.56	0.00	0.00	0.00	0.00	0.00	9483983.56	0.00	0.00	0.00
Non-Ferrous Metals	0.00	0.00	126572.71	0.00	0.00	0.00	126572.71	0.00	12781993.35	12781993.35
Non-Metallic Minerals	2703727.15	0.00	318775.71	0.00	0.00	0.00	3022502.86	0.00	980631.89	980631.89
Transport Equipment	0.00	0.00	20638.93	0.00	0.00	0.00	20638.93	0.00	58862.22	58862.22
Machinery	0.00	0.00	44292.68	0.00	0.00	0.00	44292.68	0.00	45194.29	45194.29
Mining and Quarrying	314289.77	0.00	21233.37	0.00	0.00	0.00	335523.14	1608130.36	24682275.65	26290406.01
Food and Tobacco	0.00	0.00	70194.55	0.00	0.00	0.00	70194.55	0.00	543223.94	543223.94
Paper Pulp and Print	0.00	0.00	166476.46	0.00	0.00	0.00	166476.46	0.00	1269579.53	1269579.53
Wood and Wood Products	0.00	0.00	3840.51	0.00	0.00	0.00	3840.51	0.00	350512.85	350512.85
Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	773653.28	28908.36	802561.64
Textile and Leather	0.00	0.00	1013.26	0.00	0.00	0.00	1013.26	0.00	319887.49	319887.49
Non-specified (Industry)	9209945.09	0.00	182756.75	0.00	0.00	0.00	9392701.84	1194321.82	23665434.78	24859756.61
							0.00			
<b>Transport Sector</b>	<b>0.00</b>	<b>0.00</b>	<b>1621.89</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>1621.89</b>	<b>42865499.55</b>	<b>4599336.01</b>	<b>47464835.56</b>
International Civil Aviation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2981037.37	0.00	2981037.37
Domestic Air Transport	0.00	0.00	1621.89	0.00	0.00	0.00	1621.89	2048613.98	26587.87	2075201.85
Road	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37206718.88	28678.87	37235397.75
Rail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	607445.81	2918172.27	3525618.08
Pipeline Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	52920.75	52920.75
Internal Navigation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5261.48	5261.48
Non-specified (Transport)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21683.51	1567714.77	1589398.29
<b>Other Sectors</b>	<b>4945288.03</b>	<b>0.00</b>	<b>15091.15</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>4960379.18</b>	<b>5562973.82</b>	<b>46907770.46</b>	<b>52470744.27</b>
Agriculture	142447.00	0.00	0.00	0.00	0.00	0.00	142447.00	3520976.74	3361200.38	6882177.12
Commerce and Public Services	1600939.70	0.00	12939.74	0.00	0.00	0.00	1613879.44	11095.92	14589337.29	14600433.21
Residential	3201901.34	0.00	0.00	0.00	0.00	0.00	3201901.34	1849203.67	24377886.13	26227089.80
Non-specified other	0.00	0.00	2151.41	0.00	0.00	0.00	2151.41	181697.49	4579346.65	4761044.14
<b>Non-Energy Use</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>1639287.71</b>	<b>0.00</b>	<b>1639287.71</b>
Memo: Non-Energy Use Industry/ Transfer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1639287.71	0.00	1639287.71

**C5: Methane emission factors for coal**

Supply and Consumption	Energy Balance, DME 2002			Blignaut, and King, 2004			t CH <sub>4</sub> /t coal	t CH <sub>4</sub> /TJ
	(t)	(TJ)	(TJ/t)	Coal (t)	(TJ)	CH <sub>4</sub> (t)		
Indigenous Production	228232317.92	5301907.52	0.0232					1.11
Import	1109362.00	34390.22	0.0310					1.11
Export	-69909179.00	-1957457.01	0.0280					1.11
Intl. Marine Bunkers	0.00	0.00	0.0000					1.11
Stock Changes	1736450.00	46884.15	0.0270					1.11
<b>Total Primary Energy Supply</b>	<b>161168950.92</b>	<b>3425724.88</b>	<b>0.0213</b>	<b>160633756.00</b>	<b>2174411.46</b>	<b>3823582.00</b>	<b>0.02</b>	1.11
<b>Total Primary Energy Consumed</b>	<b>161168950.92</b>	<b>3425724.88</b>	<b>0.0213</b>	<b>160633756.00</b>	<b>2174411.46</b>	<b>3823582.00</b>	<b>0.02</b>	1.11
Transfers	0.00	0.00	0.0000					0.00
Statistical Differences	-140198.00	31097.46	-0.2218					-1.11
Public Electricity Plant	93845304.00	-1886290.61	-0.0201	92300000.00	1855230.00	<b>3241434.18</b>	<b>0.02</b>	
Auto producer Electricity Plant	4298000.00	-116046.00	-0.0270	1556304.00	42020.21	2267733.00	0.02	-1.22
Public CHP Plant	0.00	0.00	0.0000			38441.00	0.02	-0.91
Auto producer CHP Plant	0.00	0.00	0.0000					
Public Heat Plant	0.00	0.00	0.0000					
Auto producer Heat Plant	0.00	0.00	0.0000					
Heat pumps	0.00	0.00	0.0000					
Electric boilers	0.00	0.00	0.0000					
Gas Works	7510428.00	-133407.00	-0.0178	8354558.62	148401.21	184585.59	0.02	-1.24
Oil Refineries	777.07	0.00	0.0000	864.40	0.00	19.10	0.02	0.00
Coal Transformation	664710.00	-12158.72	-0.0183	739419.73	13525.29	16336.74	0.02	-1.21
Liquefaction	29878000.00	-654328.20	-0.0219	33236122.16	727871.08	734318.75	0.02	-1.01
Non-specified (Transformation)	0.00	0.00	0.0000					
Own Use	0.00	0.00	0.0000					
Distribution Losses	0.00	0.00	0.00					
<b>Total Final Consumption</b>	<b>25111929.85</b>	<b>654591.81</b>	0.0261	<b>24446487.09</b>	<b>612636.32</b>	<b>582147.82</b>	<b>0.02</b>	0.95

<b>Industry Sector</b>	<b>22722789.74</b>	<b>590320.68</b>	0.0260	<b>20457193.09</b>	<b>504925.39</b>	<b>483611.82</b>	<b>0.02</b>	0.96
Iron and Steel	6628381.94	178886.20	0.0270	4465206.00	120506.60	110289.00	0.02	0.92
Chemical and Petrochemical	1225347.40	31855.03	0.0260	1080816.00	28097.69	26696.00	0.02	0.95
Petrochemical Industry	8512299.63	221292.00	0.0260	9469035.088	246164.00	209208.8246	0.02	0.85
Non-Ferrous Metals	66100.59	0.00	0.0000	1272014.00	0.00	31419.00	0.02	0.96
Non-Metallic Minerals	1414213.57	33688.93	0.0238					0.98
Transport Equipment	10778.36	0.00	0.0000					0.96
Machinery	23131.15	0.00	0.0000					0.96
Mining and Quarrying	156129.79	3916.11	0.0251	145041.00	3637.97	3583.00	0.02	0.98
Food and Tobacco	36657.99	0.00	0.0000					0.96
Paper Pulp and Print	86939.69	0.00	0.0000					0.96
Wood and Wood Products	2005.64	0.00	0.0000					0.96
Construction	0.00	0.00	0.0000					0.96
Textile and Leather	529.16	0.00	0.0000					0.96
Non-specified (Industry)	4560274.82	120682.42	0.0265	4025081.00	106519.13	102416.00	0.03	0.96
<b>Transport Sector</b>	<b>847.00</b>	<b>0.00</b>	<b>0.0000</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
International Civil Aviation	0.00	0.00	0.0000					0.00
Domestic Air Transport	847.00	0.00	0.0000					0.00
Road	0.00	0.00	0.0000					0.00
Rail	0.00	0.00	0.0000					0.00
Pipeline Transport	0.00	0.00	0.0000					0.00
Internal Navigation	0.00	0.00	0.0000					0.00
Non-specified (Transport)	0.00	0.00	0.0000					0.00
<b>Other Sectors</b>	<b>2388293.11</b>	<b>64271.12</b>	<b>0.0269</b>	<b>3989294.00</b>	<b>107710.94</b>	<b>98536.00</b>	<b>0.02</b>	<b>0.91</b>
Agriculture	69053.00	1864.43	0.0270	69053.00	1864.43	1706.00	0.02	0.92
Commerce and Public Services	777210.58	20802.23	0.0268					0.91
Residential	1540906.00	41604.46	0.0270	3920241.00	105846.51	96830.00	0.02	0.91
Non-specified other	1123.54	0.00	0.0000					0.91
<b>Non-Energy Use</b>	<b>0.00</b>	<b>0.00</b>	<b>0.0000</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Memo: Non-Energy Use Industry/ Transfer	0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00



**C6: Methane emission factors for aggregated energy balance**

Supply and Consumption	Methane emission factors (t CH <sub>4</sub> /TJ)								
	Coal	Crude Oil	Natural Gas	Nuclear Energy	Renewable Energy	Total	Petroleum Products	Electricity	Total
Indigenous Production	1.1128	0.0030	0.0034	0.0000	0.0000		0.0000	0.2465	
Import	1.1128	0.0030	0.0034	0.0000	0.0000		0.0000	0.2465	
Export	1.1128	0.0030	0.0034	0.0000	0.0000		0.0000	0.2465	
Intl. Marine Bunkers	1.1128	0.0030	0.0034	0.0000	0.0000		0.0000	0.2465	
Stock Changes	1.1128	0.0030	0.0034	0.0000	0.0000		0.0000	0.2465	
<b>Total Primary Energy Supply</b>									
<b>Total Primary Energy Consumed</b>									
Transfers	0.0000	0.0030	0.0034	0.0000	0.0000		0.0000	0.2465	
Statistical Differences	1.1100	0.0030	0.0034	0.0000	0.0000		0.0000	0.2465	
Public Electricity Plant	1.2223	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
Auto producer Electricity Plant	0.9148	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
Public CHP Plant	0.0000	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
Auto producer CHP Plant	0.0000	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
Public Heat Plant	0.0000	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
Auto producer Heat Plant	0.0000	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
Heat pumps	0.0000	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
Electric boilers	0.0000	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
Gas Works	1.2438	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
Oil Refineries	0.0000	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
Coal Transformation	1.2079	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
Liquefaction	1.0089	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
Non-specified (Transformation)	0.0000	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
Own Use	0.0000	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
Distribution Losses	1.2223	0.0030	0.0010	0.0000	0.0000		0.0000	0.0300	
<b>Total Final Consumption</b>									

<b>Industry Sector</b>									
Iron and Steel	0.9152	0.0020	0.0050	0.0000	0.0000		0.0000	0.0300	
Chemical and Petrochemical	0.9501	0.0020	0.0050	0.0000	0.0000		0.0000	0.0300	
Petrochemical Industry	0.8499	0.0020	0.0050	0.0000	0.0000		0.0000	0.0300	
Non-Ferrous Metals	0.9615	0.0020	0.0050	0.0000	0.0000		0.0000	0.0300	
Non-Metallic Minerals	0.9849	0.0020	0.0050	0.0000	0.0000		0.0000	0.0300	
Transport Equipment	0.9615	0.0020	0.0050	0.0000	0.0000		0.0000	0.0300	
Machinery	0.9615	0.0020	0.0050	0.0000	0.0000		0.0000	0.0300	
Mining and Quarrying	0.9849	0.0020	0.0050	0.0000	0.0000		0.0000	0.0300	
Food and Tobacco	0.9615	0.0020	0.0050	0.0000	0.0000		0.0000	0.0300	
Paper Pulp and Print	0.9615	0.0020	0.0050	0.0000	0.0000		0.0000	0.0300	
Wood and Wood Products	0.9615	0.0020	0.0050	0.0000	0.0000		0.0000	0.0300	
Construction	0.9615	0.0020	0.0050	0.0000	0.0000		0.0000	0.0300	
Textile and Leather	0.9615	0.0020	0.0050	0.0000	0.0000		0.0000	0.0300	
Non-specified (Industry)	0.9615	0.0020	0.0050	0.0000	0.0000		0.0000	0.0300	
<b>Transport Sector</b>									
International Civil Aviation	0.0000	0.0005	0.0000	0.0000	0.0000		0.0000	0.0000	
Domestic Air Transport	0.0000	0.0005	0.0000	0.0000	0.0000		0.0000	0.0000	
Road	0.0000	0.0200	0.0500	0.0000	0.0000		0.0000	0.0000	
Rail	0.0000	0.0050	0.0000	0.0000	0.0000		0.0000	0.0000	
Pipeline Transport	0.0000	0.0050	0.0000	0.0000	0.0000		0.0000	0.0000	
Internal Navigation	0.0000	0.0050	0.0000	0.0000	0.0000		0.0000	0.0000	
Non-specified (Transport)	0.0000	0.0050	0.0000	0.0000	0.0000		0.0000	0.0000	
<b>Other Sectors</b>									
Agriculture	0.9150	0.0100	0.0050	0.0000	0.0000		0.0000	0.3000	
Commerce and Public Services	0.9148	0.0100	0.0050	0.0000	0.0000		0.0000	0.3000	
Residential	0.9148	0.0100	0.0050	0.0000	0.0000		0.0000	0.3000	
Non-specified other	0.9148	0.0100	0.0050	0.0000	0.0000		0.0000	0.3000	
<b>Non-Energy Use</b>									
Memo: Non-Energy Use Industry/ Transfer	0.00	0.00	0.00	0.00	0.00		0.00	0.00	

Source: IPCC, 1996; Blignaut and King, 2002

**C7: Methane emissions for aggregated energy balance (CH4)**

Supply and Consumption	Methane emissions (t CH <sub>4</sub> )									
	Coal	Crude Oil	Natural Gas	Nuclear Energy	Renewable Energy	Biomass	Total	Petroleum Products	Electricity	Total
Indigenous Production	5899754.93	0.00	224.20	0.00	0.00	58530.00	5958509.13	0.00	0.00	0.00
Import	38268.09	2344.59	0.00	0.00	0.00	0.00	40612.68	1605.02	1226.56	2831.58
Export	-2178181.46	-22.79	0.00	0.00	0.00	0.00	-2178204.26	-20565.80	-1041.50	-21607.30
Intl. Marine Bunkers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-8976.16	0.00	-8976.16
Stock Changes	52170.84	0.00	0.00	0.00	0.00	0.00	52170.84	0.00	0.00	0.00
<b>Total Primary Energy Supply</b>	<b>3812012.41</b>	<b>2321.79</b>	<b>224.20</b>	<b>0.00</b>	<b>0.00</b>	<b>58530.00</b>	<b>3873088.40</b>	<b>-27936.94</b>	<b>185.06</b>	<b>-27751.88</b>
<b>Total Primary Energy Consumed</b>	<b>-3812012.41</b>	<b>-2321.79</b>	<b>-224.20</b>	<b>0.00</b>	<b>0.00</b>	<b>-58530.00</b>	<b>-3873088.40</b>	<b>27936.94</b>	<b>-185.06</b>	<b>27751.88</b>
Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Statistical Differences	34518.18	0.00	0.00	0.00	0.00	0.00	34518.18	0.00	-4591.42	-4591.42
<b>Transformation sector</b>	<b>-3252607.10</b>	<b>-2321.79</b>	<b>-25.19</b>	<b>0.00</b>	<b>0.00</b>	<b>-1410.00</b>	<b>-3256364.09</b>	<b>85793.90</b>	<b>46071.50</b>	<b>131865.40</b>
Public Electricity Plant	-2305699.81	0.00	0.00	0.00	0.00	0.00	-2305699.81	0.00	52493.18	52493.18
Auto producer Electricity Plant	-106161.40	0.00	0.00	0.00	0.00	0.00	-106161.40	0.00	1510.91	1510.91
Public CHP Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer CHP Plant	0.00	0.00	0.00	0.00	0.00	-1410.00	-1410.00	0.00	79.80	79.80
Public Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heat pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electric boilers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gas Works	-165935.37	0.00	39.86	0.00	0.00	0.00	-165895.51	0.00	0.00	0.00
Oil Refineries	0.00	-3339.45	-0.03	0.00	0.00	0.00	-3339.48	85793.90	-3465.09	82328.81
Coal Transformation	-14686.10	0.00	0.00	0.00	0.00	0.00	-14686.10	0.00	0.00	0.00
Liquefaction	-660124.42	1017.66	-65.02	0.00	0.00	0.00	-659171.78	0.00	0.00	0.00
Non-specified (Transformation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Own Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-114.79	-114.79
Distribution Losses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-4432.52	-4432.52
<b>Total Final Consumption</b>	<b>593923.49</b>	<b>0.00</b>	<b>199.01</b>	<b>0.00</b>	<b>0.00</b>	<b>57120.00</b>	<b>651242.49</b>	<b>57856.97</b>	<b>41665.14</b>	<b>99522.10</b>

<b>Industry Sector</b>	<b>535126.89</b>	<b>0.00</b>	<b>197.66</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>535324.55</b>	<b>3856.97</b>	<b>25914.80</b>	<b>29771.76</b>
Iron and Steel	163719.78	0.00	50.74	0.00	0.00	0.00	163770.51	0.00	5435.80	5435.80
Chemical and Petrochemical	30265.90	0.00	61.75	0.00	0.00	0.00	30327.65	0.00	686.30	686.30
Petrochemical Industry	188070.72	0.00	0.00	0.00	0.00	0.00	188070.72	0.00	0.00	0.00
Non-Ferrous Metals	0.00	0.00	11.28	0.00	0.00	0.00	11.28	0.00	3908.60	3908.60
Non-Metallic Minerals	33179.85	0.00	28.41	0.00	0.00	0.00	33208.26	0.00	299.87	299.87
Transport Equipment	0.00	0.00	1.84	0.00	0.00	0.00	1.84	0.00	18.00	18.00
Machinery	0.00	0.00	3.95	0.00	0.00	0.00	3.95	0.00	13.82	13.82
Mining and Quarrying	3856.93	0.00	1.89	0.00	0.00	0.00	3858.82	1734.43	7547.59	9282.02
Food and Tobacco	0.00	0.00	6.26	0.00	0.00	0.00	6.26	0.00	166.11	166.11
Paper Pulp and Print	0.00	0.00	14.84	0.00	0.00	0.00	14.84	0.00	388.22	388.22
Wood and Wood Products	0.00	0.00	0.34	0.00	0.00	0.00	0.34	0.00	107.18	107.18
Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	834.41	8.84	843.25
Textile and Leather	0.00	0.00	0.09	0.00	0.00	0.00	0.09	0.00	97.82	97.82
Non-specified (Industry)	116033.72	0.00	16.29	0.00	0.00	0.00	116050.00	1288.12	7236.65	8524.77
<b>Transport Sector</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>46232.08</b>	<b>1406.43</b>	<b>47638.51</b>
International Civil Aviation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3215.16	0.00	3215.16
Domestic Air Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2209.51	8.13	2217.64
Road	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40128.87	8.77	40137.64
Rail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	655.15	892.35	1547.50
Pipeline Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.18	16.18
Internal Navigation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	1.61
Non-specified (Transport)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.39	479.39	502.78
<b>Other Sectors</b>	<b>58796.60</b>	<b>0.00</b>	<b>1.34</b>	<b>0.00</b>	<b>0.00</b>	<b>57120.00</b>	<b>115917.94</b>	<b>5999.88</b>	<b>14343.91</b>	<b>20343.79</b>
Agriculture	1706.00	0.00	0.00	0.00	0.00	0.00	1706.00	3797.51	1027.82	4825.33
Commerce and Public Services	19030.20	0.00	1.15	0.00	0.00	0.00	19031.35	11.97	4461.27	4473.24
Residential	38060.40	0.00	0.00	0.00	0.00	57120.00	95180.40	1994.44	7454.51	9448.94
Non-specified other	0.00	0.00	0.19	0.00	0.00	0.00	0.19	195.97	1400.32	1596.28
<b>Non-Energy Use</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>1768.03</b>	<b>0.00</b>	<b>1768.03</b>
Memo: Non-Energy Use Industry/ Transfer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1768.03	0.00	1768.03

**C8: Methane emissions for aggregated energy balance (CO<sub>2</sub> eqs)**

Supply and Consumption	Methane emission factors (t CO <sub>2</sub> equivalents)									
	Coal	Crude Oil	Natural Gas	Nuclear Energy	Renewable Energy	Biomass	Total	Electricity	Petroleum products	Total
Indigenous Production	123894853.63	0.00	4708.20	0.00	0.00	1229130.00	125128691.83	0.00	0.00	0.00
Import	803629.92	49236.33	0.00	0.00	0.00	0.00	852866.25	33705.36	25757.81	59463.18
Export	-45741810.67	-478.69	0.00	0.00	0.00	0.00	-45742289.36	-431881.82	-21871.49	-453753.31
Intl. Marine Bunkers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-188499.26	0.00	-188499.26
Stock Changes	1095587.74	0.00	0.00	0.00	0.00	0.00	1095587.74	0.00	0.00	0.00
<b>Total Primary Energy Supply</b>	<b>80052260.62</b>	<b>48757.64</b>	<b>4708.20</b>	<b>0.00</b>	<b>0.00</b>	<b>1229130.00</b>	<b>81334856.46</b>	<b>-586675.72</b>	<b>3886.32</b>	<b>-582789.39</b>
<b>Total Primary Energy Consumed</b>	<b>-80052260.62</b>	<b>-48757.64</b>	<b>-4708.20</b>	<b>0.00</b>	<b>0.00</b>	<b>-1229130.00</b>	<b>-81334856.46</b>	<b>586675.72</b>	<b>-3886.32</b>	<b>582789.39</b>
Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Statistical Differences	724881.76	0.00	0.00	0.00	0.00	0.00	724881.76	0.00	-96419.89	-96419.89
<b>Transformation sector</b>	<b>-68304749.14</b>	<b>-48757.64</b>	<b>-529.07</b>	<b>0.00</b>	<b>0.00</b>	<b>-29610.00</b>	<b>-68383645.85</b>	<b>1801671.99</b>	<b>967501.48</b>	<b>2769173.47</b>
Public Electricity Plant	-48419696.08	0.00	0.00	0.00	0.00	0.00	-48419696.08	0.00	1102356.85	1102356.85
Auto producer Electricity Plant	-2229389.49	0.00	0.00	0.00	0.00	0.00	-2229389.49	0.00	31729.21	31729.21
Public CHP Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer CHP Plant	0.00	0.00	0.00	0.00	0.00	-29610.00	-29610.00	0.00	1675.70	1675.70
Public Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heat pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electric boilers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gas Works	-3484642.71	0.00	836.99	0.00	0.00	0.00	-3483805.72	0.00	0.00	0.00
Oil Refineries	0.00	-70128.43	-0.56	0.00	0.00	0.00	-70128.99	1801671.99	-72766.92	1728905.07
Coal Transformation	-308408.10	0.00	0.00	0.00	0.00	0.00	-308408.10	0.00	0.00	0.00
Liquefaction	-13862612.75	21370.79	-1365.51	0.00	0.00	0.00	-13842607.46	0.00	0.00	0.00
Non-specified (Transformation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Own Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2410.50	-2410.50
Distribution Losses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-93082.87	-93082.87
<b>Total Final Consumption</b>	<b>12472393.24</b>	<b>0.00</b>	<b>4179.13</b>	<b>0.00</b>	<b>0.00</b>	<b>1199520.00</b>	<b>13676092.37</b>	<b>1214996.27</b>	<b>874967.92</b>	<b>2089964.19</b>

<b>Industry Sector</b>	<b>11237664.74</b>	<b>0.00</b>	<b>4150.88</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>11241815.63</b>	<b>80996.30</b>	<b>544210.75</b>	<b>625207.06</b>
Iron and Steel	3438115.30	0.00	1065.46	0.00	0.00	0.00	3439180.76	0.00	114151.76	114151.76
Chemical and Petrochemical	635584.00	0.00	1296.66	0.00	0.00	0.00	636880.67	0.00	14412.37	14412.37
Petrochemical Industry	3949485.02	0.00	0.00	0.00	0.00	0.00	3949485.02	0.00	0.00	0.00
Non-Ferrous Metals	0.00	0.00	236.88	0.00	0.00	0.00	236.88	0.00	82080.63	82080.63
Non-Metallic Minerals	696776.84	0.00	596.58	0.00	0.00	0.00	697373.43	0.00	6297.21	6297.21
Transport Equipment	0.00	0.00	38.63	0.00	0.00	0.00	38.63	0.00	377.99	377.99
Machinery	0.00	0.00	82.89	0.00	0.00	0.00	82.89	0.00	290.22	290.22
Mining and Quarrying	80995.54	0.00	39.74	0.00	0.00	0.00	81035.28	36423.03	158499.29	194922.32
Food and Tobacco	0.00	0.00	131.37	0.00	0.00	0.00	131.37	0.00	3488.36	3488.36
Paper Pulp and Print	0.00	0.00	311.56	0.00	0.00	0.00	311.56	0.00	8152.71	8152.71
Wood and Wood Products	0.00	0.00	7.19	0.00	0.00	0.00	7.19	0.00	2250.85	2250.85
Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17522.71	185.64	17708.35
Textile and Leather	0.00	0.00	1.90	0.00	0.00	0.00	1.90	0.00	2054.18	2054.18
Non-specified (Industry)	2436708.04	0.00	342.03	0.00	0.00	0.00	2437050.06	27050.56	151969.56	179020.12
<b>Transport Sector</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>970873.76</b>	<b>29535.02</b>	<b>1000408.78</b>
International Civil Aviation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	67518.42	0.00	67518.42
Domestic Air Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46399.68	170.74	46570.42
Road	0.00	0.00	0.00	0.00	0.00	0.00	0.00	842706.31	184.16	842890.47
Rail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13758.23	18739.29	32497.51
Pipeline Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	339.84	339.84
Internal Navigation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.79	33.79
Non-specified (Transport)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	491.12	10067.21	10558.33
<b>Other Sectors</b>	<b>1234728.50</b>	<b>0.00</b>	<b>28.24</b>	<b>0.00</b>	<b>0.00</b>	<b>1199520.00</b>	<b>2434276.74</b>	<b>125997.49</b>	<b>301222.15</b>	<b>427219.64</b>
Agriculture	35826.00	0.00	0.00	0.00	0.00	0.00	35826.00	79747.67	21584.23	101331.90
Commerce and Public Services	399634.17	0.00	24.22	0.00	0.00	0.00	399658.38	251.31	93686.64	93937.96
Residential	799268.33	0.00	0.00	0.00	0.00	1199520.00	1998788.33	41883.18	156544.62	198427.80
Non-specified other	0.00	0.00	4.03	0.00	0.00	0.00	4.03	4115.32	29406.66	33521.98
<b>Non-Energy Use</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>37128.73</b>	<b>0.00</b>	<b>37128.73</b>
Memo: Non-Energy Use Industry/ Transfer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37128.73	0.00	37128.73

**C9: Nitrous oxide emission factors for aggregated energy balance**

Supply and Consumption	Nitrous oxide emission factors (t N <sub>2</sub> O/TJ)								
	Coal	Crude Oil	Natural Gas	Nuclear Energy	Renewable Energy	Total	Petroleum Products	Electricity	Total
Indigenous Production	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Import	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Export	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Intl. Marine Bunkers	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Stock Changes	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
<b>Total Primary Energy Supply</b>									
<b>Total Primary Energy Consumed</b>									
Transfers	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Statistical Differences	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Public Electricity Plant	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Auto producer Electricity Plant	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Public CHP Plant	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Auto producer CHP Plant	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Public Heat Plant	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Auto producer Heat Plant	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Heat pumps	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Electric boilers	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Gas Works	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Oil Refineries	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Coal Transformation	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Liquefaction	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Non-specified (Transformation)	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Own Use	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
Distribution Losses	0.0014	0.0006	0.0001	0.0000	0.0000		0.0000	0.0040	
<b>Total Final Consumption</b>									

<b>Industry Sector</b>								
Iron and Steel	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Chemical and Petrochemical	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Petrochemical Industry	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Non-Ferrous Metals	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Non-Metallic Minerals	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Transport Equipment	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Machinery	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Mining and Quarrying	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Food and Tobacco	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Paper Pulp and Print	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Wood and Wood Products	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Construction	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Textile and Leather	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Non-specified (Industry)	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
<b>Transport Sector</b>								
International Civil Aviation	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Domestic Air Transport	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Road	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Rail	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Pipeline Transport	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Internal Navigation	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Non-specified (Transport)								
<b>Other Sectors</b>								
Agriculture	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Commerce and Public Services	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Residential	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
Non-specified other	0.0014	0.0006	0.0001	0.0000	0.0000	0.0000	0.0040	
<b>Non-Energy Use</b>								
Memo: Non-Energy Use Industry/ Transfer								

Source: IPCC, 1996



**C10: Nitrous emissions for aggregated energy balance (N2O)**

Supply and Consumption	Nitrous emissions (t N <sub>2</sub> O)									
	Coal	Crude Oil	Natural Gas	Nuclear Energy	Renewable Energy	Biomass	Total	Petroleum Products	Electricity	Total
Indigenous Production	7422.67	0.00	6.50	0.00	0.00	949.60	8378.77	0.00	0.00	0.00
Import	48.15	468.92	0.00	0.00	0.00	0.00	517.06	811.64	50.97	862.60
Export	-2740.44	-4.56	0.00	0.00	0.00	0.00	-2745.00	-10399.90	-43.28	-10443.18
Intl. Marine Bunkers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-4539.14	0.00	-4539.14
Stock Changes	65.64	0.00	0.00	0.00	0.00	0.00	65.64	0.00	0.00	0.00
<b>Total Primary Energy Supply</b>	<b>4796.01</b>	<b>464.36</b>	<b>6.50</b>	<b>0.00</b>	<b>0.00</b>	<b>949.60</b>	<b>6216.48</b>	<b>-14127.40</b>	<b>7.69</b>	<b>-14119.71</b>
<b>Total Primary Energy Consumed</b>	<b>-4796.01</b>	<b>-464.36</b>	<b>-6.50</b>	<b>0.00</b>	<b>0.00</b>	<b>-949.60</b>	<b>-6216.48</b>	<b>14127.40</b>	<b>-7.69</b>	<b>14119.71</b>
Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Statistical Differences	43.54	0.00	0.00	0.00	0.00	0.00	43.54	0.00	-190.78	-190.78
<b>Transformation sector</b>	<b>-3923.12</b>	<b>-464.36</b>	<b>-2.52</b>	<b>0.00</b>	<b>0.00</b>	<b>-188.00</b>	<b>-4578.00</b>	<b>43385.03</b>	<b>1914.33</b>	<b>45299.36</b>
Public Electricity Plant	-2640.81	0.00	0.00	0.00	0.00	0.00	-2640.81	0.00	2181.16	2181.16
Auto producer Electricity Plant	-162.46	0.00	0.00	0.00	0.00	0.00	-162.46	0.00	62.78	62.78
Public CHP Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer CHP Plant	0.00	0.00	0.00	0.00	0.00	-188.00	-188.00	0.00	3.32	3.32
Public Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heat pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electric boilers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gas Works	-186.77	0.00	3.99	0.00	0.00	0.00	-182.78	0.00	0.00	0.00
Oil Refineries	0.00	-667.89	0.00	0.00	0.00	0.00	-667.89	43385.03	-143.98	43241.05
Coal Transformation	-17.02	0.00	0.00	0.00	0.00	0.00	-17.02	0.00	0.00	0.00
Liquefaction	-916.06	203.53	-6.50	0.00	0.00	0.00	-719.03	0.00	0.00	0.00
Non-specified (Transformation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Own Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-4.77	-4.77
Distribution Losses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-184.18	-184.18
<b>Total Final Consumption</b>	<b>916.43</b>	<b>0.00</b>	<b>3.98</b>	<b>0.00</b>	<b>0.00</b>	<b>761.60</b>	<b>1682.01</b>	<b>29257.63</b>	<b>1731.24</b>	<b>30988.87</b>

<b>Industry Sector</b>	<b>826.45</b>	<b>0.00</b>	<b>3.95</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>830.40</b>	<b>1950.43</b>	<b>1076.79</b>	<b>3027.22</b>
Iron and Steel	250.44	0.00	1.01	0.00	0.00	0.00	0.00	251.46	0.00	225.86	225.86
Chemical and Petrochemical	44.60	0.00	1.23	0.00	0.00	0.00	0.00	45.83	0.00	28.52	28.52
Petrochemical Industry	309.81	0.00	0.00	0.00	0.00	0.00	0.00	309.81	0.00	0.00	0.00
Non-Ferrous Metals	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.23	0.00	162.41	162.41
Non-Metallic Minerals	47.16	0.00	0.57	0.00	0.00	0.00	0.00	47.73	0.00	12.46	12.46
Transport Equipment	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.04	0.00	0.75	0.75
Machinery	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.08	0.00	0.57	0.57
Mining and Quarrying	5.48	0.00	0.04	0.00	0.00	0.00	0.00	5.52	877.08	313.61	1190.69
Food and Tobacco	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.13	0.00	6.90	6.90
Paper Pulp and Print	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.30	0.00	16.13	16.13
Wood and Wood Products	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	4.45	4.45
Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	421.95	0.37	422.32
Textile and Leather	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.06	4.06
Non-specified (Industry)	168.96	0.00	0.33	0.00	0.00	0.00	0.00	169.28	651.39	300.69	952.08
<b>Transport Sector</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>23379.06</b>	<b>58.44</b>	<b>23437.50</b>
International Civil Aviation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1625.87	0.00	1625.87
Domestic Air Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1117.32	0.34	1117.66
Road	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20292.73	0.36	20293.09
Rail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	331.30	37.08	368.38
Pipeline Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.67
Internal Navigation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07
Non-specified (Transport)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.83	19.92	31.75
<b>Other Sectors</b>	<b>89.98</b>	<b>0.00</b>	<b>0.03</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>761.60</b>	<b>851.61</b>	<b>3034.07</b>	<b>596.01</b>	<b>3630.08</b>
Agriculture	2.61	0.00	0.00	0.00	0.00	0.00	0.00	2.61	1920.36	42.71	1963.07
Commerce and Public Services	29.12	0.00	0.02	0.00	0.00	0.00	0.00	29.15	6.05	185.37	191.42
Residential	58.25	0.00	0.00	0.00	0.00	0.00	761.60	819.85	1008.56	309.74	1318.31
Non-specified other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.10	58.18	157.28
<b>Non-Energy Use</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>894.08</b>	<b>0.00</b>
Memo: Non-Energy Use Industry/ Transfer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	894.08	0.00

**C11: Nitrous emissions for aggregated energy balance (CO2 eqs)**

Supply and Consumption	Nitrous emissions (t CO <sub>2</sub> equivalents)									
	Coal	Crude Oil	Natural Gas	Nuclear Energy	Renewable Energy	Biomass	Total	Petroleum Products	Electricity	Total
Indigenous Production	2301027.86	0.00	2015.75	0.00	0.00	294376.00	2597419.61	0.00	0.00	0.00
Import	14925.36	145364.40	0.00	0.00	0.00	0.00	160289.76	251608.28	15799.21	267407.49
Export	-849536.34	-1413.27	0.00	0.00	0.00	0.00	-850949.61	-3223968.82	-13415.44	-3237384.26
Intl. Marine Bunkers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1407134.29	0.00	-1407134.29
Stock Changes	20347.72	0.00	0.00	0.00	0.00	0.00	20347.72	0.00	0.00	0.00
<b>Total Primary Energy Supply</b>	<b>1486764.60</b>	<b>143951.13</b>	<b>2015.75</b>	<b>0.00</b>	<b>0.00</b>	<b>294376.00</b>	<b>1927107.48</b>	<b>-4379494.84</b>	<b>2383.78</b>	<b>-4377111.06</b>
<b>Total Primary Energy Consumed</b>	<b>-1486764.60</b>	<b>-143951.13</b>	<b>-2015.75</b>	<b>0.00</b>	<b>0.00</b>	<b>-294376.00</b>	<b>-1927107.48</b>	<b>4379494.84</b>	<b>-2383.78</b>	<b>4377111.06</b>
Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Statistical Differences	13496.30	0.00	0.00	0.00	0.00	0.00	13496.30	0.00	-59141.60	-59141.60
<b>Transformation sector</b>	<b>-1216168.05</b>	<b>-143951.13</b>	<b>-781.01</b>	<b>0.00</b>	<b>0.00</b>	<b>-58280.00</b>	<b>-1419180.20</b>	<b>13449360.47</b>	<b>593441.75</b>	<b>14042802.22</b>
Public Electricity Plant	-818650.12	0.00	0.00	0.00	0.00	0.00	-818650.12	0.00	676158.73	676158.73
Auto producer Electricity Plant	-50363.96	0.00	0.00	0.00	0.00	0.00	-50363.96	0.00	19461.92	19461.92
Public CHP Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer CHP Plant	0.00	0.00	0.00	0.00	0.00	-58280.00	-58280.00	0.00	1027.84	1027.84
Public Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heat pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electric boilers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gas Works	-57898.64	0.00	1235.56	0.00	0.00	0.00	-56663.08	0.00	0.00	0.00
Oil Refineries	0.00	-207045.86	-0.82	0.00	0.00	0.00	-207046.68	13449360.47	-44633.45	13404727.02
Coal Transformation	-5276.88	0.00	0.00	0.00	0.00	0.00	-5276.88	0.00	0.00	0.00
Liquefaction	-283978.44	63094.72	-2015.75	0.00	0.00	0.00	-222899.46	0.00	0.00	0.00
Non-specified (Transformation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Own Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1478.54	-1478.54
Distribution Losses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-57094.75	-57094.75
<b>Total Final Consumption</b>	<b>284092.84</b>	<b>0.00</b>	<b>1234.73</b>	<b>0.00</b>	<b>0.00</b>	<b>236096.00</b>	<b>521423.58</b>	<b>9069865.63</b>	<b>536683.92</b>	<b>9606549.55</b>

<b>Industry Sector</b>	<b>256199.18</b>	<b>0.00</b>	<b>1225.50</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>257424.68</b>	<b>604631.96</b>	<b>333805.57</b>	<b>938437.52</b>
Iron and Steel	77636.61	0.00	314.56	0.00	0.00	0.00	77951.18	0.00	70017.90	70017.90
Chemical and Petrochemical	13825.08	0.00	382.82	0.00	0.00	0.00	14207.91	0.00	8840.19	8840.19
Petrochemical Industry	96040.73	0.00	0.00	0.00	0.00	0.00	96040.73	0.00	0.00	0.00
Non-Ferrous Metals	0.00	0.00	69.94	0.00	0.00	0.00	69.94	0.00	50346.25	50346.25
Non-Metallic Minerals	14620.99	0.00	176.13	0.00	0.00	0.00	14797.13	0.00	3862.55	3862.55
Transport Equipment	0.00	0.00	11.40	0.00	0.00	0.00	11.40	0.00	231.85	231.85
Machinery	0.00	0.00	24.47	0.00	0.00	0.00	24.47	0.00	178.01	178.01
Mining and Quarrying	1699.59	0.00	11.73	0.00	0.00	0.00	1711.32	271895.51	97219.59	369115.09
Food and Tobacco	0.00	0.00	38.78	0.00	0.00	0.00	38.78	0.00	2139.67	2139.67
Paper Pulp and Print	0.00	0.00	91.98	0.00	0.00	0.00	91.98	0.00	5000.67	5000.67
Wood and Wood Products	0.00	0.00	2.12	0.00	0.00	0.00	2.12	0.00	1380.61	1380.61
Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	130805.84	113.87	130919.71
Textile and Leather	0.00	0.00	0.56	0.00	0.00	0.00	0.56	0.00	1259.99	1259.99
Non-specified (Industry)	52376.17	0.00	100.98	0.00	0.00	0.00	52477.15	201930.61	93214.41	295145.02
<b>Transport Sector</b>	<b>0.00</b>	<b>0.00</b>	<b>0.90</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.90</b>	<b>7247507.42</b>	<b>18116.06</b>	<b>7265623.48</b>
International Civil Aviation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	504020.50	0.00	504020.50
Domestic Air Transport	0.00	0.00	0.90	0.00	0.00	0.00	0.90	346370.51	104.73	346475.24
Road	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6290746.03	112.96	6290859.00
Rail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	102704.23	11494.22	114198.45
Pipeline Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	208.45	208.45
Internal Navigation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.72	20.72
Non-specified (Transport)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3666.15	6174.98	9841.13
<b>Other Sectors</b>	<b>27893.67</b>	<b>0.00</b>	<b>8.34</b>	<b>0.00</b>	<b>0.00</b>	<b>236096.00</b>	<b>263998.01</b>	<b>940562.79</b>	<b>184762.30</b>	<b>1125325.09</b>
Agriculture	809.16	0.00	0.00	0.00	0.00	0.00	809.16	595311.04	13239.24	608550.28
Commerce and Public Services	9028.17	0.00	7.15	0.00	0.00	0.00	9035.32	1876.05	57465.10	59341.14
Residential	18056.34	0.00	0.00	0.00	0.00	236096.00	254152.34	312655.11	96020.64	408675.75
Non-specified other	0.00	0.00	1.19	0.00	0.00	0.00	1.19	30720.60	18037.32	48757.92
<b>Non-Energy Use</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>277163.45</b>	<b>0.00</b>	<b>277163.45</b>
Memo: Non-Energy Use Industry/ Transfer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	277163.45	0.00	277163.45

**C12: Total energy emissions for aggregated energy balance**

Supply and Consumption	Total energy emissions (t CO <sub>2</sub> equivalents)									
	Coal	Crude Oil	Natural Gas	Nuclear Energy	Renewable Energy	Biomass	Total	Petroleum Products	Electricity	Total
Indigenous Production	518377691.57	0.00	3654907.64	0.00	0.00	1523506.00	523556105.21	0.00	0.00	0.00
Import	3362398.12	57511939.52	0.00	0.00	0.00	0.00	60874337.64	1773454.86	4052688.15	5826143.01
Export	-191384335.43	-559144.69	0.00	0.00	0.00	0.00	-191943480.12	-22724066.23	-3441220.90	-26165287.13
Intl. Marine Bunkers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-9918152.02	0.00	-9918152.02
Stock Changes	4583953.48	0.00	0.00	0.00	0.00	0.00	4583953.48	0.00	0.00	0.00
<b>Total Primary Energy Supply</b>	<b>334939707.75</b>	<b>56952794.83</b>	<b>3654907.64</b>	<b>0.00</b>	<b>0.00</b>	<b>1523506.00</b>	<b>397070916.22</b>	<b>-30868763.40</b>	<b>611467.25</b>	<b>-30257296.15</b>
<b>Total Primary Energy Consumed</b>	<b>-334939707.75</b>	<b>-56952794.83</b>	<b>-3654907.64</b>	<b>0.00</b>	<b>0.00</b>	<b>-1523506.00</b>	<b>-397070916.22</b>	<b>30868763.40</b>	<b>-611467.25</b>	<b>30257296.15</b>
Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Statistical Differences	3036791.20	0.00	0.00	0.00	0.00	0.00	3036791.20	-0.02	-15170532.58	-15170532.60
<b>Transformation sector</b>	<b>-282514399.28</b>	<b>-56952794.83</b>	<b>-1414821.36</b>	<b>0.00</b>	<b>0.00</b>	<b>-87890.00</b>	<b>-340969905.47</b>	<b>94797491.87</b>	<b>152224955.27</b>	<b>247022447.14</b>
Public Electricity Plant	-213137186.99	0.00	0.00	0.00	0.00	0.00	-213137186.99	0.00	173442857.74	173442857.74
Auto producer Electricity Plant	-8977469.01	0.00	0.00	0.00	0.00	0.00	-8977469.01	0.00	4992217.89	4992217.89
Public CHP Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer CHP Plant	0.00	0.00	0.00	0.00	0.00	-87890.00	-87890.00	0.00	263652.31	263652.31
Public Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto producer Heat Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heat pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electric boilers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gas Works	-11910289.06	0.00	2238232.93	0.00	0.00	0.00	-9672056.13	0.00	0.00	0.00
Oil Refineries	0.00	-81915577.60	-1489.34	0.00	0.00	0.00	-81917066.95	94797491.87	-11449016.64	83348475.24
Coal Transformation	-1054272.02	0.00	0.00	0.00	0.00	0.00	-1054272.02	0.00	0.00	0.00
Liquefaction	-47435182.19	24962782.77	-3651564.94	0.00	0.00	0.00	-26123964.36	0.00	0.00	0.00
Non-specified (Transformation)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Own Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-379264.28	-379264.28
Distribution Losses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-14645491.75	-14645491.75
<b>Total Final Consumption</b>	<b>55462099.67</b>	<b>0.00</b>	<b>2240086.28</b>	<b>0.00</b>	<b>0.00</b>	<b>1435616.00</b>	<b>59137801.95</b>	<b>63928728.45</b>	<b>137665889.95</b>	<b>201594618.40</b>
<b>Industry Sector</b>	<b>49254189.47</b>	<b>0.00</b>	<b>2223335.76</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>51477525.24</b>	<b>4261733.73</b>	<b>85625147.96</b>	<b>89886881.69</b>
Iron and Steel	17060646.36	0.00	570692.39	0.00	0.00	0.00	17631338.75	0.00	17960433.50	17960433.50

Chemical and Petrochemical	3152894.63	0.00	694531.58	0.00	0.00	0.00	3847426.21	0.00	2267616.00	2267616.00
Petrochemical Industry	13529509.31	0.00	0.00	0.00	0.00	0.00	13529509.31	0.00	0.00	0.00
Non-Ferrous Metals	0.00	0.00	126879.53	0.00	0.00	0.00	126879.53	0.00	12914420.24	12914420.24
Non-Metallic Minerals	3415124.99	0.00	319548.43	0.00	0.00	0.00	3734673.42	0.00	990791.65	990791.65
Transport Equipment	0.00	0.00	20688.96	0.00	0.00	0.00	20688.96	0.00	59472.06	59472.06
Machinery	0.00	0.00	44400.04	0.00	0.00	0.00	44400.04	0.00	45662.52	45662.52
Mining and Quarrying	396984.90	0.00	21284.84	0.00	0.00	0.00	418269.74	1916448.91	24937994.52	26854443.43
Food and Tobacco	0.00	0.00	70364.70	0.00	0.00	0.00	70364.70	0.00	548851.97	548851.97
Paper Pulp and Print	0.00	0.00	166880.00	0.00	0.00	0.00	166880.00	0.00	1282732.91	1282732.91
Wood and Wood Products	0.00	0.00	3849.82	0.00	0.00	0.00	3849.82	0.00	354144.31	354144.31
Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	921981.83	29207.87	951189.70
Textile and Leather	0.00	0.00	1015.71	0.00	0.00	0.00	1015.71	0.00	323201.67	323201.67
Non-specified (Industry)	11699029.30	0.00	183199.76	0.00	0.00	0.00	11882229.05	1423302.99	23910618.75	25333921.74
<b>Transport Sector</b>	<b>0.00</b>	<b>0.00</b>	<b>1622.78</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>1622.78</b>	<b>51083880.73</b>	<b>4646987.08</b>	<b>55730867.81</b>
International Civil Aviation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3552576.29	0.00	3552576.29
Domestic Air Transport	0.00	0.00	1622.78	0.00	0.00	0.00	1622.78	2441384.17	26863.34	2468247.51
Road	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44340171.23	28975.99	44369147.22
Rail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	723908.26	2948405.77	3672314.03
Pipeline Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	53469.03	53469.03
Internal Navigation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5315.99	5315.99
Non-specified (Transport)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25840.78	1583956.96	1609797.74
<b>Other Sectors</b>	<b>6207910.20</b>	<b>0.00</b>	<b>15127.73</b>	<b>0.00</b>	<b>0.00</b>	<b>1435616.00</b>	<b>7658653.93</b>	<b>6629534.10</b>	<b>47393754.90</b>	<b>54023289.01</b>
Agriculture	179082.16	0.00	0.00	0.00	0.00	0.00	179082.16	4196035.45	3396023.85	7592059.30
Commerce and Public Services	2009602.03	0.00	12971.11	0.00	0.00	0.00	2022573.14	13223.28	14740489.03	14753712.31
Residential	4019226.01	0.00	0.00	0.00	0.00	1435616.00	5454842.01	2203741.96	24630451.40	26834193.35
Non-specified other	0.00	0.00	2156.62	0.00	0.00	0.00	2156.62	216533.41	4626790.63	4843324.04
<b>Non-Energy Use</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>1953579.89</b>	<b>0.00</b>	<b>1953579.89</b>
Memo: Non-Energy Use Industry/ Transfer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1953579.89	0.00	1953579.89

## Appendix D: Consistency Tables

### D1: Energy in native units of volume per energy in energy units

	Energy consumed (native units of volume) per energy consumed (TJ)									
	Primary Energy							Secondary Energy		
	Coal	Crude Oil	Natural Gas	Nuclear Energy	Renewable Energy	Biomass	Total	Petroleum Products	Electricity	Total
Agriculture	37.04	0.00	0.00	0.00	0.00	0.00		26.50	277.78	
Coal	41.76	0.00	0.00	0.00	0.00	0.00		26.36	437.53	
Crude Oil	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Natural gas	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Nuclear Energy	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Renewable Energy	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Biomass	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Gold & other mining	41.76	0.00	0.00	0.00	0.00	0.00		26.36	277.78	
Food & Textiles	0.00	0.00	0.00	0.00	0.00	0.00		0.00	277.78	
Wood & paper	0.00	0.00	0.00	0.00	0.00	0.00		0.00	277.78	
Petroleum	37.26	23.79	2.58	0.00	0.00	0.00		0.00	268.91	
Chemicals	305.69	0.00	0.00	0.00	0.00	0.00		0.00	277.78	
Iron & Metal	37.42	0.00	0.00	0.00	0.00	0.00		0.00	277.78	
Machinery & Equipment	0.00	0.00	0.00	0.00	0.00	0.00		0.00	277.78	
Other Manufacturing	37.79	0.00	0.00	0.00	0.00	0.00		32.92	277.78	
Electricity	49.01	0.00	0.00	0.00	0.00	1.00		0.00	-25.19	
Water	37.79	0.00	0.00	0.00	0.00	0.00		32.92	277.78	
Buildings & Accommodation	0.00	0.00	0.00	0.00	0.00	0.00		26.38	277.78	
Transport & Communication	0.00	0.00	0.00	0.00	0.00	0.00		28.39	277.78	
Financial & Community	37.42	0.00	0.00	0.00	0.00	0.00		35.92	277.78	
Household consumption	37.04	0.00	0.00	0.00	0.00	1.00		28.27	277.78	
Non-energy use	0.00	0.00	0.00	0.00	0.00	0.00		23.93	0.00	
Statistical diff	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Total	47.05	23.79	1.00	0.00	0.00	1.00		-58.33	277.78	

**D2: Energy emissions per energy consumed in native units of volume**

	Energy emissions (CO <sub>2</sub> eq) per total energy consumed (native units of volume)									
	Primary Energy							Secondary Energy		
	Coal	Crude Oil	Natural Gas	Nuclear Energy	Renewable Energy	Biomass	Total	Petroleum Products	Electricity	Total
Agriculture	2.59	0.00	0.00	0.00	0.00	0.00		3.30	0.86	
Coal	2.43	0.00	0.00	0.00	0.00	0.00		3.32	0.55	
Crude Oil	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Natural gas	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Nuclear Energy	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Renewable Energy	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Biomass	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Gold & other mining	2.43	0.00	0.00	0.00	0.00	0.00		3.32	0.86	
Food & Textiles	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.86	
Wood & paper	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.86	
Petroleum	1.94	3.09	0.00	0.00	0.00	0.00		0.00	0.89	
Chemicals	0.32	0.00	0.00	0.00	0.00	0.00		0.00	0.86	
Iron & Metal	2.55	0.00	0.00	0.00	0.00	0.00		0.00	0.86	
Machinery & Equipment	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.86	
Other Manufacturing	2.57	0.00	0.00	0.00	0.00	0.00		2.65	0.86	
Electricity	2.26	0.00	0.00	0.00	0.00	1.87		0.00	-9.47	
Water	2.57	0.00	0.00	0.00	0.00	0.00		2.65	0.86	
Buildings & Accommodation	0.00	0.00	0.00	0.00	0.00	0.00		3.31	0.86	
Transport & Communication	0.00	0.00	0.00	0.00	0.00	0.00		3.08	0.86	
Financial & Community	2.58	0.00	0.00	0.00	0.00	0.00		2.43	0.86	
Household consumption	2.61	0.00	0.00	0.00	0.00	7.54		3.09	0.86	
Non-energy use	0.00	0.00	0.00	0.00	0.00	0.00		3.65	0.00	
Statistical diff	2.16	0.00	0.00	0.00	0.00	0.00		3.03	0.86	
Total	2.08	3.09	56.21	0.00	0.00	6.42		-1.50	0.00	



**D3: Energy emissions per energy consumed in energy units**

	Energy emissions (CO <sub>2</sub> eq) per total energy consumed (TJ)									
	Primary Energy							Secondary Energy		
	Coal	Crude Oil	Natural Gas	Nuclear Energy	Renewable Energy	Biomass	Total	Petroleum Products	Electricity	Total
Agriculture	96.05	0.00	0.00	0.00	0.00	0.00	96.05	87.40	238.56	121.97
Coal	101.37	0.00	56.24	0.00	0.00	0.00	95.11	87.40	238.56	213.18
Crude Oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Natural gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nuclear Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewable Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biomass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gold & other mining	101.37	0.00	56.24	0.00	0.00	0.00	95.11	87.40	238.56	213.18
Food & Textiles	0.00	0.00	56.24	0.00	0.00	0.00	56.24	0.00	238.56	238.56
Wood & paper	0.00	0.00	56.24	0.00	0.00	0.00	56.24	0.00	238.56	238.56
Petroleum	72.40	73.59	56.16	0.00	0.00	0.00	72.68	87.40	238.56	80.16
Chemicals	98.98	0.00	56.24	0.00	0.00	0.00	87.04	0.00	238.56	238.56
Iron & Metal	95.37	0.00	56.24	0.00	0.00	0.00	92.83	0.00	238.56	238.56
Machinery & Equipment	0.00	0.00	56.24	0.00	0.00	0.00	56.24	0.00	238.56	238.56
Other Manufacturing	96.94	0.00	56.24	0.00	0.00	0.00	95.87	87.40	238.56	217.43
Electricity	110.93	0.00	0.00	0.00	0.00	1.87	101.18	0.00	238.56	238.56
Water	96.94	0.00	56.24	0.00	0.00	0.00	95.87	87.40	238.56	217.43
Buildings & Accommodation	0.00	0.00	1.00	0.00	0.00	0.00	0.00	87.40	238.56	89.14
Transport & Communication	0.00	0.00	56.14	0.00	0.00	0.00	56.14	87.40	238.56	92.28
Financial & Community	96.61	0.00	56.24	0.00	0.00	0.00	96.09	87.40	238.56	233.82
Household consumption	96.61	0.00	0.00	0.00	0.00	7.54	23.51	87.40	238.56	208.89
Non-energy use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	87.40	0.00	87.40
Statistical diff	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	97.77	73.59	56.21	0.00	0.00	6.42	85.41	87.40	238.56	86.30

## Appendix E: Structure of the energy-emissions IO table

E1: Energy share of total energy, intermediate output, and total output  
(R million)

	Intermediate Output			Final Demand	Total Output	Energy share of total energy output	Energy share of intermediate output	Energy share of sector output	Energy share of total output
	Energy Industry Output	Other industry Output	Total Industry Output						
Agriculture	8170.58	44362.21	52532.79	4234.74	56767.53	8.30	15.55	14.39	0.28
Coal	8199.09	5015.34	13214.43	7345.51	20559.94	8.33	62.05	39.88	0.28
Crude Oil	1451.82	22277.42	23729.24	5298.53	29027.77	1.47	6.12	5.00	0.05
Natural gas	3.95	0.00	3.95	0.00	3.95	0.00	100.00	100.00	0.00
Nuclear Energy	313.70	0.00	313.70	-40.00	273.70	0.32	100.00	114.61	0.01
Renewable Energy	12.84	46.51	59.35	83.33	142.68	0.01	21.63	9.00	0.00
Biomass	0.00	1.61	1.61	8139.94	8141.55	0.00	0.00	0.00	0.00
Gold & other mining	10554.92	19762.64	30317.56	81132.54	111450.10	10.72	34.81	9.47	0.36
Food & Textiles	181.62	49627.25	49808.87	84864.25	134673.12	0.18	0.36	0.13	0.01
Wood & Paper	190.19	43412.65	43602.84	11455.11	55057.95	0.19	0.44	0.35	0.01
Petroleum products	2114.73	7141.25	9255.98	45.21	9301.19	2.15	22.85	22.74	0.07
Chemicals	2897.27	91870.07	94767.34	27609.39	122376.73	2.94	3.06	2.37	0.10
Iron & metals	796.43	57687.53	58483.96	36665.48	95149.44	0.81	1.36	0.84	0.03
Machinery & Equipment	4253.83	96903.38	101157.21	97837.81	198995.02	4.32	4.21	2.14	0.15
Other manufacturing	72.21	5555.62	5627.83	11701.50	17329.33	0.07	1.28	0.42	0.00
Electricity	2378.46	17027.20	19405.66	11577.96	30983.62	2.42	12.26	7.68	0.08
Water	361.62	7948.41	8310.03	1817.02	10127.05	0.37	4.35	3.57	0.01
Construction & Accommodation	2034.27	44842.13	46876.40	221500.81	268377.21	2.07	4.34	0.76	0.07
Transport & Communications	6148.61	69237.86	75386.47	93187.59	168574.06	6.25	8.16	3.65	0.21
Financial & Community Services	4092.59	164634.23	168726.82	298713.26	467440.08	4.16	2.43	0.88	0.14
Labour	12979.01	384336.50	397315.51	27642.49	424958.00	13.19	3.27	3.05	0.44
Taxes less subsidies	639.68	19150.30	19789.97	80215.52	100005.49	0.65	3.23	0.64	0.02
Gross operating surplus	27902.76	330063.25	357966.02	5127.49	363093.51	28.35	7.79	7.68	0.95
Imports	2684.21	225414.25	228098.46	1367.59	229466.05	2.73	1.18	1.17	0.09
<b>Total</b>	<b>98434.39</b>	<b>1706317.61</b>	<b>1804752.00</b>	<b>1117523.05</b>	<b>2922275.05</b>	<b>100.00</b>	<b>5.45</b>	<b>3.37</b>	<b>3.37</b>

**E2: Energy share of total energy, intermediate input, and total input (R million)**

	Intermediate Input			Final payments	Total Input	Energy share of total energy input	Energy share of intermediate input	Energy share of sector input	Energy share of total input
	Energy Industry Input	Other Industry Input	Total Industry input						
<b>Agriculture</b>	3205.57	24137.04	27342.61	29424.92	56767.53	3.26	11.72	5.65	0.11
<b>Coal</b>	687.88	9114.28	9802.16	10757.77	20559.93	0.70	7.02	3.35	0.02
<b>Crude Oil</b>	5897.54	12591.45	18488.99	10538.78	29027.77	5.99	31.90	20.32	0.20
<b>Natural gas</b>	0.42	1.50	1.92	2.03	3.95	0.00	21.99	10.70	0.00
<b>Nuclear Energy</b>	0.00	224.00	224.00	49.70	273.70	0.00	0.00	0.00	0.00
<b>Renewable Energy</b>	0.40	43.75	44.15	98.53	142.68	0.00	0.91	0.28	0.00
<b>Biomass</b>	0.00	8141.55	8141.55	0.00	8141.55	0.00	0.00	0.00	0.00
<b>Gold &amp; other mining</b>	4442.76	33382.80	37825.56	73624.54	111450.10	4.51	11.75	3.99	0.15
<b>Food &amp; Textiles</b>	2162.54	85286.23	87448.77	47224.36	134673.13	2.20	2.47	1.61	0.07
<b>Wood &amp; Paper</b>	403.12	31542.77	31945.89	23112.06	55057.95	0.41	1.26	0.73	0.01
<b>Petroleum products</b>	1894.04	4034.82	5928.86	3372.34	9301.19	1.92	31.95	20.36	0.06
<b>Chemicals</b>	5977.34	57083.28	63060.62	59316.11	122376.73	6.07	9.48	4.88	0.20
<b>Iron &amp; metals</b>	9177.34	48338.64	57515.98	37633.46	95149.44	9.32	15.96	9.65	0.31
<b>Machinery &amp; Equipment</b>	1371.36	78048.65	79420.01	119575.00	198995.01	1.39	1.73	0.69	0.05
<b>Other manufacturing</b>	248.14	9524.84	9772.98	7556.35	17329.33	0.25	2.54	1.43	0.01
<b>Electricity</b>	5994.30	5602.80	11597.10	19386.52	30983.62	6.09	51.69	19.35	0.21
<b>Water</b>	696.60	6289.96	6986.56	3140.49	10127.05	0.71	9.97	6.88	0.02
<b>Construction &amp; Accommodation</b>	5993.17	126029.83	132023.00	136354.21	268377.21	6.09	4.54	2.23	0.21
<b>Transport &amp; Communications</b>	12537.63	51432.93	63970.56	104603.50	168574.06	12.74	19.60	7.44	0.43
<b>Financial &amp; Community Services</b>	5293.76	144747.01	150040.77	317399.31	467440.08	5.38	3.53	1.13	0.18
<b>Household consumption</b>	33792.77	518947.24	552740.00	3912.00	556652.00	34.33	6.11	6.07	1.16
<b>Government expenditure</b>	0.00	166330.00	166330.00	0.00	166330.00	0.00	0.00	0.00	0.00
<b>Investment &amp; savings</b>	-19126.45	60594.42	41467.97	99117.09	140585.06	-19.43	-46.12	-13.60	-0.65
<b>Exports</b>	17784.16	224847.83	242631.99	11324.00	253955.99	18.07	7.33	7.00	0.61
<b>Total</b>	98434.39	1706317.61	1804752.00	1117523.05	2922275.05	100.00	5.45	3.37	3.37

**E3: Value Added, Energy and Labour (R million)**

	<b>Value added</b>	<b>Energy</b>	<b>Labour</b>	<b>Energy/Labour</b>	<b>Labour/Value added</b>	<b>Energy/Value added</b>
<b>Agriculture</b>	20521.15	3205.57	8903.76	0.36	0.43	0.16
<b>Coal</b>	6150.63	687.88	4607.14	0.15	0.75	0.11
<b>Crude Oil</b>	9276.53	5897.54	1262.25	4.67	0.14	0.64
<b>Natural gas</b>	1.88	0.42	0.15	2.81	0.08	0.22
<b>Nuclear Energy</b>	0.00	0.00	49.70	0.00	0.00	0.00
<b>Renewable Energy</b>	10.02	0.40	88.51	0.00	8.83	0.04
<b>Biomass</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>Gold &amp; other mining</b>	52514.41	4442.76	21110.13	0.21	0.40	0.08
<b>Food &amp; Textiles</b>	28962.82	2162.54	18261.54	0.12	0.63	0.07
<b>Wood &amp; Paper</b>	12974.05	403.12	10138.01	0.04	0.78	0.03
<b>Petroleum products</b>	2967.86	1894.04	404.48	4.68	0.14	0.64
<b>Chemicals</b>	42594.25	5977.34	16721.86	0.36	0.39	0.14
<b>Iron &amp; metals</b>	25351.31	9177.34	12282.15	0.75	0.48	0.36
<b>Machinery &amp; Equipment</b>	102554.41	1371.36	17020.59	0.08	0.17	0.01
<b>Other manufacturing</b>	5208.67	248.14	2347.69	0.11	0.45	0.05
<b>Electricity</b>	12819.74	5994.30	6566.78	0.91	0.51	0.47
<b>Water</b>	2083.98	696.60	1056.51	0.66	0.51	0.33
<b>Construction &amp; Accommodation</b>	70785.56	5993.17	65568.65	0.09	0.93	0.08
<b>Transport &amp; Communications</b>	70499.26	12537.63	34104.24	0.37	0.48	0.18
<b>Financial &amp; Community Services</b>	140577.94	5293.76	176821.37	0.03	1.26	0.04

**E4: Economic Multipliers**

	Output Multiplier		Income Multiplier							Employment Multiplier						
	Simple	Total	Open	Closed	Direct	Indirect	Induced	Simple	Total	Open	Closed	Direct	Indirect	Induced	Simple	Total
<b>Agriculture</b>	2.94	3.45	1.50	1.76	0.51	0.99	0.26	2.94	3.45	1.50	1.76	0.51	0.99	0.26	2.94	3.45
<b>Coal</b>	3.04	3.66	1.89	2.27	0.62	1.27	0.38	3.05	3.66	1.89	2.27	0.62	1.27	0.38	3.05	3.66
<b>Crude Oil</b>	2.90	3.31	1.18	1.34	0.41	0.77	0.16	2.88	3.27	1.18	1.34	0.41	0.77	0.16	2.88	3.27
<b>Natural gas</b>	2.46	2.78	0.80	0.91	0.33	0.47	0.11	2.42	2.76	0.80	0.91	0.33	0.47	0.11	2.42	2.76
<b>Nuclear Energy</b>	3.60	4.25	2.33	2.75	0.65	1.68	0.42	3.58	4.23	2.33	2.75	0.65	1.68	0.42	3.58	4.23
<b>Renewable Energy</b>	3.92	5.10	4.61	5.99	1.18	3.43	1.38	3.91	5.08	4.61	5.99	1.18	3.43	1.38	3.91	5.08
<b>Biomass</b>	3.94	4.45	2.01	2.27	0.51	1.50	0.26	3.94	4.45	2.01	2.27	0.51	1.50	0.26	3.94	4.45
<b>Gold &amp; other mining</b>	2.56	3.06	1.28	1.52	0.50	0.78	0.24	2.56	3.04	1.28	1.52	0.50	0.78	0.24	2.56	3.04
<b>Food &amp; Textiles</b>	3.47	4.06	2.06	2.41	0.59	1.47	0.35	3.49	4.08	2.06	2.41	0.59	1.47	0.35	3.49	4.08
<b>Wood &amp; Paper</b>	3.43	4.08	2.23	2.65	0.65	1.58	0.42	3.43	4.08	2.23	2.65	0.65	1.58	0.42	3.43	4.08
<b>Petroleum products</b>	2.90	3.31	1.18	1.34	0.41	0.77	0.16	2.88	3.27	1.18	1.34	0.41	0.77	0.16	2.88	3.27
<b>Chemicals</b>	2.94	3.45	1.49	1.75	0.51	0.98	0.26	2.92	3.43	1.49	1.75	0.51	0.98	0.26	2.92	3.43
<b>Iron &amp; metals</b>	3.21	3.76	1.75	2.05	0.55	1.20	0.30	3.18	3.73	1.75	2.05	0.55	1.20	0.30	3.18	3.73
<b>Machinery &amp; Equipment</b>	2.34	2.65	0.72	0.82	0.31	0.41	0.10	2.32	2.65	0.72	0.82	0.31	0.41	0.10	2.32	2.65
<b>Other manufacturing</b>	3.15	3.70	1.71	2.00	0.54	1.17	0.29	3.17	3.70	1.71	2.00	0.54	1.17	0.29	3.17	3.70
<b>Electricity</b>	2.78	3.35	1.59	1.91	0.57	1.02	0.32	2.79	3.35	1.59	1.91	0.57	1.02	0.32	2.79	3.35
<b>Water</b>	3.66	4.21	2.04	2.35	0.56	1.48	0.31	3.64	4.20	2.04	2.35	0.56	1.48	0.31	3.64	4.20
<b>Construction &amp; Accommodation</b>	3.27	3.98	2.32	2.83	0.71	1.61	0.51	3.27	3.99	2.32	2.83	0.71	1.61	0.51	3.27	3.99
<b>Transport &amp; Communications</b>	2.73	3.26	1.46	1.75	0.54	0.92	0.29	2.70	3.24	1.46	1.75	0.54	0.92	0.29	2.70	3.24
<b>Financial &amp; Community Services</b>	3.15	3.99	2.63	3.32	0.83	1.80	0.69	3.17	4.00	2.63	3.32	0.83	1.80	0.69	3.17	4.00

**E5: Backward and Forward Linkages**

	Backward Linkages		Forward Linkages	
	Direct	Direct + Indirect	Direct	Direct + Indirect
Agriculture	0.48	1.09	1.42	2.88
Coal	0.48	0.01	0.49	1.76
Crude Oil	0.64	0.01	0.27	1.60
Natural gas	0.49	0.00	0.00	1.00
Nuclear Energy	0.82	0.01	0.01	1.02
Renewable Energy	0.31	0.01	0.00	1.00
Biomass	1.00	1.09	0.00	1.00
Gold & other mining	0.34	0.01	1.58	3.14
Food & Textiles	0.65	0.36	0.44	1.98
Wood & Paper	0.58	0.15	0.55	2.07
Petroleum products	0.64	0.01	0.13	1.26
Chemicals	0.52	0.02	1.00	3.41
Iron & metals	0.60	0.01	0.74	2.52
Machinery & Equipment	0.40	0.01	1.06	3.24
Other manufacturing	0.56	0.05	0.21	1.27
Electricity	0.37	0.01	0.30	1.62
Water	0.69	0.01	0.48	1.94
Construction & Accommodation	0.49	0.02	0.26	1.53
Transport & Communications	0.38	0.01	0.79	2.71
Financial & Community Services	0.32	0.01	1.02	3.38

**E6: Direct Pollution-Pollution Multipliers**

	Primary Energy							Secondary Energy		
	Coal	Crude Oil	Natural Gas	Nuclear	Renewable Energy	Biomass	Total	Electricity	Petroleum Products	Total
Agriculture	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.55	0.45	1.00
Coal	0.90	0.00	0.10	0.00	0.00	0.00	1.00	0.07	0.93	1.00
Crude Oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Natural gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nuclear Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewable Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biomass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gold & other mining	0.90	0.00	0.10	0.00	0.00	0.00	1.00	0.07	0.93	1.00
Food & Textiles	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00
Wood & Paper	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00
Petroleum products	0.53	0.46	0.01	0.00	0.00	0.00	1.00	1.15	-0.15	1.00
Chemicals	0.78	0.00	0.22	0.00	0.00	0.00	1.00	0.00	1.00	1.00
Iron & metals	0.94	0.00	0.06	0.00	0.00	0.00	1.00	0.00	1.00	1.00
Machinery & Equipment	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00
Other manufacturing	0.98	0.00	0.02	0.00	0.00	0.00	1.00	0.06	0.94	1.00
Electricity	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00
Water	0.98	0.00	0.02	0.00	0.00	0.00	1.00	0.06	0.94	1.00
Construction & Accommodation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.03	1.00
Transport & Communications	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.92	0.08	1.00
Financial & Community Services	0.99	0.00	0.01	0.00	0.00	0.00	1.00	0.01	0.99	1.00

**E7: Indirect Pollution-Pollution Multipliers**

	Primary Energy							Secondary Energy		
	Coal	Crude Oil	Natural Gas	Nuclear	Renewable Energy	Biomass	Total	Electricity	Petroleum Products	Total
Agriculture	0.01	0.01	0.02	0.00	0.00	0.00	0.04	0.04	-0.15	-0.11
Coal	0.13	0.12	0.08	0.00	0.00	0.01	0.34	0.34	0.33	0.67
Crude Oil	0.03	0.10	0.06	0.00	0.00	0.00	0.19	0.19	0.18	0.37
Natural gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nuclear Energy	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
Renewable Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biomass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gold & other mining	0.11	0.31	0.25	0.00	0.00	0.00	0.67	0.67	0.82	1.49
Food & Textiles	0.01	0.01	0.04	0.00	0.00	0.00	0.06	0.06	-0.03	0.03
Wood & Paper	0.02	0.02	0.09	0.00	0.00	0.00	0.13	0.13	-0.01	0.12
Petroleum products	0.25	1.01	0.40	0.00	0.00	0.00	1.66	1.66	3.00	4.66
Chemicals	0.07	0.11	0.35	0.00	0.00	0.00	0.53	0.53	0.19	0.72
Iron & metals	0.09	0.03	0.30	0.00	0.00	0.00	0.43	0.43	0.04	0.46
Machinery & Equipment	0.10	0.09	0.10	0.00	0.00	0.01	0.29	0.29	0.03	0.32
Other manufacturing	0.03	0.00	0.04	0.00	0.00	0.00	0.07	0.07	-0.04	0.03
Electricity	0.69	0.04	0.04	0.00	0.00	0.06	0.83	0.83	0.09	0.92
Water	0.03	0.01	0.03	0.00	0.00	0.00	0.07	0.07	0.01	0.08
Construction & Accommodation	0.05	0.02	0.02	0.00	0.00	0.00	0.09	0.09	-0.07	0.02
Transport & Communications	0.08	0.14	0.10	0.00	0.00	0.00	0.32	0.32	-1.44	-1.12
Financial & Community Services	0.11	0.11	0.13	0.00	0.00	0.01	0.35	0.35	0.08	0.43



**E8: Direct Pollution-Output Multipliers**

	Primary Energy							Secondary Energy		
	Coal	Crude Oil	Natural Gas	Nuclear	Renewable Energy	Biomass	Total	Electricity	Petroleum Products	Total
Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.14	-0.11	-0.25
Coal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.14	-0.15
Crude Oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Natural gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nuclear Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewable Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biomass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gold & other mining	0.01	0.00	0.00	0.00	0.00	0.00	0.01	-0.05	-0.72	-0.77
Food & Textiles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	-0.03
Wood & Paper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	-0.05
Petroleum products	0.20	0.17	0.00	0.00	0.00	0.00	0.37	3.07	-0.39	2.68
Chemicals	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	-0.07	-0.07
Iron & metals	0.03	0.00	0.00	0.00	0.00	0.00	0.04	0.00	-1.02	-1.02
Machinery & Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other manufacturing	0.02	0.00	0.00	0.00	0.00	0.00	0.02	-0.04	-0.59	-0.63
Electricity	0.52	0.00	0.00	0.00	0.00	0.00	0.52	0.00	4.92	4.92
Water	0.01	0.00	0.00	0.00	0.00	0.00	0.01	-0.01	-0.20	-0.21
Construction & Accommodation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	-0.03
Transport & Communications	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.69	-0.15	-1.84
Financial & Community Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.64	-0.65

**E9: Indirect Pollution-Output Multipliers**

	Primary Energy							Secondary Energy		
	Coal	Crude Oil	Natural Gas	Nuclear	Renewable Energy	Biomass	Total	Electricity	Petroleum Products	Total
Agriculture	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	-0.15	-0.14
Coal	0.11	0.02	0.00	0.00	0.00	0.00	0.13	0.13	0.34	0.46
Crude Oil	0.03	0.02	0.00	0.00	0.00	0.00	0.04	0.04	0.19	0.23
Natural gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nuclear Energy	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
Renewable Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biomass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gold & other mining	0.09	0.05	0.00	0.00	0.00	0.00	0.14	0.14	0.83	0.98
Food & Textiles	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	-0.03	-0.02
Wood & Paper	0.02	0.00	0.00	0.00	0.00	0.00	0.02	0.02	-0.01	0.01
Petroleum products	0.20	0.17	0.00	0.00	0.00	0.00	0.38	0.38	3.06	3.44
Chemicals	0.06	0.02	0.00	0.00	0.00	0.00	0.08	0.08	0.19	0.27
Iron & metals	0.07	0.01	0.00	0.00	0.00	0.00	0.08	0.08	0.04	0.12
Machinery & Equipment	0.08	0.01	0.00	0.00	0.00	0.00	0.10	0.10	0.04	0.13
Other manufacturing	0.02	0.00	0.00	0.00	0.00	0.00	0.02	0.02	-0.04	-0.02
Electricity	0.56	0.01	0.00	0.00	0.00	0.00	0.57	0.57	0.09	0.66
Water	0.02	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.01	0.03
Construction & Accommodation	0.04	0.00	0.00	0.00	0.00	0.00	0.05	0.05	-0.07	-0.03
Transport & Communications	0.06	0.02	0.00	0.00	0.00	0.00	0.09	0.09	-1.47	-1.38
Financial & Community Services	0.09	0.02	0.00	0.00	0.00	0.00	0.11	0.11	0.09	0.19