



กรมพัฒนาพลังงานทดแทน
และอนุรักษ์พลังงาน
กระทรวงพลังงาน

POCKET BOOK 2011

Energy in Thailand

www.dede.go.th



Department of Alternative
Energy Development and Efficiency
MINISTRY OF ENERGY

DEDE

The Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy has the main role and functions in research development and promotion of alternative energy, as well as energy conservation. DEDE also publishes the annual publications of "Oil and Thailand", "Electric Power in Thailand" and "Thailand Energy Situation", apart from the main duties, in order to disseminate data and information on statistics of crude oil, natural gas, petroleum products, electricity, coal & lignite, renewable and related details gathered during the calendar year.

In 2004, DEDE produced a handy, pocket - sized summary of key energy data. This new report is the First Issue of Thailand Energy Summary. Key Thailand Energy Statistics contains timely data on the statistics of energy production, import, export, transformation and consumption, energy & economy and related details, which may be useful for further studies and references.

In this regard, DEDE would like to take this opportunity to express our sincere appreciation to all government agencies and state enterprises as well as energy production and distribution companies for their excellent cooperation in providing useful data and information for this publication.

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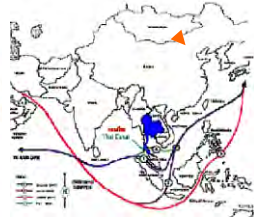
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Abbreviations

Com.	= Commercial
GDP	= Gross Domestic Product
HSD	= High Speed Diesel
LPG	= Liquefied Petroleum Gas
NG.	= Natural Gas
NGL	= Natural Gasoline
Res.	= Residential
ULG	= Unleaded Premium Gasoline

Bcf	= Billion Cubic Feet
bil	= Billion
Btu	= British Thermal Unit
e	= Estimated Data
Gcal	= Gigacalories
Gj	= Gigajoules
Gwh	= Gigawatt - Hour
kcal	= Kilocalories (10^3 Calories)
ktoe	= Kilo Ton of Oil Equivalent
mil	= Million
MMscf	= Million Standard Cubic Feet
MMscfd	= Million Standard Cubic Feet Per Day
scf	= Standard Cubic Feet
toe	= Ton of Oil Equivalent

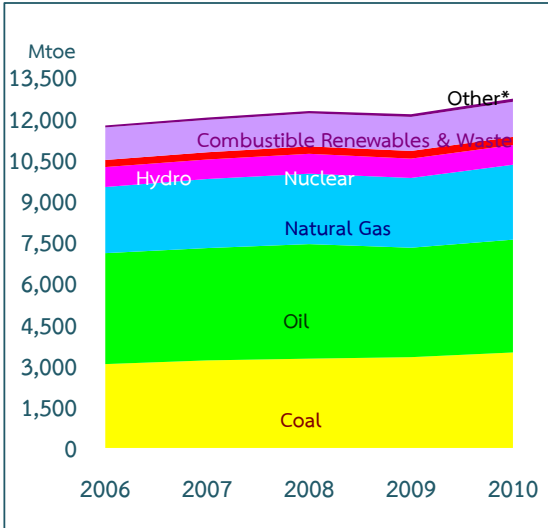
General Information on Thailand 2011



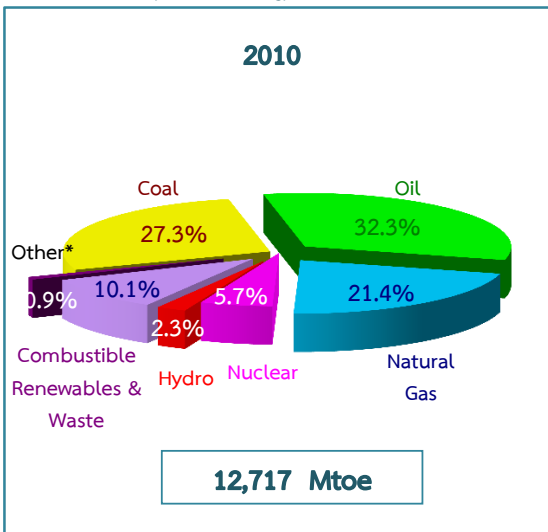
Area	:	513,115 km ²
Population	:	64,076 thousand
Number of Provinces	:	77
Number of Households	:	22,240,259
Average Size of Household:	:	2.9 persons
GDP (1988 Prices)	:	4,598 10 ⁹ Baht
GDP Growth	:	0.5 %
GDP per capita	:	71,759 Baht/capita
GDP per household	:	206,762 Baht/household
Export	:	6,897 10 ⁹ Baht
Import	:	6,974 10 ⁹ Baht
Currency	:	1 USD = 30.63 Baht

World Energy

Total Primary Energy Supply by Fuel



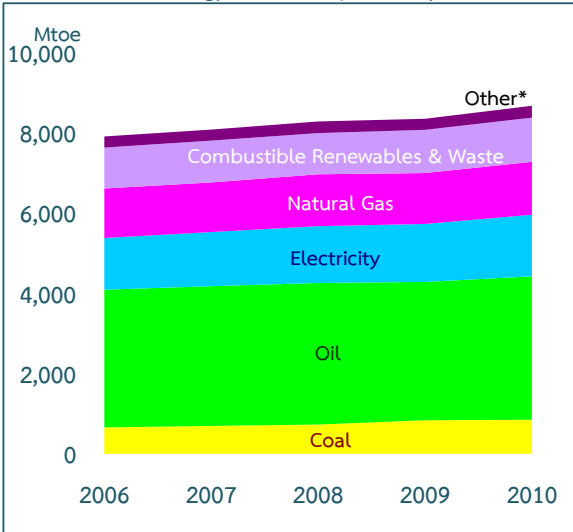
Source : IEA's Key World Energy Statistics 2012



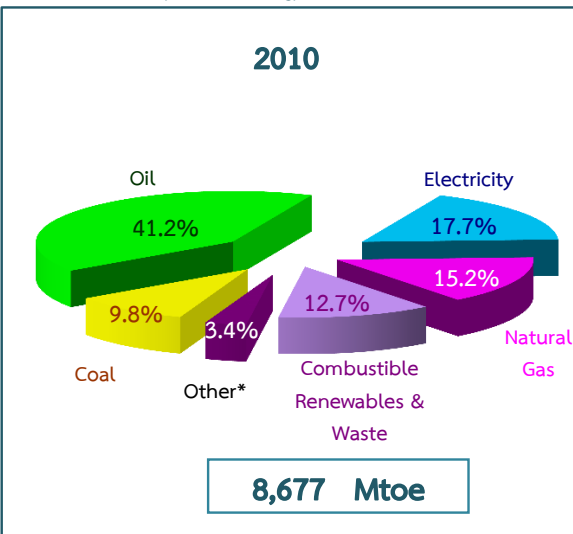
* Other includes geothermal, solar, wind and heat, etc.

World Energy

Total Final Energy Consumption by Fuel



Source : IEA's Key World Energy Statistics 2012



* Other includes geothermal, solar, wind and heat, etc.

Production

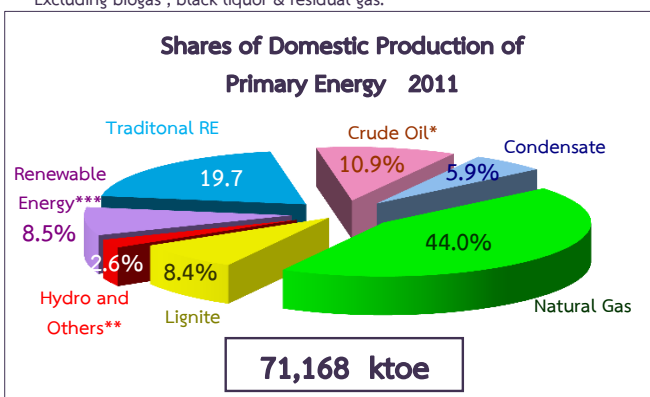
Domestic Production of Primary Energy

Domestic Production of Primary Energy (ktoe)	2007	2008	2009	2010	2011
Total	58,072	62,487	64,966	71,515	71,166
Commercial Energy	39,845	43,208	45,461	50,447	51,080
Crude Oil*	6,911	7,946	8,367	8,475	7,778
Condensate	3,670	4,032	3,950	4,368	4,183
Natural Gas	22,553	24,910	26,783	31,407	31,310
Lignite	4,912	4,743	4,775	4,966	5,992
Hydro and Others**	1,799	1,577	1,586	1,231	1,817
Renewable Energy***	4,468	4,719	5,182	5,601	6,041
Traditional RE	13,759	14,560	14,323	15,467	14,045

*Including feedstocks, ethanol and biodiesel.

**Others include geothermal, solar cell and wind power.

***Excluding biogas, black liquor & residual gas.



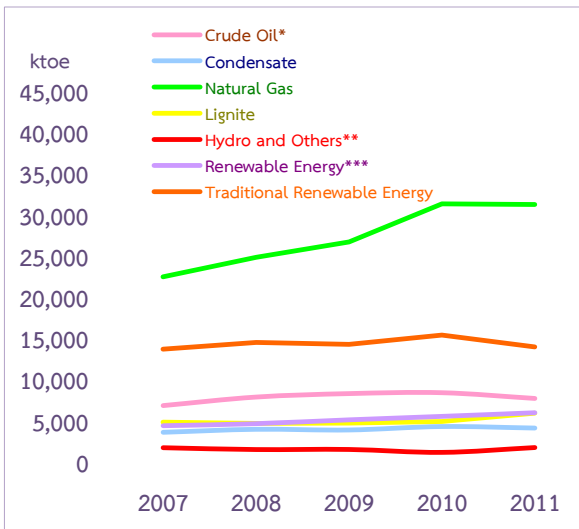
Domestic Production of Primary Energy

(Physical unit)

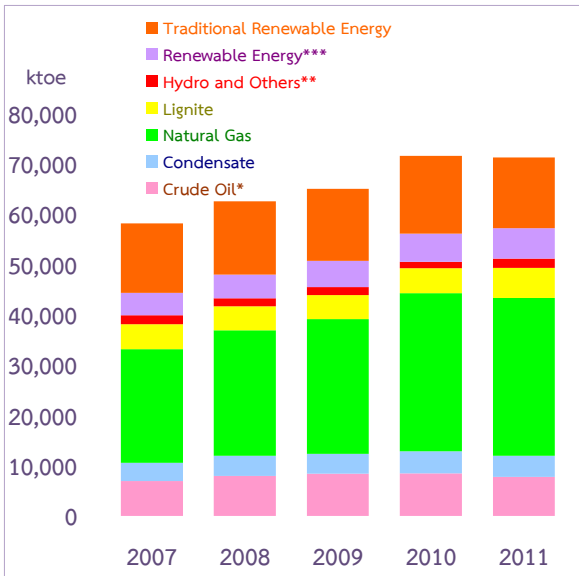
Domestic Production of Primary Energy	2007	2008	2009	2010	2011
Commercial Energy					
Crude Oil* (mil. litres)	8,062	9,282	9,781	9,911	9,110
Condensate (mil. litres)	4,689	5,151	5,047	5,580	5,344
Natural Gas (MMscf)	917,897	1,013,833	1,090,082	1,278,254	1,274,303
Lignite (10 ³ ton)	18,239	17,982	17,786	18,344	21,327
Hydro and Others** (Gwh)	8,117	7,118	7,160	5,565	8,253
Renewable Energy*** (10 ³ ton)	22,033	23,429	25,208	26,336	29,957
Traditional RE (10 ³ ton)	37,539	39,917	39,460	42,386	38,216

Production

Trends of Domestic Production of Primary Energy 2007 - 2011



Shares of Domestic Production of Primary Energy 2007 - 2011



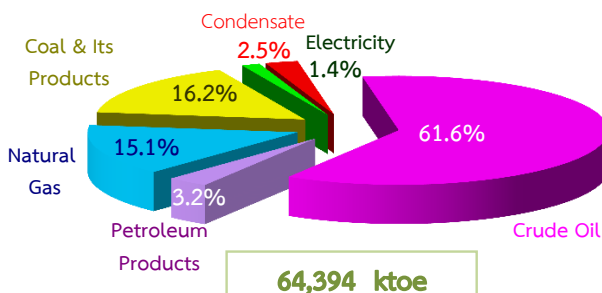
Imports & Exports

Energy Imports

Energy Imports* (ktoe)	2007	2008	2009	2010	2011
Commercial Energy	58,882	60,702	62,824	65,052	64,394
Crude Oil	39,858	40,641	41,163	40,734	39,637
Petroleum Products	825	364	429	161	2,071
Natural Gas	8,869	9,434	9,364	11,385	9,744
Coal & Its Products	8,947	10,026	10,270	10,669	10,402
Electricity	383	237	208	621	910
Condensate	-	-	1,390	1,482	1,630

*Excluding renewable energy.

Shares of Energy Imports 2011



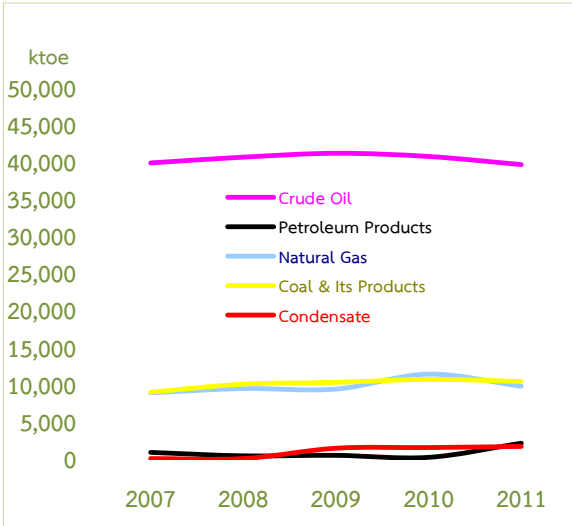
Energy Imports

(Physical unit)

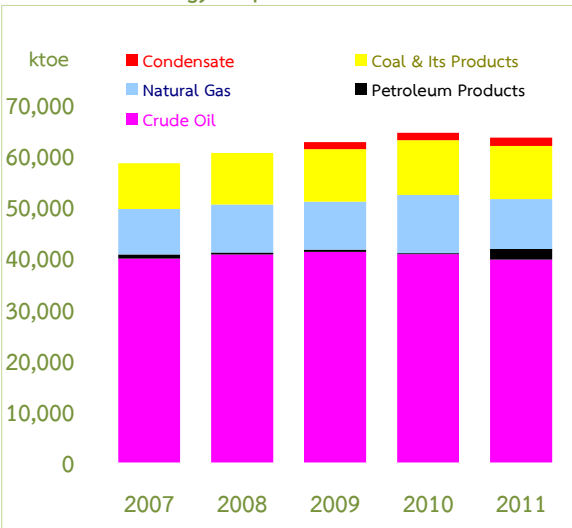
Energy Imports*	2007	2008	2009	2010	2011
Commercial Energy					
Crude Oil (mil. litres)	46,347	47,257	46,701	47,365	46,090
Petroleum Products (mil. litres)	932	404	493	182	3,094
Natural Gas (MMscf)	360,985	383,980	381,126	463,393	397,154
Coal & Its Products (10 ³ ton)	14,271	16,012	16,317	17,011	16,618
Electricity (Gwh)	4,491	2,785	2,439	7,287	10,682
Condensate	0	0	4,776	1,894	2,083

Imports & Exports

Trends of Energy Imports 2007 - 2011



Shares of Energy Imports 2007 - 2011



Imports & Exports

Energy Exports

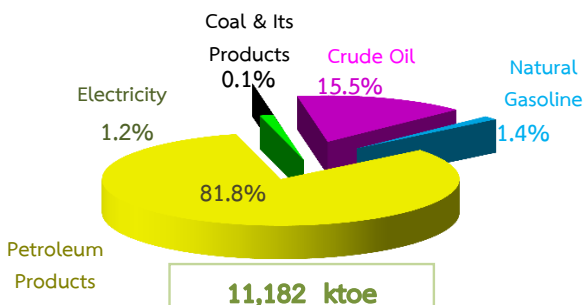
Energy Exports* (ktoe)	2007	2008	2009	2010	2011
Commercial Energy	9,337	11,703	12,531	12,088	11,182
Coal & Its Products	**	47	18	13	4
Crude Oil***	2,607	2,437	2,152	1,507	1,741
Natural Gasoline	102	109	88	103	155
Petroleum Products	6,549	9,009	10,140	10,327	9,142
Electricity	79	101	133	138	140

*Excluding renewable energy.

**Less than 0.5.

***Including Ethanol.

Shares of Energy Exports 2011



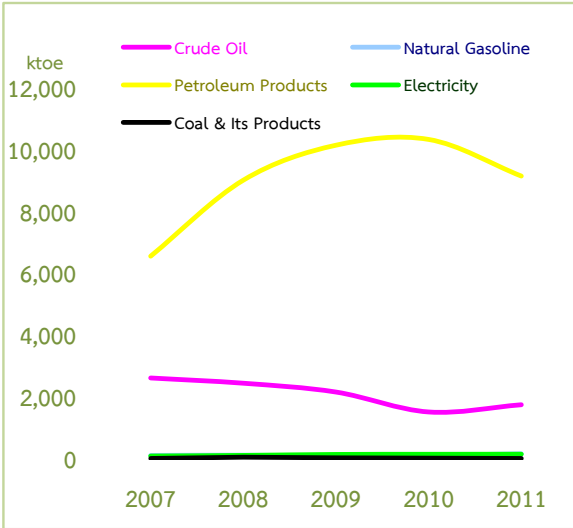
Energy Exports

(Physical unit)

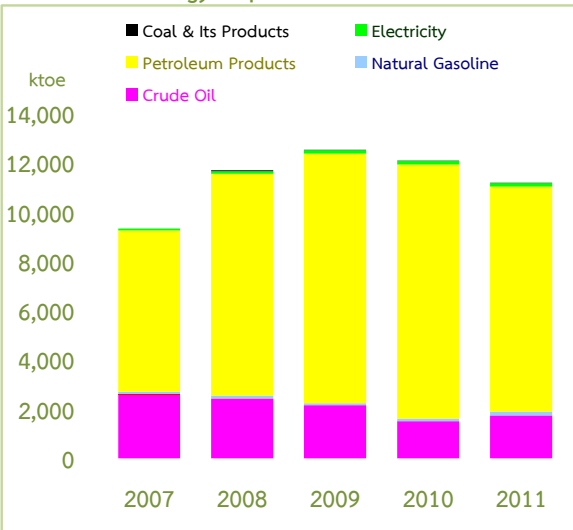
Energy Exports*	2007	2008	2009	2010	2011
Commercial Energy					
Coal & Its Products (10 ³ ton)	**	75	27	21	6
Crude Oil*** (mil. litres)	3,034	2,843	2,504	1,759	2,042
Natural Gasoline (mil. litres)	130	139	112	132	198
Petroleum Products (mil. litres)	7,747	10,403	11,682	11,973	10,495
Electricity (Gwh)	926	1,180	1,560	1,615	1,645

Imports & Exports

Trends of Energy Exports 2007 - 2011



Shares of Energy Exports 2007 - 2011



Supply

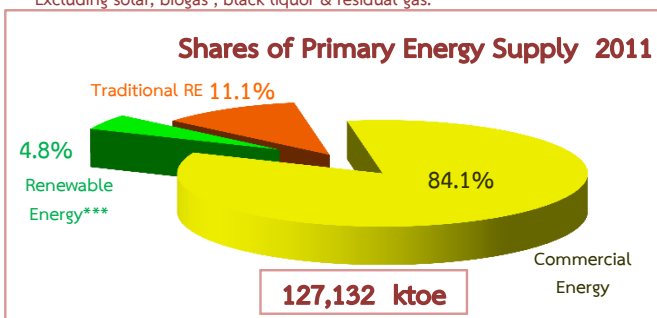
Primary Energy Supply

Primary Energy Supply (ktoe)	2007	2008	2009	2010	2011
Total*	108,482	111,158	113,529	123,672	127,132
Commercial Energy	90,261	91,844	93,987	102,553	106,980
Crude Oil**	46,308	46,699	47,344	48,587	47,212
Condensate & NGL	2,991	3,345	4,841	4,937	5,369
Natural Gas	31,422	34,344	36,147	42,792	41,054
Coal & Its Products	13,866	14,947	14,207	14,996	15,766
Petroleum Products	(6,429)	(9,204)	(10,213)	(10,473)	(5,008)
Electricity	2,103	1,713	1,661	1,714	2,587
Renewable Energy***	4,026	4,719	5,182	5,600	6,041
Traditional RE.	14,195	14,595	14,360	15,519	14,111

*Domestic Production + Import - Export +/- Stock Change

**Including feedstocks, ethanol and biodiesel.

***Excluding solar, biogas, black liquor & residual gas.



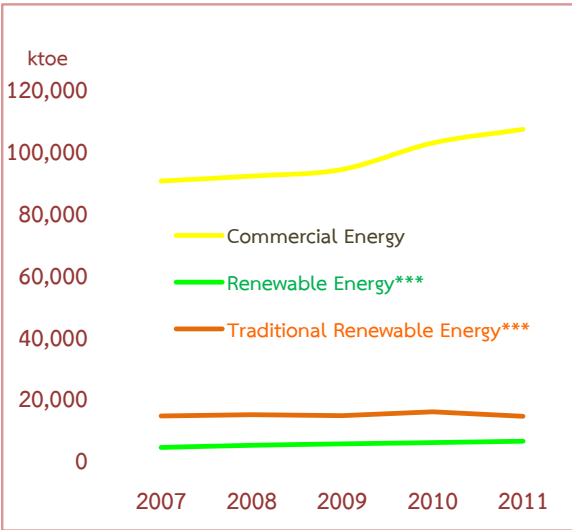
Primary Energy

(Physical unit)

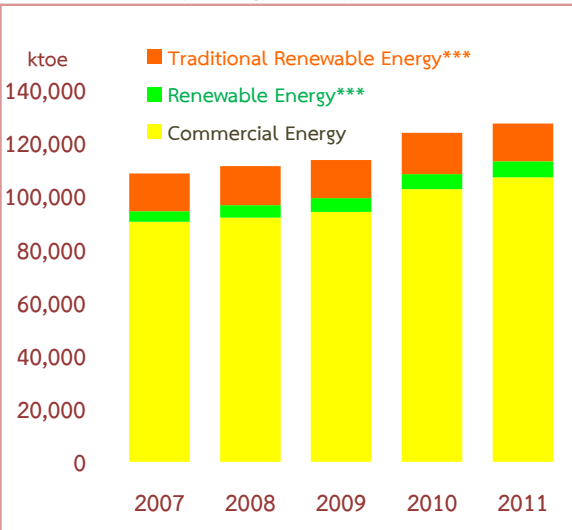
Primary Energy Supply	2007	2008	2009	2010	2011
Commercial Energy					
Crude Oil** (mil. litres)	53,870	54,346	55,110	56,555	54,956
Condensate & NGL (mil. litres)	3,821	4,273	6,186	6,308	6,860
Natural Gas (Bcf)	1,279	1,398	1,471	1,742	1,671
Coal & Its Products (10 ³ ton)	32,392	34,429	32,789	34,193	36,463
Petroleum Products (mil. litres)	(7,721)	(10,776)	(11,948)	(12,356)	(10,453)
Electricity (Gwh)	11,682	8,723	8,039	11,237	17,290
Renewable Energy*** (10 ³ ton)	20,530	23,429	25,207	26,336	29,957
Traditional RE. (10 ³ ton)	33,902	35,460	34,207	37,293	38,313

Supply

Trends of Primary Energy Supply 2007 - 2011



Shares of Primary Energy Supply 2007 - 2011

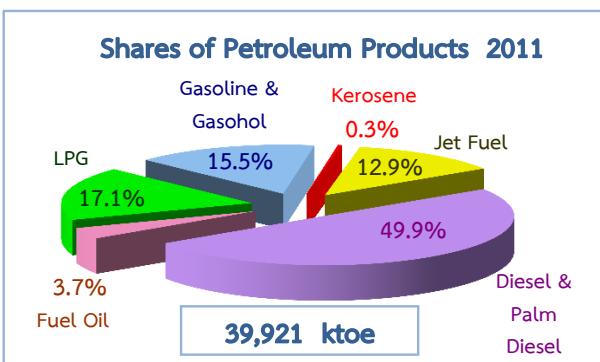


Transformation

Petroleum Products

Petroleum Products* (ktoe)	2007	2008	2009	2010	2011
Total	40,351	41,630	43,233	44,372	39,921
LPG	4,885	5,394	5,764	6,631	7,047
Gasoline & Gasohol	6,485	6,296	6,594	6,513	6,204
Kerosene	107	159	84	389	132
Jet Fuel	4,351	4,906	4,884	5,065	5,144
Diesel & Palm Diesel	18,421	18,375	19,394	20,097	19,901
Fuel Oil	6,102	6,500	6,513	5,677	1,493

*Including petroleum products from petroleum refineries, NG, processing plants & other conversion



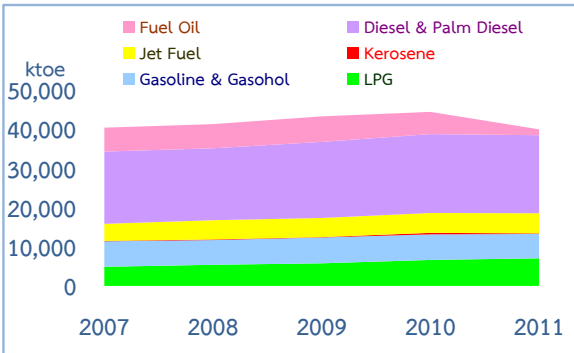
Petroleum Products

(Physical unit)

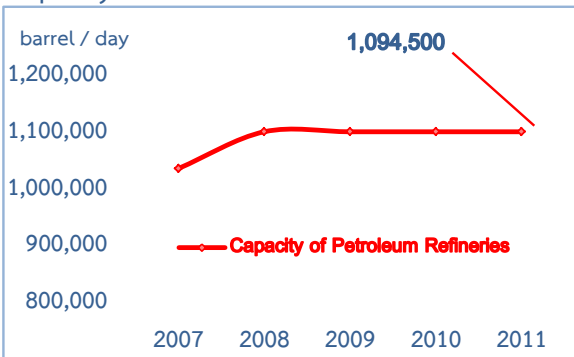
Petroleum Products* (mil.litres)	2007	2008	2009	2010	2011
Total	49,762	51,429	53,495	55,282	54,949
LPG	7,752	8,560	9,147	10,522	11,696
Gasoline & Gasohol	8,703	8,449	8,851	8,742	8,325
Kerosene	131	195	103	476	161
Jet Fuel	5,323	6,002	5,975	6,196	6,293
Diesel & Palm Diesel	21,370	21,317	22,499	23,315	23,075
Fuel Oil	6,483	6,906	6,920	6,031	5,399

Transformation

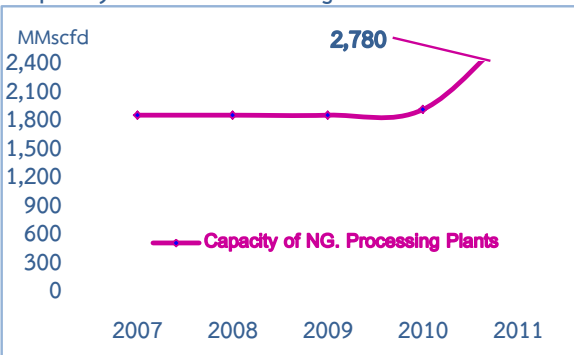
Trends of Petroleum Products 2007- 2011



Capacity of Petroleum Refineries



Capacity of NG. Processing Plants

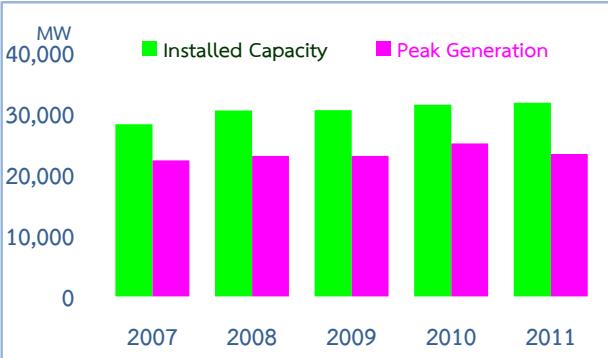


Transformation

Electricity (Installed Capacity)

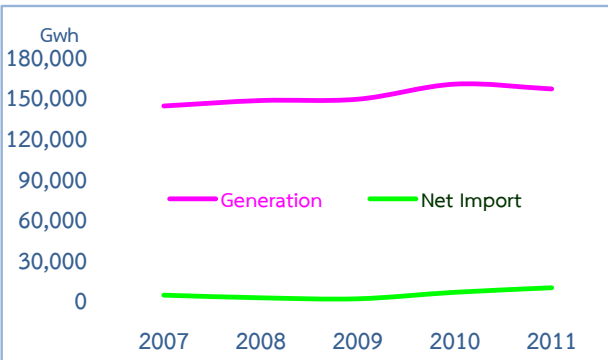
Installed Capacity (MW)	2007	2008	2009	2010	2011
Thermal Plants	24,807	27,024	27,106	27,968	28,094
Hydro Power	3,475	3,481	3,488	3,488	3,500
Other*	3	3	13	29	179

*Including geothermal, solar cell and wind power, etc.



Electricity (National Grid Generation)

Electricity (Gwh)	2007	2008	2009	2010	2011
Total	146,943	149,032	149,269	165,190	165,023
Generation	143,378	147,427	148,390	159,518	155,986
Net Import	3,565	1,605	879	5,672	9,037

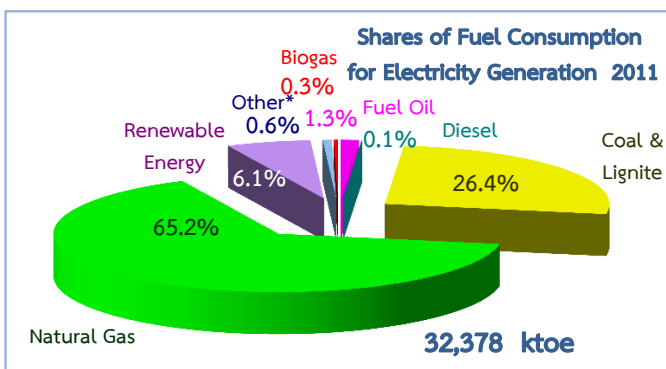


Transformation

Fuel Consumption for Electricity Generation

Fuel Consumption (ktoe)	2007	2008	2009	2010	2011
Total	30,598	31,373	31,394	34,210	32,378
Fuel Oil	888	337	149	227	421
Diesel	21	39	22	34	17
Coal & Lignite	6,885	7,203	6,714	6,756	8,565
Natural Gas	21,368	22,097	22,543	24,912	21,096
Renewable Energy	1,138	1,414	1,626	1,653	1,969
Other*	292	267	304	566	212
Biogas	6	16	36	62	98

*Including black liquor and residual gas from production processes, etc.



Electricity (Fuel Consumption)

(Physical unit)

Fuel Consumption	2007	2008	2009	2010	2011
Fuel Oil (mil.litres)	943	358	158	241	447
Diesel (mil.litres)	24	45	25	39	32
Coal & Lignite (10 ³ ton)	20,549	21,435	20,218	20,438	24,044
Natural Gas (MMscf)	877,862	907,327	925,984	1,023,888	865,561
Renewable Energy (10 ³ ton)	4,995	6,102	7,061	7,173	9,530
Other* (TJ)	12,335	11,286	12,845	23,931	8,943
Biogas (mil.m ³)	12	32	73	124	197

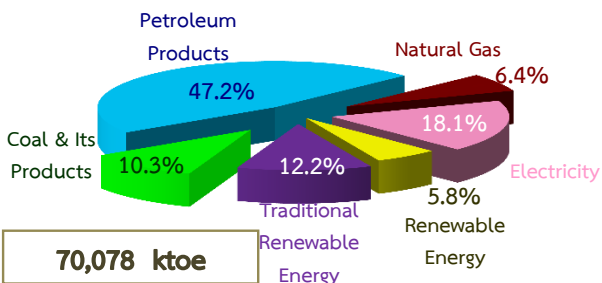
Consumption

Final Energy Consumption by Fuel

Final Energy Consumption (ktoe)	2007	2008	2009	2010	2011
Total	64,679	65,676	66,198	69,438	70,078
Coal & Its Products	6,981	7,744	7,493	8,240	7,201
Petroleum Products	32,298	31,207	31,661	32,096	33,067
Natural Gas	2,594	3,153	3,568	3,769	4,485
Electricity	11,348	11,541	11,521	12,724	12,671
Renewable Energy*	3,448	3,828	3,946	4,222	4,072
Traditional RE.	8,010	8,203	8,009	8,387	8,582

* Excluding solar and biogas.

Shares of Final Energy Consumption by Fuel 2011



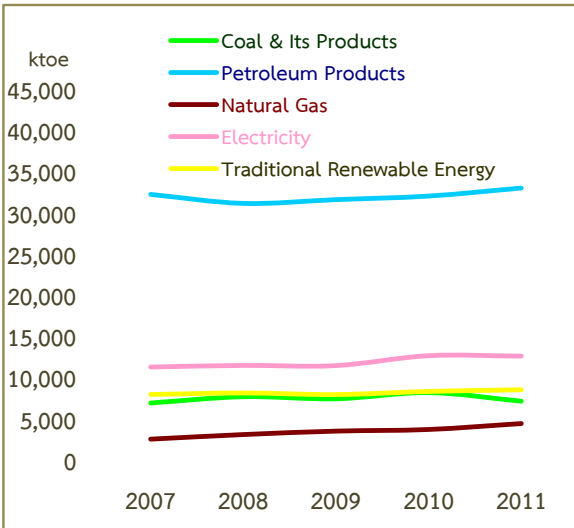
Final Energy Consumption by Fuel

(Physical unit)

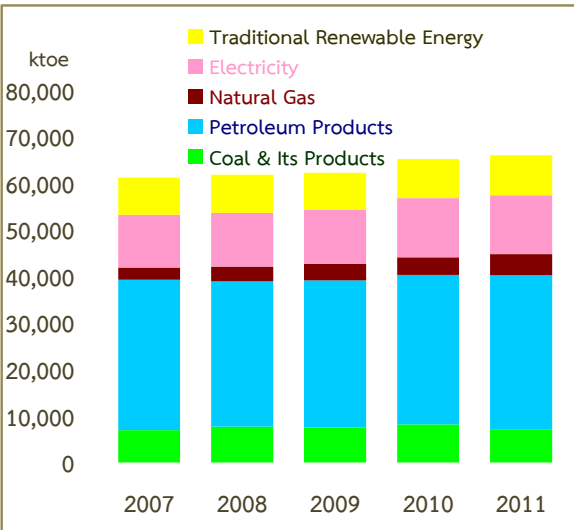
Final Energy Consumption	2007	2008	2009	2010	2011
Coal & Its Products (10 ³ ton)	11,843	12,994	12,571	13,755	12,419
Petroleum Products (mil. litres)	39,939	38,912	39,478	40,199	41,566
Natural Gas (MMscf)	107,293	130,403	147,568	155,868	185,493
Electricity (Gwh)	133,178	135,449	135,209	149,320	148,700
Renewable Energy (10 ³ ton)	17,469	19,144	19,555	20,119	20,425
Traditional RE. (10 ³ ton)	18,581	18,810	18,542	18,910	20,114

Consumption

Trends of Final Energy Consumption by Fuel 2007 - 2011



Shares of Final Energy Consumption by Fuel 2007 - 2011



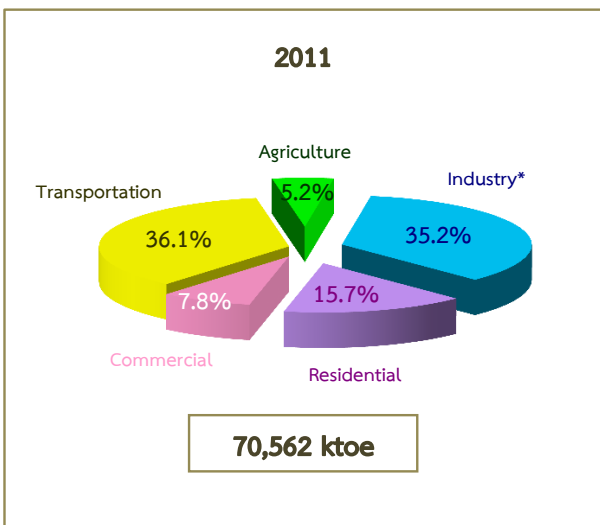
Consumption

Final Energy Consumption by Economic Sector

Final Energy Consumption (ktoe)	2007	2008	2009	2010	2011
Total	64,866	65,890	54,243	70,247	70,562
Agriculture	3,448	3,446	3,477	3,499	3,686
Industry*	23,781	24,421	17,366	25,571	24,856
Residential	9,533	9,958	4,328	10,963	11,040
Commercial	4,489	5,041	4,940	5,620	5,511
Transportation	23,615	23,024	24,132	24,594	25,469

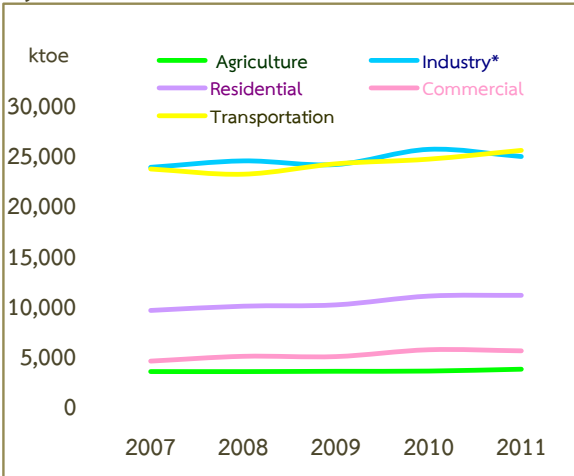
*Industry = Manufacturing + Mining + Construction

Shares of Final Energy Consumption by Economic Sector 2011

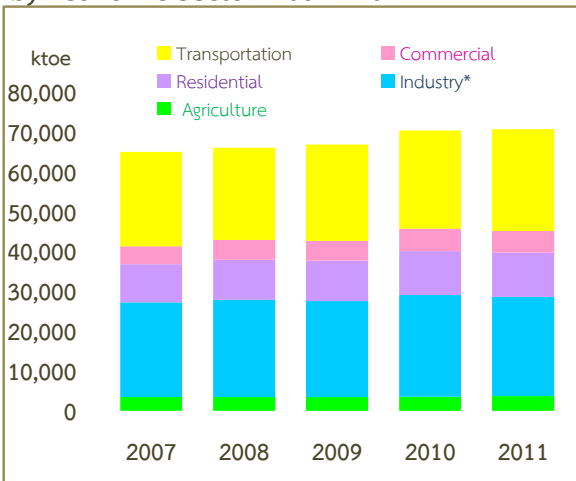


Consumption

Trends of Final Energy Consumption by Economic Sector 2007 - 2011



Shares of Final Energy Consumption by Economic Sector 2007 - 2011



*Industry = Manufacturing + Mining + Construction

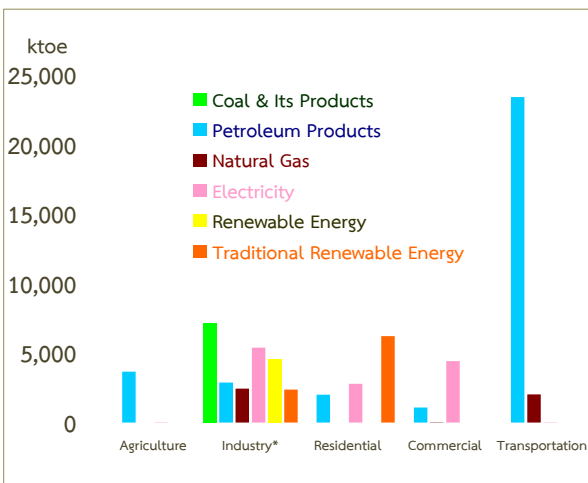
Consumption

Final Energy Consumption for Economic Sector by Fuel 2011

Final Energy Consumption (ktoe)	Agriculture	Industry*	Res.	Com.	Transportation	Total
Coal & Its Products	-	7,201	-	-	-	7,201
Petroleum Products	3,660	2,882	2,021	1,080	23,424	33,067
Natural Gas	-	2,447	-	2	2,036	4,485
Electricity	26	5,404	2,805	4,427	9	12,671
Renewable Energy	-	4,556	-	-	-	4,556
Traditional RE,	-	2,368	6,214	-	-	8,582
Total	3,686	24,858	11,040	5,509	25,469	70,562

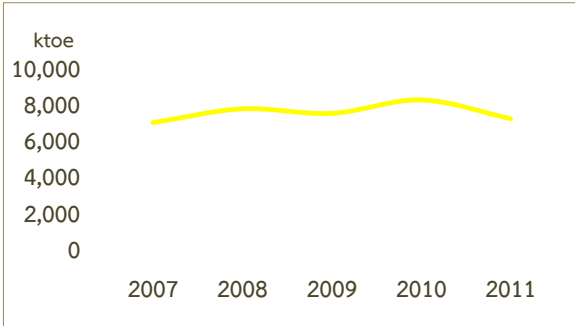
*Industry = Manufacturing + Mining + Construction

Shares of Final Energy Consumption for Economic Sector by Fuel 2011

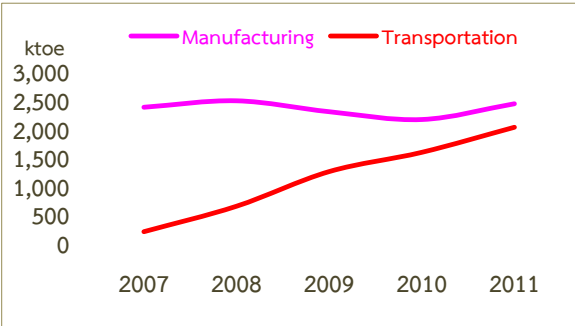


Consumption

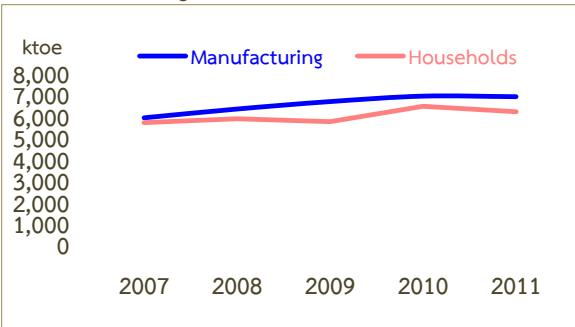
Coal & Its Products Consumption in Manufacturing



Natural Gas Consumption in Manufacturing and Transportation



Renewable Energy and Traditional RE. Consumption in Manufacturing and Households



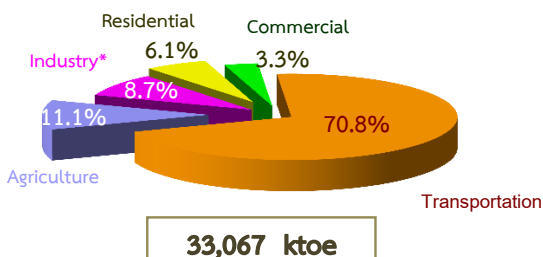
Consumption

Petroleum Products Consumption by Economic Sector

Petroleum Products (ktoe)	2007	2008	2009	2010	2011
Total	32,298	31,207	31,661	32,096	33,067
Agriculture	3,425	3,422	3,450	3,470	3,660
Industry*	3,266	2,938	2,736	2,790	2,882
Residential	1,435	1,607	1,740	1,652	2,021
Commercial	770	875	868	1,193	1,080
Transportation	23,402	22,365	22,867	22,991	23,424

*Industry = Manufacturing + Mining + Construction

Shares of Petroleum Products Consumption by Economic Sector 2011



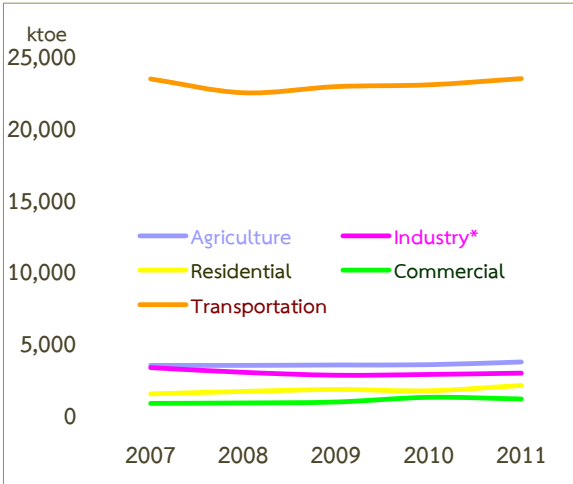
Petroleum Products Consumption by Economic Sector

(Physical unit)

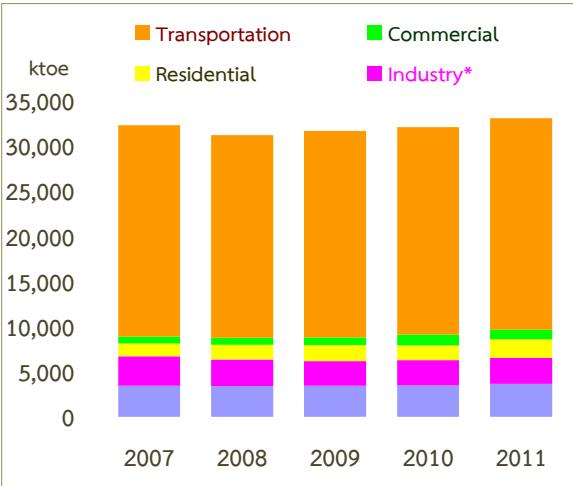
Petroleum Products (million litres)	2007	2008	2009	2010	2011
Total	39,939	38,912	39,478	40,199	41,566
Agriculture	3,984	3,979	4,014	4,036	4,255
Industry*	3,940	3,624	3,373	3,537	3,614
Residential	2,273	2,548	2,758	2,620	3,206
Commercial	1,222	1,388	1,377	1,892	1,714
Transportation	28,520	27,373	27,956	28,114	28,777

Consumption

Trends of Petroleum Products Consumption
by Economic Sector 2007 - 2011



Shares of Petroleum Products Consumption
by Economic Sector 2007 - 2011



*Industry = Manufacturing + Mining + Construction

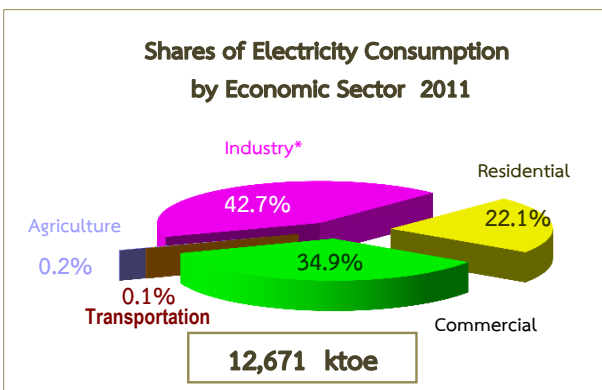
Consumption

Electricity Consumption by Economic Sector

Electricity Consumption (ktoe)	2007	2008	2009	2010	2011
Total	11,348	11,541	11,521	12,724	12,671
Agriculture	23	24	27	29	26
Industry*	5,212	4,893	4,829	5,422	5,404
Residential	2,389	2,453	2,588	2,841	2,805
Commercial	3,719	4,166	4,072	4,426	4,427
Transportation	5	5	5	6	9

*Industry = Manufacturing + Mining + Construction

Shares of Electricity Consumption by Economic Sector 2011



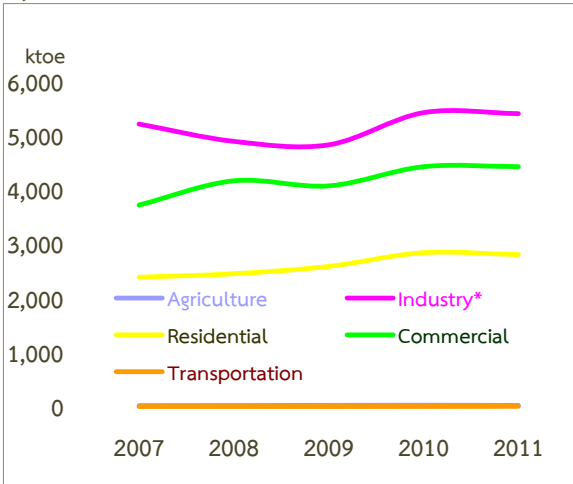
Electricity Consumption by Economic Sector

(Physical unit)

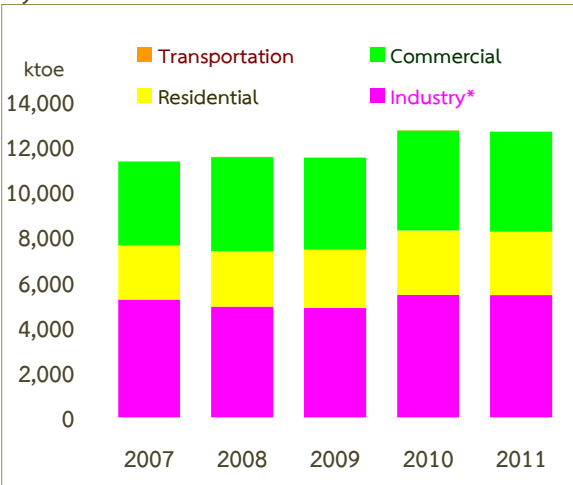
Electricity Consumption (Gwh)	2007	2008	2009	2010	2011
Total	133,178	135,449	135,209	149,320	148,700
Agriculture	268	282	318	336	304
Industry*	61,168	57,429	56,670	63,630	63,418
Residential	28,041	28,785	30,371	33,337	32,920
Commercial	43,643	48,893	47,788	51,943	51,952
Transportation	58	60	62	74	106

Consumption

Trends of Electricity Consumption
by Economic Sector 2007 - 2011



Shares of Electricity Consumption
by Economic Sector 2007 - 2011

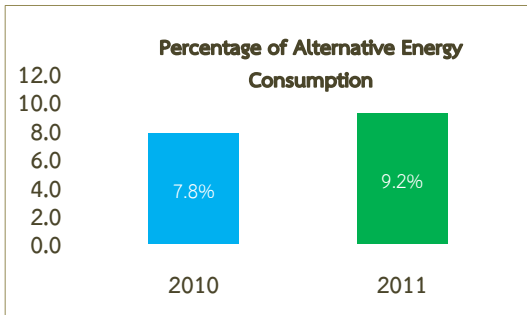
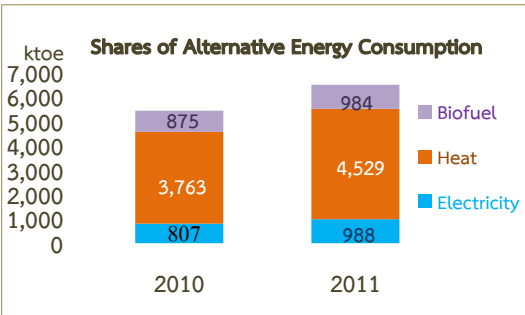


*Industry = Manufacturing + Mining + Construction

Consumption

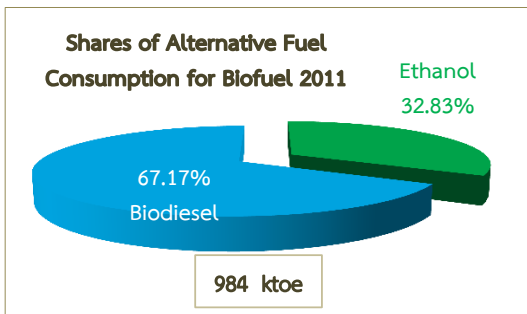
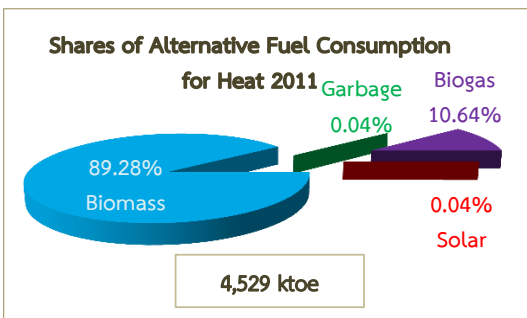
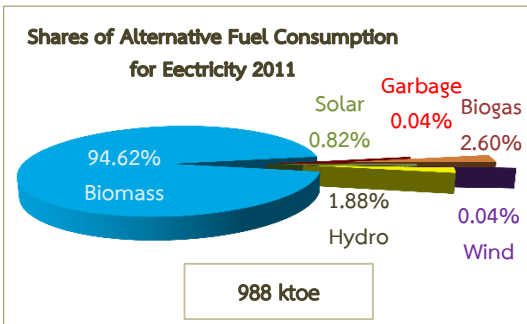
Alternative Energy Consumption

Alternative Energy Consumption (ktoe)	2010	2011
Electricity (Solar Wind Hydro Biomass Garbage and Biogas)	807	988
Heat (Solar Biomass Garbage and Biogas)	3,763	4,529
Biofuel (Ethanol and Biodiese)	875	984
Total	5,445	6,501
Final Energy Consumption	70,247	70,562
Percentage of Alternative Energy Consumption	7.0	7.8



Consumption

Shares of Alternative Energy Fuel Consumption 2011



Emissions

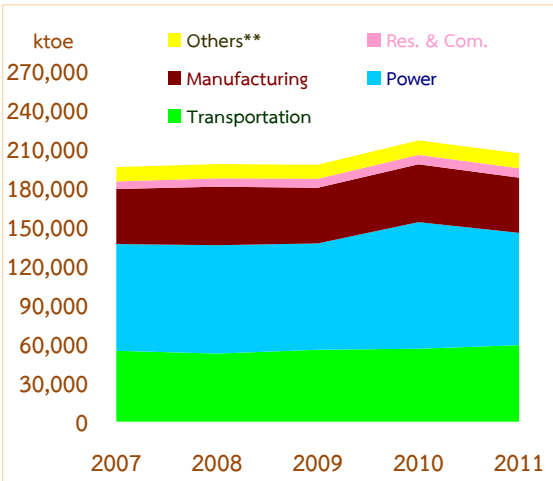
CO₂ Emissions*

CO ₂ Emissions (10 ³ ton)	2007	2008	2009	2010	2011
Total	195,847	198,146	197,657	216,363	206,403
Transportation	54,554	52,380	55,342	56,108	58,865
Power	82,087	83,370	81,797	97,384	86,382
Manufacturing	42,318	45,023	42,786	44,514	42,425
Res. & Com.	5,849	6,389	6,916	7,234	7,222
Others**	11,039	10,984	10,816	11,123	11,509

*Excluding emission from renewable energy and

international bunker oil, diesel and jet fuel.

**Including agriculture, construction and mining.



Energy Balances

Thailand Energy Commodity Account 2010

Unit : physical - unit

SUPPLY AND CONSUMPTION	Coal & Its Products (10 ³ ton)	Crude Oil* (10 ⁶ litre)	Natural Gas MMscf	Condensate & NGL (10 ⁶ litre)	Petroleum Products (10 ⁶ litre)	Hydro (Gwh)	Electricity (Gwh)	Renewable and Waste (10 ³ ton)	Traditional Renewable Energy (10 ³ ton)	Others** (Gwh)	Black Liquor & Residual Gas (GJ)	Total
Domestic Production	18,344	9,911	1,278,254	5,580	-	5,565	-	54,531****	40,411	28	23,931,079	
Imports	17,011	47,365	463,393***	1,894	182	-	7,287	-	93	-	-	
Exports	(21)	(1,759)	-	(132)	(11,973)	-	(1,615)	-	(13)	-	-	
Stock Changes/Statistical Differences	(1,141)	1,038	-	(1,034)	(565)	-	-	-	-	-	-	
Total Primary Energy Supply	34,193	56,555	1,741,647	6,308	(12,356)	5,565	5,672	54,531****	40,491	28	23,931,079	
Petroleum Refineries	-	(56,339)	-	(475)	47,264	-	-	-	-	-	-	
NG. Processing Plants	-	-	(253,657)	810	7,307	-	-	-	-	-	-	
Power Plants	(20,438)	-	(1,023,888)	-	(280)	(5,565)	159,518	(14,314)****	(19,922)	(28)	(23,931,079)	
Other Transformation	-	-	-	-	711	-	-	-	-	-	-	
Total Transformation	(20,438)	(56,339)	(1,277,545)	335	55,002	(5,565)	159,518	(14,314)****	(19,922)	(28)	(23,931,079)	
Own Uses	-	-	(251,021)	-	-	-	(5,749)	-	-	-	-	
Losses	-	(216)	-	-	-	-	(10,121)	-	-	-	-	
Total Final Energy Consumption	13,755	-	207,081	6,643	42,646	-	149,320	40,217	20,569	-	-	
Non - Energy Uses	-	-	51,213	6,643	2,447	-	-	-	-	-	-	
Final Energy Consumption	13,755	-	155,868	-	40,199	-	149,320	40,217	20,569	-	-	
Agriculture	-	-	-	-	4,036	-	336	-	-	-	-	
Industry *****	13,755	-	89,785	-	3,537	-	63,630	40,217	7,386	-	-	
Residential	-	-	-	-	2,620	-	33,337	-	13,183	-	-	
Commercial	-	-	33	-	1,892	-	51,943	-	-	-	-	
Transportation	-	-	66,050	-	28,114	-	74	-	-	-	-	
CO₂ emission (unit : Mt)												216

*Including feedstocks, ethanol and biodiesel.

**Including geothermal, solar cell and wind power, etc.

***Including propane and butane import 91,592 MMscf.

****Excluding solar 42,297 GJ, and biogas 752,842,126 m³.

*****Including manufacturing, mining and construction.

Energy Balances

Thailand Energy Balance 2010

Unit : ktoe

SUPPLY AND CONSUMPTION	Coal & Its Products	Crude Oil*	Natural Gas	Condensate & NGL	Petroleum Products	Hydro	Electricity	Renewable and Waste	Traditional Renewable Energy	Others**	Black Liquor & Residual Gas	Total
Domestic Production	4,966	8,475	31,407	4,368	-	1,231	-	5,875****	14,882	2	566	71,772
Imports	10,669	40,734	11,385***	1,482	161	-	621	-	61	-	-	65,113
Exports	(13)	(1,507)	-	(103)	(10,327)	-	(138)	-	(9)	-	-	(12,097)
Stock Changes/Statistical Differences	(626)	885	-	(810)	(307)	-	-	-	-	-	-	(858)
Total Primary Energy Supply	14,996	48,587	42,792	4,937	(10,473)	1,231	483	5,875****	14,934	2	566	123,930
Petroleum Refineries	-	(48,401)	-	(372)	39,319	-	-	-	-	-	-	(9,454)
NG. Processing Plants	-	-	(6,603)	634	4,605	-	-	-	-	-	-	(1,364)
Power Plants	(6,756)	-	(24,912)	-	(261)	(1,231)	13,593	(1,653)	-	(2)	(566)	(21,788)
Other Transformation	-	-	-	-	448	-	-	-****	(6,049)	-	-	(5,601)
Total Transformation	(6,756)	(48,401)	(31,515)	262	44,111	(1,231)	13,593	(1,653)****	(6,049)	(2)	(566)	(38,207)
Own Uses	-	-	(6,270)	-	-	-	(490)	-	-	-	-	(6,760)
Losses	-	(186)	-	-	-	-	(862)	-	-	-	-	(1,048)
Total Final Energy Consumption	8,240	-	5,007	5,199	33,638	-	12,724	4,222	8,885	-	-	77,915
Non - Energy Uses	-	-	1,238	5,199	1,542	-	-	-	-	-	-	7,979
Final Energy Consumption	8,240	-	3,769	-	32,096	-	12,724	4,222	8,885	-	-	69,936
Agriculture	-	-	-	-	3,470	-	29	-	-	-	-	3,499
Industry *****	8,240	-	2,171	-	2,790	-	5,422	4,222	2,415	-	-	25,260
Residential	-	-	-	-	1,652	-	2,841	-	6,470	-	-	10,963
Commercial	-	-	1	-	1,193	-	4,426	-	-	-	-	5,620
Transportation	-	-	1,597	-	22,991	-	6	-	-	-	-	24,594
CO₂ emission (unit : Mt)												216

*Including feedstocks, ethanol and biodiesel.

**Including geothermal, solar cell and wind power, etc.

***Including propane and butane import 2,250 ktoe.

****Excluding solar 1 ktoe and biogas 373 ktoe.

*****Including manufacturing, mining and construction.

Energy Balances

Thailand Energy Commodity Account 2011

Unit : physical - unit

SUPPLY AND CONSUMPTION	Coal & Its Products (10 ³ ton)	Crude Oil* (10 ⁶ litre)	Natural Gas MMscf	Condensate & NGL (10 ⁶ litre)	Petroleum Products (10 ⁶ litre)	Hydro (Gwh)	Electricity (Gwh)	Renewable and Waste (10 ³ ton)	Traditional Renewable Energy (10 ³ ton)	Others** (Gwh)	Black Liquor & Residual Gas (GJ)	Total
Domestic Production	21,327	9,110	1,274,303	5,344	-	8,253	-	29,957****	38,216	89	8,943,258	
Imports	16,618	46,090	397,154***	2,083	3,094	-	10,682	-	116	-	-	
Exports	(6)	(2,042)	-	(198)	(10,495)	-	(1,645)	-	(19)	-	-	
Stock Changes/Statistical Differences	(1,476)	1,798	-	(369)	(3,052)	-	-	-	-	-	-	
Total Primary Energy Supply	36,463	54,956	1,671,457	6,860	(10,453)	8,253	9,037	29,957****	38,313	89	8,943,258	
Petroleum Refineries	-	(54,747)	-	(549)	46,668	-	-	-	-	-	-	
NG. Processing Plants	-	-	(281,012)	984	8,008	-	-	-	-	-	-	
Power Plants	(24,044)	-	(865,561)	-	(479)	(8,253)	154,886	(9,530)****	(18,199)	(89)	(8,943,258)	
Other Transformation	-	-	-	-	752	-	-	-	-	-	-	
Total Transformation	(24,044)	(54,747)	(1,146,573)	435	54,949	(8,253)	154,886	(9,530)****	(18,199)	(89)	(8,943,258)	
Own Uses	-	-	(262,023)	-	(7)	-	(5,474)	-	-	-	-	
Losses	-	(209)	-	-	-	-	(9,749)	-	-	-	-	
Total Final Energy Consumption	12,419	-	262,861	7,295	44,489	-	148,700	20,427	20,114	-	-	
Non - Energy Uses	-	-	77,368	7,295	2,923	-	-	-	-	-	-	
Final Energy Consumption	12,419	-	185,493	-	41,566	-	148,700	20,427	20,114	-	-	
Agriculture	-	-	-	-	4,255	-	304	-	-	-	-	
Industry *****	12,419	-	101,194	-	3,614	-	63,418	20,427	7,257	-	-	
Residential	-	-	-	-	3,206	-	32,920	-	12,857	-	-	
Commercial	-	-	95	-	1,714	-	51,952	-	-	-	-	
Transportation	-	-	84,204	-	28,777	-	106	-	-	-	-	
CO₂ emission (unit : Mt)												206

*Including feedstocks, ethanol and biodiesel.

**Including geothermal, solar cell and wind power, etc.

***Including propane and butane import 91,592 MMscf.

****Excluding biogas 124,765,114 m³.

*****Including manufacturing, mining and construction.

Energy Balances

Thailand Energy Balance 2011

Unit : ktoe

SUPPLY AND CONSUMPTION	Coal & Its Products	Crude Oil*	Natural Gas	Condensate & NGL	Petroleum Products	Hydro	Electricity	Renewable and Waste	Traditional Renewable Energy	Others**	Black Liquor & Residual Gas	Total
Domestic Production	5,992	7,778	31,310	4,183	-	1,817	-	6,041****	14,045	8	212	71,386
Imports	10,402	39,637	9,744***	1,630	2,071	-	910	-	79	-	-	64,473
Exports	(4)	(1,741)	-	(155)	(9,142)	-	(140)	-	(13)	-	-	(11,195)
Stock Changes/Statistical Differences	(624)	1,538	-	(289)	2,063	-	-	-	-	-	-	2,688
Total Primary Energy Supply	15,766	47,212	41,054	5,369	(5,008)	1,817	770	6,041****	14,111	8	212	127,352
Petroleum Refineries	-	(47,032)	-	(430)	35,161	-	-	-	-	-	-	(12,301)
NG. Processing Plants	-	-	(7,212)	770	5,046	-	-	-	-	-	-	(1,396)
Power Plants	(8,565)	-	(21,096)	-	(438)	(1,817)	13,198	(1,969)	-	(8)	(212)	(20,907)
Other Transformation	-	-	-	-	152	-	-	-****	(5,529)	-	-	(5,377)
Total Transformation	(8,565)	(47,032)	(28,308)	340	39,921	(1,817)	13,198	(1,969)****	(5,529)	(8)	(212)	(39,981)
Own Uses	-	-	(6,390)	-	(4)	-	(466)	-	-	-	-	(6,860)
Losses	-	(180)	-	-	-	-	(831)	-	-	-	-	(1,011)
Total Final Energy Consumption	7,201	-	6,356	5,709	34,909	-	25,342	4,072	8,582	-	-	92,171
Non - Energy Uses	-	-	1,871	5,709	1,842	-	12,671	-	-	-	-	22,093
Final Energy Consumption	7,201	-	4,485	-	33,067	-	12,671	4,072	8,582	-	-	70,078
Agriculture	-	-	-	-	3,660	-	26	-	-	-	-	3,686
Industry *****	7,201	-	2,447	-	2,882	-	5,404	4,072	2,368	-	-	24,374
Residential	-	-	-	-	2,021	-	2,805	-	6,214	-	-	11,040
Commercial	-	-	2	-	1,080	-	4,427	-	-	-	-	5,509
Transportation	-	-	2,036	-	23,424	-	9	-	-	-	-	25,469
CO₂ emission (unit : Mt)												206

*Including feedstocks, ethanol and biodiesel.

**Including geothermal, solar cell and wind power, etc.

***Including propane and butane import 2,250 ktoe.

****Excluding biogas 62 ktoe.

*****Including manufacturing, mining and construction.

Imported Prices

Average Prices of Energy Imports

TYPE	2007	2008	2009	2010	2011
Crude Oil					
1,000 Baht / toe	17.95	24.56	15.46	18.50	24.62
US.\$ / toe	517.39	733.46	448.38	580.54	803.69
US.\$ / bbl	70.77	100.29	61.31	79.38	109.89
Condensate					
1,000 Baht / toe	-	-	17.76	16.05	20.96
US.\$ / toe	-	-	515.32	503.56	684.30
US.\$ / bbl	-	-	64.13	80.06	108.80
Natural Gas					
1,000 Baht / toe	7.94	10.22	9.93	10.80	11.26
US.\$ / toe	228.80	305.34	287.97	338.99	367.75
US.\$ / 1,000 scf	5.62	7.50	7.08	8.33	9.04
Petroleum Products					
1,000 Baht / toe	18.68	24.14	15.76	20.28	23.98
US.\$ / toe	538.41	720.93	457.13	636.29	782.92
US.\$ / bbl	75.77	103.01	63.31	89.50	83.35
Coal & Its Products*					
1,000 Baht / toe	2.99	3.64	3.59	3.70	4.05
US.\$ / toe	86.10	108.65	104.18	115.98	132.22
US.\$ / ton	53.18	69.52	65.57	72.74	82.76
Electricity					
1,000 Baht / toe	19.68	18.24	16.98	11.71	15.12
US.\$ / toe	567.42	544.72	492.71	367.55	493.69
US.\$ / kWh	1.68	1.55	1.45	1.00	1.29

*Average from anthracite, bituminous, coke, briquettes, and other coal.

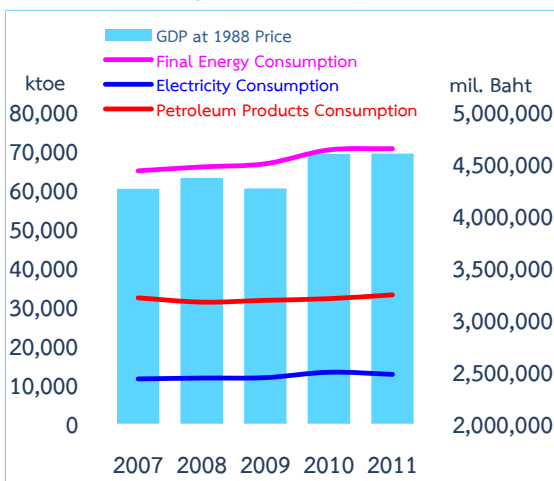
Energy and Economy

Final Energy Consumption, Electricity Consumption, Petroleum Products Consumption and GDP

Year	Final Energy Consumption (ktoe)	Electricity Consumption (ktoe)	Petroleum Products Consumption* (ktoe)	GDP at 1988 Prices (mil. Baht)
2007	64,886	11,508	32,298	4,259,026
2008	65,890	11,726	31,207	4,364,833
2009	66,698	11,833	31,661	4,263,139
2010	70,247	13,221	32,096	4,596,112 ^p
2011	70,562	12,671	33,067	4,598,441 ^p

*Including petroleum products consumption for electricity generation.

Relations of Energy and Economy

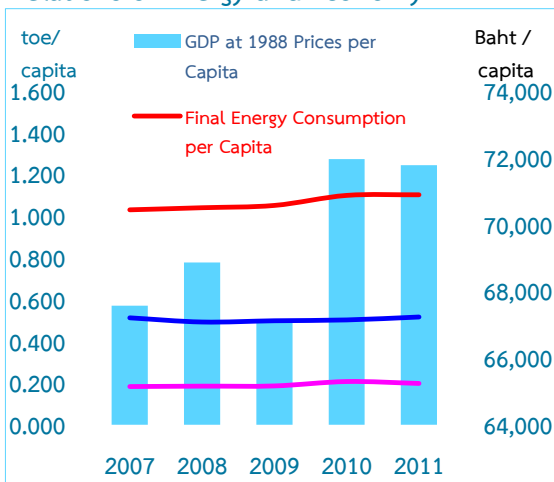


Energy and Economy

Energy Consumption Per Capita

Year	GDP at 1988 Prices per Capita (Baht/capita)	Final Energy Consumption per Capita (toe/capita)	Electricity Consumption per Capita (toe/capita)	Petroleum Products Consumption per Capita (toe/capita)
2007	67,563	1.029	0.183	0.512
2008	68,857	1.039	0.185	0.492
2009	67,110	1.050	0.186	0.498
2010	71,951	1.098	0.207	0.502
2011	71,765	1.101	0.198	0.516

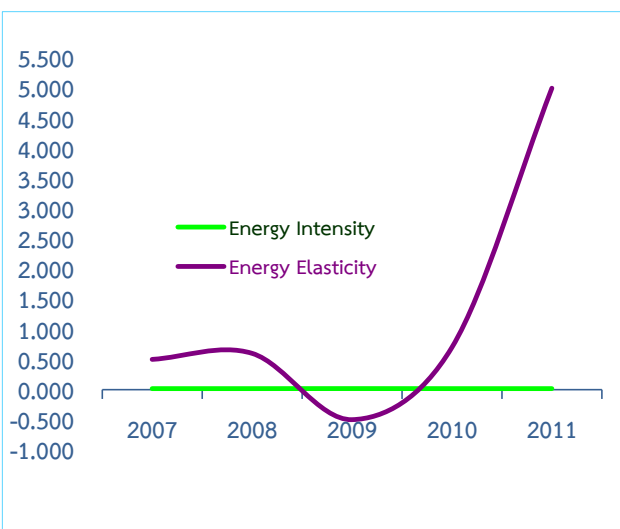
Relations of Energy and Economy



Energy and Economy

Energy Intensity & Elasticity

Year	GDP at 1988 Prices (million Baht)	Final Energy Consumption (ktoe)	Energy Intensity (/ million Baht)	Energy Elasticity	% Change of GDP	% Change of Consumption
2007	4,259,026	64,866	0.015	0.5	5.0	2.6
2008	4,364,833	65,890	0.015	0.6	2.5	1.6
2009	4,263,139	66,698	0.016	(0.5)	(2.3)	1.2
2010	4,596,112 ^D	70,247	0.015	0.7	7.8	5.3
2011	4,598,441 ^D	70,562	0.015	5.0	0.1	0.5



Energy and Economy

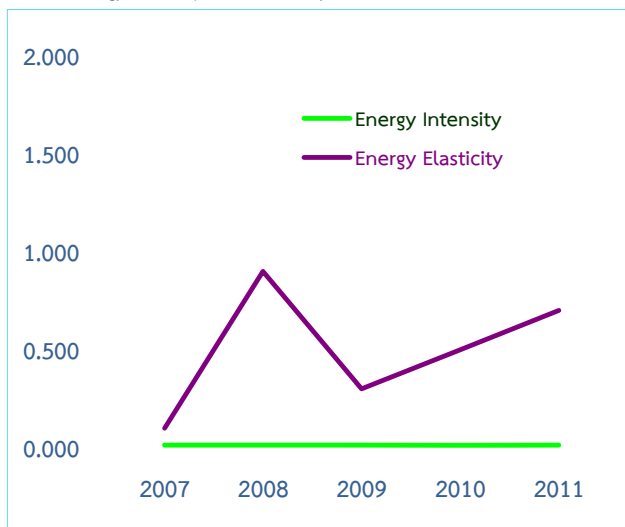
Energy Intensity & Elasticity (Industry¹)

Year	GDP at 1988 Prices** (million Baht)	Final Energy Consumption*** (ktoe)	Energy Intensity (ktoe / million Baht)	Energy Elasticity	% Change of GDP*	% Change of Consumption**
2007	1,881,971	23,781	0.013	0.1	5.9	0.3
2008	1,941,881	24,421	0.013	0.9	3.2	2.7
2009	1,836,671	24,060	0.013	0.3	(5.4)	(1.5)
2010	2,076,401 ^P	25,571	0.012	0.5	13.1	6.3
2010	1,988,741 ^P	24,856	0.013	0.7	(4.2)	(2.8)

*Including manufacturing , mining and construction.

**GDP at 1988 prices for Industry.

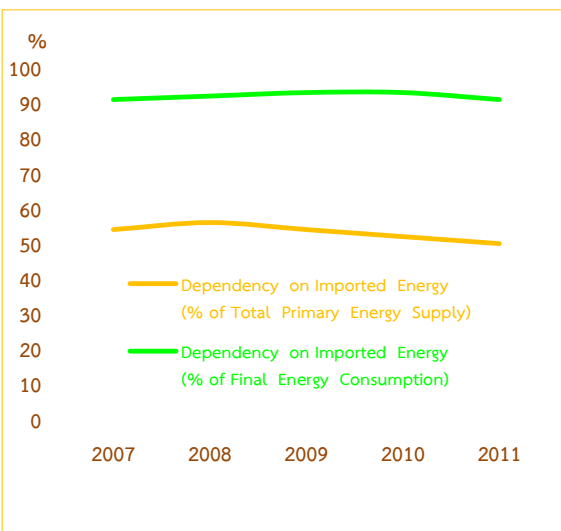
** Final Energy Consumption for Industry.



Energy Indicators

Proportion of Imported Energy Dependency

Year	Total Primary Energy Supply (ktoe)	Final Energy Consumption (ktoe)	Energy Imports (ktoe)	Dependency on Imported Energy (% of Total Primary Energy Supply) (%)	Dependency on Imported Energy (% of Final Energy Consumption) (%)
2007	108,780	64,886	58,903	54	91
2008	111,441	65,890	60,745	56	92
2009	113,869	66,698	61,877	54	93
2010	124,301	70,247	65,113	52	93
2011	127,926	70,562	64,473	50	91



Energy Indicators

Energy Values

Energy Values (thousand mil. Baht)	2007	2008	2009	2010	2011
1. Energy Imports	835	1,150	794	957	1,236
Petroleum	801	1,109	753	911	1,181
Coal & Its Products	26	37	37	39	42
Electricity	8	4	4	7	13
Renewable Energy	0	0	0	0	0
2. Energy Exports	177	284	209	232	281
Petroleum	175	281	205	229	277
Coal & Its Products	0	0	0	0	0
Electricity	2	3	4	3	4
Renewable Energy	0	0	0	0	0
3. Net Energy Imports	658	866	585	725	955
4. Commodity Imports	4,870	5,962	4,601	5,857	6,974 ^p
5. Commodity Exports	5,302	5,851	5,195	6,176	6,897 ^p
6. GDP (at Current Market Prices)	8,525	9,080	9,042	10,105 ^p	10,539 ^p
7. Energy Import Value as a Percentage of					
GDP	9.8	12.7	8.8	9.5	11.7
Commodity Import	17.1	19.3	17.3	16.4	17.7
Commodity Export	15.7	19.7	15.3	15.5	17.9
8. Final Energy Consumption Value	1,383	1,593	1,426	1,639	1,678

Note : Data shown as "0" means figure is less than 0.5.

Energy Indicators

Key Energy Indicators

	2007	2008	2009	2010	2011
1. Primary Energy Supply (ktoe)	108,780	111,441	113,869	124,301	127,926
Growth(%)	3.7	2.5	2.2	9.2	2.9
Per capita(toe/capita)	1.7	1.8	1.8	2.0	2.0
2. Final Energy Consumption (ktoe)	64,886	65,890	66,698	70,247	70,562
Growth(%)	2.6	1.6	1.2	5.3	0.5
Per capita(toe/capita)	1.0	1.0	1.1	1.1	1.1
3. GDP at 1988 prices (thousand mil. Baht)	4,529	4,365	4,263	4,596	4,598
Growth(%)	5.0	2.5	(2.3)	7.8	0.0
Per capita(Baht/capita)	67,563	68,857	67,110	71,951	71,765
4. Petroleum Products (million litres)	39,939	38,912	39,478	40,199	41,566
Growth(%)	2.6	(2.6)	1.5	1.8	3.4
Per capita(litres/capita)	634	614	622	629	649
5. Electricity (Gwh)	133,178	135,449	135,209	149,320	148,700
Growth(%)	4.2	1.7	(0.2)	10.4	(0.4)
Per capita(kwh/capita)	2,113	2,137	2,128	2,338	2,321
6. Value of Net Energy Imports(mil. Baht)	658,188	864,744	584,420	724,802	955,092
Growth(%)	(2.8)	29.2	(31.1)	23.8	31.8
Per capita(Baht/capita)	10,441	13,410	9,218	11,347	14,906
7. Value of Final Energy Consumption(mil. Baht)	1,382,692	1,592,675	1,426,465	1,639,515	1,677,964
Growth(%)	1.9	15.2	(10.4)	14.9	2.4
Per capita(Baht/capita)	21,934	25,125	22,455	25,666	26,187
8. Energy Intensity (ktoe / mil. Baht)	0.015	0.015	0.016	0.015	0.015
9. Energy Elasticity	0.511	0.623	(0.526)	0.682	5.000
10. Populations (thousand inhabitants)	63,038	63,390	63,525	63,878	64,076

International Comparisons

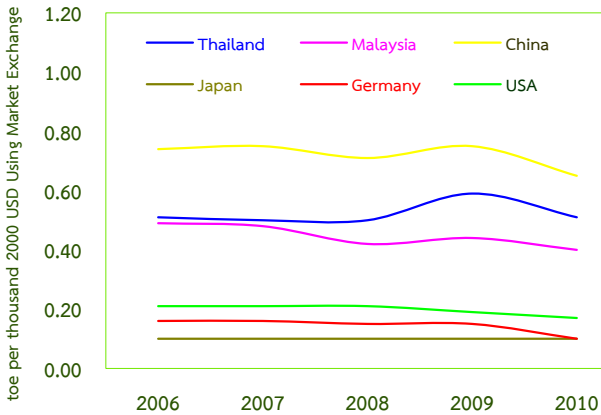
International Comparisons 2010

	Thailand	Malaysia	China	Japan	Germany	USA
Population mil.Inhabitants	69.1	28.4	1,345.0	127.4	81.8	310.1
Gross Domestic Products (GDP) in bil 2000 USD	210.1	171.8	4,053.0	4,579.0	2,945.8	13,017.0
Primary Energy Consumption Mtoe	106.0	69.2	2,613.2	477.6	306.4	2,269.3
Primary Energy Consumption/GDP toe/ thousand 2000 USD	0.51	0.40	0.65	0.10	0.10	0.17
Primary Energy Consumption toe/capita	1.5	2.4	1.9	3.8	3.8	7.3
Electricity Consumption kWh/capita	2,243.0	4,117.0	2,958.0	8,399.0	7,217.0	13,361.0
CO ₂ Emission tons/capita	3.6	6.5	5.4	9.0	9.3	17.3

Source : IEA's Key World Energy Statistics 2012.

Bp Statistical Review of World Energy 2012.

Primary Energy Consumption per USD of GDP



Conversion Factors

TYPE OF ENERGY AND FUEL	UNIT	toe/ 10 ⁶ unit
COMMERCIAL ENERGY		
1. Crude Oil	litre	860.00
2. Condensate	litre	782.72
3. Natural Gas	scf.	24.18
4. Petroleum Products		
4.1 LPG	litre	630.14
4.2 Gasoline	litre	745.07
4.3 Kerosene	litre	817.40
4.4 Aviation Fuel	litre	817.40
4.5 Diesel	litre	861.98
4.6 Fuel Oil	litre	941.24
4.7 Bitumen	litre	974.93
5. Electricity	kWh	85.21
6. Coal (Import)	kg.	624.19
7. Coke	kg.	653.92
8. Anthracite	kg.	743.09
9. Lignite	kg.	247.70
RENEWABLE ENERGY		
1. Fuel Wood	kg.	378.48
2. Charcoal	kg.	683.64
3. Paddy Husk	kg.	340.83
4. Bagasse	kg.	178.34
5. Garbage	kg.	114.93
6. Saw Dust	kg.	257.60
7. Agricultural Waste	kg.	300.21
General		
1 kcal	=	4186 Joules
	=	3.968 Btu
1 toe	=	10.093 Gcal
	=	42.244 GJ
	=	40.047 × 10 ⁶ Btu
1 barrel	=	158.99 Litres

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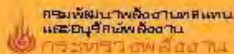
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