

# Enerdata market research

## Sample report

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# LUXEMBOURG: INSTITUTIONS AND ENERGY POLICY

The **State Energy Service** (SEE), which is part of the Ministry of Economy, is responsible for the energy sector.

A regulator, the **Luxemburg Institute of Regulation** (ILR), was created to control the regulation of electricity and gas.

**AEL**, the **Luxembourg Energy Agency**, which has a private status (State 50%, Cegedel 40%, SEO 10%), was created in 1991 to promote energy saving, renewables and the production of decentralised energy.

The main objectives of the energy policy are the diversification of supplies, the promotion of energy efficiency and low energy prices in order to maintain the competition of local industries.

## **Electricity**

The electricity market has been open to competition since 1 July 2007. All professional customers have been free to choose their electricity supplier since July 2004. Luxembourg liberalised its electricity market one year after the other European countries; Brussels has imposed sanctions on the country for its failure to comply with the Directive.

A law that came into force in July 2000 defined a first eligibility level for the period up until December 2000 (for consumption > 100 GWh/year, concerning 3 customers); the eligibility threshold was 20 GWh/year in 2004, that is to say 57% of the market.

## **Gas**

Since July 2007 the gas market has been fully open to competition. In 2004, consumers consuming more than 15 Mm3 were free to choose their suppliers (72% of the market). Luxembourg started the gas

market opening process in 2000: the only eligible customers were the electric power plants (with the exception of those that sold their electricity to Cegedel).

## **Efficiency**

In accordance with the European Directive on Energy Services the new energy efficiency plan fixed an energy savings rate of 9% in 2016, which is the equivalent of 1582 GWh. In April 1999 the country put forward a National Sustainable Development Plan; despite the fact that the plan is not legally binding, the main points developed in the field of energy efficiency are: a 20% reduction in the energy intensity by 2010 (compared to 1993 levels); a 30% reduction of the heating consumption per m2 in buildings by 2020; the promotion of cogeneration (target: from 9% in 2003 to 15% in 2010); the promotion of electricity production by autoproducers (target: 45% of the total electricity produced in 2010).

A law on energy efficiency was passed in August 1993. A new thermal regulation for new buildings came into effect at the beginning of 1996. A programme to promote energy saving in municipal buildings was implemented in 1996. It should make it possible to save 30-50% of the energy consumption of those buildings.

## **Renewables**

The country aims to double the share of renewables in final electricity consumption (5% in 2010) and to double the share of wood in final energy consumption (0.5%-1% by 2010).

## **CO2**

Luxembourg's emission reduction target under the Kyoto Protocol is to reduce its greenhouse gas emissions by 28% by 2008-2010 (compared to 1990 levels). In 2006, its emissions were approximately at their 1990 level.

Within the framework of the National Allocation Plan, covering the 2005-2007

period, the country allocated 3.4 MtCO<sub>2</sub>/year of emission quotas to 15 factory sites. The observed emissions were 30% lower than the quota over the period 2005-2007. The allocated volume for the second plan, covering the 2008-2012 period, is 2.7 Mt CO<sub>2</sub>/year.

## ECUADOR: ENERGY COMPANIES

### Electricity

In 1999 the public company Instituto Ecuatoriano de Electricidad (Inecel), which controlled the production, transport and distribution of electricity, was split into several different electricity generation, transport and distribution companies. The country counts 13 electricity generation companies (including 6 from the former Inecel), one transport company (**Transelectric S.A.**) and 20 distribution companies.

The state-owned "Fondo de Solidaridad" is the only shareholder of the generation companies created through the split-up of Inecel (with the exception of Elecaastro, in which it holds 53.5% of the shares) and of Transelectric, and holds shares in the distribution companies. Although so far the various attempts to privatise the State assets in the electricity sector have failed, at the end of 2003 the Fondo de Solidaridad launched new calls for tender for contracts in the distribution sector.

The American company EDC (a subsidiary of Noble Energy) created the company Machala Power through a 30-year concession contract signed with the State. In 2002 the said company built a 130 MW gas power plant in Machala, the capacity of which should be increased to 310 MW in the future, and which uses the gas produced by EDC from the Amistad field.

### Oil

The public company **Petroecuador** is in charge of the management of hydrocarbons in Ecuador. Petroecuador was created through the nationalisation in 1985 of CEPE, a consortium between the State and the company Texaco. Petroecuador is in charge of the exploitation and the development of the country's hydrocarbon fields. Its subsidiaries Petroproduccion, Petroindustrial and Petrocomercial are in charge, respectively, of the hydrocarbons exploration and exploitation, of the refining, and of the transport and the marketing of oil products for the domestic market.

Petroecuador's share in oil production increased following the takeover by Petroecuador of the offices and installations of Occidental Petroleum (56% in 2008).

There are currently 34 contracts with private companies in the production sector, including 14 participation contracts, 12 services contracts and 8 marginal field contracts. The main foreign companies active in the country are: Repsol-YPF (8% of the production in 2008), Andes Petroleum (8% of the production, consortium with CNPC, which took over EnCana's shares in 2005), Perenco (4.9% of the production) and Agip Oil (4.6% of the production).

In May 2006, the Government cancelled the contract with Occidental Petroleum (OXY), the country's main foreign investor, which exploited Block 15. That move followed the transfer by OXY in 2000 of 40% of its shares to EnCana without the authorisation of the Ministry of Energy, in spite of the provisions of Article 79 of the Hydrocarbons Law. The aforementioned transfer resulted in the seizure of the fields operated by OXY, the withdrawal of its facilities and its employees as well as the loss of its guarantees. The said actions caused the company to lose US\$306m in the second half of 2006. OXY filed a claim against the Ecuadorian Government with the International Center for

the Settlement of Investment Disputes. OXY wants its rights to the field to be restored and is claiming US\$1bn in compensation for its losses; at the beginning of 2009 the conflict had not yet been resolved.

The field, which suffers a production decrease of 10% due to technical difficulties, is now being exploited by Petroecuador. However, the national company is also in charge of OXY's debt (approximately US\$40m) to the members of the Chamber of Oil and Energy Services. The said debt is added to the US\$208m debt that the company already had with the aforementioned institution.

Since 2007, Ecuador has threatened to seize the production of the foreign oil companies that have not complied with the new laws regarding windfall profits, and have accumulated those taxes since 2007. At the beginning of 2009, Perenco still refused to pay and Repsol agreed to pay \$447m up to 2014. A new agreement was signed with Petrobras for Block 18, reducing the State's taxes from 99% to 70% in exchange for a 60% stake in the production.

The refining activities are entirely controlled by Petroindustrial, a subsidiary of Petroecuador.

In the field of transport, a new pipeline with a capacity of 130 000 bl/d, the OCP (Oleoducto de Crudos Pesados), was commissioned in 2003 by the consortium OCP Limited, which is made up of Agip Oil, Alberta Energy Corporation, Repsol YPF, Occidental Petroleum, Perenco, Petrobras Energía S.A. and Techint. According to the contract, OCP Limited has the right to exploit the pipeline for a period of 20 years, after which it will become the property of the State. The other pipelines are managed by Petroecuador.

The company **Petroleos y Servicios S.A.** is the main distributor of oil products, with 29% of the national market.

## **Gas**

The American company EDC (a subsidiary of Noble Energy) operates the Amistad field (called Block 3). A consortium made up of Keyano Pimee (Canada) and the state-owned company Amazonia Gas, obtained the rights for the exploitation of the Sacha gas field for a 14-year period starting in 2002, and plans to build a gas transformation plant. The long-term objective of the consortium is to produce 80 t/day of LPG.

## **ANGOLA: ENERGY SUPPLY**

### **Resources**

Angola has an enormous potential for gas exploitation, with estimated reserves of 270 Gm<sup>3</sup>. Proven oil reserves are increasing rapidly and are estimated at 9.5 Gbl (1.3 Gt) (2009). The country does not have coal, but does have a huge hydroelectric potential, estimated at 150 TWh.

### **Electricity**

The installed capacity recently increased through the commissioning of the last two 210 MW turbines of the Capanda dam in 2005, which followed the commissioning of the first two turbines in 2003 and 2004 (520 MW, or 4x130 MW). It now totals 1190 MW (about 850 MW of which is effectively available).

The country's electricity production comes to 3.2 TWh (2007), with hydroelectric power plants accounting for nearly 90% and oil-fired power plants for 10% of the total.

ENE has divided the fifteen provinces into 3 geographical areas: the Northern system (Luanda), which has the 2 largest hydroelectric power plants, Cambambe, with a capacity of 180 MW, and Capanda (520 MW), as well as a gas turbine with a capacity of 90 MW; the Central system (Benguela), which has two hydroelectric plants (Biopo and Lomaum) and a gas turbine, amounting to a total capacity of 70 MW; and, finally, the

Southern system (Namibe), which has a 40 MW hydroelectric plant (Matala). ENE also supplies the enclave of Cabinda using a gas power plant and a diesel generator of 10 MW each.

The electricity distribution network managed by ENE in the Northern system is made up of 9 electricity stations, only 2 of which are currently operational, connected by a network of 220 kV, 150 kV and 60 kV that is almost 1000 km long. In the Central system there are 6 sub-stations, only 3 of which are operational (network of 150 kV – 60 kV, 420 km). The Southern system also has 6 sub-stations, 4 of which are in service (network of 150 kV – 60 kV, 620 km).

EDEL is also quickly developing according to a programme launched in 2005 (around \$200m for the first four phases).

### **Oil**

Oil production is increasing rapidly; in 2008 it reached 97 Mt, compared to 62 Mt in 2005, 37 Mt in 2000 and 23 Mt in 1990. Angola is the second largest oil producer in Africa after Nigeria. That rapid increase is due to the recent commissioning of several new fields, situated in deep offshore areas (between 1000-2000 m) and produced with FPSOs. Most of the current production is situated in the enclave of Cabinda (the offshore sites were relatively well protected during the war).

Around 95% of the production is exported, with half going to the United States and to China.

Almost all the domestic diesel and kerosene needs are met by the country's only refinery, which has a capacity of 39 000 bl/d, and which is being increased to 60 000 bl/d. Angola currently imports nearly 25% of its refined products consumption.

### **Gas**

In 2007 the marketed gas production reached 0.8 Gm<sup>3</sup>. Until now nearly all the gas produced in Angola was flared. The Government is developing policies to limit this phenomenon and to increase the commercial use of gas. CABGOC was the first company to operate fields without flaring (in Nemba, Lomba and Kuito).

## **CENTRAL AFRICAN REPUBLIC: ENERGY PRICES**

### **Oil**

Oil product prices are frequently re-examined by the authorities according to international prices, the cost of transportation or the place of origin of the imported oil.

At the end of 2000 the prices of fuels strongly increased because of the blockade of the deliveries from the Democratic Republic of Congo. In order to mitigate the said blockade of deliveries, the CAR had fuels transported by truck from Sudan, which strongly increased the transport costs. More recently, following the adoption of the Finance Law by Parliament at the end of December 2005, the price of motor fuel increased from €6.1c to €7.6c at the beginning of January 2006; the price of premium gasoline increased from €0.97/l to €1/l, and the price of diesel from €0.94/l to €1.01/l.

Likewise, the price of kerosene, which is used for lighting, increased by 12% to €0.6/l.

Following the said rises in the tariffs it was stated that *"a Prime Ministerial Decree will lay down the measures to be taken to mitigate the effects of the said rise on the most vulnerable segments of the population"*.

### **Electricity**

The prices of electricity have been stable for several years. An increase of the said prices is not really being considered. Nevertheless, there have been talks about a possible

simplification of the tariff grid, which distinguishes various uses.

The price of electricity is €0.14/kWh for the residential sector and €0.12/kWh for the industrial sector.

## URUGUAY: ENERGY CONSUMPTION

The average energy consumption per capita is 0.9 toe, including 2000 kWh of electricity consumption per capita.

Oil represents about 60% of the country's total energy needs.

Traditional energies and hydro contribute almost equally with 16% and 21%, respectively, of the country's total energy needs (2008).

Uruguay's final consumption increases since 2003 (2.5 Mtoe in 2007); it has been relatively stable between 1997 and 2003 (it fluctuated around 2.2-2.4 Mtoe).

Electricity consumption increased until 2000 (5.4%/year on average since 1990) and has slightly decreased between 2000 and 2003 and increases again since then. About half of the electricity is consumed in Montevideo. The household electrification rate is 97%.

Households and services consume 44% of the country's final consumption, 29% of which of traditional fuels (2007).

The transport sector accounts for a third of the country's final consumption. Finally, industry holds a more modest share.

The residential sector is Uruguay's most important electricity consumer, accounting for almost 40% of the consumption.

The industrial sector represents 21% of the final consumption and 27% of the electricity consumption (2007).

## LAO: ISSUES AND PROSPECTS

### Electricity

Laos is planning the large-scale development of its hydroelectric resources in order to increase its exports to Thailand, and then to Vietnam. Electricity exports account for a quarter of the country's exports, the same percentage as wood and textiles. On average, they represent revenues of \$100m. Private capital has been mobilised for such projects, either in the form of BOT-type schemes or in the form of joint ventures.

In total, eight hydropower projects are under construction for a full capacity of approximately 2 500 MW. Around 15 hydropower projects should be developed (including 6 projects of more than 300 MW), representing a total capacity of about 4 000 MW. Most of them are independent production projects (IPPs) under BOT arrangements. The country's capacity should reach 2100 MW by 2010 for a demand of 580 MW. The electricity demand should continue to increase by 10%/year on average and reach 2 TWh in 2010, half of which for households, and 3.7 TWh in 2020.

The main hydroelectric plants under construction are: **Nam Theun 2** (1 070 MW in 2009), **Nam Ngum 2** (615 MW, consortium consisting of Chor-Karmchang, Sri U-Tong, Shipak; an agreement with EGAT for 597 MW in 1997, commissioning in 2011), **Xe Kaman 3** [250 MW, project developed by VLP (Vietnam) (85%) and EDL (15%) for the exports to Vietnam, cost of \$360m, commissioning in 2010], **Nam Lik 1-2** (120 MW), **Nam Ngum 5** (100 MW) and **Xeset 2** (EDL, 176 MW). A project for the extension of the **Theun Hinbun** hydroelectric power plant, involving a capacity of 280 MW, should be commissioned in 2012.

The other hydropower projects are: **Nam Ou** [1100 MW to be commissioned in 2015, Sinohydro (75%) and the Government of

Laos (25%), production exported to Thailand and China], **Nam Ngum 3** [440 MW, MDX, Marubeni (Japan), Ratchburi (Thailand) and the Laotian State; an agreement with EGAT in March 1997 for exports of 400 MW, to be commissioned in 2014, production totally exported to Thailand]; **Xe Kaman** [320 MW, HEC, Hydro Electric Commission Enterprise, (Australia), production exported to Vietnam], and **Xe Pian** and **Xe Nam Noy** [439 MW, 360 MW of which to be exported; an agreement signed in March 1997 with EGAT; a consortium consisting of Dong Ah 45%, a Thai partner 20% and a Laotian partner 35%] and **Nam Ngiep 1** (260 MW, commissioning planned in 2015, production exported to Thailand). Lastly, a project for a hydropower plant on the Mekong is being carried out by Mega First (Malaysia, 80%) and the Laotian State (20%). **Don Sahong** would have a capacity of 300 MW, to be commissioned in 2015.

**Nam Theun 2** is implemented by the international consortium NTPC, Nam Theun 2 Power Company, made up of EDF 35%, the Lao Government 25%, EGCO 25% (which in November 2000 bought the stakes of Jasmine International and Meryll Lynch) and Italian Thai Development (15%). 93% of the construction work has been completed and the filling of the reservoir began in April 2008; the commissioning will take place in 2009. The project is estimated to cost US\$1.450m. In October 2002 the Lao Government signed a 30-year concession contract with NTPC. Most of the production will be exported to Thailand: in November 2003 EGAT and NTPC signed an agreement for the supply of 920 MW over 25 years (PPA), at a price of US\$4.2 cents/kWh. For a long time, the future of Nam Theun 2, the country's biggest plant, depended on the World Bank, which had agreed to finance the project after in depth studies regarding environmental and social impacts had been carried out. The decision for a loan of \$270m was made in April 2005 by the World Bank. Not long afterwards, the EIB granted the

Government a loan for US\$55m over 30 years to finance its stake in the company NTPC. In 2003, EDF withdrew from the project but 3 months later reconsidered its decision. The project should bring in revenues of \$30m/year for the Government between 2009 and 2019 and \$110m/year between 2020 and 2034, in the form of royalties, dividends and taxes.

A 1 800 MW thermal power plant to be supplied with local lignite is under construction in **Hongsa**. This project is being developed by a consortium from Thailand and Lao, Thai Lao Power Co Ltd. The lignite reserves could supply an installed capacity of up to 2 000 MW.

The plant would export most of its production (600 MW) to Thailand. It should be commissioned in 2013. A contract has already been signed with EGAT (average price of US\$5.7 cents/kWh).

Other priorities for the development of the electricity sector are the expansion of the electricity network, in particular in rural areas, and the reduction of transmission distribution losses. The official objective is to electrify 70% of the population by 2010, 79% by 2015 and 90% by 2020 (including 150 000 households to be electrified through the decentralised production of electricity using renewables).

In June 1993, Laos and Thailand signed an agreement for the supply of 1500 MW in the year 2000. A second agreement signed in 1996 extended that agreement for an extra capacity of 1500 MW to be exported by 2006, which raised the total volume to 3000 MW. Following the economic crisis that hit the Thai economy in 1998, the export agreement was postponed for 2 years, from 2006 to 2008. The agreement was then renegotiated several times. At the end of 2006, the agreement concerned 5000 MW as of 2009. The Thai company EGAT has signed different import agreements for each of those projects.

Six projects for exports to Thailand are included in Thailand's Electricity Sector Development Plan 2004-2015: Nam Theun 2 (for 920 MW of imports as of 2009), Nam Ngum 2 (597 MW, 2012), the expansion of Nam Theun Hinbun (220 MW, 2012), Nam Ngum 3 (440 MW, 2013), Nam Theun 1 (523 MW, 2013) and Nam Ngiep (261 MW, 2014). In 2020, the export volume to Thailand should reach 7 000 MW.

Lao also signed an agreement (MOU) with Vietnam for the export of 1 000 MW between 2006 and 2010 and for 2 000 MW after 2010 (or 3.35 TWh after 2010).

In 2020, the authorities plan to export 5 000 MW to Vietnam and 1 500 MW to Kampuchea.

To make the exports possible, there are 5 electricity interconnection projects with Thailand. In addition, to improve the supply of certain provinces, there are 7 interconnection projects to import electricity (4 with Thailand, 2 with Vietnam and 1 with China). The length of the transmission network must be increased by nearly 3 300 km between 2003 and 2011.

# Ecuador

**Table 1: Economic Indicators**

		1990	2000	2003	2004	2005	2006	2007
Population	Millions	10.3	12.3	12.9	13.0	13.2	13.4	13.6
GDP growth rate	%/year	2.7	2.8	3.6	7.9	4.7	3.9	2.5
GDP/capita	US \$	1008	1295	2228	2503	2758	2918	3016
Exports	Billions \$	2.7	4.9	6.2	7.8	10.1	n.a.	n.a.
Imports	Billions \$	1.9	3.7	6.7	8.2	10.3	n.a.	n.a.
Inflation Rate	%/year	48.5	96.1	7.9	2.7	2.4	3.3	2.3
Exchange rate	lc/\$	1.00	1.00	1.0	1.0	1.0	1.0	1.0

Sources : World Bank , IMF

**Table 2: Supply Indicators**

		1990	2000	2003	2004	2005	2006	2007
<b>RESERVES*</b>								
Oil	Mt	190	288	630	630	630	615	615
Gas	Gm3	111	10.0	9.0	9.0	9.0	9.0	8.0

\* On December 31 st

**CAPACITY\***

Refining capacity	Mbl/j	0.14	0.18	0.18	0.18	0.18	0.18	0.18
Electricity capacity	GW	1.9	3.4	3.6	3.6	3.6	3.7	3.9
of which Thermal	GW	0.96	1.6	1.8	1.8	1.9	1.9	1.9
Hydroelectricity	GW	0.91	1.7	1.7	1.7	1.8	1.8	2.0
Nuclear	GW	0	0	0	0	0	0	0
Geothermal	GW	0	0	0	0	0	0	0
Wind	GW	0	0	0	0	0	0	0.002

\* On December 31 st

**PRODUCTION**

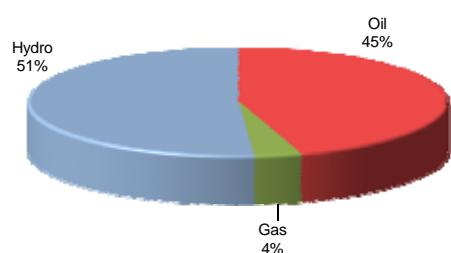
Oil	Mt	15.0	21.0	21.5	26.9	27.0	28.1	27.7
Gas	Gm3	0.22	0.27	0.39	0.36	0.41	0.54	0.53
Coal	Mt	0	0	0	0	0	0	0
Electricity	TWh	6.3	10.6	11.5	12.6	13.4	15.4	17.3
of which Thermal	%	21.5	28.3	37.8	41.1	48.6	53.7	47.7
of which Coal	%	0	0	0	0	0	0	0
Gas	%	0	0	8	8	8	10	8
Hydroelectricity	%	79	72	62	59	51	46	52
Nuclear	%	0	0	0	0	0	0	0
Geothermal	%	0	0	0	0	0	0	0
Wind	%	0	0	0	0	0	0	0

**EXTERNAL TRADE\***

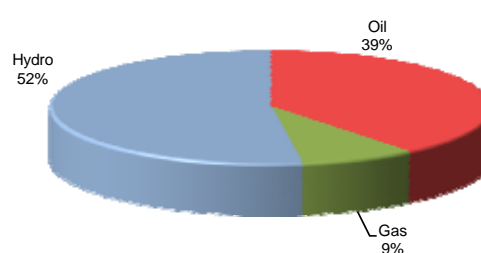
Crude oil	Mt	-8.9	-12.5	-13.2	-18.5	-18.8	-19.6	-17.8
Oil products	Mt	-1.4	-1.3	-0.38	-0.09	0.64	0.98	-0.87
Gas	Gm3	0	0	0	0	0	0	0
Coal	Mt	0	0	0	0	0	0	0
Electricity	TWh	0	0	1.1	1.6	1.7	1.6	1.4

\* Imports(+) exports(-) balance

**ELECTRICITY CAPACITY**



**ELECTRICITY PRODUCTION**



# Angola

**Table 3: Demand Indicators**

1990 2000 2003 2004 2005 2006 2007

## CONSUMPTION PER CAPITA

		1990	2000	2003	2004	2005	2006	2007
Total	toe	0.60	0.57	0.61	0.61	0.61	0.63	0.63
Electricity	kWh	55.9	83.6	106	116	132	145	149

## CONSUMPTION TRENDS

		1990	2000	2003	2004	2005	2006	2007
Total	%/year	6.5	4.7	5.8	3.0	3.1	5.4	3.3
Electricity	%/year	2.8	8.1	13.3	12.2	17.5	12.4	6.1
Oil	%/year	-1.3	10.0	13.2	-1.4	2.8	10.4	4.5

## TOTAL CONSUMPTION

		1990	2000	2003	2004	2005	2006	2007
Total	Mtoe	6.3	8.0	9.2	9.4	9.7	10.3	10.6
of which								
Oil	%	23	24	27	26	26	27	28
Gas	%	7	6	6	7	6	6	6
Coal, lignite	%	0	0	0	0	0	0	0
Primary electricity*	%	1	1	1	2	2	2	2
Biomass	%	69	69	66	66	65	64	64

\* Nuclear (1TWh = 0.26 Mtoe), Hydroelectricity and wind (1 TWh = 0.086 Mtoe), Geothermal (1 TWh = 0.86 Mtoe)

## FINAL CONSUMPTION

		1990	2000	2003	2004	2005	2006	2007
Total	Mtoe	4.9	6.2	7.2	7.4	7.7	8.2	8.5
By energy								
Oil	%	24	25	29	28	28	31	31
Gas	%	9	8	7	8	8	8	8
Coal, lignite	%	0	0	0	0	0	0	0
Electricity	%	1	2	2	2	2	2	3
Heat	%	0	0	0	0	0	0	0
Biomass	%	65	66	62	62	61	59	59
By sector								
Industry	%	16	13	15	14	15	15	15
Transport	%	14	14	15	17	17	19	19
Households & services	%	69	71	67	67	67	65	65
Non energy uses	%	1	3	3	2	2	2	2

## ELECTRICITY CONSUMPTION

		1990	2000	2003	2004	2005	2006	2007
Total	TWh	0.59	1.2	1.6	1.8	2.1	2.4	2.5
of which								
Industry	%	27	31	31	31	31	31	31
Households	%	73	69	69	69	69	69	69
Services	%	0	0	0	0	0	0	0

## ENERGY SECURITY

		1990	2000	2003	2004	2005	2006	2007
Energy independence rate	%	456	548	552	608	726	770	906
Share of oil imported(+) exported(-)	%	-1639	12104	-1503	-1438	-2265	-1979	-2216
Energy imports(+) exports(-) balance	M US \$	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Energy imports(+) exports(-) balance/GDP	%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

## ENERGY EFFICIENCY

		1990	2000	2003	2004	2005	2006	2007
Total consumption/GDP *	koe/\$05	0.30	0.35	0.33	0.31	0.26	0.23	0.20
Total consumption/GDP *	2005=100	114	134	126	117	100	88.9	75.8
Transport and distribution rate of losses	%	25.1	14.6	14.4	14.5	14.5	14.5	14.0
Efficiency of thermal power plants	%	11.0	26.1	27.4	27.3	27.4	27.3	27.3

## CO2 EMISSIONS

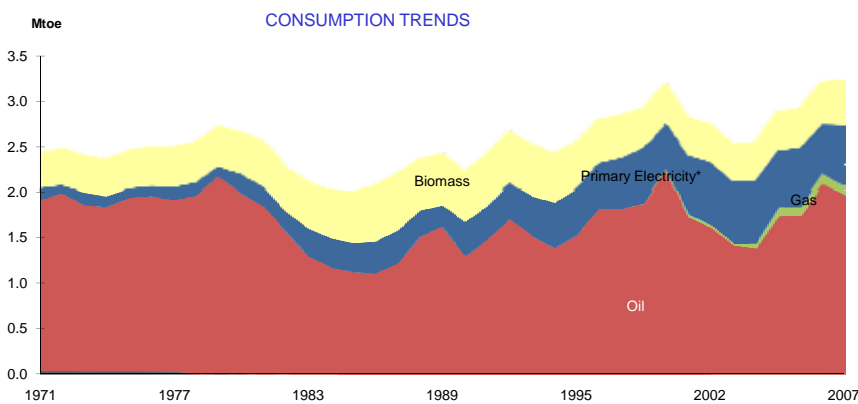
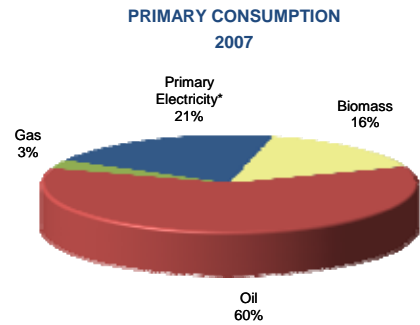
		1990	2000	2003	2004	2005	2006	2007
CO2 emissions/GDP *	kg/\$05	0.36	0.63	0.69	0.65	0.55	0.49	0.41
CO2 emissions/capita	tCO2/cap.	0.72	1.0	1.3	1.3	1.3	1.3	1.3

\* at power purchase parity

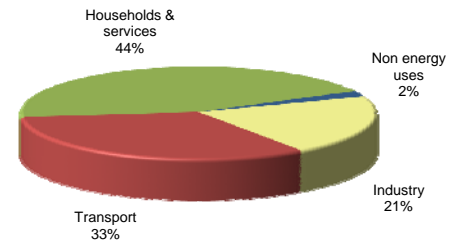
# Uruguay

**Table 4: Energy Balances**

TOTAL ENERGY BALANCE	1990	2000	2003	2004	2005	2006	2007
(Mtoe)							
Production	1.15	1.03	1.16	0.85	1.02	0.78	1.20
Imports	1.38	2.23	2.10	2.86	2.67	2.99	2.55
Exports	0.24	0.22	0.29	0.40	0.49	0.30	0.36
Marine Bunkers	0.12	0.29	0.31	0.33	0.35	0.24	0.30
Stock Changes	0.04	0.06	-0.13	-0.10	0.05	-0.03	0.13
Primary Supply	2.22	2.81	2.53	2.87	2.91	3.20	3.23
Final Consumption	1.94	2.52	2.20	2.33	2.34	2.40	2.53
Industry	0.53	0.48	0.43	0.49	0.49	0.50	0.53
Transport	0.51	0.85	0.68	0.72	0.73	0.77	0.83
Residential & Services	0.84	1.13	1.05	1.06	1.07	1.08	1.12
Non-Energy Uses	0.06	0.06	0.05	0.06	0.05	0.05	0.05



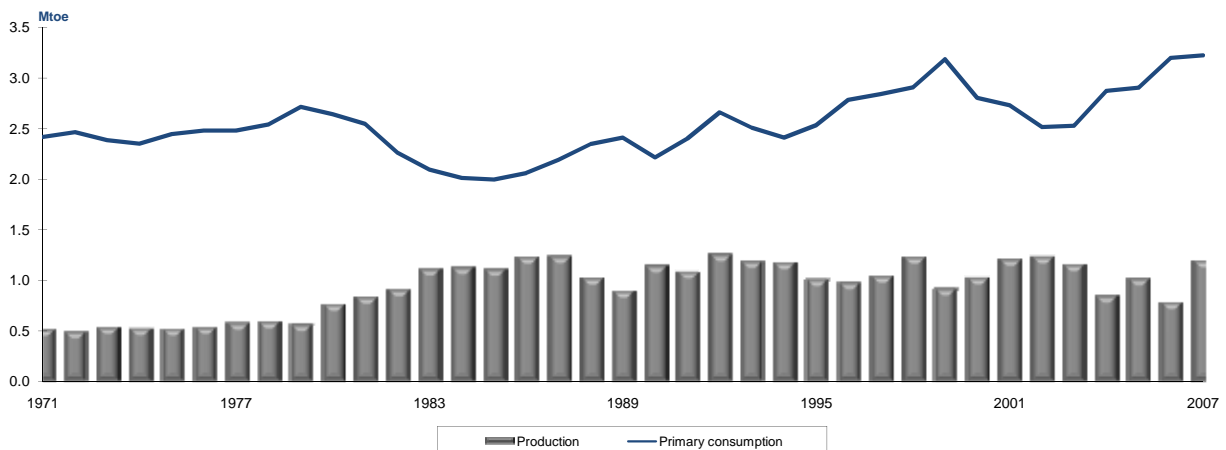
**FINAL CONSUMPTION 2007**



**DETAILED ENERGY BALANCE (Mtoe)**

(Mtoe)	Coal	Crude Oil	Oil Products	Natural Gas	Primary Elec.**	Elec.	Biomass	Total**
Production					0.69		0.51	1.20
Imports	0.002	1.42	0.97	0.09		0.07	0.0	2.55
Exports			-0.27			-0.09		-0.36
Intl. Marine bunkers			-0.30					-0.30
Stock changes		0.25	-0.12					0.13
Primary supply	0.002	1.67	0.27	0.09	0.69	-0.02	0.51	3.23
Petroleum refineries		-1.67	1.54					-0.14
Power plants			-0.33	0.0	-0.69	0.81	-0.01	-0.23
Others	0.0		-0.14	-0.02		-0.18		-0.33
Final Consumption	0.003		1.34	0.08		0.61	0.49	2.53
of which :								
Industry	0.003		0.14	0.06		0.16	0.17	0.53
Transport			0.83			0.45	0.32	0.83
Households & services			0.32	0.02				1.12
Non energy uses			0.05					0.05

\*\* Including heat



\*Nuclear (1TWh = 0.26 Mtoe), Hydroelectricity and wind (1 TWh = 0.086 Mtoe), Geothermal (1 TWh = 0.86 Mtoe)

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## Contact:

T: +44 207 183 4475

F: +44 207 183 8445

[knowledge@enerdata.net](mailto:knowledge@enerdata.net)

ENERDATA  
271 Regent Street  
London, UK W1B 2ES  
United Kingdom  
[www.enerdata.net](http://www.enerdata.net)