

# 22-ENERGY

Given the presence of the metallurgic industry, New Caledonia's energy requirements are significant. However the territory has few energy resources, and the majority must therefore be imported.

An assessment of the last ten years shows that, on average, 97% of **primary energy** resources were imported, and only 3% produced locally.

Primary energy production in New Caledonia is almost exclusively of water-powered origin (98% over the last 10 years), while wind and solar generation remain at low levels despite clear increases in available capacity (almost 50 times more in ten years).

In 2005, 81% of New Caledonia's primary energy consumption was petroleum based, 15% from coal, 4% **water-powered**, 1% butane gas and 0.2% from renewable sources.

Metallurgy consumed almost 30% of all primary energy produced, as was the case for the transport sector and the energy industry itself (loss of energy in fossil fuel powered production), followed a long way back by mining and distribution to the public, each accounting for less than 5% of consumption.

New Caledonia's high level of **energy dependence** is set to become even more significant in years to come, on the one hand with the fossil fuel powered station to be commissioned in Prony, and on the other, increased capacity of existing generation units like those at Doniambo to satisfy the new production targets of the metallurgy factory.

**CTME** manages the energy assistance fund, which is funded by New Caledonia (through the renewable energies tax on super fuels) and **ADEME**. Each year these two organisations finance the territorial energy programme, which includes activities to promote new and renewable sources, and energy efficiency. All equipment recognised by the committee as part of these activities can be exempted from general import tax.

▶ **Primary energy.** Raw energy having undergone no transformation after its extraction (coal, lignite or brown coal, crude oil, natural gas), electricity from water-powered sources or nuclear energy) as opposed to secondary energy.

▶ **Secondary energy.** Energy produced by transforming primary energy or another form of secondary energy (in particular energy derived from fossil fuels). Transformation is most often carried out by organisations in the energy industry, but also by steel manufacturers and metallurgists. Final energy is the energy delivered to the consumer for end-use: petrol at the pump, electricity in the home.

▶ **Electricity from water-powered sources.** Electrical energy derived from the power of water (hydroelectric dams).

▶ **Tonne oil equivalent (TOE).** Unit of measure commonly used by energy economists to compare different energy forms, using equivalence ratios.

▶ **Energy dependence.** As opposed to the rate of energy independence, the energy dependence rate is the ratio between imported primary energy and total available primary energy in a country or territory.

▶ **CTME.** Territorial committee for energy efficiency, established in 1989 by deliberation n°78 dated January 26, 1989.

▶ **ADEME.** The Environmental and energy efficiency agency is a public establishment of an industrial and commercial nature, under the joint governance of the ministries responsible for the Environment and sustainable development, industry and research. Its missions are to solicit, animate, co-ordinate, facilitate and carry out operations designed to protect the environment and achieve energy efficiency.

## SOURCES

[1] Direction de l'Industrie, des Mines et de l'Énergie (DIMENC), données relatives à l'énergie.

[2] Institut National de la Statistique et des Études Économiques (INSEE), Tableaux de l'Économie Française, Édition 2006.

## SEE ALSO

Observatoire de l'énergie : [www.industrie.gouv.fr/energie](http://www.industrie.gouv.fr/energie)

Documentation juridique de la Nouvelle-Calédonie : [www.juridoc.gouv.nc](http://www.juridoc.gouv.nc)

# 22.1 ENERGY ASSESSMENT

## Energy assessment of New Caledonia [1]

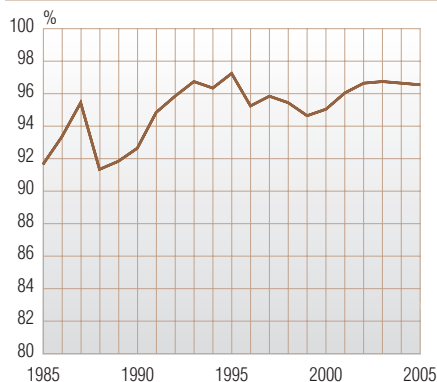
	1990	1995	2000	2001	2002	2003	2004	2005
Primary production (a)	39 621	19 597	38 524	32 082	28 562	27 889	28 999	30 590
Imports consumed (b)	496 991	688 347	732 633	772 818	819 513	813 863	813 478	841 365
<b>Total primary energy resources</b>	<b>536 612</b>	<b>707 944</b>	<b>771 157</b>	<b>804 900</b>	<b>848 075</b>	<b>841 751</b>	<b>842 477</b>	<b>871 955</b>
Energy dependence rate	92.6	97.2	95.0	96.0	96.6	96.7	96.6	96.5

(a) Electrical energy from water, wind, and solar sources.

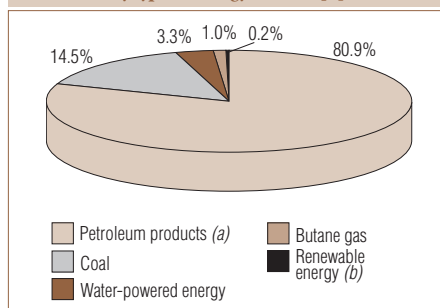
(b) Petroleum products, butane gas, coal.

Units : tonne oil equivalent (TOE), %

### Energy dependence [1]



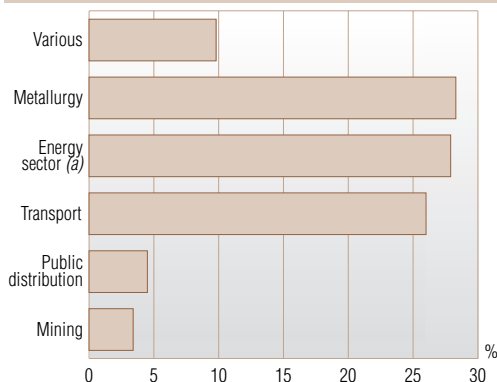
### Primary energy consumption by type of energy in 2005 [1]



(a) Heavy fuel, diesel, petrol, kerosene, jet fuel.

(b) Wind and photovoltaic.

### Primary energy consumption by sector in 2005 [1]



(a) Losses during the production of fossil fuel powered energy production.

### Primary energy consumption world-wide in 2004 [1 and 2]

North America	6.4
United States	7.9
Canada	8.4
Latin America	1.1
Western Europe	3.5
France	4.4
Germany	4.2
Eastern Europe	1.7
Africa	0.7
Asia	0.8
Japan	4.2
China	1.1
Middle East	2.5
Oceania	5.4
New Caledonia	3.7
<b>World</b>	<b>1.7</b>

Unit : TOE per inhabitant

### Energy independence rates in selected countries in 2004 [1 and 2]

United Kingdom	96.4
United States	70.6
France	49.9
Germany	39.1
Belgium	23.5
Spain	22.9
Japan	18.2
Italy	16.3
Portugal	14.7
New Caledonia	3.4

Unit : %

### CTME recognised undertakings in the period 2003-2005 [1]

	2003	2004	2005
Energy audit	1 173	-	9 042
Biofuel oil filter station	9 293	-	-
Wind measurement campaign	-	8 900	2 036
Communication	-	-	138 262
Electrification of homes	124 720	198 941	71 473
Studies	-	46 928	-
Rural electrification fund (a)	125 164	275 744	2 263
Energy saver lamps	-	-	50 280
Solar pumping	124 183	14 875	21 268
Economic and social council's 335.2 E subsidy	-	-	201 120
Building industry scientific and	-	-	-
Technical centre approval subsidy	-	-	9 419
Solar water heater subsidies	146 005	40 174	50 087
<b>Total</b>	<b>530 538</b>	<b>585 561</b>	<b>555 250</b>

(a) Contribution to interior installations of photovoltaic installations funded by FER.

Unit : Euros

# 22-ENERGY

New Caledonia's energy bill has risen significantly over the last few years, not only attributable to soaring oil prices, but also to increasing local consumption.

**Coal** and the majority of heavy fuels are only used in metallurgy. Accordingly, New Caledonia's energy bill is not only dependent on oil prices, but also on metallurgic activity.

There are strict rules in place for **stocks of petroleum products held by oil companies**.

Prices of liquid hydrocarbons are controlled and set by government decree. Up until April 2006, petrol and diesel pricing structures were reviewed quarterly. The **stabilisation tax** enabled New Caledonia to maintain stable prices at the pump between 1991 and 2000, despite world-wide fluctuations. However, from 2000 onwards, faced with soaring oil prices, prices at the pump increased (+21% between 2000 and 2005), but significantly less rapidly than the cost of imports (+70%). Today, Singapore is the supplier. The other refineries around the region (Australia, Hawaii and the United States), all former exporters, can no longer satisfy their own domestic demand.

The difference between the price at the pump and the purchase cost is made up of taxes and customs duties, as well as oil company and retailer margins.

Butane gas prices are reviewed half-yearly. There is no stabilisation tax on gas, accordingly prices follow world-wide trends. Gas is ocean freighted to New Caledonia from Australia and New Zealand. Consumption is not significant and has been relatively stable over the longer term. It accounted for only 1% of consumption in 2005, its usage limited to heating water and cooking. Gas is nonetheless an important part of daily life in rural areas.

► **Coal.** *This term encompasses coal, brown coal (lignite), coke, briquettes and recycled products. In New Caledonia, it is mainly bituminous coal imported for the metallurgic industry.*

► **Petroleum product stocks.** *A decree dated May 6, 1995, and made applicable to New Caledonia by order dated September 14, 1995, requires oil companies to maintain strategic stocks of 20% of quantities supplied for annual consumption (being 73 days consumption) for each product.*

► **Oil companies.** *At the end of 2005, three oil companies were supplying New Caledonia with liquid hydrocarbons : Mobil International Petroleum Corporation, Shell Pacifique, and Total Pacifique (the latter has announced its withdrawal from the Pacific region by the end of 2007).*

► **Stabilisation tax.** *Introduced by deliberation 25 dated July 9, 1986, it guarantees stability of prices at the pump by compensating crude prices : when petroleum prices increased, the proportional share of the tax in the price of petrol diminished ; conversely, in the event of lower crude prices, the proportional share of the tax increased, filling the territory's coffers. The mechanism was totally invisible for vehicle users who continued to pay the same price at the pump. It was repealed by local law n°2006-5 dated March 29, 2006 reforming fiscal policy relating to petroleum products, and in particular replaced price-dependent ad valorem taxes with specific taxes on imported quantities. This reform was completed by way of deliberation n°173 dated March 29, 2006 relating to the structure of petrol and diesel prices, introducing, among other things, a monthly review of hydrocarbon prices, upwards and downwards, in relation to world-wide fluctuations.*

## SOURCES

[1] Direction de l'Industrie, des Mines et de l'Énergie (DIMENC), données relatives aux hydrocarbures en Nouvelle-Calédonie.

[2] Direction Régionale des Douanes de Nouvelle-Calédonie (DRDNC), données relatives aux importations d'hydrocarbures et de charbon.

[3] Institut National de la Statistique et des Études Économiques (INSEE), séries statistiques, disponibles sur : [www.insee.fr](http://www.insee.fr)

Délibération n°25 du 9 juillet 1986 instituant une taxe de stabilisation sur les produits pétroliers.

Arrêté n°84-331/CG du 10 juillet 1984 fixant les règles de détermination des prix de certains produits pétroliers liquides.

Loi du pays n°2006-5 du 29 mars 2006 portant réforme de la fiscalité des produits pétroliers et délibération n°173 du 29 mars 2006 relative à la structure des prix de l'essence et du gazole.

# 22.2 PETROLEUM PRODUCTS-COAL

Consumption of petroleum products and coal [1]

	1990	1995	2000	2001	2002	2003	2004	2005
Super grade (leaded) (a)	57 363	54 064	15 711	///	///	///	///	///
Unleaded super	-	8 586	47 550	63 688	63 088	64 835	69 472	71 186
Diesel	65 491	83 734	113 367	113 208	121 338	126 284	158 266	148 839
Kerosene	1 030	714	1 318	1 725	1 473	4 503	-	-
Jet fuel	26 252	25 001	28 434	30 784	29 100	28 642	33 557	31 353
Aviation fuel	254	467	248	251	284	235	286	-
Heavy fuel	229 796	348 083	350 358	372 586	391 377	399 597	391 259	454 325
Butane gas	7 172	7 909	8 810	8 592	8 776	8 911	8 931	8 857
Coal	109 633	159 789	166 837	181 984	204 077	180 855	151 706	126 805

(a) Has not been available in New Caledonia since 2001.

Unit : TOE

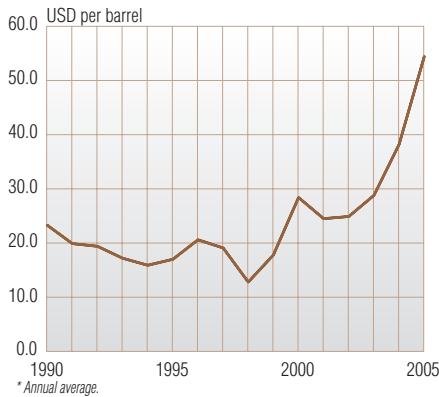
CIF\* values of imported petroleum products and coal [2]

	1990	1995	2000	2001	2002	2003	2004	2005
Petrol	13 383	10 743	20 003	19 014	17 808	17 833	23 280	27 637
Diesel	13 165	13 341	35 338	29 565	28 249	33 311	38 590	54 512
Kerosene	1 173	980	1 743	2 539	1 073	nd	1 366	4 073
Heavy fuel	25 517	27 193	68 297	70 685	67 040	73 007	68 532	111 018
Butane gas	1 902	2 305	3 427	4 014	3 712	2 480	3 486	4 592
Coal	9 226	9 847	8 698	11 648	11 313	10 173	12 813	17 749
incl. bituminous coal	5 422	6 897	7 081	9 746	9 813	8 623	10 869	10 081

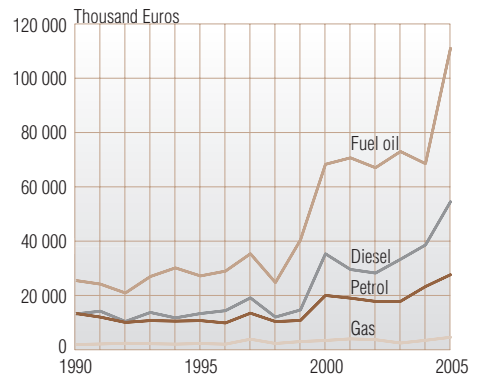
\* Cost, insurance, freight.

Unit : thousand Euros

Rotterdam crude oil prices\* [3]



CIF total values for imported petroleum products [2]



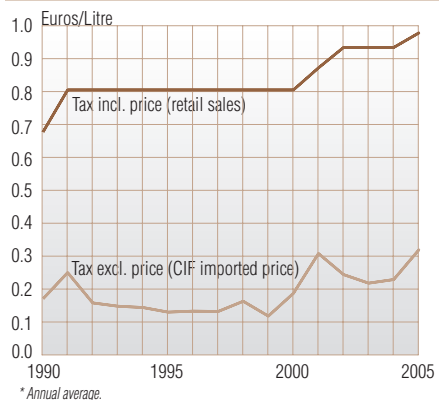
Pre-tax\* petroleum product prices [1]

	Super grade petrol	Diesel
1990	0.169	0.163
1991	0.250	0.225
1992	0.158	0.168
1993	0.148	0.148
1994	0.144	0.146
1995	0.130	0.125
1996	0.133	0.121
1997	0.132	0.153
1998	0.163	0.155
1999	0.117	0.104
2000	0.187	0.166
2001	0.308	0.319
2002	0.244	0.244
2003	0.218	0.221
2004	0.229	0.204
2005	0.319	0.321

\* Annual average.

Unit : Euros/litre

Super grade petrol prices\* in New Caledonia [1]



# 22-ENERGY

Electricity production in New Caledonia is undertaken almost exclusively by **ENERCAL**, who, at the end of 2005, operated the following generation plants :

- fossil fuel power stations at Doniambo (160 MW) operated on behalf of **Société Le Nickel (SLN)**, Népoui (53 MW) and combustion turbines in Ducos (45 MW).

- hydroelectric developments at Yaté, Néaoua and Tu, with respective capacities of 68 MW, 7.2 MW, and 2.2 MW. Production at Yaté is almost exclusively for SLN, with the exception of 37 GWh for public distribution.

These 6 major installations account for 90% of production capacity, to which are added the lower capacity units : diesel powered stations, hydroelectric micro-stations, **wind-powered plants** and **photovoltaic installations** set up by ENERCAL, EEC and other smaller operators to satisfy the electricity requirements of municipalities and tribes that cannot be hooked up to the interconnected network.

The strong increases in peak power recorded in the early 1990s have been taken into consideration in the development plans and have led to doubling of capacity at the Népoui station and the installation of a new turbine in Ducos in 2004. **Prony Énergie's** fossil-fuel powered station, currently under construction, will start producing power by mid-2007, with its first stage development comprising two 50 MW units and the possibility for three further generators.

In 2005, **net electricity production** amounted to 1 883 GWh, comprising 81% fossil fuel powered and 19% from renewable sources (95% water-powered, 4.9% wind-generated and 0.1% biofuels). With the exception of water-powered generation, renewable sources play only a marginal role in the production of electricity in New Caledonia, although they have undergone significant development over the last ten years, in particular wind-powered energy ; from virtually non-existent in the mid-1990s to a capacity of approximately 16 000 kW at the end of 2005.

► **ENERCAL.** See 22.4. **EEC.** See 22.4. **Société Le Nickel (SLN).** See 23.1.

► **Production capacity.** Expressed in kilowatts (KW), indicates the amount of energy per unit of time a plant is capable of producing. Units of measure are : KW (kilowatt), MW (megawatt =  $10^3$  KW) and GW (gigawatt =  $10^6$  KW).

► **Wind-powered plants.** Complete system enabling the conversion of wind into electrical energy. At the end of 2005, 6 wind farms were in service in New Caledonia (Lifou, Isle of Pines, Négandi, Prony I, Prony II and Kaféate I), and with another under construction (Kaféate II).

► **Photovoltaic installations.** Sunlight is directly transformed into electricity by the photovoltaic effect of solar cells.

► **Prony Énergie.** Simplified shares company undertaking design, funding, construction, creation and operation of new electricity production capacity, fossil fuel powered and cogenerated, in southern New Caledonia, to satisfy existing and future electricity requirements. The shareholders are ENERCAL (75%), Elyo (15%) and EEC (10%). Through its Prony power station (flame burnt coal), Prony Énergie will have two missions : satisfy the increasing demands of public distribution on the one hand, and on the other, satisfy the electricity needs of the future Goro-Nickel factory.

► **Net electricity production.** Measured at the output terminals of power stations, after deduction of auxiliary services consumption and losses in the major transformers involved in production. The units of measure are kilowatt/hour (KWb), megawatt/hour (MWh) and gigawatt/hour (GWh).

## SOURCES

[1] EEC, données relatives à la production d'électricité.

[2] ENERCAL, données relatives à la production d'électricité.

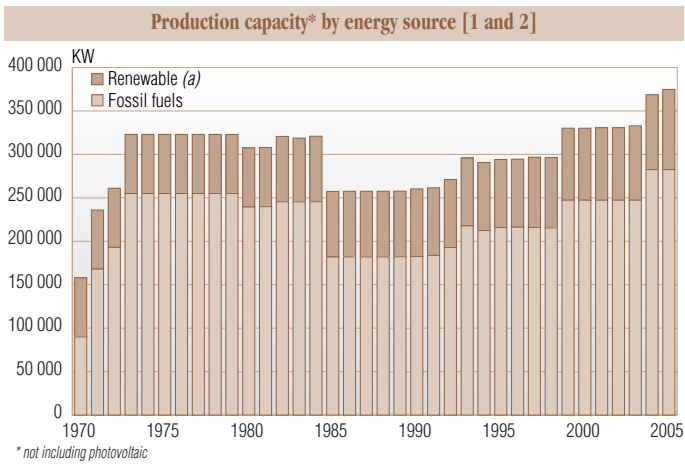
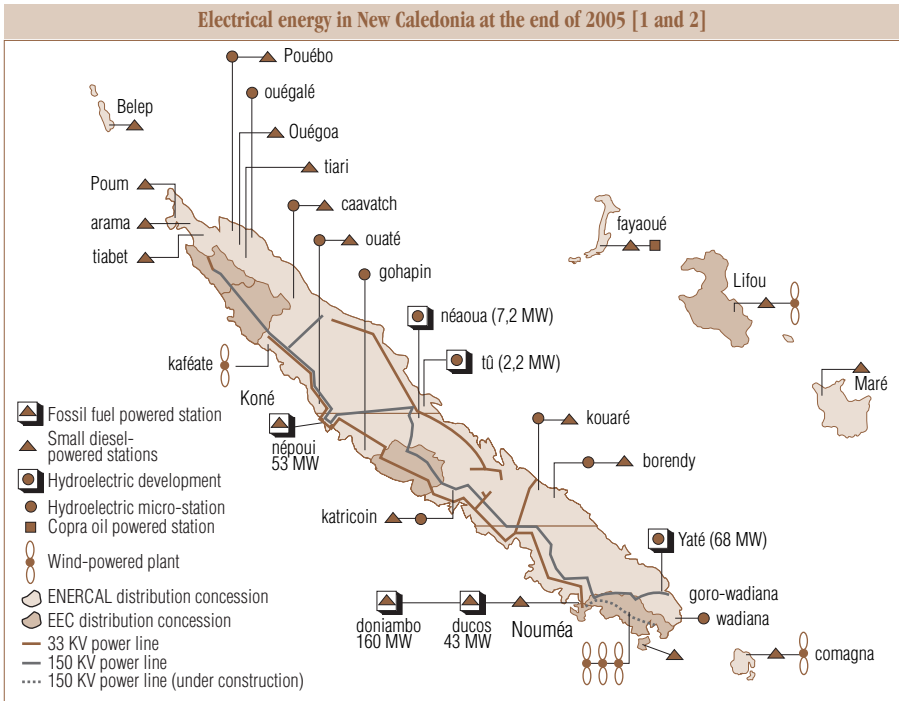
Direction de l'Industrie, des Mines et de l'Énergie (DIMENC), données relatives à l'électricité.

Observatoire de l'énergie : [www.industrie.gouv.fr/energie](http://www.industrie.gouv.fr/energie)

## SEE ALSO

ENERCAL, Rapport technique d'activité.

# 22.3 ELECTRICITY-PRODUCTION



**Electricity production\* by energy source [1 and 2]**

	1970	1980	1990	1995	2000	2001	2002	2003	2004	2005
<b>Fossil fuels (T)</b>	653 506	1 021 898	686 386	1 185 722	1 196 293	1 355 030	1 420 575	1 429 889	1 340 587	1 526 299
Doniambo + Ducos	na	1 021 138	678 915	992 337	834 751	956 544	1 014 944	1 038 240	933 261	1 092 567
Poró	-	-	262	-	-	-	-	-	-	-
Diesel powered stations	na	760	7 208	14 384	21 978	23 401	23 980	25 946	27 122	27 685
Népoui	-	-	-	179 001	339 565	375 086	381 567	365 583	380 058	405 839
<b>Water-powered (H)</b>	218 906	276 101	460 675	228 619	441 518	366 946	320 425	323 108	325 530	339 288
Yaté	na	276 101	420 945	205 383	399 624	331 392	286 263	295 467	295 392	301 893
Néooua	-	-	38 254	17 950	33 301	28 780	26 941	20 647	23 459	29 447
Tù	-	-	1 124	4 838	8 037	6 103	6 606	6 557	6 061	7 123
Mini-stations	-	-	351	448	556	670	615	437	618	825
<b>Wind-powered (E)</b>	-	-	-	-	7 302	6 834	8 163	4 675	11 409	17 519
<b>Biofuels</b>	-	-	-	-	-	-	84	120	146	209
<b>Total</b>	<b>873 403</b>	<b>1 297 999</b>	<b>1 147 060</b>	<b>1 414 341</b>	<b>1 645 113</b>	<b>1 728 810</b>	<b>1 749 163</b>	<b>1 757 672</b>	<b>1 677 527</b>	<b>1 883 105</b>

\* not including photovoltaic

Unit : MWh

# 22-ENERGY

Since 1972, **ENERCAL** has held the concession for the carriage of electrical energy throughout the territory of New Caledonia.

The **interconnected carriage network**, 1 045 kilometres long in 2005, comprises 471 kilometres of 150 KV lines between the various production centres, and 574 kilometres of 33 KV distribution lines servicing the localities of Greater Nouméa. With the completion of the two 150 KV lines from Témala to Ouaième (linking the East and West coasts) and from Témala to Koumac, electricity distribution around the Mainland is almost complete.

Over and above its own distribution concessions in 27 municipalities (as well as parts of Dumbéa), ENERCAL supplies **EEC**. The latter has concessions in the 6 other municipalities (Koumac, Kala-Gomen, Lifou, Mont-Dore, Nouméa and the rest of Dumbéa). Accordingly, in 2005, the **distribution network** reached approximately 76 500 customers, of which 6% in the Loyalty islands province, 15% in the Northern Province and 78% in the Southern province, through a network of 5 156 kilometres of power lines.

The ongoing programmes of the **Rural Electrification Fund (FER)** since 1983 have enabled ENERCAL and EEC to connect many more households. In 2005, total electricity consumption amounted to 1 823 GWh, of which 69% consumed by the metallurgic industry, and 31% distributed to the public. Peak power recorded for public distribution was 107.2 MW in the month of March.

The price at which electricity is sold to the subscriber is set by the government of New Caledonia. Given the territory's high level of energy dependence, the price per kilowatt/hour changes in relation to world-wide oil fluctuations. Relatively stable between 1997 and 2000 after a period of constant rise from 1992 to 1997, the price has risen considerably over the last five years (+13% between 2000 and early 2006).

► **ENERCAL.** *The New Caledonian energy company is a limited liability public/private joint venture company established in 1955. Its main mission is the production, carriage and distribution of electrical energy in New Caledonia.*

► **Interconnected carriage network.** *Through 150 KV and 33 KV lines, the network collects energy produced by the fossil fuel and water-powered stations to be carried in bulk flows to the areas of consumption. This optimises the cost price of KWh in real time through the use of appropriate production means, and enables investment savings for a given level of satisfaction.*

► **EEC.** *A subsidiary of the Suez-Lyonnaise des Eaux group, EEC has been present in New Caledonia since 1929.*

► **Distribution network.** *Supplied by the interconnected carriage network through the 33 KV (thousands of volts) distribution lines, providing medium (33 kV and 15 kV) and low tension (400V/220V) supply for general industrial and domestic consumption.*

► **Customers.** *All subscribers : households, businesses...*

► **Rural Electrification Fund (FER).** *Established in 1983, FER has the task of electrifying isolated rural areas using lines or installing renewable energy sources. Money for the fund comes from a tax on electricity, contributions from municipalities belonging to FER (all municipalities outside Nouméa, Dumbéa, Mont-Dore) and a contribution from the State.*

## SOURCES

[1] EEC, données relatives à la distribution et à la consommation d'électricité.

[2] ENERCAL, données relatives à la distribution et à la consommation d'électricité.

[3] Institut de la Statistique et des Études Économiques (ISEE), Indice des prix à la consommation.

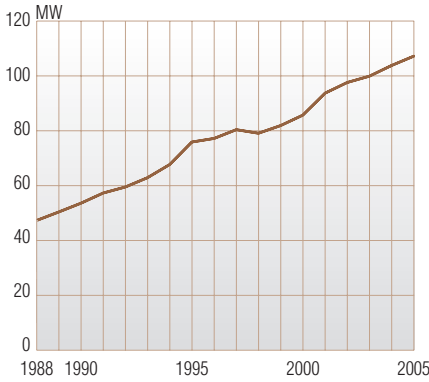
Direction de l'Industrie, des Mines et de l'Énergie (DIMENC), données relatives à l'électricité.

## SEE ALSO

ENERCAL, Rapport technique d'activité.

# 22.4 ELECTRICITY-CONSUMPTION

**Peak power in public distribution [2]**



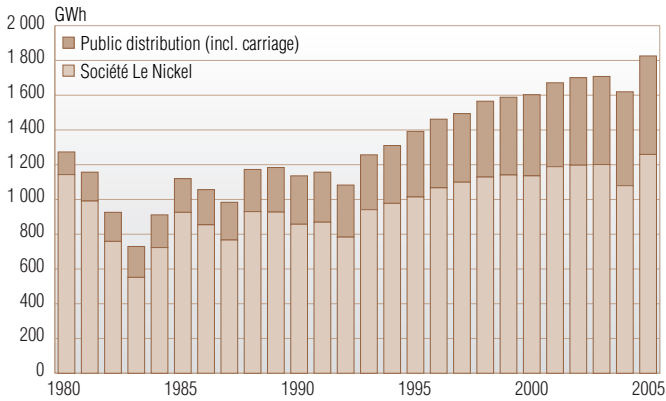
**Number of subscribers by Province [1 and 2]**

	Loyalty island Province	Northern Province	Southern Province	New Caledonia
1990	1 910	5 312	35 702	42 924
1995	3 495	7 884	42 755	54 134
2000	4 309	9 406	50 912	64 627
2001	4 434	9 970	52 916	67 320
2002	4 573	10 522	54 780	69 875
2003	4 703	10 948	56 436	72 087
2004	4 895	11 147	58 016	74 058
2005	4 967	11 532	60 048	76 547

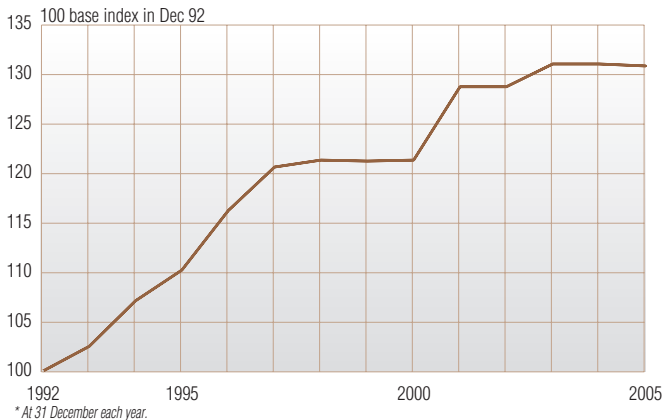
\* Annual average

Unit : number

**Electricity consumption [1 and 2]**



**Retail electricity prices\* for the average domestic consumer [3]**



\* At 31 December each year.

**Assessment of subsidies from the Rural Electrification Fund (FER) [3]**

		2001/2004 programme				2005/2009 prog.	Total
		2001	2002	2003	2004	2005	
Lines	Number of households	164	186	218	137	205	910
	Amount of subsidies	3 251	4 341	4 341	3 763	4 668	20 363
Renewable	Number of households	17	47	35	78	57	234
	Amount of subsidies	260	712	704	1 190	863	3 729

Units : number, thousand Euros