

### PRICES SYSTEM ELECTRICITY

Council Directive 90/377/EEC of 29 June 1990 lays down a Community procedure to improve the transparency of gas and electricity prices charged to industrial end-users.

In accordance with Article 1.2, this note sets out a summary of the price systems (industrial sector) in force as at 1 July 1993.

#### BELGIUM

There are a large number of tariffs, but we shall restrict ourselves here to summarizing those which are applied to the standard consumers of our study.

Tariffs A, B and C are two-part and are applied to these consumers as follows:

Tariff A :  $I_a, I_b, I_c, I_d, I_e, I_f$ ;  
 Tariff B :  $I_g$ ;  
 Tariff C :  $I_h, I_j$ .

The different components of tariffs are revised monthly via the price revision parameters  $N_E$  and  $N_C$ , defined below.

The meaning of parameters D, M, n and m also appear below.

Tariff A is applied to those customers whose consumption is less than 1000 kW. The most advantageous tariff, A or B, is applied to the customer whose demand is between 1000 and 4000 kW. Tariff C is applied to customers with a 15 kV secondary connection to a major installation and whose power exceeds 4000 kW.

There is a base version of tariff C (without differentiation between the different months), and an optional seasonal variable (where the different terms take different values according to the tariff season).

Tariff systems : the tariff comprises :

a) a power component equal to :

337.4 D  $N_E$  BEF/kW per month (tariff A);  
 805.8 D  $N_E$ , 644.6 D  $N_E$  or 564.1 D  $N_E$  BEF/kW per month, according to the tariff season;  
 7299.4 n/m M  $N_E$  BEF/kW per month (tariff C base);  
 911.8 M  $N_E$  551.7 M  $N_E$  or 315.7 M  $N_E$  according to the tariff season; (C seasonal tariff).

b) A commodity charge for the energy consumed in peak hours (hp); in F/kWhp, at :

(1.855 D  $N_E$  + 0.642  $N_C$ ) for tariff A;  
 (0.683  $N_E$  + 0.642  $N_C$ ) for tariff B;  
 (0.440  $N_E$  + 0.622  $N_C$ ) for tariff C base;  
 (0.659  $N_E$  + 0.622  $N_C$ ), (0.399  $N_E$  + 0.622  $N_C$ ) or (0.229  $N_E$  + 0.622  $N_C$ ) according to the tariff season for C seasonal tariff.

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As covers tariff A, the average price per kWh consumed in peak hours, resulting from the application of components a and b above, is limited by a ceiling price equal to  $(4.250 N_E + 0.642 N_C)$  F/Whp.

c) A commodity charge for the energy consumed in off peak hours ( $h_c$ ), F/kWhc, equal to :

$(0.919 N_E + 0.542 N_C)$  tariff A;  
 $(0.354 N_E + 0.542 N_C)$  tariff B;  
 $(0.159 N_E + 0.536 N_C)$  tariff C base;  
 $(0.281 N_E + 0.536 N_C)$ ,  $(0.140 N_E + 0.536 N_C)$  or  $(0.047 N_E + 0.536 N_C)$  according to the tariff season for C seasonal tariff.

d) A proportional component for the reactive energy, both inductive and capacitive, which is consumed beyond 50 %, 50 % and 33 % (for tariffs A, B and C respectively) of the total quantity of active energy consumed (kWh). This component expressed in (F/kVA reactives per hour) F/kVArh, is equal to 20 % of the average price per kWh determined by applying : either components a (power component), b and power component, C above; or, if appropriate the certain price and component C.

#### Time zones

The peak hours cover a period of 15 hours per day, the limits being fixed by distributor, from Monday to Friday with the exception of national statutory public holidays.

The off-peak hours cover the period outside the peak hours.

The tariff seasons are the following (tariff B and C seasonal optional tariff).

- Winter : November to February
- Mid-season : March, April, September and October
- Summer : May to August.

#### Parameters

- $N_C$  in the "fuel" components of the tariffs, this parameter reflects the development in the cost of fuels consumed to produce electrical energy for the Belgian grid
- $N_E$  in the "non fuel" components of the tariffs, this parameter reflects the development of the costs of depreciation and operation
- $kW$  represents the power taken into consideration for invoicing, generally the quarter hour monthly
- $D$  as a function of this power  $D = 0.74 + 70/(340 + kW)$  for tariffs A + B
- $M$  this coefficient is defined by  $M = 0.675 + 8/(40 + MW)$ , when  $MW = kW/1000$ , rounded up to the next higher unit (tariff C)
- $n$  the number of days in the month under consideration closing days of the company deducted (annual leave).
- $m$  the total of the twelve values of the calendar year under consideration.

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## DENMARK

### STRUCTURE OF DANISH ELECTRICITY SUPPLY

There are 105 distributing utilities, of which each has an obligation to supply a specific geographical area. The distributing utilities of a certain area own as a partnership the generating utility of their area. 7 generating utilities West of Storebælt coordinate their activities in the umbrella organisation of ELSAM. 2 generating utilities East of Storebælt perform a similar coordination in ELKRAFT. 2 small generating companies are outside the umbrella organisations.

Only the electric utility of Copenhagen (Københavns Belysningsvæsen) is vertically integrated.

The supply areas West and East of Storebælt are not interconnected and the number and sizes of utilities are very different in the two areas. The same goes for the degree of urbanisation.

### TARIFFS AND PRICES

Tariff systems and prices vary from one utility to another. A great part of the end-user price is represented by costs of buying electricity at electricity generating plants. Therefore price variations within a generating utility area normally are only due to different distribution costs. Substantial differences exist between the Western and the Eastern grid - in 1993 on average 20 %.

Tariff and price statistics for all utilities and for 5 consumer categories are collected and published every year in March/April - Elforsyningens Tariffer & Epriser- by the Association of Danish Electric Utilities. To prevent double collecting of statistics the task is carried out in cooperation with the Electricity Price Control Board. In the publication a number of tables show weighted prices for various geographic areas plus highest and lowest prices. The weighting is done according to the GWh sales of distribution utilities (for the energy charge) and according to the number of consumers of distribution utilities (for the standing charge).

The Danish Central Statistical Office has entrusted the Association of Danish Electric Utilities the task of collecting and publishing the yearly statistics on electricity consumption.

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## GERMANY

### Industrial electricity pricing system

Legal relations between electricity supply utilities (ESUs) and industrial customers are based on individual electricity supply contracts ("special contracts") concluded by the parties involved. Up to a certain demand that can still be supplied with medium voltage (approximately up to 20 kV), the different ESUs have developed standard contracts with identical texts and tariffs.

Although there are differences in prices between ESUs, the tariff structure for medium-voltage supply is largely identical. All ESUs offer a capacity tariff with unit prices for day and night, i.e. a dual tariff with two time zones. For special supply situations where periods of maximum load rarely coincide, some ESUs offer a time-zone tariff (no demand rate; unit rate generally also with two time zones). In some cases, there are also seasonal price differences.

Most ESUs provide the option of a "flatter" and a "steeper" capacity tariff, in some cases in addition to a time-zone tariff ("flat" tariffs have relatively low demand rates and relatively high unit rates; the opposite applies in the case of "steep" tariffs). In most supply areas, therefore, customers supplied with medium voltage can choose the most favourable tariff for their requirements from two or three different tariffs when concluding a contract.

### Demand tariffs

Generally speaking, the demand rate is based on the maximum demand utilized. Invoicing is normally based on the annual chargeable demand, which is mostly determined from the average of the maximum demand over two or three months (actual demand in kW or apparent demand in kVA).

Demand is usually measured over periods of 15 minutes, sometimes 30 minutes. In most tariffs, the demand rate (at least for a certain level of demand) is dependent on the reserved supply. In addition, some tariffs contain a utilization period discount.

Some ESUs calculate the demand rate for a demand specified by the customer and agreed in the contract; if that demand is exceeded, a higher rate is charged for the excess.

The duration of the day/night time zones depends on the total load curve in individual supply areas. The off-peak period is often longer in summer than in winter, but runs from at least 22.00 to 06.00. Many ESUs offer longer off-peak periods, partly during weekend day hours.

Some ESUs whose total load curve during the day still shows considerable troughs offer their customers - in addition to the tariffs described above - the possibility of lowering their electricity costs by reducing utilized demand during certain peak periods anticipated by the ESU. However, the smoother the load distribution the fewer such possibilities. Large consumers who can adjust their demand to the load curve of the ESU are also often offered interruptible supply contracts.

### Time-zone tariffs

In addition to unit costs (for different time zones) that fall as consumption rises, such tariffs contain a utilization period discount based on maximum annual demand measured over quarter-hour periods. The off-peak periods specified in the contract are generally the same as in the demand tariff of the ESU in question. These tariffs are on the decline.

### Consumption of reactive current

Electricity supply contracts are normally based on the assumption that the electricity is delivered with a power factor of at least  $\cos \varphi = 0.9$ . Since the actual power (kW) is specified in most contracts, a supplement is calculated for any reactive current consumption that exceeds this value. If, on the other hand, demand is calculated on apparent power (kVA), the customers themselves endeavour to achieve the maximum possible power factor.

## Price adjustment

The contracts contain clauses for adjusting electricity prices during their term (generally one to three years). Coal prices and wages are mostly used as a basis for adjusting prices. No official authorization is required for applying these price adjustment clauses in electricity supply contracts.

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## GREECE

### Legal Framework

The activities of generation, transmission and distribution of electricity in Greece are the responsibility of PPC (Public Power Corporation) set up by law in 1950.

PPC is an enterprise with the legal status of a private company, serving however the public interest.

Functions which relate to control and coordination in the electricity sector are dealt with by various State administrative bodies, as :

- a) The Ministry of Industry, Energy and Technology, which supervises PPC's activities, approves PPC's Development Plan and investment programmes and gives instructions for its activity.
- b) The Ministry of National Economy, which approves PPC's budgets etc.

In Greece, 97.5 % of the electricity supply to the country is provided by PPC. The remaining 2.5 % represents generation of electricity by self-producers, mainly industrial users, covering their own needs.

### The tariff system

The structure and - in principle - the price level of the tariffs applied are uniform for the whole of the national territory.

All tariffs are published and each customer can choose, from the available tariffs, the one which is best suited to the nature and level of his electricity requirements.

Tariff conditions take account of :

- the supply voltage : low (220-380 V), medium (20 kV), high (150 kV)
- the use (domestic, industrial, agricultural, commercial, general use)
- the level of subscribed or minimum demand (kW), low voltage (between 200 kW-10 MW) and high voltage (above 10 MW)
- the utilization time of the subscribed demand.

### Industrial users

Three types of tariffs are provided for industrial users, as follows :

#### 1. Tariffs for low voltage industrial users

Three tariffs are provided for this case i.e.

- a 2-part tariff, including a fixed charge and a flat energy rate per kW
- a 2-part tariff, providing a fixed charge and a time-of-day energy charge per kW.
- a 3-part tariff, providing a fixed charge, a capacity charge and a flat energy charge per kW.

#### 2. Tariff for middle voltage industrial users

There are two tariffs for middle voltage industrial users as follows :

- 2.1 The first tariff is provided for middle voltage industrial users with an effective load factor (i.e. more than 40%). This tariff is a 2-part tariff, providing a capacity charge plus an energy 2-rate charge, relative to the maximum monthly demand for electricity.
- 2.2 The second tariff is provided for middle voltage industrial users with a less effective load factor (i.e. less than 40 %). The respective tariff, is a 2-part tariff providing a capacity plus a flat-rate energy charge.

### 3. Tariffs for high voltage industrial users

The respective tariff is provided for consumers directly to the 150 kV grid. It is a two part tariff providing a capacity charge, plus an energy charge.

It is also a seasonal time of day tariff, since energy and capacity charge differentiated according to the period of electricity consumption, i.e. peak load hours, off-peak load hours and intermediate load hours.

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## SPAIN

The Spanish electricity sector is made up of about 1 000 generating and distribution companies, but 21 of them, forming the UNESA group, account for over 97 % of production for the market. Of these 21 companies, only a third are genuinely independent and there are currently strong trends towards company mergers, the foreseeable short-term result of which will probably be that almost all the sector will be dominated by a few corporate groups operating in the midst of large numbers of small companies active largely at the distribution end.

### Prices: Approval and control

Electricity rates in general are determined by applying a system of standard costs and charges which form the "Marco Legal Estable" (stable legal framework) in force since 1988. In accordance with this system, the Ministry of Industry, Commerce and Tourism on the basis of a report by the Upper Price Board, submits to the Government once a year the proposal for modifications to the corresponding tariff for the financial year beginning on 1 January each year.

Once the Government, acting through the Council of Ministers, has approved the new tariffs, the above Ministry establishes the maximum prices applicable to the different types of consumers and publishes them in the Official State Bulletin. These prices are uniform rates for the entire national territory.

### Taxation

Since 1 January 1986 the only tax in force has been VAT. The current rate is 15 % and is applied to the total invoice figure including, where applicable, the hire of metering equipment and other items.

Power distributing companies also pay local authorities 1.5 % of amounts invoiced for electricity in the municipality, but this payment is not legally deemed to be a tax but recompense for occupation of municipal land and installation of electricity lines above and below ground.

### Pricing system

As already mentioned, power rates are uniform and public, including those of major consumers, and are ceiling prices. In theory special contracts can be freely negotiated between distributors and customers, but in practice there are hardly any such agreements or if so they refer to minor aspects, mainly because the current system of inter-company compensation makes these arrangements difficult.

### Tariff parameters and formulas

The parameters applied for classifying consumers, and hence the application of prices are:

- Supply voltage,
- Contracted power,
- Hours of power use,
- In special cases type of use : distributors, irrigation, electric traction.

Tariffs have two constituent parts : a fixed part for the power contracted and/or registered and a second variable part for the kWh consumed. The sum of these two parts constitutes the basic amount invoiced, which is generally modified by the application of discounts or surcharges for the following :

- Selected consumption times,
- Reactive power consumption,
- Season,
- Interruptibility.

### Options

To obtain the most suitable supply conditions and most favourable prices, customers have the following options:

- Daily basis : double and triple tariff systems, with different prices for energy and power.
- Weekly basis : as above, but taking into account off-peak hours for the 24 hours of Saturdays and public holidays.

- Annual basis : days of the year are classified into four categories for the purposes of kWh prices, with up to three types of power catered for in contracts.
- Seasonal basis : with six contractual power types and five-tariff meter. There is also a simplified option.
- Interruptibility : contracts valid for 5 years with a minimum interruptible power of 5 MW and four types of interruption depending on the length of notice given.

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## FRANCE

Electricity tariffs have a two-part structure comprising a standing charge, which is calculated as a function of the subscribed demand, and various energy prices which depend on the seasonal time-of-day tariff periods in which the electricity is consumed, for an average year of 8 760 hours.

There are also several possibilities for modulating the subscribed demand in the tariff periods. If this is done, the demand billed is the reduced power, which is calculated from the subscribed demand in peak periods plus any power supplements in the other periods, multiplied by a reduction coefficient. Customers can therefore reduce their bills by lowering their specified demand.

However, the reference quantities within the meaning of the Directive of 29 June 1990 do not admit of any modulation of the subscribed demand; by the same token, only the basic tariff is used to calculate the reference consumption.

### Yellow tariff

Generally speaking, the yellow tariff applies to all customers whose subscribed demand is between 36 and 250 kVA.

Subscribed demand is measured in terms of apparent power (kVA). It therefore takes account of the installed power; in other words, there is no separate billing for reactive energy. Nevertheless, the customer will wish to keep his power factor within reasonable limits so as to avoid excessive subscribed demand for apparent power, the basis on which the standing charge is calculated.

### Green tariff

The green tariff generally applies to all customers subscribing to at least 250 kW of power.

Subcategories also apply to "green" customers: Green A5 or A8 for between 250 and 10 000 kW, and Green B for between 10 and 40 MW.

The tariff applied depends on the duration of use of the subscribed demand (average use, long use or very long use).

Subscribed demand is measured in units of active power (kW) for each of the seasonal time-of-day tariff periods.

Active energy is billed separately.

Reactive energy is supplied free of charge:

- up to the equivalent of 40% of the active energy consumed (tg  $\phi = 0.4$ ) during peak hours in December, January and February and during high-load hours in November, December, January, February and March;
- without limit during off-peak hours in November, December, January, February and March and throughout all of April, May, June, July, August, September and October.

During periods in which limitations apply, the reactive energy consumed in excess of tg  $\phi = 0.4$  is billed monthly on the basis of current price lists.

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## IRELAND

### Small Premises

The standard tariff consists of a standing charge and two kWh rates, with reduced price for consumption in excess of 8 000 units per two-month period. There is an optional day/night tariff with both a higher standing charge and day kWh rate, but with a substantial reduction for usage at night. Both tariffs contain a surcharge for low power factor.

### Medium and Large Premises

These customers are normally on maximum demand tariffs which comprise a two-monthly maximum demand charge, day and night kWh rates and a surcharge for low power factor. In the case of supplies at 10 kV and above there is also a service capacity charge, which is intended to recover the cost of distribution assets close to the customer.

Maximum demand charges are not subscribed in advance, although in the medium voltage (10 kV/20 kV) and high voltage (38 kV or 110 kV) tariffs, there is a service capacity charge which is charged on the greatest of: the actual two-monthly maximum demand; the highest chargeable maximum demand in any of the five immediately preceding two-monthly bills; or 70 % of the total kVA capacity in the customer's supply agreement.

Demand charges in the low voltage tariff are the same throughout the year, but in the medium and high voltage tariffs they are higher in the winter (November-February) than in the rest of the year. Demand charges are normally restricted to demands set up in the period 08.00-21.00 GMT, Monday-Friday inclusive. However, an option is available to customers who notify ESB of their intention to reduce their demand during winter peak hours. In this option customers only pay for demands during peak hours, which are notified to customers during the autumn of each year, and which are at present 17.00-19.00, Monday-Friday.

Maximum demand and service capacity charges are reduced by 25 % for demands between 500 kW and 2 500 kW, and by 50 % for demands in excess of 2 500 kW.

Demand is measured in kW with an "integration" period of 15 minutes. The chargeable demand is the actual two-monthly maximum demand or 70 % of the highest chargeable maximum demand in any of the five immediately preceding two-monthly bills. For customers who notify ESB of their intention to reduce demand during winter peak hours the 70 % clause does not apply in the November/December or January/February billing periods.

All the maximum demand tariffs have separate day and night kWh rates. The night is 9 hours (23.00-08.00 GMT). In addition the 38 kV and 110 kV have higher kWh rates in the winter than in the summer. Day kWh are in blocks. A reduced day rate applies after the first 350 kWh/kW of chargeable maximum demand in each two-monthly billing period.

Demand charges are increased by 2.5 % for each 0.01 or part thereof by which the average lagging power factor in each billing period is less than 0.95. No rebate is given if the power factor exceeds 0.95.

A rebate is available for interruptible loads in excess of 250 kW.

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## ITALY

Since 1961 electricity charges in Italy have been standard throughout the country, both in terms of price and of structure. Differences are based on the main features of the particular supply, i.e. delivery voltage, contract demand, duration of use and period of offtake and charges vary according to the main categories of use, such as street lighting, domestic use, use in non-residential premises, agricultural use, etc.

The tariff system in Italy offers two-part, flat-rate and multiple-hour tariffs with a fixed charge in relation to contract demand expressed in lire per kW and a fluctuating price based on the power used and expressed in lire per kWh.

In 1974 this latter element of the tariff structure was divided into two parts: one relating to cost recovered by means of the fluctuating charge (price of power) and the other to the costs incurred in the thermal production and for related energy (heating surcharge).

This breakdown proved necessary in order to allow undertakings with conventional thermal production systems to recover the costs incurred in the purchase of fuel.

Recovery of costs is effected through the Cassa Conguaglio per il Settore Elettrico (Adjustment Fund for the Electricity Sector), which has the task of redistributing the proceeds of the heating surcharge derived from all electricity companies among the production and distribution undertakings in accordance with the costs incurred by each of them in purchasing imported fuel.

This arrangement makes it possible to calculate the contribution to be given to each of them in line with the actual fuel costs incurred.

A short description of the tariffs applicable to each type of user is given below.

#### Low- and medium-voltage tariffs for use in non-residential premises

Flat-rate two-part tariffs are used for this type of user. The tariffs depend on the band of contract power, the type of voltage and the duration of the supply.

Special tariffs apply to contract demand above 100 kW used solely at night (between 22.00 and 06.00 from Monday to Friday, from 13.00 to 24.00 on Saturday and all day Sunday until 06.00 on the following Monday).

Since 1 July 1991, on a trial basis, those occupying non-residential premises and taking at least 25 kW of low-voltage power for electric ovens used in preparing foodstuffs or for agricultural use may request, as an alternative to the usual tariffs, a two-rate time-of-day tariff.

This tariff is applied at the following times :

- busy hours : between 07.00 and 09.30 from Monday to Friday;
- off-peak hours : all times other than the busy hours indicated above, plus all public holidays falling on weekdays (1 and 6 January; Easter Monday; 25 April; 1 May; 15 August; 1 November; 8, 25 and 26 December).

The user may fix during off-peak hours a contract demand above that for busy hours. The latter may not be less than 25 kW.

Special tariffs are available to farmers for professional uses : irrigation, farm buildings, seasonal work and supplies to agencies for land reclamation or improvement.

These tariffs take into consideration not only the specific offtake times of agricultural users (seasonal or night work) but also the social requirement of providing, where possible, preferential treatment for agriculture.

There is also a special tariff for short-time (exceptional) supplies, which involves only a charge per kW/day.

#### Tariffs for non-residential premises using more than 400 kW of medium- and high-voltage power

Multiple-hour tariffs are applicable to this type of consumption; prices depend on the time and season of offtake.

1. winter, i.e. from January to March and from October to December (six months);  
summer, i.e. from April to September (six months).

2. Time bands :

Peak hours	( 520 hours)
Maximum load hours	(1 804 hours)
Medium load hours	(1 231 hours)
Off-peak hours	(5 205 hours)

There are four tariff scales for each level of voltage (up to 50 kV, 50-100 kV and 100-200 kV). These are related to the amount of use : low, average, high and very high.

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## LUXEMBOURG

With the exception of the steel sector, which has its own network managed by SOTEL, the distribution of electrical energy is undertaken by the CEGEDEL company, either directly or via resellers (municipalities or individuals, currently numbering twelve).

The current tariffs, resulting from the agreement between the Government and CEGEDEL of 2 August 1991, are the same throughout the country, apart from a few minor differences affecting the cities of Luxembourg and Esch-sur Alzette.

In the main, the tariff conditions depend on the voltage at which electricity is supplied. For the medium-voltage sector, the tariffs encourage dispensing with power during peak hours.

The period of integration is 30 minutes.

All the elements of the tariffs vary in proportion to a special index for low, medium and high voltage. These economic indices reflect, to differing degrees, the variations in the main components of the cost price of electricity for the distributing company.



Flat-rate rental charges are made for metering independently of the tariff for the three types of voltage.

Supply exceeding some tens of kW up to levels not justifying, in technical terms, a voltage above 20 kV : bi-hourly two-part tariffs

- Fixed rental as a function of demand in three distinct periods :
  - . peak : hours of heavy loading during winter
  - . daytime : from 06.00 to 22.00 outside the peak hours
  - . night-time : from 22.00 to 06.00 every day
- Price P1 per kWh during the peak and daytime period,
- Price Pn per kWh during the night-time with Pn < p1.

Major supplies necessitating a voltage above 20 kV

These supplies to major consumers using 65 or 220 kV are not covered by published contracts.

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## NETHERLANDS

Changes in the area of electricity tariffs in the Netherlands have been largely influenced by the advent of the Electricity Act of 1989.

The most important features of the Electricity Act are:

- The organizational separation between the generating and distribution sectors
- The prescription for a system of pooling of production costs of the various generating companies
- The regulating of tariffs that apply between the branches within the entire electricity sector and to end-user tariffs
- The regulation of the establishment of resupply tariffs
- The granting of certain rights to customers using at least 20 million kWh with an operating time of at least 4 000 hours per year: the so-called special industrial customers (bij-zondere grootverbruikers - BGV)
- The regulation of a (limited) form of third party access on behalf of special industrial customers and distribution companies.

Concomitant with the introduction of the Electricity Act, the separation between the generating and distribution sectors was effected during the period 1988-1990. This resulted in the creation of four electricity companies, which provide the total public electricity generation for the Netherlands.

The four generating companies supply this electricity to the seventeen distribution companies which are connected to the national grid. The Regional Base Tariff (Regionaal Basis Tarief - RBT) applies to these supplies. Each generating company has its own RBT. The Electricity Act prescribes that such tariffs shall not exceed the maximum RBTs to be established.

As far as the distribution companies are concerned, the regional RBT is their purchase price. These distribution companies supply electricity to end-users customers and to about twenty electricity distribution companies not linked to the grid. These latter distribution companies are subject to a tariff based on the RBT, on top of which a cost component has been added to cover transport costs of the supplying distribution company. All distribution companies are associated in EnergieNed. With the introduction of the Electricity Act, one of the tasks this organization was given was the establishment of maximum tariffs for end-users and, in consultation with interest groups of autoproducers resupplying electricity to the public network, the setting of resupply tariffs.

The maximum end-users tariff is established by EnergieNed, subject to the approval of the Minister of Economic Affairs. The electricity distribution companies are free to set their own tariffs, provided these do not result in tariffs higher than those that would apply to legal maximum end-user tariffs.

### The LBT and the RBT

The structure of the LBT National base tariff for the supply from SEP, the Dutch Electricity Generating Board to the four generating companies to meet the demand for electricity within their own region is very simple. It is made up of a kW component and a kWh component. The latter has two distinctive levels:

- the kWh price for the period between 07.00 and 23.00 on working days, excluding public holidays
- the kWh price for the remaining hours of the year.

## End-user Tariffs

In the Netherlands end-users can be divided into 3 categories, as follows:

### Special Industrial Customers (BGV)

These are customers who use at least 20 million kWh per year, with an operating time of at least 4 000 hours. The maximum tariff for special industrial customers applies to direct connections to the power supply point of the medium voltage network, or to a network with a higher voltage, unless a tariff has been agreed with the user in question based on a structure other than that of the maximum tariff structure. In the latter case, the maximum end-user tariffs applicable are the maximum amounts as indicated for MV industrial customers for supplies from the medium voltage network.

### Industrial Customers

These are the users, connected to the medium voltage network (MV) (usually 10 kV), or to the low voltage network (LV), with an available power supply larger than 50 kVA or consumption of more than 100 000 kWh per year. An additional division between LV and MV industrial customers depends primarily on the difference in levels that could be attributed to both market subsections. Only LV users make use of the LV distribution network. The tariff level for this group of customers is higher than that of comparable MV customers.

The industrial customer tariff has several components:

- a tariff for power, consisting of the division into tariff categories: a tariff for the highest actual demand occurring per month, a tariff for power made available and a quantity discount
- the tariff for electrical energy, consisting of cost of fuel, cost of power per kWh
- the fixed charge
- the tariff for reactive power

### Small-supplies customers

These are customers whose connection has a maximum fuse value of 3x80A (= circa 50 kVA). This category also includes domestic customers. The market subsection is further divided in small-supplies customers with a fuse value up to an including 3x25A and small-supplies customers with a fuse value larger than 3x25A, and up to and including 3x80A.

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## PORTUGAL

### Price setting mechanisms

Tariffs are agreed between EDP and the Directorate-General of Competition and Prices in consultation with the Ministry of Industry and Energy. The agreed tariffs reflect government's objectives for inflation targets, reduction of public debt and competitiveness of the Portuguese economy, whereas EDP's objectives include the efficient use of resources and the financial and economic soundness of the company. Tariffs are uniform throughout the country for consumers with similar use patterns (separate companies on the Azores and Madeira islands have their own tariffs). Tariffs vary according to the level of demand, voltage, and time of use (seasonal or time-of-day). In theory, the tariffs take account of marginal costs covering monthly peak demand and total energy consumption. In practice, the negotiations to apportion marginal costs among consumer groups reflect the various objectives of those groups. Also, the tariffs are adjusted for fuel costs and include a surcharge used to flatten the cost differences that result from irregularities in hydroelectric production.

Cross-subsidiarisation of residential consumers by industrial consumers is being phased out and the peak versus off-peak differential has been increased to provide industrial consumers favourable off-peak tariffs. A VAT of 8 % was introduced in 1986 and this was revised to 5 % in 1992.

### Costs, prices, and taxes

#### Electricity Tariff Structure

EDP offers four tariff voltage levels :

- low for up to 1 kV,
- medium from 1 to 45 kV,
- high from 45 to 110 kV,
- very high for above 110 kV.

All tariffs, with the exception of public lighting, are two-part tariffs :

- a demand charge per kW
- a consumption charge per kWh.

Customers at the different voltage levels have various options. Low voltage customers are subdivided into 3 categories according to subscribed power. The lowest kVA customers can choose a flat rate tariff or a two-rate tariff that varies according to peak and off-peak. A seasonal tariff also is available. For higher power consuming customers in the low voltage category, there are more tariff options with varying demand charges for different levels of use expressed in hours. Consumption ranges for medium and large use are split into peak, full, and low periods.

Medium and high voltage customers have three options for charges based on short, medium, and long term use. Each charge per kWh is divided into peak, full, and low load periods and the medium and high use tariffs have different summer and winter rates.

Very high voltage tariffs have a one flat demand charge and no duration flexibility. Per kWh charges depend on peak, full and low load periods plus summer and winter. Reactive energy is invoiced, except for low voltage tariffs, whenever (the high-load off-low-load) reactive consumption exceeds 40 % of the active energy during the same period. Two tariff time schedules are available. The first is a daily cycle that is made up of a four-hour peak load period, a ten-hour full-load period, and a 10-hour low-load period. The second is a weekly cycle.

#### Taxes

All electricity consumption in Portugal is subject to the 5 % VAT mentioned above. In addition, there is a mechanism to maintain a thermal support fund (Fundo Apoio Termico) to balance costs from dry to wet years. In wet years, money is transferred into the fund, and in dry years the fund is used to pay for higher fuel costs. While this mechanism effectively involves ensuring that tariffs reflect average year costs, the recent series of dry years has made it necessary to replenish the fund via a temporary 8 % levy on all electricity tariffs, this levy decreased to 4 % for customers with subscribed power above 19.8 kVA, in 1993.

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## UNITED KINGDOM

At the present in England, Wales and Scotland, industrial and commercial customers, whatever the nature of their business, can be placed in one of three categories, which determine the type of supply and hence the pricing mechanism. Customers in Northern Ireland are all charged according to published tariffs.

- Demands over 10 MW : customers are obliged to enter into contracts; this can be either their local supply company or another licensed supplier.
- Demands over 1 MW but not over 10 MW : customers can choose either to be supplied according to a published tariff by their local supply company, or to be supplied under a contract by any licensed supplier, including their local supply company.
- Demands below 1 MW : customers are supplied by their local supply company, normally according to a published tariff, but under contract if that is more reasonable.

Where contracts are entered into, the price is determined for each individual customer and usually related to maximum demand, consumption and the seasonal and daily pattern of use. Depending on the supplier, options are sometimes available under which the contract price is related to the "pool" price. In such cases there will be additions to the "pool" price to cover firstly transmission charges over the NGC (National Grid Company) network and secondly "use of system" charges, which are paid to the local supply company for use of their distribution network. Customers of some supply companies can also negotiate Load Management terms whereby the price is lowered in return for an agreement to reduce load peak periods.

Tariffs vary according to the supply companies. The tariffs all include a "use of system" element, which recovers the costs of providing and maintaining the distribution system. They also allow for the costs of purchasing electricity, providing support services such as accounting systems and making a reasonable rate of return. Where appropriate tariffs reflect seasonal, monthly and time-of-day variations in costs. Some costs are fixed and some vary within consumption. Fixed costs are generally contained in standing charges and availability charges. Under some tariffs the unit cost is adjusted monthly for changes in the cost of fuel for generation.

Generally the following types of tariff are offered to industrial and non-domestic consumers :

a) Quarterly tariffs :

These are generally made up of a quarterly standing charge, a unit rate for the first block of units consumed each quarter and a different unit rate for subsequent units consumed. There can also be a third, lower, unit rate for units consumed at night (or off-peak), in which case a higher standing charge is applicable. These tariffs apply to most small non-domestic premises taking less than about 50 kVA or 60 MWh a year. They are billed quarterly.

b) Maximum demand tariffs :

This is the main type of tariff for larger industrial and commercial customers, who are billed each month. The tariff structure usually comprises four elements : a standing charge, a capacity charge, a demand charge and a unit charge, which can be applied to all consumption or can be at different day and night rates. There are usually different tariffs for low voltage supplies (below 1 000 volts, normally 240 volts or 415 volts) and for high voltage supplies (above 1 000 volts, normally 11 000 volts). The majority of maximum demand tariffs feature demand charges which vary from month to month, are higher in the winter and often zero in the summer. It is also common for the unit rates to be indexed to the cost of generation fuels.

c) Seasonal time-of-day tariffs :

Such tariffs are used by consumers who can minimise usage at peak times. These differ from the maximum demand tariffs in that seasonal differentiation is introduced by varying the unit rates rather than through maximum demand charges. The highest unit rates are applicable to the winter week-day consumption and the lowest to units consumed at night.