PART 10

GREECE

CHAPTER 35

ELECTRICITY

1. INTRODUCTION

The Greek electricity market has undergone radical changes over the past decade, the most prominent of which is the effort to open up the market to competition. At the same time efforts have been made in relation to the country's energy infrastructure such as the infiltration of natural gas, the construction of trans-European networks and the promotion of renewable energy sources (RES). Much of the restructuring of the Greek energy market has aimed at reducing the country's dependence on imported oil and on lignite (i.e. Greece's primary source of electricity production for several decades). **35–01**

The installed capacity of 12.9 GW is dominated by thermal sources (71 per cent) whilst hydro sources account for 24 per cent. In 2009, Greece produced about 48 TWh, of which 63 per cent was from lignite, 19 per cent was from gas and 9 per cent was from hydro. Production kept falling for a second year in a row, after it had reached an all-time high in 2007. Crucially, it was consumption that decreased in 2009 (and indeed quite substantially) for the first time in a generation, falling from about 57 TWh in 2008 to 51 TWh in 2009. The decrease has been attributed partly to the mild summer of 2009 and partly to the escalating economic crisis. The country imports between 3.5m and 5.5m TWh annually: in 2009 imports fell to less than 5 TWh whilst in 2008 they had reached an all-time high at 5.6 TWh. Whilst industrial prices are about 10 per cent lower than the EU average, household prices are much lower, i.e. by 25 per cent. In real terms, electricity prices decreased about 40 per cent between 1990 and 2000 and have not truly recovered in the last decade. The Greek Public Power Company ("PPC"), the formerly vertically integrated undertaking, remains the dominant electricity generator and supplier. At the end of 2005, PPC's installed power capacity amounted to 12.3 GW out of a total of 12.9 GW. PPC, which is now state-owned by 51.45 per cent and listed at the Athens Stock Exchange, provides electricity to more than seven million customers, which amounts to more than 95 per cent of the power market. Over the past year and following the full opening up of the market to competition in mid-2007, suppliers other than PPC have emerged taking a market share in medium- and high-voltage customers—a share that has been rising rapidly in the second part of 2009.

The market is split into two different systems: the mainland grid and the so-called "non-interconnected islands". The latter include Crete and Rhodes and have their own autonomous systems. The distinction is important because there are different rules applicable for each system (for instance, a tendering procedure for authorisations is used in the non-interconnected islands).

Power generation in the mainland is concentrated in north Greece where lignite deposits are located. The total installed thermal and hydro capacity of the interconnected system (i.e. the mainland grid) is 11,350 MW, of which 5,288 MW come from lignite-fired power plants, 1,841 MW come from natural gas, 836 MW from oil-fired plants and 3,385 MW from hydro plants. The total capacity installed on the non-interconnected islands amounts to 1,605 MW, of which 140 MW come from RES and 1,465 from fuel-fired plants. The total output of thermal capacity has recently increased due to the commissioning of two new power plants. One of these is owned by Thessaloniki Energy SA—an affiliate of the partially state-owned Hellenic Petroleum SA ("ELPE"); the other is a gas-fired plant in Viotia, a region close to Athens in which more plants are expected to start operating in the near future. RES, CHP and autoproducers are under a special protective regime according to which the Greek TSO buys all electricity generated from renewable and small CHP at regulated feed-tariffs.

The transmission and distribution system consists of high-voltage transmission lines (400 kV, 150 kV and 66 kV), the total length of which is approximately 10,500 km. In the mainland grid, transmission lines are of 400 kV and of 150 kV. The 400 kV network, which has been developed considerably in recent years, forms the backbone of the transmission system. The distribution system includes medium and low voltage lines. The total length of the distribution lines is about 185,000 km. The medium voltage lines are of 20 kV and 15 kV with a small number of lines at 22 kV and 6.6 kV. The low-voltage lines are of 380/220 V. Greece has been connected to the other EU Member States since July 2002 through a submarine line with Italy of a capacity of 500 MW and a length of 63 km. The construction of the line cost €340 m and took four years. The line belongs 75 per cent to the Italian operator Terna and 25 per cent to PPC.

2. THE FIRST ELECTRICITY LAW OF 1999

35–02 Statute 2773/1999 ("On the liberalization of the Electricity Market", hereinafter "First Electricity Law") was introduced to transpose directive 96/92/EC into Greek law. It was passed in December 1999 and in so far as the opening-up of the market to competition was concerned it came into force on February 19, 2001. The statute introduced the new key entities of the sector, namely the regulator (RAE) and the Greek transmission system operator

(HTSO). The former came into being in July 2000 and the latter in 2001 after Presidential Decree 328/2000 was promulgated. The First Electricity Law also set in train the unbundling of the PPC. The new regulatory system allowed the participation of electricity generators and suppliers, whilst the transmission and distribution systems remained monopolies under the management of the HTSO and the PPC respectively. Ownership of both systems remained with PPC. Crucially, the First Electricity Law shared regulatory competencies between RAE and the Minister for Development who retained the authority to pass all secondary legislation envisaged in the Law, i.e. the Licence Code, the Supply Code, the Market Rules, the Grid Code and the Distribution Code.

Although set to become the cornerstone of the liberalisation of the Greek electricity market, the First Electricity Law failed dismally to bring about the intended results, primarily because of the failure to introduce the secondary legislation it had envisaged. Even though an impressive number of authorisations were issued, neither new competitors entered the market nor any new power plants were constructed—for a number of reasons. First, PPC, which has held (and still holds) a dominant market position, has used profits from non-eligible customers to cross subsidise offers to eligible customers and beat the very objectives of unbundling. Secondly, the First Electricity Law obstructed the supply and trading of electricity as it required that every supplier be the owner of generating capacity, in Greece or another EU country, which would be sufficient to meet the demands of the contracted customers. Therefore, every supplier had to be a generator as well, which made the existence of energy wholesalers practically impossible. Thirdly, banks considered involvement in the electricity market as a high-risk investment. Fourthly, the natural gas market was nowhere near liberalisation.

3. AMENDMENTS MADE BY STATUTE 3175/2003

Statute 3175/2003, which amended the First Electricity Law, aimed to overcome some of the early barriers to liberalisation. In so doing, it dealt with the following. **35–03**

Broadening of eligible customers

Except for those who used electricity for domestic purposes, all consumers in the mainland became eligible customers on July 1, 2004. It was further stipulated that as of July 1, 2007 all consumers, with the exception of those in the non-interconnected islands, would become eligible customers. **35–04**

Suppliers as traders

35–05 Suppliers were no longer required to *own* generating capacity but only to show that they had secured the respective capacity of electricity production from generators inside the European Union.

Capacity payments system

35–06 The capacity payments system aimed to provide an additional source of income to generators and reduce investment-related risks. It was thus intended to develop mechanisms that would ensure capacity adequacy (in comparison with demand) in both the short and longer term. The mechanisms involved the imposition of capacity obligations on suppliers (load serving entities) and the development of a market for tradable capacity certificates or capacity availability contracts or direct capacity payments. Such mechanisms would be controlled and operated by the HTSO under the supervision of RAE. Thus the HTSO would carry out a tender procedure to conclude capacity availability contracts between the HTSO and licensed generators. The HTSO would therefore enter into a contract for the sale or purchase of electricity only if this was required for the provision of ancillary services and the needs of balancing the generation—demand imbalances during the operation of the system in real time. In this fashion, availability of sufficient capacity and of sufficient reserve capacity could be secured on a long-term basis.

Day-ahead electricity market

35–07 Under Statute 3175/2003 the definition of deviations became wider to facilitate the management of balance payments by the HTSO. Participation in the day-ahead market became obligatory for all generators and suppliers who wanted to buy or sell electricity the following day. All suppliers would pay the same price as this would be determined by the bids submitted during the previous day. The new model was fundamentally based on the "pool model" used in the United Kingdom during the 1990s.

Unbundling

35–08 A new definition was introduced about the horizontally and vertically integrated undertakings to ensure a more effective unbundling and transparency of accounts.

4. STATUTE 3426/2005 ("NEW ELECTRICITY LAW")

35–09 Despite these legislative measures and the rapid increase in electricity demand, the Greek electricity market never really opened up to competition

nor any power plant projects ever got off the ground. Indeed, of the 12 generation authorisations granted to gas-fired non-PPC producers for a total capacity of 4,153 MW between 2001 and 2005, only the two power plants mentioned in the Introduction came into being. Partly because of this failure and partly because of the need to transpose Directive 2003/54/EC into national legislation, Statute 3426/2005 ("Acceleration of Electricity Market Liberalization" hereinafter "New Electricity Law") came into force on December 22, 2005.

undertaken by RAE pursuant to Statute 2735/1999, which transposed the arbitration rules adopted by the United Nations Commission on International Trade Law ("UNCITRAL") into Greek legislation.

Non-interconnected islands

35–16 The New Electricity Law adopts an authorisation procedure for electricity generation on the non-interconnected islands. An authorisation is granted to the applicant by the Minister for Development following RAE's opinion. To deal with emergency needs of a non-interconnected island, an authorisation for electricity generation may be granted directly to PPC. A tendering procedure may be launched when unsolicited applications and the authorisations resulting from them are not sufficient to ensure security of supply. For small isolated systems, except in the cases of auto-producers and of generation of electricity from RES or from hybrid plants, a generation authorisation can be granted only to PPC.

Public service obligations

35–17 New provisions foster a number of principles such as environmental protection, protection of vulnerable customers and access to remote areas, which are understood as public service obligations (PSOs). The New Electricity Directive provides that public service obligations must be clearly defined, transparent, non-discriminatory and measurable. They are designated by the Minister for Development, yet the way they were calculated in 2009 has given rise to severe objections on the part of independent suppliers who argue that they favour PPC, which has PSOs, to the detriment of the new entrants to the supply market. The matter has ended in the *Conseil d'Etat*, Greece's supreme administrative court, which is expected to deal with this dispute in 2010.

Supply Code

Supply activities follow the Supply Code, which was issued by the Minister of Development in 2001. The supplier switching process contained in this Code is unfavourable for consumers and is considered obsolete as it introduces an obligation to notify the current supplier of a unilateral termination of the supply contract three months prior to the switch.

The Supply Code is under revision (it has never been modified since its introduction in 2001) and is expected to be amended by the end of 2010. It is envisaged that the new Supply Code will include the following:

- Supplier and customer obligations and rights in much greater detail;
- Procedures for submitting an offer to supply;
- Procedures for switching suppliers;

- Quality of supply service and indicators;
- Data publishing obligations;
- Regulation of supply by companies with significant market share; and
- Dispute resolution.

In practice, the switching process, which is partly dealt with by the 2005 Grid and Market Operation Code (and its subsequent amendments), is initiated by the new supplier with the submission to the HTSO of a declaration requesting to assume representation of the consumer's meter. The HTSO must in about a month process the request and implement the supplier switch. Identification of the metering/delivery points of electricity on the distribution network is effected by means of code numbers uniquely assigned to the consumer supply point and the meter installed on this supply.

Eligible customers

35–18 Except those who are connected to small isolated systems, from July 1, 2007, all consumers are in principle regarded as eligible customers. However, over the last two and a half years there has been minimal competition in the retail market due to the following:

- Regulated retail tariffs have not been cost reflective and contain cross-subsidies between different tariff groups;
- Due to the market dominance of PPC, there is lack of information on consumer characteristics, including typical load profiles;
- Consumers are still not fully aware of their freedom of choice of supplier;
- End-user retail tariffs have been bundled, i.e. they are not separated by activity;
- There is still no independent Distribution System Operator and no Distribution Code; and
- The revision of the Supply Code, which will introduce more favourable and practical switching conditions for consumers is still pending.
- Details of the regulations governing the supplier of last resort have not yet been determined.

Direct lines

35–19 The New Electricity Law aims to facilitate electricity producers or suppliers to supply their own premises, subsidiaries and eligible customers through a direct line. The Licence Code sets out the criteria under which constructing, owning and operating a direct line is allowed. The granting of this

authorisation does not release its holder from the obligation to obtain all other required authorisations and licences.

Overall assessment

Despite the changes made to the regulatory and institutional framework, liberalisation of the Greek electricity market is still an elusive objective. Whether recent statutory amendments will make a difference remains to be seen. In addition to institutional, statutory and market forces, political developments, following the national elections of October 2009, which saw the Greek social democratic party PASOK coming back to power for the first time since 2004, are also expected to play a critical role to the long-awaited liberalisation. Crucially, the rise of suppliers other than PPC in 2009, especially in the medium- and high-voltage supply market, is to be tested in 2010 to indicate whether market liberalisation is finally a realistic target for the Greek power market. **35–20**

CHAPTER 36

RENEWABLE ENERGY SOURCES

1. INTRODUCTION

In 2009, the share of the RES sector (i.e. solar, wind, biomass, small hydro- **36–01**
power stations, and geothermal energy) in the country's energy balance rose 10 to 12 per cent of total demand. However, there is still plenty of room for development in all areas of RES in Greece, even though there has been considerable growth over the past few years, mainly through the development of wind and, recently (as of 2008), of solar farms. Rules regulating the production of electricity from RES were first introduced into Greek law by Statute 1559/1985 ("Regulations of Issues of Alternative Forms of Energy and Specific Issues of Power Production from Conventional Fuels"). On the basis of this statute, PPC installed 24 MW and local government bodies confined themselves to 3 MW, whilst the private sector was entirely left out. The inadequacies of this statute, which made licensing an almost impossible task, led to its amendment by Statute 2244/1994 ("Regulation of Issues pertinent to the Generation of Electrical Energy Sources and Fossil Fuels"), which became a landmark piece of legislation for the development of RES in Greece. Indeed the new statute attracted investors into the RES sector by ensuring that electricity produced by RES would be sold to PPC. Crucially, Statute 2244/1994 introduced fixed tariffs at 90 per cent of the medium-voltage tariff for RES electricity sold into the country's interconnected system and at 90 per cent of the low-voltage tariff for RES electricity sold into the country's non-interconnected islands. In either case, PPC was obliged to buy such electricity under 10-year contracts with RES producers. Moreover, RES projects were generously supported by investment laws, which provided grants and subsidies amounting to as high as 60 per cent of the project budget. This led to the establishment of the first private wind farms in 1998.

Statute 2773/1999 ("On the liberalization of the Electricity Market") retained the favourable pricing regime for RES whilst placing emphasis on priority access of RES to the grid. Moreover, it introduced a 2 per cent duty on renewable energy sales in favour of local government bodies. Growing investment interest in RES also led to Statute 2491/2001 ("Simplification of Procedures for Establishing Companies, Licensing Renewable Energy Sources Plants etc."). Between 2002 and 2005 a thorough revision of the statutory framework for RES had been under way, partly

because of commitments undertaken by Greece under international conventions (e.g. the Kyoto Protocol, which was adopted by Statute 3017/2002) and EU secondary legislation (e.g. Directive 2001/77/EC) and partly because of the country's fast-growing RES sector. Statute 3175/2003 aimed to give a further impetus to RES development (e.g. it adopted the definition of Directive 2001/77/EC on hybrid plants and what counts as RES, including geothermal energy; and promulgated new rules aimed at speeding up the licensing process). Yet the regulatory framework for RES remained uneven and inconsistent. What is more, authorisation and licensing procedures were still time-consuming, local communities were unsympathetic to RES projects, which often had them get stuck with hapless litigation, and the grid was occasionally of limited capacity in accommodating all RES production.

2. THE RES STATUTE

36–02 The RES Statute, which entered into force on July 14, 2006, transposed Directive 2001/77/EC ("On the Promotion of Electricity Produced from RES in the Internal Electricity Market") into Greek legislation and set out *de novo* the entire legal framework for RES. The new statute regards as renewable all non-fossil energy sources such as wind energy, solar energy, wave energy, tidal energy, biomass, landfill gas, sewage, biogases, geothermal energy and hydropower. In the main, it is intended better to meet the commitments undertaken under the Kyoto Protocol; to simplify and accelerate the authorisation process; to attract further investment to the RES sector; and to meet the thresholds set by Directive 2001/77/EC. Under the RES Statute, the monitoring of RES development is vested into CRES (i.e. the Centre for Renewable Energy Sources), which drafts an annual report regarding (a) the RES penetration into the country's energy balance; (b) reasons impeding such penetration; and (c) comparative data between Greece and other EU Member States. The new statute introduces several provisions that are intended to attract further investment in the RES sector by reducing bureaucracy, simplifying procedures and overcoming administrative constraints. Pursuant to art.19 of the RES Statute, a RES Projects Committee is set up. Its role is to promote and monitor investments in RES and co-generation projects which are related to power plants with an installed capacity of at least 30 MW or with an investment budget of at least €30,000,000.

Production authorisation

36–03 The RES Statute sets out a coherent authorisation framework for the production of electricity from RES. In doing so, it brings together for the first time dispersed and incomplete provisions laid down in a number of different

laws. Under art.3 of the RES Statute, the applications submitted to RAE are evaluated on the following criteria: (a) national security; (b) protection of public health and safety; (c) safety of the facilities and the equipment; (d) energy efficiency; (e) implementation phasing; (f) the site under consideration; (g) financial, scientific and engineering background of the applicant; (g) performance of public service obligations; and (h) environmental protection. Furthermore, it better specifies licensing phasing (i.e. generation, installation and operation) and the approvals (e.g. environmental, urban planning etc.) that are necessary. Also, it better regulates issues relating to the Power Purchase Agreements that are involved in the RES market and the corresponding feed-in tariffs.

The authorisation is typically granted for a period of 25 years (in the case of solar parks, for 20 years). Unless an installation permit is granted within 24 months from the time the authorisation was granted, the authorisation must be revoked. RAE reviews how the above criteria match a particular application and requests a so-called Preliminary Environmental Impact Study from the competent environmental authority. This authority must give an opinion to RAE within 60 days, following which RAE reaches its own opinion and communicates it to the Minister for Development. It is the Minister who decides whether to grant the authorisation or not and whether to amend a production authorisation following an application by the holder. A production authorisation does not release its holder from the obligation to obtain other required authorisations, permits or licences (e.g. approval from the environmental authority or the granting of an installation permit by the urban planning authority). As in other countries, the wide range of authorisations, licences and permits to be granted still remains a painstaking exercise. Moreover, the new statute sets out strict rules on monitoring holders of production authorisations to ensure that, unlike what was happening under the licensing regime before the introduction of the RES Statute, licence trading is no longer under way.

Exempted persons

36–04 The RES Statute exempts certain classes of RES producers from the obligation to get an authorisation. Such producers are those who own electricity production installations located on a site owned or leased by them, provided that electricity is produced:

- by geothermal energy from plants with an installed capacity of less than or equal to 500 KW;
- by biomass or biofuels from plants with an installed capacity of less than or equal to 100 KW;
- by photovoltaic systems from plants with an installed capacity of less than or equal to 100 KW;

- by wind energy whether from plants with an installed capacity of less than or equal to 20 KW, provided these plants are located on isolated micro grids as such grids are defined in Statute 2773/1999; or from plants with an installed capacity of less than or equal to 40 KW, provided these plants are located in the non-interconnected islands; or from plants with an installed capacity of less than or equal to 50 KW, provided these plants are located on the mainland grid;
- in plants constructed for educational or research purposes with an installed capacity of up to 5 MW;
- in plants installed by CRES.

The decision whether or not to grant such exemption rests with RAE. Such decision is not necessary in cases of plants with an installed capacity of up to 20 KW which are situated in locations that make part of the so-called interconnected system.

RES installations

36–05 The RES Statute repealed the previous regime under which priority was given to some producers and now provides for a simplified and uniform system for authorisation and licensing of RES plants. Article 7 of the RES Statute provides for the areas in which installations of power generation using RES or co-generation may be installed and operate, i.e. on a lot or location whereon the applicant has the right of lawful use; on the shoreline, coast, sea or seabed following a decision of the Minister for Development; and in forests or scrublands provided that such use is permitted on account of the public interest. Applications for the installation of RES facilities must occur with the production authorisation or the exemption from the obligation to obtain it. The bodies competent to decide on the granting of the installation permit are the Minister for Development and the Minister for Agriculture. Similarly, a permit is also required for the expansion of RES plants, the General Secretary of the Prefecture in the territory in which the installation is situated being the person to grant such permit. Pursuant to a recent joint ministerial decision, small-scale RES plants have been classified as of zero environmental impact, which allows them to be integrated into urban areas.

Guarantee of origin

36–06 Further measures have been put in force pursuant to the RES Statute to guarantee the origin of RES electricity. New provisions aim at facilitating trade of electricity produced by RES and safeguard consumers' choice of electricity produced by RES or non-RES on the basis of non-discriminatory and transparent criteria. A "green certificate" is thus granted following a relevant application. Such certificate, which is of 30-day duration, includes information on the source of the electricity produced, the date and place of

generation and in the case of hydroelectric plants, the capacity of the plants as well. The authorities entitled to issue Guarantees of Origin are:

- the HTSO for electricity supplied into the mainland grid;
- PPC for electricity supplied into the non-interconnected islands grid;
- CRES for electricity produced by autonomous plants.

RAE is the body responsible for supervising the overall procedure. The authority issuing the "green certificate" has the right to access the generation facilities in order to gather all necessary information.

Tariffs

The RES feed-in tariffs (except for those for photovoltaic that are set out below), which are now applicable are the following: **36–07**

Generation of electricity from	**Interconnected System**	**Non-interconnected islands**
Wind energy	87,85€/MWh	99,45€/MWh
Wind energy from sea wind farms	104,85€/MWh	
Small-scale hydroelectric plants with an installed capacity of up to 15 MW	87,85€/MWh	99,45€/MWh
Solar energy from units other than photovoltaic with an installed capacity of up to 5 MW	264,85€/MWh	284,85€/MWh
Solar energy from units other than photovoltaic with an installed capacity of over 5 MW	244,85€/MWh	264,85€/MWh
Geothermal energy, biomass, etc.	87,85€/MWh	99,45€/MWh
Other RES	87,85€/MWh	99,45€/MWh
Through high efficiency co-generation	87,85€/MWh	99,45€/MWh

Hybrid plants

The RES Statute introduces a special regime on the authorisation of hybrid plants. An application for such an authorisation must come together with a detailed study of the projected operation of the plant, of the way the plant will be incorporated into the grid of the non-interconnected islands, of the minimum guaranteed power supply and of the terms and conditions of the plant's operation. The holder of such authorisation sells the produced **36–08**

electricity exclusively to the operator of the system in the non-interconnected islands (i.e. PPC).

Photovoltaic (PV)

36–09 EU report "Photovoltaic 2010" rightly maintains that Greece, for obvious reasons, has sufficient potential to meet a third of its energy requirements using PV. There are two ways of using photovoltaic technology in Greece, namely either in conjunction with PPC's interconnected system or through an autonomous system. In the former case, solar energy is sold to PPC at a rate specified in the RES Statute. Alternatively, a photovoltaic system may be a so-called autonomous system, which is so installed as to cover the energy needs of a particular site such as a building. To secure an uninterrupted energy supply to the consumer, the photovoltaic installation should comprise a unit for the storage (batteries) and for the management of energy. PV is also used for emergency purposes: although connected with PPC's network, the system makes use of batteries to cover emergencies such as interruption of energy supply. Most PV is installed in remote areas. The total installed PV capacity in 2009 amounted to 1 MW, current regime of table overleaf. The new legislation also provides that licences for energy production from photovoltaic plants and decisions exempting from the obligation to obtain such an authorisation are not allowed to be transferred before the photovoltaic plants start operation. As a result, acquisition of a project that is still under development is possible only through shareholding/equity arrangements into the vehicle holding the authorisation (or the exemption from it) rather than a licence transfer.

Rooftop PV

A new programme for the development of rooftop PV systems of up to 10 KWp (both for residential users and small companies) was introduced by the decision of the Minister of Development of 4.6.2009. The new programme sets a feed-in tariff at 0.55€/kWh under a 25-year PPA and certain inflation adjustments (at 25 per cent of the previous year's consumer price index).

3. BIOFUELS

36–10 Greek legislation adopted new rules regarding the promotion of biofuels in the transport sector. To this end, Statute 3423/2005 ("Introduction of biofuels or other renewable fuels to the Greek market") transposed Directive 2003/30/EC ("Promotion of the use of biofuels or other renewable fuels for transport") into Greek law. The new statute defined biofuels as the liquid or gaseous fuel produced by biomass (biomass being the biodegradable fraction

of products, waste and residues from agriculture, including vegetal and animal substances, forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste).

According to the RES Statute (art.4), those who produce electricity from biomass or biofuels in plants whose installed capacity is less than or equal to 100 kWe, are exempted from the obligation to be granted a production authorisation. As part of the national strategy to promote biofuels, any investment in this field is subsidised under Statute 3299/2004 (National Development Law). Subsidies range from 20 per cent to 55 per cent depending on the region in which the investment is implemented.

In Greece, two types of biofuels are of interest: biodiesel (a methylester produced from vegetable or animal oil which is of diesel quality) and bioethanol (ethanol produced from biomass and/or from the biodegradable fraction of waste). Statute 3423/2005 confirmed in accordance with Directive 2003/30/EC that Greece will take measures so that by 2010 biodiesel and bioethanol participate by 5.75 per cent in, respectively, the petrol and diesel consumption of the Greek transport sector. Considerable activity has been under way in 2006, which is expected to increase biodiesel production and take this sector well beyond its negligible capacity of early 2005 when there were only two biodiesel plants in Greece, one in Kilkis and one in Volos with a maximum annual capacity of 40,000 tons each.

Starting in 2006, bio-diesel production has risen substantially and has attracted investors to levels that in 2006 amounted to 91,000m3 and in 2007 to 114,000m3. Investment interest keeps rising for various reasons (e.g. abundant raw material, agricultural sector that equals 5.2 per cent of the Greek GDP against an EU average of 1.8 per cent, high feed-in tariffs, etc.) and is expected to continue to grow.

CHAPTER 37

GAS

1. INTRODUCTION

Natural gas production is negligible (less than 1 GM^3), which makes the country dependent on imports. Imports started in 1996 and reached 2.7Gm^3 in 2005. The Greek natural gas industry is controlled by the Greek Public Gas Company ("DEPA"), which was created in September 1988 in order to diversify primary energy supply by increasing the role of natural gas in the country. DEPA was originally a wholly owned subsidiary of Hellenic Petroleum S.A. (ELPE), at the time called the Public Petroleum Corporation. The listing of ELPE in 1998 at the Athens Stock Exchange resulted in 85 per cent of the share capital of DEPA being transferred to the Greek state, while the remaining 15 per cent remained with the parent company. Today, the share capital of DEPA is owned 65 per cent by the state and 35 per cent by ELPE. **37–01**

The construction of a natural gas network, the longest and most expensive post-war project in Greece at $1.2 billion, is still under development. The network includes a main pipeline, running from north to south, various branches, city networks and a large liquefied natural gas (LNG) terminal. The network has three entry points—two at the northern border (i.e. at Sidirocastro and Kipoi), which connect with the Bulgarian and Turkish gas networks, and one at the south where gas from the LNG terminal of Revythousa is imported to the network. The distribution network develops at a slow pace. Delays have been so substantial that they resulted in the imposition by RAE of a €300,000 penalty on EPA Attiki, the gas supply company for the Athens region, in early November 2006.

DEPA started receiving gas from Russia in July 1997 via a Bulgarian pipeline on the basis of a 20-year take-or-pay contract signed in 1987. The take-or-pay contract with Gazexport guarantees the supply of 2.8 billion cubic metres (cm) of natural gas on an annual basis, which makes up a total of almost 75 per cent of the current Greek annual demand. Furthermore, 0.68 billion cm of liquefied natural gas (LNG) per annum, i.e. 25 per cent of the annual consumption, is imported from Algeria, following a 20-year take-or-pay agreement concluded in 1998. Imports from Algeria were initiated in 2000 and will eventually be terminated in 2020. LNG is regasified in the Greek regasification terminal of Revythousa. The electricity sector absorbs 75 per cent of the gas consumption. Importantly, the

introduction of natural gas to the Greek energy market helped develop co-generation which had been negligible for years.

A large increase in gas demand is expected to triple gas consumption by 2010 and make it reach 4.2 Gm^3 (or 17 per cent of the projected total energy consumption). This is mainly the reason why several gas pipelines projects are under way. The most advanced of these is the Greek-Turkish project ITG (Interconnection Turkey Greece). Following an agreement between DEPA and Botas, the Turkish counterpart of DEPA, in 2002, an agreement was signed between the line ministries of the two countries in 2003. The gas pipeline has a length of 285 km and an initial capacity of 3.5 Gm^3/year, which may extend to 11.5 Gm^3/year. It will connect Bursa, in the west of Turkey, to Komotine, in the northeast of Greece, and will be supplied with gas from the Caspian Sea, mainly from Azerbaijan. Ideally, the pipeline could be used for the transit of gas from the Caspian region or Iran towards other EU Member States by the use of a 220 km underwater connection with Italy.

Under both EU Gas Directives, Greece has benefited from a derogation arrangement in its capacity both as an "emergent region" and as a "non-interconnected country". Indeed Greece's first supply by means of a long-term gas supply contract started in July 1997; moreover, the country had no interconnection with any other member state until January 1, 2007 and has only one main external supplier, namely Russia, which accounts for more than 75 per cent of the country's imports. Greece benefited from this derogation up to the end of 2006.

Distribution licences have been granted for the regions of Attiki, Thessaloniki and Thessalia. The granting of licences for the distribution and supply of low-pressure gas in the areas of north eastern Greece, the island of Euboea and Central Greece has been around for some time but the anticipation of the new statutory framework as well as slow-moving tendering processes have resulted in no real progress having been made.

2. APPLICABLE LEGISLATION

37–02 Statute 2364/1995, which came into force in December 1995, was the principal regulatory instrument in the gas sector for a decade. It laid down the framework for the importation, transportation, trading, distribution and supply of natural gas and provided for the distinction between gas distribution companies ("EDAs") and gas supply companies ("EPAs")—a distinction that was eventually discontinued. DEPA was granted the non-transferable right to import, transmit and sell natural gas. The transmission system and all related infrastructure belonged to it. Statute 2364/1995 was amended in 1997 by Statute 2528/1997 to promote the commercial viability of gas supply companies. In 1998 a Presidential Decree was passed, which introduced the

legal framework for the selection of private investors to construct and manage distribution networks and thus laid down the key rules for foreign investments. Statute 2364/1995 was further amended by Statute 2992/2002 which provided for the right of DEPA to establish new EPAs without the prior establishment of EDAs. In late 2005 Statute 3428/2005 ("On the liberalization of the natural gas market", hereinafter "Gas Law") was passed to bring Greek law in line with the second Gas Directive 2003/55/EC and to lay down the rules for a market that had hardly made its first steps towards market liberalisation. The Gas Law is an ambitious statute, the implementation of which depends heavily on secondary legislation that is yet to be passed. In the main, it aims to spell out clearly third-party access to the transmission and distribution system of natural gas; the bodies to undertake the operation of the transmission and distribution systems; the gradual opening-up of the market to eligible customers; the minimum set of supervisory responsibilities to be assigned to RAE; tariff methodologies; and unbundling requirements.

Under the Gas Law, the following pieces of secondary legislation need to be introduced: (a) regulation on gas authorisations; (b) a grid code; (c) regulation of gas pricing; and (d) regulation on the user registry of the Gas Network. None of these by-laws has been finalised to date in order to enable the drafting of this secondary legislation, yet some developments are currently under way (primarily through the initiative of RAE).

3. INDUSTRY REGULATION

The role of DEPA

DEPA was created in 1988 and is directly owned by the Greek State. Its former parent company, the partially privatised Hellenic Petroleum S.A. (ELPE), retains a 35 per cent stake. Plans to privatise DEPA have been around for some time but no real progress has been made. In 2003 the state initiated the privatisation of 35 per cent of the capital of DEPA which, however, did not go forward. Privatisation was again within the objectives of the Greek Government for 2007 and plans for an IPO were made for the second half of 2007, which did not materialise. Interestingly, PPC has an option to buy 30 per cent of DEPA. Prior to the Gas Law DEPA was vested with the essentially monopolistic right to purchase, import, export, transport, store, process, sell, distribute and generally trade in natural gas. Before the issue of licences to the EPAs of Attiki, Thessaloniki and Thessalia, DEPA also had the exclusive right to supply low-pressure natural gas. Being a vertically integrated natural gas undertaking as defined in both Gas Directives, DEPA is required to keep separate accounts for its natural gas activities and, where appropriate, consolidated accounts for non-gas activities. This was provided for in art.8 of Statute 2837/2000, which transposed the unbundling **37–03**

requirement of Directive 98/30/EC into Greek law and is reiterated in the Gas Law (art.32), as required in Directive 2003/55/EC.

According to the Gas Law, DESFA S.A. is named the system's TSO and is granted the responsibility for balancing deliveries and off-takes in the system and for providing balancing services to the users. DESFA S.A. prepares and submits to RAE for approval an annual balancing plan, which includes the estimates of the TSO regarding balancing gas needs and an evaluation of possible balancing gas supply sources for the following year. Following RAE's approval of its balancing plan, DESFA S.A. concludes the necessary balancing gas supply contracts. Balancing costs and the methodology for allocating such costs to the users of the transmission system are also subject to RAE's approval.

Gas transportation system—The new transmission system operator ("GTSO")

37–04 Before the Gas Law, the so-called National Natural Gas Transportation System ("Gas Network") was managed by DEPA which had been granted the right to manage the system's planning, construction, ownership and exploitation (art.3 of Statute 2364/1995). Transportation referred to the transmission of natural gas by means of pipelines with a pressure greater than 19 bars, whilst distribution referred to the transmission of gas through pipelines at a pressure of up to 19 bars. The Gas Network (i.e. all installations comprising the natural gas transportation/transmission network within the territory of the Greek state, including a central conduit, branch lines, all installations of whatever nature for the storage of natural gas and its return to the transportation/transmission network, all installations for measurement, compression, decompression and control, and in general all installations that constitute functional and support elements of the transportation/transmission network) was made up of the following key components:

- a main high-pressure (70 bar) gas transmission pipeline from the Greek-Bulgarian border to Attica, of a total length of 512 km;
- high-pressure branch pipelines to Eastern Macedonia and Thrace, Thessaloniki, Volos, Inophyta, and Attica, of a total length of 450 km;
- metering and regulating stations to meter the gas and regulate pressure;
- a remote-control system to manage operations and telecommunications while exercising control of the Gas Network;
- operation and maintenance control centres in Attica (Patima, Elefsina), Thessaloniki (Nea Mesimvria), and Thessaly (Ambelia, Pharsala), and in the Xanthi region;
- twin submarine pipelines from the islet of Revythousa to Aghia Triada;

- liquified natural gas terminal (storage and gasification) on the islet of Revythousa;
- steel medium-pressure (19 bar) networks in Attica, Thessaloniki, Larisa, Volos, Inophyta, and Platy Imathias;
- polyethylene low-pressure (4 bar) networks in the cities of Athens, Piraeus, Thessaloniki, Larisa, and Volos.

Statute 2364/1995 also provided that seven years following DEPA's first gas deliveries in November 1996, the Greek state could grant licences for a period up to 30 years to other companies to install, manage and exploit natural gas transportation systems in areas to which the Gas Network would not be extended or in areas where DEPA has not expressed any interest in extending its services. Likewise, the statute also provided that ten years after the first gas deliveries, the Ministry for Development could grant licences to companies other than DEPA for the import, export and sales of gas either to DEPA or to large consumers located in areas where the Gas Network has not been extended or in any area where DEPA has not expressed any interest in extending its services.

The Gas Law sets out a new regulatory framework under which the management and development of the Gas Network is undertaken, in line with Directive 2003/55/EC, by an entity (i.e. GTSO) that is separate from the vertically integrated DEPA. The GTSO is set to be a spin-off of DEPA which will transfer to the GTSO the ownership of the transportation network, i.e. of more than 19 bar pressure ("Transmission Network"), while remaining entirely separate from DEPA in terms of shareholding, management, accounting and decision-making. The Gas Law grants extensive powers to the GTSO in operating the Transmission Network and various guarantees and safety valves to ensure the independence of the operator. The GTSO will come into being through a Presidential Decree and will very much depend on the transmission system and the metering codes, which have not yet been published.

The GTSO will be responsible, among others, for operating, maintaining, managing, exploiting and developing the Transmission Network and its interconnections; for ensuring non-discriminatory third-party access; and dealing with capacity allocation and deliveries; system balancing; emergency management; settlements; and public service obligations. The GTSO may in the future assume the role of a full market operator in the event that the Greek natural gas market adopts a pool market model.

Gas distribution and supply

Past regime

Article 3(6) of Statute 2364/1995 granted DEPA the right to sell natural gas to: **37–05**

- gas distribution companies ("EDAs") and gas supply companies ("EPAs");
- "eligible consumers", i.e. those using 100 GWh or more per year;
- consumers using gas as motor vehicle fuel; and
- all consumers regardless of their consumption, during the period preceding the issue of licences for the distribution of natural gas.

Prior to the passing of Statute 2364/1995, three gas distribution companies ("EDAs") had been established in 1995 as wholly owned subsidiaries of DEPA for the regions of Attiki (Athens), Thessaloniki and Thessalia. The statute also provided that within their own areas EDAs enjoy the exclusive and transferable right to:

- plan, design, construct, own and exploit the Gas Network in their area;
- sell gas to consumers other than "eligible consumers", i.e. consumers using less than 100 GWh per year.

Statute 2364/1995 as amended by Statute 2528/1997 provided that the EDAs, despite owning and operating the gas distribution systems, should establish EPAs in the form of separate legal entities. On the basis of art.4(7) of Statute 2364/1995 and Presidential Decree 10/1998, the three EDAs undertook international tenders under which a Cinergy-Shell joint venture acquired 49 per cent of the EPA of Attiki; and Italgas acquired 49 per cent of the EPAs of Thessaloniki and Thessalia. At the same time the EDAs maintained 51 per cent of the shares of these three EPAs, thus securing the state's vertical intervention in the gas market under Statute 2837/2000.

Statute 2992/2002 stipulated that DEPA could carry out international tenders for the establishment of EPAs (gas supply companies) without the establishment of an EDA (gas distribution companies) at all, since it had become clear by then that the dual system of EDAs and EPAs was dysfunctional. Moreover, the new statute provided for the power of DEPA to merge with the three EDAs (gas distribution companies) and for EDAs to merge with each other. Statute 2992/2002 also amended the framework for the role of local governments in the EDAs. Thus the right of local governments to participate in the share capital of the respective EDAs has been replaced by their right to levy a special tax equal to the 10 per cent of the dividend that DEPA or the existing EDAs would receive from the EPAs (gas supply companies).

New regime

37–06 Under the Gas Law the EDAs that have been set up under Statute 2364/1995 will either be merged in a single EPA or will be taken over by DEPA. The Gas Law retained the arrangements of Statute 2992/2002 under which

DEPA no longer needed to establish new EDAs (i.e. gas distribution companies). Pursuant to art.21, DEPA is granted gas distribution and supply licences in various regions of the country and may proceed with the establishment of a gas supply company or EPA (of the type provided under the previous regime) in any of the designated regions. A distribution licence remains different from a supply licence which is to follow the rules of the supply code that is yet to be issued. Licensing is, in any case, to follow the provisions of a licence code that has not been published either. The Gas Law provides for detailed rules for the unbundling of accounts and for access to them in accordance with Directive 2003/55/EC. The effectiveness of such provisions in what is a quite monopolistic market, is yet to be seen.

The Gas Law provides for a new phasing of market opening. Under art.25, eligible customers are, in addition to those already eligible under the past regime, all co-generation production licensees whose annual consumption exceeds the 100 GWh per year. As of November 15, 2008 all non-household customers located outside areas that belong to an EPA or are derogated under art.28 of Directive 2003/55/EC, will also become eligible. As of November 15, 2008 EPAs can also become eligible for quantities beyond the quantities that have already been contracted with DEPA (the Gas Law sets the contracted quantity for 2010 as the threshold beyond which an EPA becomes an eligible customer). As of November 15, 2009 all household customers who are not located in a derogated region or in a region that falls under an EPA also become eligible. In contrast to the established EPAs, any new EPA becomes an eligible customer.

(c) Network Tariffs

Tariffs for TPA to Gas Network as well as connection charges were set in 2006 by Ministerial Decision 4955/2006. Regarding distribution tariffs, the three distribution companies (EPAs) perform the combined activities of a DSO and an exclusive supplier. As a result, EPA tariffs are bundled in the sense that there is no discrete charge for transmission and distribution of gas, but there is a single end user tariff including all gas and non-gas costs and the company's profit. EPAs set their tariffs under a revenue cap scheme, as set out in their respective concession licence, which is adjusted every year according to the consumer price index. Indeed, EPAs have the right to (and actually do) follow the methodology of their choice in setting the end user prices (market value or cost plus) subject to previous notification to RAE. According to art.24 of the Gas Law, access is granted to other suppliers serving eligible customers in the distribution system of each EPA. In this case, tariffs have to be approved by RAE (art.31 of the Gas Law).

CHAPTER 38

OIL

1. PROSPECTING, EXPLORATION AND PRODUCTION OF HYDROCARBONS

Introduction

Even though Greece is considered to have a high oil potential, it remains one of the most unexplored countries in the Mediterranean region. At the same time, the modest oil reserves that have been proven keep decreasing: from 2.9 Mt in 1990 they were reduced to 0.95 Mt in 2005. Several factors such as sea depth and geological peculiarities have confined targets to relatively shallow depths of up to 3,000 m and have discouraged major exploration projects. However, expectations were high in the mid-1970s in the aftermath of maritime exploration in the region of Thasos (i.e. Prinos and south Kavala), which had led to the discovery of the first exploitable oil deposits in the country and to the establishment of the Public Petroleum Corporation, what has today become the Hellenic Petroleum (ELPE). Three commercially exploitable fields (i.e. Prinos, north Prinos, south Kavala) were thus developed, whilst two other deposits, one in the maritime area of Katakolo and another in Epanomi (for oil and gas, respectively), turned out to be marginally exploitable. But the high expectations of the 1970s proved inconsequential. The Prinos oil deposit, which was discovered in 1973 and started production in 1981, had 110,000,000 barrels in recoverable reserves and ceased production by 1998. Likewise, the south Kavala natural gas deposit, which had also entered production in 1981 and had recoverable reserves of about 615,000,000 m3, ended production in 1993. In 1994 the so-called north Prinos oil deposit (with recoverable reserves of 4,000,000 barrels) was discovered about 1.5 km from the existing production site of Prinos. The deposit was considered economically viable because of joint exploitation with the production section of the main Prinos field by the North Aegean Petroleum Company (NAPC), which was the concession holder of the Prinos deposits. In 1999 NAPC withdrew from the region and operation of the field has since been undertaken by Kavala Oil. Today, there are three proven hydrocarbon (oil and gas) deposits in Greece with a total of less than 2 Mt in proven reserves: the Prinos and north Prinos deposits, the Epanomi deposit and the oil content of the Katakolo deposit. With such meager deposits, it is not surprising that the contribution of domestic production to the country's hydrocarbons needs has remained infinitesimal **38–01**

and today is less than 1 per cent. Indicatively, at the end of 2006, of the approximately 380,000 barrels consumed in Greece daily, only 2,000 came from domestic production (i.e. the Prinos field). Crucially, prospecting activities have ceased as of 2002; by then ENTERPRISE OIL, UNION TEXAS (now Arco), MOL and TRITON, which had been granted the right to prospect/explore four regions, had discontinued their operations for reasons other than the existence of reserves.

Applicable legislation

38–02 Statute 2289/1995 ("Hydrocarbons Exploration Law") is the law governing the prospecting, exploration and exploitation (other than distillation) of hydrocarbons. It replaced Statute 468/1976, which had formed the basis for the development of the Prinos field by NAPC, and transposed Directive 94/22/EC into Greek law. The statute uses the following definitions:

- Hydrocarbons are all oil products found in solid, liquid or gaseous form and in particular mineral crude oil and natural hydrocarbonated gas as well as all kind of minerals and substances found with them.
- Prospecting is the process of locating hydrocarbons in specified areas by all methods with the exception of drilling.
- Exploration is the process of identifying, for the purposes of extraction, deposits of hydrocarbons by all methods including drilling.
- Exploitation is the mining of hydrocarbons, the process of turning them into marketable products (with methods other than distillation) and the storage and carriage of such products to transit installations for further distribution.

The fact that Chapter A of the Hydrocarbons Exploration Law is entitled "Exercise of Public Rights" indicates that the rights of prospecting, exploration and exploitation of hydrocarbons are treated as exclusively public, their exercise always being conditional on THE "public interest" (art.2(1) Hydrocarbons Exploration Law). Ownership of petroleum and other hydrocarbons is thus vested in the Greek state. The state in turn controls rights of exploration development and production through the Minister for Development and ELPE. These bodies can lease exploration and exploitation areas to third parties on the basis of a contractual relationship.

By and large, the statute was intended to create a competitive investment climate and to attract new investors by improving the framework for the commercial exploration and development of hydrocarbon deposits in Greece. Its key principles provided for (a) the right of exploration and exploitation to be conceded by the state to interested parties by way of a tendering process; (b) two types of concessions, one for leasing and another for

CHAPTER 39

LIGNITE AND COAL

1. INTRODUCTION

39–01 There are no indigenous hard coal reserves in Greece. The Greek cement companies, mainly AGET HERACLES and TITAN CEMENT, are the major importers and consumers of hard coal in the country. PPC occasionally adds hard coal to its supplies of lignite in its thermal power plants to upgrade the calorific value of low-quality lignite. Small amounts of hard coal are also sold to various craft industries (mainly in the field of building materials production), to the transport industry, to agriculture (for use in greenhouses, processing units, etc.) and to the metallurgical industry. Efforts have been made to reduce the use of hard coal in the cement industry by substituting biomass for hard coal.

Greece's most important indigenous energy source is lignite ("brown coal"), a brownish-black coal of low quality used almost exclusively for electricity generation. Greece is the second largest lignite producer in the European Union after Germany and the sixth largest in the world. Lignite reserves in Greece are estimated at 5 billion tonnes. However, the quality of Greek lignite is poor because of the high water and ash content. Greek lignite reserves can be mined only at high cost. The largest deposits are in northern Greece at Ptolemais and Amintaio and in southern Greece at Megalopolis.

The large-scale introduction of natural gas into the energy system of the country, together with the wider use of RES, has recently contributed towards curbing the use of lignite as a prime fuel for electricity generation. Indeed lignite has gradually been phased out and is being replaced by more efficient combined cycle plants. At present there are no plans for the construction of a new lignite-fired power plant.

2. APPLICABLE LEGISLATION

39–02 Statute 210/1973 ("Mining Code"), as amended by Statute 274/1976, is the principal piece of legislation for the Greek mining sector and applies to the entire range of minerals. The Mining Code is based on the principle of free

requests from the Greek government. The Government grants the right to explore and exploit mineral resources to the first applicant through a concession agreement.

This is not true for all minerals, however. For some, including hydrocarbons and lignite, special rules confine their exploitation to a limited number of persons or merely to the state; or make exploitation subject to tendering rules. In the case of lignite, the right to explore and exploit belongs exclusively to the state, which has to date assigned the right mainly to PPC at no cost. Even if the state does not grant concessions for exploitation of minerals, it can still enter into leasing arrangements.

The Mining Code simplified the requirements and procedures for those interested in exploiting and exploring mineral resources. Key features of the Code are the following:

- the carrying out of a financial and technical study that meets proper exploitation requirements as a prerequisite for the granting of a concession;
- the finite duration (i.e. 50 years) of the concession agreement, which may, however, be extended;
- the possibility of transferring the site under exploitation to a new concessionaire rather than back to the state in the event of failure of the primary concessionaire.

According to the Mining Code, the right of possession of mineral resources is distinct from the right of ownership of the real property where the minerals are located. Interestingly, mineral rights have priority over other possessory and non-possessory rights in the relevant property. The exploitation of mines is regarded as an activity of "public interest".

Lignite apart, there are two methods of acquiring a mining interest: the primary and the secondary acquisition.

- Primary acquisition, which involves a concession agreement made between the Government and the beneficiary. There are three stages to this type of acquisition:

  (a) The application for an authorisation to undertake exploration. This authorisation is issued by the local prefect for areas where no previous mineral title has been granted or no previous application for an authorisation for exploration has been made. The authorisation may cover an area of up to 10 km^2 and lasts for three years. After the end of the exploration period, the holder may apply for a concession.

  (b) The application for the grant of a concession. If the holder of an authorisation to undertake exploration finds any mineral deposits, he is required to apply to the local prefect for a concession for the