



## Turkey's Energy Prospects in the EU-Turkey Context

**Yusuf Işık**

### Abstract

The legislative framework for the energy market in Turkey has been changing rapidly over the last few years with further progress made towards harmonising Turkey's legislation with the Community's energy *acquis*. Yet there are still shortcomings in the functioning of the market, such as the effectiveness of regulation, price trends and loss rates. Moreover, there are still regulatory restrictions on cross-border trading, although the technical preparations to connect the Turkish grid to Europe are advancing well. In all energy sub-sectors, further efforts are needed to guarantee alignment with the *acquis*. Nevertheless, if the proposed changes – including the privatisation of electricity generation – are fully implemented and cross-border trade is liberalised, Turkey soon may be integrated into the EU's energy system even in advance of full membership.

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# Turkey's Energy Prospects in the EU-Turkey Context

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Yusuf Işık

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## Introduction

The policy changes that followed the major economic crisis of 2001 had a profound impact on the Turkish energy sector. The regulatory framework is now evolving rapidly along the lines of the reform programme agreed as a result of the crisis. The key issues now are the efficient *functioning of the energy* market, the robustness of its structure, and the adequacy and effectiveness of the regulatory framework that is being put into place. Also critical is Turkey's integration into the EU energy networks, markets and system, including alignment with the EU energy *acquis*.

The prospect of EU integration enables the problem concerning the domestic energy supply and demand balance in Turkey to be viewed from a different angle. This also applies to the security of supply, including primary sources of energy and their relative weights. There are now new opportunities for energy trade between Turkey and the other European countries, especially for the sale or resale and transportation of gas (and possibly oil as well) from or through Turkey.<sup>1</sup>

The Turkish energy sector is quite complex – owing to, among other things, decisions that were taken and implemented in the 1990s that have had long-term consequences. For the purpose of this working document it is necessary to focus on specific issues and more detailed aspects of the energy sector to better evaluate EU-Turkish prospects in this area.

Turkey's accession process to the EU in itself makes the structure, particularities, evolution and future of the EU's energy system essential factors to its own energy scene. Furthermore, energy trade and the connection of Turkey's energy networks to those of EU are on the agenda, with some preparation already under way and a larger potential flow being contemplated.

Section 1 offers a brief discussion of the basic, relevant features and issues of EU policy on the energy sector. The energy supply and demand situation in Turkey and its background are then examined in section 2, together with relevant figures and projections. This is followed by an evaluation of economic aspects and institutional and regulatory features in section 3. The last part, section 4, puts forward the basic approaches for Turkey's convergence towards the EU energy framework. Section 5 concludes with policy and action points that are suggested for consideration.

## EU energy

In the seven years following the 1996 Directive on electricity (96/92/EC), there have been improvements in the internal energy market in the form of some efficiency increases, certain price reductions and rises in competitiveness. Nevertheless, progress has not been sufficient and there are also visible shortcomings in the functioning of the market including dominance patterns. On the other hand, it is also necessary to take into account the fact that trade-offs exist to some extent (even if not in a systematic way) among principle objectives such as competition and security of supply, for example.

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<sup>1</sup> The issues involving transportation of oil and gas through Turkey to other European countries are dealt with in a separate contribution – see J. Roberts (2004).

The 2003 EU Directive on the electricity market (2003/54/EC) tackles such issues in a more articulate way while putting forward the vision of a gradual development towards a fully integrated, competitive, secure and environmentally sustainable energy market. Some of the areas that are critical in this process are:

- effective regulation;
- non-discriminatory network access;
- adequate interconnection at borders;
- the degree of integration within Europe;
- security of supply;
- congestion management;
- services to households and small enterprises, along with universal service;
- price trends, and
- technological development in the energy area.

Security of supply is one of the points of strong emphasis in the electricity Directive whose salient features comprise long-term planning, public service obligations, environmental requirements, energy efficiency/demand-side management, the distinction between ownership and management with respect to the independence of distribution enterprises, openness to EU companies, tendering for new capacity when the need arises as well as direct measures in situations of crisis. In this context, stability is of great importance. None of these, however, should be interpreted as a tendency to move away from the goal of a fully integrated, competitive energy market. It should also be emphasised that the central role of well-regulated competition in the EU energy sector is needed in the interest of all. The complexities of the existing realities in the energy field call for such provisions as those in the electricity Directive and an effective and up-to-date regulatory mechanism in general for making competition work and expand while ensuring security of supply. For example, after separation, there is now a tendency on the part of generation companies to purchase distribution companies. Hence, the articulation and effectiveness of the regulatory mechanism is all the more critical. In fact, for an array of reasons, some of which are touched upon further below, the nature of the regulation function and its institutional structure(s) constitute particularly pertinent issues. Both are likely to be subject to further changes as new needs arise in the development of the energy market.

The 2003 EU Directive (2003/55/EC) on the gas market pursues, in essence, the same objectives as those of the electricity Directive. In fact, progress has been slower in the gas area. On the other hand, the scale of EU gas imports combined with Russia's dominant share in it are factors that restrict the development of the EU gas and energy markets.

Both the electricity and gas Directives stipulate that member states must open up the energy markets for commercial customers on the 1st of July 2004. Although this is now a part of Community law, only very few countries have effectively reached this level of market liberalisation so far. Also, most of the new members are lagging markedly behind in terms of market opening in general. The Directives also stipulate that the legislation must be implemented for all customers by the 1st of July 2007. The Communication on infrastructure and the security of supply (2003), the cross-border Regulation on electricity exchanges (2003) as well as the Green Paper, *Towards a European Strategy for the Security of Energy Supply* (2001), are also among the relevant EU documents in the context of the energy market and its development.

Another difference between the electricity and gas sectors in the context of the EU legislative and regulatory domain is that while there is a regulation on cross-border electricity exchanges as mentioned above, this is not matched by any such regulation in gas, although the Commission has proposed one. In fact, together with regulation itself in the broader context, cross-border matters are one of the most critical issues in the present EU energy scene. The importance of the latter is obviously not confined to individual technical or economic matters relating to the borders themselves.

It stems from the fact that member-state energy markets continue to be national markets to a very considerable extent despite increasing third-party company activities.<sup>2</sup> In fact, this is one of the reasons why the opening of national markets did not lead to a corresponding increase in competition.

Although it is clearly desirable to move as quickly as possible towards the goal of a fully integrated, competitive EU energy market, national authorities have acted cautiously for a mixture of reasons. Some of these are related to the desire to protect the positions of their national companies and to ensure security of supply and stability in the context of their countries' energy sectors. Yet at the same time, the 'network' aspect of the EU energy sector, transcending individual countries, is gaining further relevance and significance, which adds to the complexity of the energy scene. In this context, the regional dimension within the EU energy system could emerge as a significant one. The positive efforts made for strengthening the south-eastern EU energy networks, indicated further below, partly reflect this potential trend. If such a trend materialises, emphasis on the regional dimension of the energy market within EU would not, and should not, be expected to lead to permanent regional structures of a nature tending to obstruct or substitute the full integration process.

## Energy demand and supply in Turkey

### 1.1 Electricity

#### 1.1.1 Demand

According to figures from the Ministry of Energy and Natural Resources (MENR), in 2002 Turkey's total electricity consumption increased by 4.3% to reach 132.6 TWh and in 2003 it rose by 6.3% to attain 140.9 TWh. In 2004, it is expected to grow by 7.2% and reach 151.1 TWh. GDP growth was 7.8% in 2002 and 5.9% in 2003, and is expected to be 6% in 2004. Part of the reason why the elasticities (i.e. the ratio of the change in electricity consumption to GDP growth) have been so different in these two years is that, according to past performance, these seem to increase proportionately less during recovery after a year of economic crisis and also decrease much less during the crisis year itself. In fact, during the year of the economic crisis, i.e. 2001, Turkey's GDP decreased by 7.5% while electricity consumption appears to have decreased by only 1.1%. Notwithstanding this partial explanation, demand figures in general and not only those of these particular years look problematic. This is especially worrying in terms of projections that effect investment decisions as argued further below and constitutes one of the biggest difficulties in the area of energy policy.

During the 1990-2000 period, electricity consumption increased by 8.6% per annum on average. On the one hand, Turkey's incremental electricity consumption needs are extensive. On the other hand, the low efficiency of plants is a contributing factor. Also, the energy intensity<sup>3</sup> indicator is not favourable either. Hence, relatively high electricity consumption growth is not surprising. For example, Spain too has experienced and is continuing to experience a relatively high growth in consumption although the similarity is not a complete one. Yet two factors have rendered future demand projections prepared during the 1990s and in 2000 excessive. One is the terrible earthquake that struck Turkey in 1999 and the major economic crisis of 2001. The other is the intrinsic overestimation of projected demand, due, to some extent but not entirely, to an overestimation of future growth. For example, the projection made as recently as in 2002 for 2002 and 2003, overestimated demand in these years by 0.9% and 3.6% respectively, although GDP growth has been quite high, i.e. 7.8% in 2003 and 5.9% in 2004.

<sup>2</sup> This point is dealt with in C. Egenhofer and K. Gialoglou (2004a).

<sup>3</sup> Energy intensity is defined as follows by Eurostat: "This indicator is the ratio between the gross inland consumption of energy and the Gross Domestic Product (GDP) for a given calendar year. It measures the energy consumption of an economy and its overall energy efficiency. The gross inland consumption of energy is calculated as the sum of the gross inland consumption of five energy types: coal, electricity, oil, natural gas and renewable energy sources." Thus, a higher figure corresponds to a lower overall energy efficiency.

For the forthcoming medium- and long-term outlook, MENR has just released the projections prepared by a joint study it led and in which the other relevant public institutions took part (MENR, 2004). The projections offer several scenarios and are based on the MAED<sup>4</sup> model as were earlier MENR projections. The report indicates that a very large number of parameters such as GDP composition, household size, population and labour force data are taken into account by this model, although obviously GDP growth has a preponderant weight in the computation of the projected rates. Projections of electricity demand covering the periods up to 2010 and 2020 have also been made by Economic Consulting Associates (ECA), in a study prepared for Turkish authorities and completed in 2003 (ECA, 2003). The 2005 to 2020 projection figures are given in Table 1 below.

*Table 1. Electricity demand scenarios by MENR, in TWh*

	Main scenario	Low demand growth scenario	High demand growth scenario
2005	163	159	168
2010	242	217	246
2020	499	407	571

*Source:* MENR (2004).

Projections based on MENR's main scenario (MENR, 2004) indicate that per capita electricity consumption will reach 5692 kWh in 2020. MENR's main scenario is based on a 6.4% average GDP growth rate for the 2010-20 period.

It must be stressed, at the outset, that accurate projections of electricity demand involve complex processes and are very difficult to make. Nevertheless, apart from some of the problematic features of past projections referred to above, there are also a number of observations that need to be made in connection with the recent ones.

According to the latest official projections of the MENR-led report mentioned above, demand will increase by 8.2% per year on average in the 2005-10 period, by 8% in 2010-15 and 7% in 2015-20.

In the 1995-2003 period, excluding the economic crisis year 2001 and the year following it, the average elasticity figure was 1.26. The corresponding projected figure for the 2005-10 period is 1.52. According to the MENR study's main scenario, the elasticity figure will decrease to 1.31 in 2011 and then to 0.99 in 2020. This elasticity projection could turn out to be a little high. A very rough alternative projection would be that for a GDP growth rate of say, 6% per annum, over the next four to five years the average increase in electricity demand could be just or a little below 8%; in the four to five years following this period it would gradually decrease towards 7% and then below it in or around 2020. The decrease of the ratio would be largely as a result of a larger than expected reduction in distribution losses, a rise in energy efficiency and an improvement in energy intensity in general. One of the factors that relates to the composition of output in the MENR study is its characterisation of Turkey as a country "at the initial phase of industrialisation". Another one is that in the forthcoming period "heavy industry" will be preponderant. Neither of these points can be said to correspond to Turkey's present situation or forthcoming prospects and both reflect an underestimation of the technology factor, which is otherwise taken into consideration in the study. Therefore they could contribute to some slight overestimation of the electricity demand though it is not possible to detect their exact weights.

This cautionary note is also called for by the fact that Turkey's per capita electricity consumption is at present very low compared with other EU countries. Although per-capita electricity consumption figures have some comparability problems, the general difference of magnitude is clear as shown in

<sup>4</sup> MAED stands for made for analyses of energy demand.

Table 2 below. On the other hand, although it is the most advanced countries that have elasticities below one, it is not possible to infer from this any regular pattern showing the trajectory of elasticities and thereby predict how high they will be or for how long. Moreover, the potential effect of technology on energy efficiency and intensity could be significantly stronger and more rapid in the following 10 to 15 years than has been the case in the previous decades. In conclusion, the existence of factors that could effect estimates in different ways and in opposite directions means that it is necessary to take into account the inherent uncertainty in terms of elasticities and other relevant aspects in the forthcoming period and make forecasts in a continuously updated and articulate way.

*Table 2. Electricity consumption, kWh per head, 2001*

EU-15	6038
Spain	5498
Germany	5969
Bulgaria	3094
Poland	2506
Romania	1617
Turkey	1436*

Source: Eurostat.

Note: \* 2001 was the economic crisis year in which electricity consumption decreased.

Energy intensity includes other kinds of energy as well as electricity, but by giving a measure of the overall energy efficiency of the economy it also relates to the level of demand for electricity. A lower energy intensity figure reflects, by itself, the need for less energy for a set level of activity. But the relationship is not a proportional one. Compared to its position in per-capita electricity consumption, Turkey is in a relatively more favourable situation in terms of energy intensity as shown in Table 3. It is also worth noting, however, that Turkey's energy intensity figure did not decrease, i.e. improve in the last decade, unlike most of the other European countries' corresponding figures.

*Table 3. Energy intensity, kgoe\* per € thousand, 2001*

EU-15	194
Spain	227
Germany	168
Bulgaria	1885
Poland	643
Romania	1164
Turkey	503

Source: Eurostat.

Note: \* kg oil equivalent.

### **1.1.2 Supply**

From a level of 27 GW in 2001, installed capacity in Turkey's electricity generation has increased to 31.8 GW in 2002 and to an estimated 37.4 GW in 2003. The distribution in terms of sources of the electricity generated in 2002 is shown in Table 4.

*Table 4. Share of sources in electricity generation, as a percentage of electricity generated, 2002*

	Natural Gas	Lignite	Hydro	Fuel Oil	Hard Coal	Others
Share	46.8	23.1	16.3	7.0	2.3	4.5

Source: MENR.

Together with lignite, the relative share of hydroelectric power has been falling, while the share of natural gas has been increasing rapidly. In 2003, however, owing also to favourable rainfall as well as the government's measures towards reducing costs, the relative share of hydroelectric power has increased. About 60% of total electricity generation was provided by the state company EUAS while the other 40% was provided by plants of the following kinds: BOO (build own operate), BOT (build, operate and transfer for thermal, hydro and wind power), BO (build operate), TOOR (transfer of operating rights), concession, auto-producer and auto-producer group IPPs (independent power producers), which generate their own electricity and mobile power plants.

Before the 1999 earthquake and the 2001 economic crisis, on the basis of fears of an energy shortage as well as inadequate projections, governments resorted to long-term BO, BOT and TOOR contracts or negotiations towards such agreements. These agreements created a surplus of capacity for a period of about five years. The series of long-term contracts in question contain, in a large number of cases, Treasury guarantees involving contingent liabilities and are on a take-or-pay basis, usually at quite high prices. Clauses providing for recourse to arbitration were specifically included in several cases. Some of the negotiations or initial, non-finalised agreements in question did not become enforceable contracts. Legal disputes or processes began in a number of instances. As a result, some uncertainty arose about the exact additional capacity expected to be installed in the following years. According to the latest official projections by the state company TEIAS, total electrical generating capacity is expected to increase from 37.4 GW in 2004 to 41 GW in 2010 as shown in Table 5 below.

Table 5. Projected capacity (GW)

	2004	2005	2006	2007	2008	2009	2010
Capacity	37.4	39.0	39.9	40.6	40.9	41.0	41.0

Source: TEIAS (State Electricity Transmission Company).

### 1.1.3 Supply-demand balance

Before comparing projected supply and demand it is necessary to point out that available energy from old plants is significantly below installed capacity. Consideration of the requirements of peak load leads to the need for a reserve ratio, which varies according to type and size of plant among other factors. For the time being a reserve allowance of around 25% is thought to be reasonable in the present circumstances. Taking these factors into account when comparing projected demand with supply, a surplus is expected for the next few years, but from 2009-10 (earlier according to some) onwards an electricity deficit could appear and increase further in the following years if new investment is not made in time (Table 6). Depending on whether actual demand growth is higher or lower than the projected rates, the potential deficit would obviously become more acute or less pressing. The rate at which expected capacity investments are completed in the next few years will affect the result. So will the pace of rehabilitation and maintenance activities.

Owing to take-or-pay agreements and to a lesser extent technical reasons such as ecological factors pertaining to dams, the must-run portion of total capacity constitutes a high percentage of the total, exceeding it in some scenarios where all the BOT contracts under discussion are realised, although this is quite unlikely.

Table 6. Projected demand and supply\*, TWh

	2004	2005	2006	2007	2008	2009	2010
Supply	179	183	186	192	193	197	197
Demand	151	163	176	191	206	224	242

Source: TEIAS for the supply figures; MENR (2004) for the demand figures.

Note: \* The main assumptions are that 1) no additional generation capacity is foreseen after 2009; 2) auto-producers' additional capacities will be less than the growth rate of their installed capacity in the last five years; 3) less rainfall than the long-term average figures is expected; 4) estimated generation capacities considering depreciation are taken into account rather than the projected figures foreseen in the feasibility reports.



## 1.2 Natural gas

Natural gas now constitutes a crucial element of Turkey's energy sector. Demand for natural gas grew by 14% per year on average during the 1989-2002 period (Table 7). The level reached in 2003 is estimated to be around 20 billion cubic meters (Bcm). The pace was somewhat slower during the last five years. Turkey is the seventh largest consumer of natural gas in Europe and its consumption is 5% of the European total. Natural gas forms 23% of the energy mix and this is in line with the corresponding European average. Yet in terms of the share of power generation in total natural gas utilisation, Turkey's situation is very different from the rest of Europe with a share of 67% in 2002, which is more than three times the European average. The shares of industrial and residential utilisations are around 17% of the total each. The further expansion of the residential component has been restricted by the very slow pace at which the state company BOTAS has been developing the grid, which expanded by an average of 6% in the 1997-2002 period.

Table 7. Average annual gas demand growth rate (percentage per annum)

Period	Power	Fertiliser production	Household	Industry	Total
1989-2002	11.7	2.0	59.3	60.1	14.0
1997-2002	18.3	-8.2	7.8	3.7	12.3

Source: Economic Consulting Associates (2003).

The MENR projection figures expect an average increase of as much as 17% per year in the next few years and then 11% up to 2010. According to these figures total natural gas utilisation would reach around 55 Bcm in 2010 and 80 Bcm in 2025. Other institutions' projections, for example those by the OECD anticipate the increase to be at a much slower rate (Table 8). The MENR projections of natural gas demand are found to be excessive. BOTAS' projections have also been very excessive; for example, its projection for 2005 was as much as 44 Bcm until as recently as last year. It has been revised down to 32 Bcm, which is still on the high side. Other projections range from as low as 26 Bcm to 37 Bcm for the 2010 figure. The level of demand will be affected by the pace at which the gas grid is developed. At present this development is still slow but the process of extending distribution from 4 to 50 provinces is continuing. The rank (merit order) given to natural gas in electricity generation will also affect total utilisation.

Table 8. Gas supply and demand balance (Bcm)

	Contracted	Must Take	MENR, with additional BOTs and TOORs		OECD GDP, network constraint, without additional BOTs or TOORs		
			Demand	Surplus	Demand	Surplus	Cumulative surplus
2004	29	23	30	0	23	0	0
2005	32	28	32	0	24	4	4
2010	61	52	55	0	30	22	92

Source: Economic Consulting Associates (2003).

Turkey's own natural gas production is very limited, so supply is mainly met by imports. Total contracted amounts are expected to rise from around 29 Bcm in 2004 to 60 Bcm in 2010. More than half of the contracted amount is already imported from Russia, with the share of supplies from the Blue Stream project of total imports from Russia increasing gradually. Some of the contracted amounts, notably from Turkmenistan, may not remain valid. Nevertheless, a surplus is expected to

exist and develop. During 2003, thanks to a series of negotiations, the surplus has been kept to a minimum but it will not be possible to contain it in the same way in the coming years – although there are signs of further improvements along these lines with Russia. The take-or-pay component of contracts is quite high, reaching as much as 85% of the total for the 2010 figure. Depending on the grid constraint and its rank in power generation, natural gas supply is expected to exceed demand by an amount that could range from 7 to 8% of the total contracted amount in the next few years to much higher levels of up to a peak of above 17 to 18% later in the decade. The realisation of the improvements in contract terms, for which efforts are continuing, would naturally decrease these surplus amounts, but such reductions are unlikely to be very drastic although they could be important.

The project to construct a sub-sea pipeline link from Turkey to Greece for natural gas transportation has begun implementation. The initial amount foreseen is as little as 3.6 Bcm but it can be raised to 11.5 Bcm through compression. The prospect of natural gas sale and transportation to EU countries is taken up extensively in the working document by John Roberts (Roberts, 2004) but the fact that contracts relating to imports are believed to contain clauses severely prohibiting or restricting sales to third parties shows that this issue is a complex one. Also, the average import price Turkey pays at the border is estimated to be significantly above the average EU price. Nevertheless, it is a prospect definitely worth pursuing for reasons extending beyond the need to decrease the expected surplus as later discussed.

Among the solutions regarding the surplus, large-scale gas storage is also reported to be under exploration. Another solution relating to decreasing the natural gas surplus that came on the agenda is reported to be the interest that some international companies have shown in buying Turkey's contracts with Nigeria and Algeria.

One of the areas needing improvements in terms of environmental effects are the outputs of older thermal plants using coal. Some of them have been temporarily closed because of their inability to reduce harmful levels of pollution that result from power generation.

## **1.3 Other fuels**

### ***1.3.1 Oil***

Turkey's oil production is around 1.6 million tonnes and constitutes only around 5% of its oil consumption. Proven oil reserves are very low. This creates an import-dependency and when oil prices are rising, as they are now, there is inevitably an impact on the economy commensurate with the magnitude of the price rise. In 2002 imports of petroleum and petroleum products totalled \$5.3 billion. Approximately 7% of electricity generation is based on oil fuel. Turkey's oil consumption is projected to rise at an average rate of about 5.5% to 50 million tonnes in 2010. The Turkish state petroleum company TPAO's exploration activities have decreased significantly to below the warranted level. On the other hand, TPAO and BP have recently started a joint exploration venture in the Black Sea. Construction of the Baku-Tiflisi-Ceyhan pipeline is also a significant development for Turkey's position as a conduit for oil and energy in general.

### ***1.3.2 Coal***

Turkey's total lignite production was 65 million tonnes in 2001. Although lignite produced for electricity generation totalled 34 million tonnes in 2000, this amount fell to 16 million tonnes in 2003. In 2002, lignite provided 23% of electricity generation. Including imports, it constitutes around 16% of primary energy consumption. Turkey's lignite deposits are estimated at 8 billion metric tonnes – the seventh largest in the world. Only a small part of these deposits, however, are suitable for use as an energy source. Nevertheless, lignite remains an important source of energy for Turkey. One of the critical points about its lignite reserves is the prospect of improving their quality and the extent to which new technologies can help. Environmental factors are also highly relevant in this context. Hard coal reserves are estimated to be 700 million tonnes, 80% of which can be coked. In 2002 hard coal provided 2.3% of electricity generation.

### 1.3.3 Hydro power

In 2002, 12,000 MW, or around 36% of the installed electrical-energy-generating capacity was hydraulic although the corresponding share in actual electricity generation was only 16%. Turkey's total potential hydraulic energy capacity is estimated to be 125,000 GWh.<sup>5</sup> Some argue that in the future, priority should be given to using the remaining 75% of this potential. Although it is obviously desirable to use indigenous and renewable energy sources as much as possible, only some part of this remaining potential can be effectively and productively used. The remaining potential for constructing new large dams for hydro-electric power generation is limited but nevertheless important. A group of projects on the agenda called 'intergovernmental hydro projects' comprise such dams. The hydraulic energy potential related to the construction of small dams is also relatively important. In total, there are 366 hydro projects (few of which are large) on the agenda at varying degrees of preparation. It is estimated that if all of the hydro projects on the agenda are completed, together with already existing hydro capacity, 45% of total hydro capacity would be reached. But for the time being this ratio represents a potential total.

### 1.4 Renewable energy sources

A draft law has been prepared for providing a series of effective incentives in the field of renewable energy sources. A glance at the prospects for such sources is below.

*Wind.* The economically meaningful potential of wind energy capacity is estimated at around 10,000 MW. Only a very small fraction of it is used at present although there are wind projects on the agenda.

*Geothermal.* Turkey's geothermal resources are estimated to be as high as one-eighth of the world's total. But their potential for electricity generation is low. The use of geothermal energy for residential heating is expanding and expected to grow further.

*Solar.* There is considerable potential for the use of solar energy, only some part of which is exploited at present.

*Bio-mass energy.* There are also efforts for exploring the potential for bio-mass energy.

*Nuclear.* The government has declared its intention to build several nuclear energy plants. This matter is now at the exploration phase.

### 1.5 Liabilities

One of the important factors of the energy sector's medium- and long-term prospects is the size of Treasury liabilities. Contingent liabilities are enormous in amount but the liabilities likely to be actually faced are more relevant. According to ECA's estimates for the electricity and gas areas combined, contingent liabilities will reach between \$9 and \$20 billion cumulatively by 2010 depending on which scenario materialises; the low-demand scenario would lead to higher liability figures. The cumulative total could exceed \$30 billion by 2020. Sales to Europe would decrease this amount.

### 1.6 Environmental aspects and renewable energy sources

With respect to the emissions targets in the Kyoto Protocol, Turkey was first in both lists of countries: Annex I and Annex II. Recognising Turkey's special needs, parties agreed in 2001 to remove Turkey from Annex II; thus Turkey will accept an emission target though no such specific level has so far been agreed. Nevertheless, Turkey's accession process to the EU involves other steps as well and these are expected to be tackled in due process.

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<sup>5</sup> Some estimates put the figure at one-third higher than this.

## Other economic aspects and institutional factors

### 1.7 Background

To understand the complex energy scene in Turkey and better evaluate its constraints, options and prospects, the salient features of the energy-related developments of the post-1990 period are reviewed here, albeit briefly. During the 1990s, Turkey's demand for electricity grew by more than 8.5% per year on average. The projection figures used anticipated the continuation and even acceleration of this pace. At the same time, the 1990s have been a period in which Turkey's public finances have generally performed poorly, with increasing deficits and public debt, and an overall worsening fiscal structure. Serious deficiencies in good governance prevented the reversal of this general trend. Measures taken to improve the economic structure and situation did not have lasting effects. At the same time, relatively large new investments in the energy sector appeared necessary. Large energy investments by the private sector were not on the agenda. The public sector's economic capacity did not allow sufficient financing for the energy investments needed. A shortage of energy was feared. This fear further increased around the mid-1990s and afterwards. Although the major earthquake of 1999 and the scale of the 2001 economic crisis could not be predicted, the electricity demand pertaining to the period up to the late 2000s was nevertheless overestimated to a certain extent. A number of BO, BOT and some TOOR contracts corresponding to the projected overestimated demand were signed in a rush and began to be implemented before the crisis.

The general pattern of these contracts was as follows. As mentioned above, they involved take-or-pay clauses requiring the purchase at a relatively high price of significant quantities of electricity to be produced for periods extending up to 20 years in a few cases. During the take-or-pay period for the supply of gas to these power plants was guaranteed on a pass-through basis. A foreign investor was in general the leading or only party involved, although in some cases the Turkish partner had the leading role. Treasury guarantees were accorded. The Treasury thus incurred considerable contingent liabilities.

The right to recourse to international arbitration was put into the contracts, including in those signed before legislative change in this direction was made in Turkey. In a number of other cases, administrative and legal issues arose before implementation or the signing of the binding contract. There is a group of around 30 projects that continues to be subject to legal procedures or uncertainty. In a few of them foreign investors have resorted to international arbitration.

The total capacity of this group of about 30 projects is relatively small. The bulk of BOs and BOTs in terms of capacity have already started production, while some are under construction. There have also been delays in start-up in a few cases. Several oil-fired, mobile electricity-generating power plants have also been commissioned and are operating. A number of hydro-electric power projects known as intergovernmental hydro projects as mentioned above were also negotiated and are waiting to go into their final stage for implementation.

On the primary energy front, contracts for the purchase of very large quantities of natural gas have been signed. The need for gas for the period extending to 2010 has been overestimated, notwithstanding the impossibility to predict the earthquake and the big economic crisis. The biggest contracts are with Russia, followed by Iran. Although all the details of the contracts are not declared, it is known that the price of the Russian (as well as the Iranian) gas is much higher than in sales to neighbouring regions. The heavy take-or-pay clauses involved constitute a serious liability. Particularly the Blue Stream Project for the import of gas from Russia is interpreted by many analysts as controversial.

When a second economic crisis erupted in February 2001 after the first economic crisis in November 2000, Turkey was faced with its biggest economic difficulty in recent history. The true extent of the imbalance and weakness in public finances then became apparent. To overcome the crisis and also improve the structure of the economy in a permanent way, an economic programme was initiated under the responsibility of the newly appointed State Minister for the Treasury and the Economy,

Kemal Derviş, and a new stand-by agreement covering the period up to the end of 2004 was signed with the IMF. The World Bank was also involved in the process. Energy was both directly and indirectly an important part of the process of improving of the economy and fostering structural change. This process comprised fiscal as well as energy-market structuring and regulatory aspects.

One of the most effective decisions implemented at that time was to permanently end the granting of Treasury guarantees to any new contracts. Efforts and progress were made towards coordinating policy and actions in the energy sector. The Electricity Market Law (No. 4628) and the Gas Market Law (No. 4646) were enacted in 2001. The Oil Market Law was enacted later, in December 2003. The Energy Market Regulatory Authority (EMRA) was established in 2001. The coherent aim of these legislative and other steps was to transform the energy sector's structure and operation in a way that, in broad terms, would conform to the corresponding structures and operation patterns in the EU.

The provisions of the Electricity Market Law aim at establishing an electricity sector where: bilateral agreements constitute the main pattern; an advanced balancing and settlement mechanism exists and functions, i.e. a mechanism on an hourly basis; competition prevails among a sufficient number of actors; electricity generation and distribution assets are privatised and security of supply is ensured. More general objectives such as sustainability, variety of resources, efficiency, low prices, high quality and environmental concerns are also included. In fact, the provisions of the law conformed broadly to the criteria of the 1996 EU electricity Directive. Preparing the secondary legislation is the responsibility of EMRA. The two most significant pieces of secondary legislation prepared by EMRA have been the licensing and tariff regulations. The European Commission's Progress Report on Turkey indicates the positive nature of the legislative steps taken in this area.

The annual consumption threshold for eligible customers (i.e. those who are allowed to choose their own suppliers) was initially fixed at 9 GWh, which was quite a large quantity. This threshold has subsequently been reduced to 7.8 GWh.

Institutionally, the separation between the production, transmission and trade parts of the previous state monopoly TEK, which had already been initiated, before has been made explicit. The production company is named EUAS, the transmission company TEIAS and the trade company TETAS; for distribution the relevant state company is TEDAS with its seven regional affiliate companies.

According to the Gas Market Law and its secondary legislation, the state monopoly company BOTAS has to annually transfer a portion corresponding to 10% of the total import contracts for gas to private companies up to 2009 and will only keep 20% of the total. It will not be able to undertake new contracts as long as it has a share of 20% or more of the total demand. Eventually, its activities outside transmission will be privatised. The threshold for eligible customers is 1 million cubic meters, which is quite a high level as well. The market share of customers above this threshold is around 80% of the total.

EMRA's responsibilities comprise, apart from preparing the secondary legislation, licensing, monitoring and control; these extend to oil in addition to electricity and gas. In electricity it is also expected to ensure the functioning of an elaborate balancing and settlement mechanism. It has prepared and published a manual relating to the structure and function of the electricity market.

## **1.8 The present situation**

About three years after the enactment of the bulk of energy market laws in 2001, which entered into force the following year, the situation is as follows.

Three and a half years after the eruption of the big economic crisis of 2001 and the start of the economic programme referred to above, macroeconomic balances have improved significantly and growth is continuing, although the economy's fragility has not disappeared. Thus public expenditure is still significantly constrained and it is likely that it will only increase in a way that will not lead to serious new imbalances.

As explained above, excess capacity has accumulated in electricity generation and take-or-pay agreements enhance the cost of this excess capacity. In 2003, guaranteed purchases exceeded 55 TWh. This constitutes about half of the total purchases of TETAS (the state-owned wholesale company) and around two-thirds of its total cost.

Since 2001 the government has tried to minimise the excess costs incurred by the BO, BOT and TOOR contracts and purchases from mobile power plants while abiding by the binding contract clauses. In 2003, measures taken in this direction included negotiating a decrease in the cost of the purchase of gas from Russia and purchasing the minimum possible quantities from the more expensive BO and BOT sources while maximising the share of hydro energy in total production. This has been very significantly aided by the abundant rainfalls that filled the dams. Thanks to these and other measures ensuring additional savings, the electricity sector State Economic Enterprises (SEEs), which had been financing a deficit of more than \$1.5 billion on a cash basis in 2002, were able to attain the programmed targets in 2003, although their debt stock continued to increase. This relatively positive development was also helped by moderate world oil prices and the appreciation of the Turkish lira.

Apart from the particularities mentioned above, the electricity sector continues to face important problems and issues (especially concerning costs) that affect both the government and users. EUAS's average generation cost is reported as below 3.5 cents/kWh, but the high share of hydro energy in its generation mix (which seems to take into account mainly operating costs) renders the comparison less relevant. In the second half of 2002, the average price of the electricity purchased by TETAS was around 5.5 cents /kWh. The BOT plants' prices are the highest, followed by the prices of mobile plants, BOs and TOORs. Conditions and factors noted so far and highlighted below lead to the prevalence of such relatively high prices. Earlier (2000) forecasts of generation costs pertaining to the 2001-05 period by the state electricity company were at around the same level but some cost-escalation factors have also appeared since then as explained elsewhere in this paper. In fact, in 2003, the average purchase price from BO, BOT, TOOR and mobile power plants was more than 7 cents/kwh and the total amount paid to these was around \$4 billion.

Some cross-subsidisation exists in favour of households and, through gas sales, for auto-producers and auto-producer groups. The price difference between industrial and household use is smaller than the corresponding EU average. In 2002 Turkey's industrial electricity price (9.4 cents per kWh) was the third highest among 21 OECD countries. It decreased to 8.6 cents/kWh in 2003. The price of electricity sold to households was among the cheapest in 21 OECD countries before 2002 when it was 9.9 cents. In 2003, it decreased to 9.1 cents/kWh. The higher price in relative terms to industrial use leads to complaints by industrialists that their competitiveness is thereby restricted. Rather than just the difference in relative prices, the fact that the cost of electricity is so high indeed constitutes an impediment to competitiveness.

Apart from the direct effects of the take-or-pay clauses and other features of the BOs and BOTs, the high cost of energy is related to several significant factors including the following:

- the rigidity imposed on the system in terms of production mix because of the long-term binding contracts;
- lack of competition;
- technical losses and losses owing to unrecorded usage totalling as much as 22% of the generated electricity;
- delays and insufficiencies in meeting the rehabilitation and investment needs of existing EUAS plants;
- the high cost of inputs, especially natural gas;
- insufficient technological development; and
- significant management and structural deficiencies in the energy sector's State Economic Enterprises.

In 2004, the share of the more expensive take-or-pay components of electricity supply and therefore the cost/price pressure has been greater as new plants of this kind are starting to operate. The shares of hydro and lignite energy supplies are likely to be reduced (and not only because of the weather in the case of the former) in the next few years, i.e. hydro production is likely to be displaced in favour of take-or-pay forms of production based mainly on gas. The merit order according to sources of generation remains constrained in the existing conditions. The quantity of existing excess supply is larger than a surplus, which would just help competition.

So far, in the electricity and gas markets, privatisation has not advanced (apart from the privatisation of the state oil distribution company, POAS), in either production or in distribution, because of a number of factors. First, the competitive structure of the greatest part of the market has been restrained through the take-or-pay contracts. The state has continued to determine prices. In conditions of surplus and the expected low capacity of plants presently under state ownership, during at least a few years privatisation was difficult to achieve in any case. The threshold of 7.8 GWh is relatively high and the share of such eligible customers is around 30% of the market. Second, preparations for privatisation have not advanced. For example asset transfers within the public sector have not been realised. It is only very recently and partially that moves in this direction have taken place. Third, despite the positive legislative framework, uncertainties about the exact shape and timing of the functioning of an effective competitive market might have led potential investors to prefer delaying any decision that, in fact, involves quite large sums.

On the price front, although EMRA asked for cost-based pricing at the regional level, this has not materialised. It must be pointed out that with unevenly distributed large losses, some of which can be explained by social motives and administrative costs, adopting such a pricing system in a short period of time would cause considerable difficulties. That is not to say that it is desirable to continue the national tariff system for very much longer.

With regard to losses, technical plus other distribution losses total 22% of the generated electricity, costing considerably more than \$1 billion a year on average, which is very high and clearly not sustainable. Apart from social and technical factors, these losses are also the result of clear management deficiencies. It is imperative that such losses are drastically reduced and that the social motives are dealt with separately from the functioning of the electricity distribution system with more effective and rational means.

Despite activities such as preparing some, but not all, of the expected secondary legislation, licensing and generally aiming at establishing a market structure that conforms to EU norms, EMRA has not been sufficiently effective. This is partly because the distribution of powers and responsibilities relating to energy policy and its application has not been adequately streamlined. Compared with the corresponding EU average, the regulatory authority has so far had a less influential role in the development of the market. This is reflected in the strategy document examined below. One of the major reasons for this situation is the insufficiency of expertise at EMRA and the lack of improvement in terms of remedying it.

Progress concerning the measurement, communication and control infrastructure has remained insufficient. Preparations towards the introduction and operation of an elaborate balancing and settlement system have lagged behind.

One of the areas in which the authorities are very keen to achieve progress is connection to the EU electricity network, the Union of Coordination of Transmission of Electricity (UCTE). Until now connection to the Bulgarian network had been done in a separate loop. Now imports from Bulgaria have stopped. Connection to UCTE requires some technical work and expenditure, particularly on frequencies, to make Turkey's network compatible with the UCTE. Preparations have started towards being ready for interconnection in 2006.

Meanwhile, rehabilitation and improvement work concerning EUAS's existing plants and the transmission network in general have been lagging behind in the aftermath of the big economic crisis.

## 1.9 The strategy document

Looking at the overall picture, for reasons explained above, some degree of uncertainty concerning the outlook for the electricity market was inevitable. In 2003 the government confirmed its commitment to energy sector reform. Yet the need for further clarification of policy in terms of concrete matters has also become more apparent as the market structure has not been moving towards a more competitive one, and a sufficient number of new actors needed for ensuring its efficient functioning and development have not been forthcoming. Although excess capacity exists at the moment, the future adequate development of supply and of the market in general also has to be ensured.

To respond to these needs, a strategy document entitled the Electricity Sector Reform and Privatisation Strategy was prepared. It was approved and issued by the High Planning Council in March 2004.<sup>6</sup> This document outlines the government's electricity policy applicable in the forthcoming years and represents the most significant step concerning energy policy since the enactment of the laws. It covers most aspects of the electricity market and stipulates changes and new steps. The strategy is obviously also relevant from the perspective of the EU-Turkey electricity and energy market. It is therefore useful to examine its essential features in the context of this paper.

The strategy document starts by reaffirming the objective of adopting the EU *acquis* in this field. It emphasises liberalisation and qualifies successful privatisation as an essential element of market liberalisation, indicating that the electricity generation and distribution assets will be privatised upon the completion of necessary sectoral reforms and the restructuring of state electricity enterprises.

The expected benefits include:

- decreasing costs;
- ensuring the security of supply and the quality of electricity;
- significantly reducing technical and non-technical losses;
- promoting infrastructure investment by the private sector; and
- transferring the benefits of competition to the consumer.

The strategy also states that to avoid supply constraints during the transition period, “temporary measures shall be taken to obtain adequate additional capacity”, which seems to be a safety measure against the probability of delays in the adequate development of the market.

The basic principles of the privatisation process envisaged by the strategy include the following:

- The privatisation activities will be overseen by the Privatisation Administration and in the framework of the Privatisation Law (No. 4046); thus, BO, BOT and TOOR projects/installations do not seem to be covered.
- The participation of financially strong companies will be encouraged (through the creation of sufficiently large and well-balanced assets).
- Privatisation will start from the distribution sector.
- Generation assets will be grouped before privatisation.
- Distribution companies will have to buy the take-or-pay energy from TETAS and no additional state guarantees will be accorded (thus, the current risks arising from must-run contracts will be minimised).
- The privatisation preparation activities will include the signing of vesting contracts between distribution companies and generation portfolio companies. (Efforts in this direction will help to ensure supply security for distribution companies and allow public generation assets to be better

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<sup>6</sup> The Electricity Sector Reform and Privatisation Strategy has been issued as a ‘decision’ of the High Planning Council in March 2004. This decision has been sent to the relevant ministries but as yet has not been published in the Official Gazette or in any comparable publication (although it is publicly available).



utilised. Moreover, since the contracts will constitute a ready-market that is transferred to the new owners upon agreement, the privatisation of generation assets would be made easier.)

- Distribution companies will be able to buy the rest of the demand in their region from market suppliers under market conditions. As times passes, the share of compulsory purchase from TETAS and purchases in line with vesting contracts in total demand will shrink.
- A transitional balancing and settlement mechanism will be operated.
- The privatisation of the generation assets will start after: i) the market management system is established by TEİAS and is functioning with hourly prices, and ii) the privatisation of distribution activities is substantially completed, which is expected in mid-2006.

With respect to the privatisation of distribution, the strategy stipulates that a maximum of 21 distribution regions have been determined. There will be multi-year tariffs; the first tariff period will cover the first five years of implementation; tariffs will be subject to EMRA's approval. Further, distribution companies shall have supply contracts with suppliers for at least 85% of their forecasted demand, pertaining to customers below the threshold in the region. The eligible consumer threshold will be 7.8 GWh until the beginning of 2009 and will be decreased afterwards (this would allow distribution companies to earn sufficiently high profits for financing new investments). Finally, the entire market will be completely opened to competition in 2011.

The market will be based on bilateral contracting as foreseen by the Privatisation Law and the balancing and settlement mechanism will function in accordance with the features and requirements of a spot market. TEİAS will assume the role of market operator and will have to be strengthened accordingly.

Although regional cost-based tariffs will be prepared, there will be a transitional tariff equalisation scheme and therefore a national tariff of at least five years applicable to customers below the threshold. If TETAS's revenues are not sufficient to cover its liabilities from long-term contracts, a surcharge will be added to transition charges.

The security of supply, as in the new EU Directive as well, is strongly emphasised in the strategy. The strategy also includes investment expenditures for rehabilitation will be allocated through the budget. Similarly, the investments necessary for ensuring that the electricity system operates in line with UCTE will be made. Finally, in order to obtain fuel and resource diversity, the strategy targets the use of generation investments in domestic resources, including large-scale hydro power plants.

In summary, the strategy is designed with the aim of making it possible, under the existing conditions, to attain the relatively broad range of objectives set by the Electricity Market Law. These objectives, explicitly or implicitly, include:

- minimising the risk to the public sector from BO, BOT and TOOR contracts;
- increasing the prospects of the sale of assets offered in the privatisation process;
- providing the conditions necessary for a smooth transition to a competitive market mechanism;
- decreasing uncertainties with respect to policy in this domain in the forthcoming years;
- ensuring that rehabilitation and infrastructure investments are made in the transition period as well;
- avoiding capacity shortage in the medium term; ensuring that planning is adequately undertaken;
- meeting social concerns by having a national tariff first while regional costs are also established in preparation for the following period;
- improving institutional efficiency through a clearer division of tasks;
- enhancing the prospect of orderly and continuous convergence towards the 2003 EU Directive; and
- providing a sufficiently flexible roadmap towards a system in which the main parameters such as price and source of supply are determined under market conditions.

Nevertheless, the strategy has also been criticised<sup>7</sup> on the grounds that it unnecessarily prolongs the period in which competition is restricted and the national tariff will distort costs (and in fact the differences would not be so high if true costing was applied). Beginning privatisation with distribution is not adequate because the potential private investors interested in generation assets are kept at bay for a new period; the state enterprises and institutions will retain their dominant power for an unnecessary additional period and inefficiencies will continue. Further some of EMRA's roles such as its competence in determining the thresholds for eligible customers are deferred to a later period.

Large and long-term take-or-pay commitments and other factors explained above have made it difficult to have a market largely based on competitive forces in a short timeframe. And there was little prospect of a change in this situation in the short term. In this framework, the main thrust of the objectives of the strategy can be considered as plausible on the whole. But the more critical aspect is to what extent and period of time will the mechanisms envisaged by the strategy be operational and the preparations accomplished. Also, when and to what extent will the trend towards an efficient and competitive market, along with the actors that ensure security of supply and effective convergence to the new EU Directive, be solidly established? For example, to start with a conceptually simple matter, establishing the balancing and settlement mechanism requires high IT capacity including the relevant skilled personnel. Will it be possible to employ such persons in sufficient numbers and ensure the adequate management required? Will EMRA's role be enhanced and will EMRA itself be equipped with the expertise necessary for such a role? In fact, the governance issue is critical and the strategy's objectives can hardly be attained without the necessary strengthening in governance. Thus it would be misleading to think that the clarification brought by the strategy text will be sufficient without vigorous steps on the governance front.

A draft law concerning a number of energy matters, such as allowing the state company TETAS to make direct sales within certain limits or delay the transfer of contracts from BOTAS, has recently been prepared and submitted to parliament, where it went through the committee stage just before the summer recess in July 2004. The intention of the draft law was to make some legislative changes in line with the stipulations of the strategy while corresponding to the de facto situation. Upon criticism that it was hastily prepared and would impede progress towards an energy market based on competition, it was withdrawn to be redrafted after October 2004, when parliament reconvenes.

With respect to the strategy's stipulation on ensuring investments in new, large hydro power plants, it is unlikely that a high number of such plants can be built. First, the remaining areas for building such dams are few. But some plants can be built and are on the agenda, mostly in the context of the intergovernmental hydro projects as referred to above. For Turkey's energy prospects, the realisation of such projects would make a positive contribution, which should certainly not be neglected.

The strategy document issued in March 2004 only deals with electricity matters. Thus, it would be expected and useful that the related natural gas and oil markets are also covered through new and compatible decisions providing clarification and prospects in a corresponding framework.

The excess supply situation pertaining to the forthcoming years has already been discussed. The actual magnitude of demand and hence the surplus as well will also be affected by the extension of the gas grid apart from electricity generation demand. The extent of the grid will matter for both industrial use and household demand. The extension of the distribution network has progressed slowly as indicated earlier. It slowed further after the 2001 crisis. On the other hand, competitive tenders for gas distribution concessions to be made by EMRA according to the Gas Market Law have begun. With the present BOTAS gas grid in the largest cities, a little above 20% of the population is covered. This figure shows how large the potential for extension is and also how its pace will impact demand.

Turkey has serious potential for becoming an exporter of gas and possibly oil towards other European countries, as well as a hub for gas and oil trade in the region. And this is desirable even if the surplus were to be reduced considerably through a combination of circumstances

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<sup>7</sup> See for example Serhat Guney's article in the May 2004 issue of *Energy World* (in Turkish).

## Energy prospects in the EU-Turkey context

### 1.10 Approaches to the critical areas of coordination with the EU energy sector

As with all major areas of its economy, Turkey's energy sector and the overriding development prospects of its markets include convergence on the applicable EU framework, structures and rules. With a view towards the 2010 and 2020-25 horizons and on the basis of the present status of the sector, the critical elements of coordinating with the EU's energy infrastructure include:

- strengthening the institutional as well as legislative framework by increasing the coordination of policy and the ability to view all sub-sectors, kinds of activities, investment areas, regulation requirements and external relations as parts of the same system, and consequently, devising a strategy document that includes the gas and oil sectors as well as the electricity sector;
- in this framework, strengthening the expertise of the relevant institutions and particularly of EMRA, whose role and resources need to be reinforced in line with its responsibilities – in conclusion, taking fully into account and without delay the provision of the 2003 EU Directive would be appropriate: “ensure that regulatory authorities carry out their duties in an efficient and expeditious way”;
- gearing energy sector policies towards the goal of gradually but fully integrating the EU electricity and gas networks and markets;
- tackling the issues arising from excess capacity and supply in the forthcoming years as well as those linked to unfavourable price and quantity conditions determined in a binding way for long periods;
- ensuring that cost pricing is achieved as much as possible before a long time elapses;
- creating an energy market effectively based on competition;
- achieving greater flexibility especially in decision-making areas such as capacity increase and choice of resources for electricity generation;
- increasing the share of renewable and indigenous energy sources, from the stage of inception of investments to the activities of the transmission system operator;
- strengthening the Privatisation Administration's expertise and capacity in view of the critical task it has in energy assets' privatisation and its hitherto generally poor record in other privatisations;
- achieving privatisation as envisaged by the energy market laws and, in this context, by vigorously applying the decisions stipulated in the strategy document to the electricity sector;
- making sure transparency prevails (good governance);
- ensuring security of supply as well lowering prices and attaining high energy quality and meeting environmental considerations;
- enhancing energy efficiency/demand management;
- adopting a balanced approach with respect to the trade-off between macroeconomic balances and the price of energy;
- attempting to limit and reduce dependency on single sources in terms of primary energy (i.e. natural gas) and supplier countries (Russia and Iran); also continuing efforts to improve the relevant terms of the purchase contracts in accordance with the interests of all the parties concerned;
- achieving sales and transfer of natural gas (and possibly oil) to Europe and, on the basis of Turkey's most favourable situation in the region, becoming a hub for energy trade within it; considering this as a main objective whichever way the surplus situation evolves; and

- in this vein and also because of the need for diversification, even if the latter approach is not achievable in the short run, it would be useful to consider potential sources such as gas from Turkmenistan.

## Conclusions

The legislative framework for the Turkish energy market has been changing rapidly over the last few years with further progress towards aligning its legislation with the Community energy *acquis*. There are still shortcomings, however, in the functioning of the market including the effectiveness of regulation, price trends and loss rates. Take-or-pay agreements in contracts concluded up to 2001 are a highly significant, restrictive factor that presents an obstacle in the short term. There are also regulatory restrictions on cross-border trading although the technical preparations to connect the Turkish electricity grid to the European one are advancing well. Similar preparations have also started in the area of natural gas.

Natural gas has become the most important source of electricity generation for Turkey and is expected to be in surplus for the forthcoming period because of the take-or-pay contracts. Hydro power is also significant though its share has decreased. The prospects for coal are more restricted because of its poor quality.

The rewarding opportunity of Turkey becoming a major conduit for energy to other European countries (even after the surplus has been exhausted) requires further investment for energy transportation and makes Turkey's gradual but full integration with the EU energy market all the more pertinent. Regarding the latter, the government's strategy document for the electricity sector was prepared with a view to moving towards an efficient market structure, and offers a timetable for privatisation of distribution and generation while ensuring security of supply. Nevertheless, vigorous efforts in this direction are imperative for achieving the stated goal. These involve devising and applying strategies for gas and oil and considerably strengthening the regulatory framework.

Apart from the crucial areas of convergence and the full integration of Turkey's energy market with the EU's in line with the *acquis* (as well as energy transportation), the EU dimension of Turkey's energy sector comprises many other significant opportunities such as investment by EU companies, transfer of technology and renewable energy.

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