

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Turkey has made impressive progress since the last IEA in-depth review in 2001. The government has made considerable efforts to address the “3 Es”, namely energy security, economic efficiency and environmental protection, in a sustainable manner. New legislation will reduce the role of the government in energy markets and strengthen market forces in the sector. An independent regulator (EMRA) has been established, an ambitious privatisation programme has been announced, the United Nations Framework Convention on Climate Change (UNFCCC) has been ratified and the country is preparing legislation to address energy efficiency. A renewable energy law has been submitted to the Parliament for approval. Some important oil and gas transit pipeline projects are under way or nearing completion, which will improve the security of supply in Turkey and make it an important “energy corridor” between East and West. Investments have been made to extend domestic gas infrastructures and upgrade refineries. Nevertheless, Turkey still faces many challenges in all areas of energy policy.

Forecasts serving as a basis for the government’s energy policy and energy enterprises’ investment plans have been overestimating demand growth in Turkey, mainly owing to the previous overly optimistic assumptions of gross domestic product (GDP) growth and the effect of the economic crisis in 2001. While it is encouraging that most recent forecasts appear to be more realistic, the government needs to continue such efforts taking into account the effects of market liberalisation and privatisation.

Despite significant efforts to liberalise the energy markets, Turkey continues to rely on its state-owned companies. Although privatisation is not a prerequisite for market reform, it is necessary to restructure the state-owned enterprises into a corporate form operating under market competition and to prevent the Treasury from requesting annual income for the state budget. This would allow them to act as a player in the liberalised markets without government intervention, thus creating a level playing field. The already announced privatisation of the generation company EÜAŞ into several parts would bring immediate competition to the market and enhance efficiency within the company. The government is determined to create a *domaine réservé* for state enterprises for security of supply, including keeping large parts of the hydro generation facilities. Lack of transparent criteria for the level of government intervention could create uncertainties for market entrants and potential investors.

It is positive that the Energy Market Regulatory Authority (EMRA) has been given considerable powers such as setting the third-party access (TPA) tariffs, providing licences and making decisions not to be overruled by the

government. At the same time, it is important that EMRA consults the different stakeholders and benefits from their experience in energy markets when preparing regulations.

Turkey has made significant progress with regard to environmental protection but more still needs to be done. The UNFCCC entered into force in May 2004. The country is in the process of developing its Climate Change Strategy and first national communication to the UNFCCC. The government should strive to monitor the effectiveness of the chosen policies and measures, both in terms of costs and emissions reductions. It should also consider defining an emissions target based on the momentum of the UNFCCC ratification. Co-ordination among the various government bodies will be key to the success of the strategy. Turkey has made significant progress in reducing local air pollution, particularly in large cities, but work remains to be done to ensure existing standards are met and to prepare for further reductions in air pollution. In this respect, it will be important to ensure that all market operators, including those owned by the State, comply with the existing air quality and emissions legislation. While investments have been made to increase security in the congested tanker traffic through the Turkish Straits, further action, such as seeking alternative transport routes, continued co-operation with other Black Sea nations and increased involvement of large oil and gas importing countries, appears necessary.

The general approach of Turkey's energy policy has been highly supply-oriented, with emphasis placed on ensuring additional energy supply to meet the growing demand, while energy efficiency has been a lower priority. Consistently high energy intensity and its imminent increase, partly attributable to the improving living standards, are matters of concern. To realise an energy savings potential of 25-30%, an Energy Efficiency Strategy was developed in 2004 and the government is preparing an Energy Efficiency Law. These positive developments lift the status of energy efficiency and conservation as part of the government's energy policy but stronger policies beyond those in the law are still needed. The evident lack of a comprehensive and co-ordinated energy efficiency policy for the transport sector is of particular concern.

The oil sector has gone through a profound reform. The 2003 Petroleum Market Law liberalised oil market activities, lifted price ceilings and removed import quotas on petroleum products at the beginning of 2005. EMRA has been assigned the responsibility to issue secondary regulations and licences, approve certain tariffs and carry out investigations concerning market activities. While its role in, for example, licensing is indispensable, it appears that there has been some level of over-regulation in other areas, possibly owing to a stated lack of consultation with the oil industry. Large-scale fuel smuggling in Turkey is a problem that degenerates the operating conditions for the legitimate market operators and reduces state revenues. The recent introduction of a national chemical oil marker will help.

Natural gas accounts for 23% of total primary energy supply (TPES) in Turkey. Gas demand has been growing rapidly but the overestimated demand forecasts, caused principally by the 2000-2001 economic crisis, have led to some risk of oversupply because most of the imports are based on long-term take-or-pay contracts. The domestic gas network is being extended quickly to allow more consumers to access gas. The new gas storage facilities can help to meet peak demand but decisions to build storage facilities to cover seasonal peak supply should be made on the basis of economic criteria taking into account alternative approaches, namely more flexible supply contracts, interruptible consumers and multi-firing in power plants. Large-scale gas transmission projects will enhance supply diversity, security of supply and competition in Europe and Turkey. However, their success will depend on the regulatory systems, including pricing, for gas transit, which will affect the viability of transit routes. It will also depend on the gas market reform given the large share of domestic consumption out of the total volumes of new pipelines.

The full implementation of the 2001 Natural Gas Market Law will substantially modify the gas market by transforming the monopolistic market structure into a competitive one through encouragement of new market entry and investments. While most of the necessary secondary regulation has been issued by EMRA and, in principle, 80% of the market is free to choose suppliers, competition has not developed because of the Petroleum Pipeline Corporation's (BOTAŞ's) *de facto* monopoly in imports. Other factors hampering competition are the lack of an independent transmission system operator (TSO) and incentives for eligible consumers to change suppliers owing to TPA tariff structures in the distribution networks. A flat price cap on all consumers constitutes cross-subsidies both between different consumer groups, notably from industrial consumers to residential consumers, and between different geographical areas.

The government wishes to maintain hard coal production to enhance fuel diversity, and consequently security of supply, but the policy is also closely related to social, regional and employment policies. Given its poor competitiveness, Turkish hard coal receives high and increasing subsidies per tonne. The International Energy Agency (IEA) considers that these indefinite subsidies are not justified because the international market in hard coal is well established and offers secure and reliable sources of fuel at prices, both now and in the future, that Turkish national production cannot match. Furthermore, Turkey has large lignite resources, which make a far bigger contribution to its security of supply and are much more competitively priced (without subsidies) than its hard coal resources ever could be. Nonetheless, there is a need for vigorous pursuit of productivity so that coal can compete as a fuel on equal grounds, even in the face of costs associated with tightening environmental requirements.

Turkey's use of hydropower, geothermal and solar thermal energy has increased since 1990. However, the total share of renewables in TPES has

declined, owing to the declining use of non-commercial biomass and the growing role of natural gas in the system. The fixed feed-in tariffs and purchase obligation for distribution companies under the proposed new Renewable Energy Law can encourage investments. The maximum level, 6 eurocents per kWh, is moderate as compared to the levels given, for example, to wind power in some other IEA member countries. While the scheme may not become excessively expensive for consumers, which is a common risk in feed-in tariffs, careful monitoring and adjustment of the cost of the scheme will be necessary until it is fully replaced by the purchase obligation in 2011. Given the diverse availability of resources among different distribution areas, it needs to be ensured that distribution companies can buy renewable electricity from certified producers located in other distribution regions to be able to fulfil their obligation at minimum cost. Despite a large potential for use of heat from renewables (geothermal, solar thermal and biomass), there are no specific policies in place for heat production from renewables.

Turkey has recently announced that it will reopen its nuclear programme in order to respond to the growing electricity demand while avoiding increasing dependence on energy imports. The competitiveness of nuclear power in a liberalised electricity market in Turkey needs to be clarified. Investment decisions should be made on the basis of efficient and transparent price signals regardless of whether power plants are being built by private or public companies. Furthermore, waste disposal options need to be defined from the outset of launching a nuclear power project.

Despite a high reserve margin of 40%, Turkey will need more capacity in the mid-term because electricity demand will continue to grow rapidly. The recently launched rehabilitation programme for the thermal power plants to increase their efficiency is a prudent approach as it postpones the need to invest in new capacity. Nonetheless, new capacity will be needed in the next decade, which requires a good investment climate. Despite some reductions in distribution losses during the last couple of years, both technical and non-technical losses (totalling about 18% in 2004) are still a concern. One notable development is the progress in the project to interconnect with the European Union for the Co-ordination of Transmission of Electricity (UCTE) network, which is scheduled for 2006.

To date, there have been cross-subsidies in electricity prices both between different consumer groups, notably from industrial consumers to residential consumers, and between different geographical areas. It is positive that the government has announced that energy prices for each consumer group will be based on cost and that transparent tariff calculation rules have been established by the regulator. However, regional cross-subsidies will remain at least for the next five years.

The government should be highly commended for the initiative to create competitive electricity markets. The steps taken so far have created a window

of opportunity to implement successful reform with clear and significant benefits. Now, decisive action will need to be taken to see the process through to a successful conclusion.

The adoption of the 2001 Electricity Market Law was a major milestone. It established EMRA, which has issued most of the necessary secondary legislation. The legislation has been supplemented by the 2004 Electricity Strategy. Despite the good legislative and regulatory framework, not much competition has developed for a number of reasons. There is a lack of consumer choice caused by the small number of market players; new entrants have difficulties competing with the state-owned incumbent who owns competitive depreciated generation units, including hydropower. Furthermore, the current generation overcapacity and lack of cost-reflective prices have made new investment unattractive. In addition, the Build-Own-Operate (BOO) and Build-Operate-Transfer (BOT) schemes have a relatively high market share (with high guaranteed price) and only 29% of the market has been made eligible to choose suppliers. The Electricity Strategy contains the key elements for tackling these issues, including the privatisation of EÜAŞ and handling the stranded cost issues caused by the BOO and BOT schemes. However, it will also be important to consider if the share of the liberalised market can be increased sooner than planned and to ensure that the transmission system and market operator (TEİAŞ) is independent from government control in its normal operation. Establishment of an electricity exchange would facilitate trade and introduce more competition. Cost-reflective pricing will be vital.

Given that Turkey is facing significant energy and environment policy challenges, the government needs to explore all possible means to respond to these challenges, including formulating a coherent energy research and development (R&D) policy. To implement such a policy, a coherent energy R&D strategy with adequate financing as well as good co-operation among the different ministries is necessary. This could be done by building on the work done for the National Research and Technology Foresight Programme (Vision 2023 Programme).

RECOMMENDATIONS

The Government of Turkey should:

General Energy Policy

- ▶ *Take into account the effects of liberalisation in the energy forecasts. Continue to revise forecasts regularly to enable the creation of a robust long-term energy policy framework in light of the sharp demand growth.*

- ▶ *Increase focus on the demand side (energy efficiency) in energy policy planning and implementation.*
- ▶ *Continue the process of liberalisation and privatisation of the energy sector in a transparent way. Specifically:*
 - *Determine clearly the role of the involved parties, i.e. the government, the regulator, state companies and other energy industries.*
 - *Create a level playing field for market entrants and avoid giving state enterprises a special role in competitive areas of the market beyond the predefined transition period.*
 - *Ensure that the interests of the final consumers remain in the central focus of the liberalisation process.*
 - *Ensure that privatisation is implemented in a way that contributes to the creation of competitive markets.*
- ▶ *While avoiding interfering with the work of the energy market regulator, ensure that it follows the appropriate consultation processes when formulating regulations.*
- ▶ *Improve co-ordination among government agencies in all areas related to energy. Involve all stakeholders, in particular consumers, in developing energy policies.*
- ▶ *Ensure that energy prices are cost-reflective.*

Energy and the Environment

- ▶ *Complete the national climate change mitigation strategy and first national communication to the UNFCCC as soon as possible.*
- ▶ *Define a framework to monitor and evaluate, in terms of costs and carbon emissions, the effectiveness of the policies and measures included in the national climate change mitigation strategy.*
- ▶ *Build on the momentum created by the ratification of the UNFCCC to consider defining an emissions target.*
- ▶ *Clearly define the roles of the different ministries and agencies involved in air quality monitoring and enforcement.*
- ▶ *Ensure the Ministry of Environment and Forestry has adequate resources to monitor and enforce environmental legislation.*
- ▶ *Ensure that all market operators, including those owned by the State, comply with the existing air quality and emissions legislation.*

- ▶ *Put in place a clear investment schedule to complete the retrofitting of flue gas desulphurisation equipment on all old power plants.*
- ▶ *Clearly define a schedule for the introduction of the new legislation on air quality standards giving clear signals to market participants.*
- ▶ *Clearly define how responsibilities are shared among ministries and municipalities with regard to transport-related air pollution and encourage co-operation.*
- ▶ *Continue efforts to reduce the risk of marine pollution in the Black Sea and Marmara Sea, notably through enhanced co-operation with countries bordering the Black Sea and with large fossil fuel-importing countries.*
- ▶ *Consider the reintroduction of tax benefits for liquefied petroleum gas.*

Energy Demand and End-use Efficiency

- ▶ *Promptly enact the Energy Efficiency Law, implement the measures in the Energy Efficiency Strategy and carefully monitor and evaluate their impacts, including the cost-effectiveness.*
- ▶ *Strengthen energy efficiency measures in the industrial sector by:*
 - *Introducing specific fiscal and financial incentives and third-party financing.*
 - *Expanding energy audit and energy manager obligations beyond large enterprises.*
 - *Exploring the possibility of voluntary agreements with industries with quantitative targets.*
- ▶ *Encourage energy efficiency in buildings by:*
 - *Demonstrating leadership by improving energy efficiency in public buildings.*
 - *Strongly enforcing the building standards for new buildings.*
 - *Introducing mechanisms to improve energy efficiency in existing buildings.*
 - *Setting high efficiency standards for air-conditioning equipment and other appliances.*
- ▶ *Integrate energy efficiency objectives in developing transport policy by, for example, promoting public transport, fostering inter-modal changes away from road transport and improving the energy efficiency of the vehicle fleet through economic and regulatory incentives. Improve transport statistics.*

Oil

- ▶ *Solve the problem of fuel smuggling.*
- ▶ *Encourage the industry to develop a Turkish Straits bypass, which is commercially feasible and is located far enough from the environmentally sensitive zones of the Black Sea, the Strait of Istanbul and the Marmara Sea.*
- ▶ *Ensure that the regulator focuses on the monitoring of competition in the downstream oil market and takes a light-handed regulatory approach.*
- ▶ *Complete the privatisation of the Turkish Petroleum Refinery Corporation (TÜPRAŞ) in a way that reduces its dominant role in the refining market.*
- ▶ *Corporatise the Turkish Petroleum Corporation (TPAO) and consider its privatisation. Give TPAO the possibility to integrate vertically in the downstream oil market.*
- ▶ *Establish clear and precise oil stockholding arrangements to define the obligation for each type of oil market operator.*

Coal

- ▶ *Promote the advantages of domestic coal reserves as a fuel and continue reforms of the coal industry to ensure it can compete on equal and competitive terms in an open electricity market, but refrain from intervention (such as providing subsidies for coal or allowing exemption from environmental regulations), which would distort the market.*
- ▶ *Rapidly step up efforts to increase productivity in coal mining, including through possible privatisation of state-owned operations, or accelerating current moves to lease and contract mining operations.*
- ▶ *Reduce coal subsidies with the aim of eliminating them, and set a clear deadline for this abolition. Replace the subsidies by restructuring programmes to address social impacts.*

Natural Gas

- ▶ *Encourage the expansion of the gas distribution networks to new cities for the environmental benefits and to enable imports by new entrants from any supplier, thereby reducing BOTAŞ's market power.*
- ▶ *Continue to promote gas transit routes and establish the necessary regulatory framework.*
- ▶ *Make natural gas prices cost-reflective for all consumer groups. Eliminate cross-subsidies between different customers.*

- ▶ *Develop and support mechanisms to divest existing imports, in accordance with a defined schedule, to provide a fair chance for new entrants. Clarify the role of the government and BOTAŞ in this process.*
- ▶ *Lift the restrictions on sources of natural gas imports by other parties from countries where BOTAŞ is importing, while paying due attention to diversification of supply sources.*
- ▶ *Monitor the market power of external gas suppliers.*
- ▶ *Define the exact steps to be taken to establish a fair and transparent open market as envisaged in the Gas Market Law. Closely monitor the progress.*
- ▶ *Establish an independent gas transmission system and storage operator by effective unbundling of BOTAŞ. Corporatise BOTAŞ.*
- ▶ *Review third-party access tariffs to the distribution networks and storage to enhance the possibilities of eligible consumers to switch suppliers.*

Renewables

- ▶ *Consider steps to accelerate economic hydropower projects, including refurbishment, consistent with the protection of the environment, to utilise the remaining hydropower potential.*
- ▶ *Enact the Renewable Energy Law as envisaged and monitor and evaluate its cost and effectiveness.*
- ▶ *Share information and experience with other countries introducing quota- and certificate-based promotional schemes for renewables.*
- ▶ *Assess the impact on the network reliability and stability resulting from increased penetration of intermittent wind power and explore ways to minimise such an impact. Consider a combination of wind power and pumped storage hydro for this purpose. Share information and experience with other countries on technical and regulatory approaches to intermittency.*
- ▶ *Investigate the extent to which policies and measures are needed to promote the use of renewables in heat production, co-generation and transport.*

Electricity, Nuclear Power and Co-generation

- ▶ *Encourage the rehabilitation of the thermal power plants to increase their efficiency where economically feasible.*
- ▶ *Allow the market participants to decide when and what kind of new power capacity will be built. Clarify the level of intervention which is considered necessary for security of supply and environmental reasons, and clearly specify the criteria under which such interventions should occur.*

- ▶ *Continue the efforts for synchronisation of the Turkish power system with the European grid of the Union for the Co-ordination of Transmission of Electricity (UCTE).*
- ▶ *Ensure that effective regulation creates incentives for distribution companies to continue decreasing technical and non-technical losses.*
- ▶ *Make sure that the transmission system and market operator (TEİAŞ) is independent from government control in its normal operation, including the development of the network.*
- ▶ *Encourage the establishment of an electricity exchange to facilitate trade and to introduce more competition.*
- ▶ *Carefully consider the sequence of market reform. In particular, ensure that the legal and regulatory framework, independent transmission system operator and spot market are fully implemented before proceeding with privatisation.*
- ▶ *Ensure that the privatisation programme can be efficiently implemented without delays.*
- ▶ *Create a sound legal framework for the use of nuclear power. Clarify the role of nuclear power in the future in terms of economic competitiveness. Define nuclear technology choices and waste disposal options before building nuclear power plants.*
- ▶ *Evaluate the potential for co-generation and pay due attention to the cost-effectiveness of future policies.*

Research and Development

- ▶ *Build on the work done within the Vision 2023 Programme to prepare a coherent energy R&D strategy. It should have adequate financing and efficient allocation in line with energy policy objectives to maximise energy R&D's contribution to the significant energy policy challenges in coming years.*
- ▶ *Concentrate on the adaptation of existing technologies and their early deployment, particularly in areas where there is a clear competitive advantage and need.*
- ▶ *Improve the collection of data on governmental R&D funding.*
- ▶ *Actively encourage the formation of private-public partnerships and, as appropriate, provide incentives for energy companies to increase R&D expenditures.*
- ▶ *Facilitate adequate R&D investment by the state-owned entities and ensure that incentives are provided post privatisation.*