

# SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

There have been many positive developments in Greek energy policy. Energy diversification has been progressing and Greece is actively increasing interconnections with neighbouring countries and has also played a crucial role in the Energy Community of South East Europe Treaty. Such efforts will not only contribute to security of supply but also make Greece an important energy hub. The impressive developments in public transport and renewable energy capacity are also encouraging examples. In the area of market reform, bills regarding the liberalisation of the Greek electricity market and the natural gas market were enacted. Important challenges remain, however.

One challenge for the Greek government is to maximise the benefit of the proposed market reforms. Important issues to be addressed are the strong market power of incumbents, and the level of independence of the transmission system operator and the independence of the Regulatory Authority for Energy (RAE). The market power of the partially state-owned incumbents, the Public Gas Corporation (DEPA) and the Public Power Corporation (PPC), constitutes a big impediment to effective competition. Unless it is addressed, effective competition is not conceivable and the benefits for consumers will be significantly diminished, even though the electricity and gas markets are now open on a legal basis. Increasing interconnection with neighbouring countries is an option to reduce the dominance of the incumbents, but domestic measures will need to be pursued with vigour to ensure the development of competition. A number of measures could be taken, such as prohibiting the participation of PPC in all future tenders for generating capacity, and/or setting a decree mandating the incumbent to reduce its market share to a certain level by a certain time.

PPC remains one of the two principal owners (49%) of the Hellenic Transmission System Operator (HTSO), and continues to own the network. DEPA will be the sole owner of the gas transmission system operator, DESFA, with DESFA owning the network. Over a 10-year period, DESFA's Board of Directors will be appointed by the Greek State. Full operative asset ownership and independence of the electricity and gas system operators is a prerequisite for effective competition. It may be preferable for the government to consider transferring HTSO and DESFA to 100% government ownership, not ruling out their later privatisation. Cross-shareholdings of electricity and gas incumbents also require close monitoring to avoid anti-competitive consequences for the markets. The government should be careful that such cross-shareholdings do not become a barrier to competition. With the enactment of the new market laws, RAE's responsibilities have been enhanced, but the regulator still continues mainly in its advisory role.

Consideration should be given to extend the RAE's powers to include those recommended for regulatory authorities in the EU market directives.

Greece suffers from a high level of local resistance and administrative barriers to new energy infrastructure. The government has introduced new laws for the simplification of the licensing procedure for Renewable Energy Sources (RES) systems, as well as for the industrial sector, including energy-related infrastructure (Law 3325/2005). In addition, the government is preparing a Special Spatial Plan focusing on areas of high RES potential, which will be completed at the end of 2006. In order for the Greek government to become sufficiently active in communicating its energy policy and the policy goals and constraints to the general public, Law 3438/2006 was recently passed in Parliament establishing the "National Energy Strategy Council".

The government is using energy pricing and taxation to achieve social objectives, such as equal cost of energy across the whole country. This practice distorts the energy market and it may also discourage energy efficiency efforts. Social policy objectives are crucial, but they can be addressed more efficiently through direct support.

Greece has made important and commendable progress in the sector of energy and environment policy but with +23.5% in 2003, greenhouse gas (GHG) emissions are already very close to the 2010 Kyoto target of 25% above 1990 levels. The National Allocation Plan was approved in 2005 and following the establishment of the registry in April 2006, Greece now participates in the EU-ETS. The government should assess the impact of the European Union Emissions Trading Scheme (EU-ETS), which is not considered in its national programme, and, if necessary, update the programme with supplementary measures. The Greek government should also consider addressing non-CO<sub>2</sub> GHG emissions.

There are no institutional arrangements or exchanges between the new energy statistics system and the national GHG inventory system under the United Nations Framework Convention on Climate Change (UNFCCC), even though the quality of UNFCCC GHG inventory system fundamentally depends on the energy statistics system. This can cause policy inconsistencies between energy policy and climate change policy.

Currently, Greece does not have a comprehensive energy efficiency strategy. Greek energy policy seems to be overly supply-side oriented, and stronger emphasis should be placed on the demand side. Greek energy demand is increasing, in particular in the transport and non-industrial sectors. While the energy intensity of Greece has stabilised after increasing to the level of the IEA Europe average, given the country's high economic growth, further efforts will be necessary to improve energy efficiency. Developing a comprehensive energy efficiency strategy with measurable objectives/targets, ensuring co-operation among relevant ministries, could help to balance Greek energy policy.

A reactive approach merely transposing EU directives may miss particular policy opportunities in Greece. Reducing the rate of increase and managing peak demand are the main challenges for future Greek energy efficiency policy, and it could be useful to consider more market-based instruments, including a more cost-reflective energy tariff to *e.g.* discourage demand at peak times. The introduction of a stronger building code in line with the EU Directive on Energy Performance in Buildings and its enforcement are also essential.

In Greece, the share of oil in total primary energy supply (TPES) and electricity generation is among the highest in the IEA, and needs to be reduced. The Greek government should, therefore, consider specific policies to reduce it. For example, Greece has recently made very significant and visible progress in the public transport sector, and tax incentives have encouraged renewal of the private car fleet. Efforts to introduce alternative fuels in public transport in Athens are commendable, and investment in such measures should be continued and increased. However, lower excise tax on road fuels, compared to other EU countries, and an absence of tax benefits for the use of fuel-efficient vehicles does not encourage modal shifts and reduces the incentive to further increase the fuel efficiency of the vehicle fleet. The government should introduce the EU vehicle label, linked to taxation.

The high level of market power in the refining sector could potentially cause problems in the future, and the government should continue to closely monitor the market. Widely diverging tax rates for light fuel oil use in stationary and mobile applications encourage tax evasion, and the government has taken various measures against this.

Greece has come into compliance with IEA stockholding requirements since the last review. This is commendable, and every effort should be made to ensure that stockholding requirements are complied with in the future.

Greek demand for natural gas has reached approximately 7% of TPES and is increasing. The successful penetration of natural gas into the energy supply in Greece is to be praised. However, gas supply in 2005 was considerably less than was forecast at the time of the last review in 2002, and the reason for this discrepancy is the failure to construct most of the planned natural gas-fired power stations. Particular consideration could be given to the prioritisation of natural gas infrastructure in spatial planning.

The effort to diversify supply and increase international gas interconnections is highly commendable. The new natural gas transmission pipeline with Turkey will be operational at the beginning of 2007, while construction of the gas interconnector between Greece and Italy is estimated to start in 2008. At the moment it appears that Greece will have overcapacity in import connections, and the government should ensure that the potential cost of excess investment in infrastructure will be passed on to the users of the interconnector according to a cost-reflective transit tariff scheme.

Greece has also made commendable progress in laying the foundations for the restructuring of the natural gas market. The full implementation of the liberalisation laws has the potential to increase competition in the Greek gas market. It is now important for the Greek government and RAE to focus on the rapid passage of the decisions which are required to implement the ministerial decree on the transportation tariffs of the Greek electricity transmission system in March 2006. With the increasing liberalisation of the Greek gas market, it is now a matter of urgency to increase the staffing at RAE's gas section.

To increase the coverage of the low-pressure gas network, long-term monopoly licences were given to three regional distribution companies in 2000, which cover a significant number of households, and approximately 10% of gas demand volume. Care should be taken that the planned establishment of three new regional gas monopolies (EPA) does not impede the development of retail competition. The EPAs are partially owned by a subsidiary of DEPA and the government should exercise vigilance in ensuring that full operational separation is preserved to enable them to develop into competitors to DEPA.

With 35% part ownership of DEPA by Hellenic Petroleum, the most important new entrant in the power generation market, PPC's option to purchase 30% of the shares of DEPA from government and PPC's "most-favoured" customer clause for its gas supplies from DEPA give rise to concern that the incumbents in the power sector would hold control over the fuel supply of their potential competitors.

With Greece's growing share of gas in the fuel mix, measures to ensure security of gas supply, including an emergency fuel switching plan and more storage facilities, will certainly become necessary in the future. From the viewpoint of short-term energy security, an emergency plan is needed in case international gas interconnections are affected by failure incidents.

Greek renewables development is positively affected by the country's very good resource potential. Greece's primary development in new renewables is in the wind sector, but care should be taken to ensure that other renewable sources are developed where they provide an economical alternative. A serious barrier encountered by renewables development in the past was a long licensing process of at least two to three years, tackled by the new law on renewables. The new law for the promotion of electricity production from RES was passed in Parliament in June 2006. The new regulatory framework provides for a simplified licensing procedure for the installation and operation of RES systems, a new set of prices for electricity produced from RES, with increased prices for power generated by photovoltaic and solar systems.

An area of serious concern is the low completion rate of renewable projects developments that have licences. A significant barrier is an absence of sufficient grid capacity. HTSO and the PPC have developed plans to reinforce the grid, in the next 4-year period, according to the "Electricity System Development Plan

2006-2010". A national campaign with the aim to raise public awareness and support of RES is soon to be launched throughout Greece.

Given Greece's very good wind resources, the government should analyse its optimal level of support. In areas with very good wind resources, the current level of the feed-in tariff may be too generous; it should be gradually reduced, capturing the benefits of the learning curve, and according to the new RES law, the duration period of the payment is set at 12 years. The risk of oversubsidisation could be further reduced by incorporating more market-oriented elements in the support scheme.

The main challenge for achieving competition in the Greek electricity policy is the dominance of the incumbent supplier, the PPC. Commendable progress has been made in setting the framework for the reduction of the dominance of the PPC in the future, including the exclusion of PPC in possible tenders for new generating capacity. However, these measures are not likely to develop sufficient competition in the Greek market. Because effective competition in generation has not emerged, the government may have to consider extending the restriction placed on the PPC when new power capacity is tendered. The RAE should be praised for its efforts to achieve progress in unbundling the accounts of the PPC. However, the independence of the HTSO from the PPC may not be sufficient under the current arrangement. Consideration should be given to transferring ownership of the transmission system to the HTSO.

Although the annual increase in electricity demand is only around 3%, the generation reserve margin is getting smaller, and the current plan for adding capacity through HTSO's tender falls short of this goal. Appropriate investment in transmission and distribution is also essential for security of supply. The capacity mechanism of the new electricity code is another measure and it is a positive development. The new code is also commendable in terms of market liberalisation and it will provide for more transparency of generation prices. The regulator and the government should carefully review the impact of the capacity availability certificates (CACs) on the electricity market, and be prepared to remove the mechanism once the generation shortage has been overcome.

At the moment, there is no incentive in the tariff structure to reduce consumption to help the system operator during peak demand times. Full demand-side participation by load customers in the daily market should be enabled. The RAE and the government should urgently consider the development of interruptible tariffs, and tariffs enabling the use of modern metering infrastructure in a market framework. Curbing demand growth is also essential to facilitate effective competition.

The island communities of Greece present another specific challenge to the country's energy policy. The inhabitants of the non-interconnected islands are paying the same electricity tariffs as the rest of Greece, despite the much higher cost of supply. The cost of this social service obligation is estimated at

four euros per MWh of electricity delivered. The requirement of geographically uniform tariffs, reinforced by the existence of sector-specific rebates, constitutes a cross-subsidy between different categories of consumers, resulting in non-optimal behaviour. Other measures, such as the taxation system, are often less distorting, both in economic and environmental terms.

Lignite, the main domestic fossil fuel resource of Greece, will continue to play a major role in the country's fuel mix in the future. Further potential exists to increase lignite generating capacity, and the government and the regulator should carefully consider introducing more advanced generation technology through retrofits or into new lignite power stations, where it is economically feasible. In terms of further developing competition, it may be an option for the government to consider allowing another operator to construct a power station using lignite from unopened deposits, for the exploitation of which a new bidding procedure is currently open.

It is a cause for concern that reliable and consistent energy R&D data seem to be missing. This situation does not allow the proper assessment of the impact of energy R&D. With relatively limited government resources, it may be necessary to further sharpen priorities in order to maximise the cost-effectiveness of government energy R&D programmes. A stronger focus on increasing the efficiency of fossil fuel conversion could contribute significantly to reducing the environmental impact from power generation in Greece. The development of R&D clusters is commendable, but the absence of private-sector involvement is a cause for concern.

## RECOMMENDATIONS

*The government of Greece should:*

### **General Energy Policy**

- ▶ *Reduce the dominance of PPC and DEPA to create true and effective competition in electricity and gas markets by setting a clear target and timetable for reducing the market share of the incumbents.*
- ▶ *Consider all possible options to reduce the dominance of the incumbent electricity and gas companies.*
- ▶ *To enhance regional security of supply and increase competition, further promote the establishment of new energy interconnections and increase the existing ones where this is economically advantageous.*
- ▶ *Ensure full independence of the electricity and gas TSOs from PPC and DEPA.*

- ▶ *Consider transferring DESFA and HTSO to 100% government ownership, not ruling out their later privatisation.*
- ▶ *Carefully monitor cross-shareholdings in the energy industry to prevent these from becoming an obstacle to competition.*
- ▶ *Further strengthen the power of the RAE by allowing it to make regulatory decisions, including the ones on regulated tariffs, and consider giving the RAE full powers envisaged for regulators in the EU Electricity and Gas Market Directives.*
- ▶ *Simplify licensing procedures not only for renewable energy projects but also other crucial energy infrastructure projects and specify them in spatial planning.*
- ▶ *Involve all the stakeholders in the formulation of the long-term national energy strategy, enhance its visibility and disseminate information on the national energy situation and future challenges to the general public.*
- ▶ *Ensure consistency between energy and environmental policies, and enhance the co-operation between relevant organisations.*
- ▶ *Establish organisational arrangements between the National Observatory of Athens (NOA), the Centre for Renewable Energy Sources (CRES) or other organisations to achieve effective co-ordination in data analysis, quantitative forecasting and policy evaluation activities for energy demand and supply and energy-related GHG emissions.*
- ▶ *Place greater overall emphasis and attention on energy efficiency and the demand side in energy policy-making.*
- ▶ *Pursue social policy objectives by means other than energy taxation and pricing.*
- ▶ *Continue efforts to improve the coverage, accuracy and speed of issue of Greek energy statistics.*

## **Energy and the Environment**

- ▶ *Reflect the evaluation results and implications of the National Climate Change Programme in the design of future programmes.*
- ▶ *Consider the introduction of stronger and more concrete GHG reduction policies in the residential, commercial and transport sectors, taking into account recent developments in Greek energy markets.*
- ▶ *Assess the impact of the National Allocation Plan (NAP) on the energy and industrial sectors and, if necessary, amend the ongoing Second National Climate Change Programme as soon as possible.*
- ▶ *Address non-CO<sub>2</sub> GHG emissions, in particular hydrofluorocarbons (HFCs) from cooling appliances.*

- ▶ *Ensure that the general energy statistics and UNFCCC National Greenhouse Gas Inventories are consistent.*

## **Energy Efficiency**

- ▶ *Formulate a comprehensive and clearly structured policy framework for improving energy efficiency with measurable targets as an integral part of a long-term energy policy strategy.*
- ▶ *Establish an effective monitoring system to achieve energy efficiency targets, and ensure that all programmes are evaluated objectively, preferably by a third party.*
- ▶ *Ensure the continued co-operation between all the ministries involved in energy efficiency in the development and implementation of such a plan.*
- ▶ *Ensure the speedy implementation of the EU Directive on the Energy Performance in Buildings by publishing the new building code and training sufficient numbers of building energy auditors.*
- ▶ *Consider the introduction of more market-oriented instruments. These could include cost-reflective energy pricing and information and awareness initiatives.*
- ▶ *Consider the removal of preferential tariffs for particular sectors and groups if these distort consumption behaviour.*
- ▶ *Utilise the experience from other countries in mandating energy suppliers to achieve energy efficiency targets.*
- ▶ *Introduce effective policies to reduce electricity demand at peak times.*
- ▶ *Develop a framework for the operation of energy service companies and energy efficiency auditors.*
- ▶ *Consider policies specifically addressed to reduce the Greek economy's heavy dependence on oil.*
- ▶ *Continue the efforts to achieve modal shifts, by e.g. improving public transport and transport infrastructure, and by introducing cost-reflective pricing.*
- ▶ *Introduce the EU vehicle label at the earliest opportunity.*
- ▶ *Consider the introduction of efficiency-related vehicle taxation, linking to EU vehicle labelling.*
- ▶ *Evaluate the possibility to further increase the use of alternative fuels in the public and private trucking and bus sectors.*

## **Oil**

- ▶ *Enhance and improve the national strategy for oil exploration and production, given the potential for discovery of domestic oil resources, e.g. by conducting a further licensing round for oil and gas exploration to establish the potential of new reserves in Greece.*
- ▶ *Monitor the refinery market to prevent potential abuses of market power.*
- ▶ *Consider a rapid introduction of already planned tax measures aiming to reduce fraud, and monitor the situation closely, preparing to introduce further tax alignments where these are required.*
- ▶ *Remove restrictions on the ownership of tanker trucks where these result in barriers to entry of new retailers and allow import terminals to move towards the most efficient operating regime.*

## **Natural Gas**

- ▶ *Continue to promote the development of critical gas infrastructure, such as pipelines, by e.g. prioritising them in spatial planning.*
- ▶ *Study the possibility to introduce zonal access charges to the transmission system.*
- ▶ *Strengthen the gas sector regulation division of the Regulation Authority for Energy.*
- ▶ *Evaluate the impact of the creation of new distribution monopolies on the introduction of retail competition in the gas sector.*
- ▶ *Ensure the independence of the existing gas distribution companies from DEPA, the Public Gas Corporation, to allow them to compete freely once the market is further opened.*
- ▶ *Remove the “most-favoured customer” clause between DEPA and the Public Power Corporation (PPC).*
- ▶ *Establish an emergency plan taking into account the projected demand increases for gas and the role gas will play in power supply in Greece in the future.*

## **Renewable Energy**

- ▶ *Reduce administrative barriers to renewables development by in particular:*
  - *Putting in place a one-stop shop for licensing renewables projects.*
  - *Establishing clear guidelines for authorisation procedures with a clear attribution of responsibilities to all institutions involved.*
  - *Establishing pre-planning mechanisms that require regions and municipalities to assign locations for renewables (spatial planning).*
  - *Introducing more simplified procedures for small projects.*

- ▶ *Ensure grid access and infrastructure availability.*
- ▶ *Optimise the current feed-in tariff scheme to improve cost-effectiveness, with a view to reflecting the technology learning curve and limiting the duration of the subsidy, while ensuring investor confidence.*
- ▶ *Consider incorporating more market-oriented elements in the national renewables support scheme, taking into account the experience of other countries.*
- ▶ *Develop renewables other than wind that could be appropriate for Greece, in particular geothermal, biomass, photovoltaics and biofuels, paying attention to their cost-effectiveness.*
- ▶ *Formulate a comprehensive strategy and policy framework for the introduction of biofuels in order to take advantage of their possible benefits.*

## **Electricity and Lignite**

- ▶ *Consider transferring ownership of the transmission and, later, the distribution network from PPC to HTSO, the Hellenic Transmission System Operator.*
- ▶ *Consider an option to further restrict PPC bids in future tenders for capacity in order to reduce its dominance.*
- ▶ *Ask PPC to offer plants scheduled for retirement to investors willing to prolong their life, where this is practicable.*
- ▶ *Ensure the availability of sufficient capacity at peak demand times by the preparation of a policy framework, including e.g. long- and short-term measures to reduce demand in peak load situations and increase grid capacity between northern and southern Greece.*
- ▶ *Ensure continued full cost transparency of the operation of the transmission grid.*
- ▶ *Consider leaving open the choice of fuel for power generation in future tenders for capacity.*
- ▶ *Carefully analyse the capacity development and adjust the capacity availability certificate mechanism to reflect the value of lost load and the probability of loss in the future.*
- ▶ *Develop tariffs for interruptible customers and full demand-side participation in the daily market.*
- ▶ *Ensure cost-reflective electricity pricing eliminating cross-subsidies among consumers, and evaluate the negative effects of geographically uniform tariffs.*
- ▶ *Ensure that future liabilities from environmental restoration continue to be taken into account in the price of lignite.*

- ▶ *Consider whether modern environmental control technologies for mining and using lignite in power stations allow the opening of new mines and power stations, and follow the development of such control technologies.*
- ▶ *Ensure full information disclosure of the costs of the lignite produced by PPC to increase transparency in electricity price formation, and allow potential non-PPC power station operators full access on commercial terms to PPC's lignite deposits.*

### **Energy Technology and R&D**

- ▶ *Develop and provide a detailed overview of priorities, funding, and actors in line with Greece's energy policy objectives.*
- ▶ *Develop clear criteria with which government R&D programmes are evaluated.*
- ▶ *Improve the collection of data on government R&D funding.*
- ▶ *Encourage the increase of the R&D capabilities of the private sector.*
- ▶ *Strengthen the research focus on reducing the environmental impact of fossil fuel use and increasing energy efficiency.*
- ▶ *Consider opportunities in joining IEA Implementing Agreements.*