

Since the last IEA in-depth review in 2000, there have been many positive developments in Portugal's energy sector. The Portuguese government decided in 2003 to restructure the energy sector. It set guidelines for energy policy associated with a demanding implementation plan. Natural gas is successfully penetrating the energy mix. Important political decisions have been taken to develop the Iberian electricity market. It has also been decided to fully liberalise the electricity market from July 2004. Oil prices have been totally liberalised. The regulator (ERSE) is functioning well with high independence and strong authority. A national action strategy to tackle climate change has been proposed and renewables are given high priority. Portugal is making efforts to tackle the many challenges in the years to come.

## SECURITY OF SUPPLY

The share of oil in Portugal's TPES was 62% in 2002 and has been decreasing over the last decade, but it is clearly higher than the IEA average of 41% (2001). Consequently, oil supply is very important for Portugal's security of supply. However, Portugal has frequently been non-compliant with its IEA obligation of holding oil stocks equivalent to 90 days of net imports since late 1992. This situation has been continuously addressed by the IEA and its members, as energy security in today's energy environment depends on solidarity. Positive decisions have been taken by the government but they still need to be fully implemented.

The government of Portugal should be commended for its efforts in the introduction of natural gas into the energy mix. Natural gas will reduce Portugal's high dependence on imported oil and will continue to diversify energy supply. While Portugal had been dependent on a single supply source (Algeria), the new liquefied natural gas (LNG) terminal has significantly enhanced security of supply both by allowing diversification of supply sources and by providing enough supply capacity for several years. Also the new underground storage facility enhances security of supply.

## ENERGY AND THE ENVIRONMENT

The EU Burden-Sharing Agreement under the Kyoto Protocol commits Portugal to limit its increase of greenhouse gas (GHG) emissions to 27% between 1990 and the first commitment period of 2008-2012. Since 1990 to 2001, GHG emissions grew by 36.4%, in line with GDP growth, but already 9.4 percentage points over the target. Even with the policies and measures in place, emissions are expected to stay above the final target. Therefore, meeting it will be a challenging task. Prompt introduction of new, strong policies and measures is required.

Furthermore, the baseline estimates should be reviewed when necessary to reflect the rapid growth in energy demand, in particular in the transport sector.

The introduction of the Climate Change National Programme (PNAC) will be particularly important and should include effective policies and measures with a clear implementation plan, time schedules as well as adequate funds for implementation. Careful monitoring of the trends and the effectiveness of policies, followed by a prompt policy response, is important. More attention needs to be paid to the cost-effectiveness of the policies and measures. Introduction of the EU Emissions Trading Scheme (EU-ETS) will be an important device to curb GHG emissions from the large emitters. Because the reference scenario shows that domestic measures are not enough to meet the target, the use of the Kyoto flexible mechanisms will be necessary. This is a sensible policy as the use of these mechanisms is likely to reduce the cost of achieving the target.

## END-USE EFFICIENCY

It is a matter of concern that since 1990, energy demand in Portugal has grown faster than GDP, thus increasing energy intensity. However, energy intensity remains below the IEA average, but the growing trend is in contrast with the trend in most other IEA member countries. While this is partly attributable to the improving living standards, there is potential in Portugal to improve energy efficiency. Better energy efficiency would also contribute positively towards energy security. Though significant new action has been taken recently to strengthen the policies, a more solid energy efficiency strategy is necessary. This should include measurable targets and thorough monitoring. The policies and measures to be included should be chosen on the basis of their cost-effectiveness.

The introduction of the EU-ETS could give a good incentive to large emitters to further improve their energy efficiency, but a new type of arrangement would be necessary for emitters not covered by the EU-ETS. Policies to de-link transport demand growth from economic growth need to be thoroughly explored and the process should be supported by effective co-ordination among different ministries.

## RENEWABLES

Portugal has a demanding indicative target to increase the share of renewables in electricity generation to 39% by 2010, and specific targets for several technologies. For this purpose, the government has relied on a feed-in tariff scheme which has the same impact as subsidies. Additional efforts are needed so that the required extra capacity will be built in time. The government should also seek to improve the current system so that the final consumers could benefit from the cost reduction through gradually reducing the feed-in tariff and limiting the duration of the buy-back period while ensuring investor confidence.

## GAS MARKET REFORM

The new challenge in the gas sector is market liberalisation and the announced intention to create an Iberian gas market. The incumbent supplier, GALP Energia, dominates the gas market from upstream to retail. It is commendable that the government has announced its intention to bring forward the beginning of the gas sector liberalisation from 2008 to 1 July 2004, even though the country has a derogation from the EU directive. Following this move, it is important to implement as soon as possible a regulatory framework which is clear, gives sufficient powers to the regulator and provides incentives for an efficient market. The third-party access tariff for networks needs to be set and should provide for fair, non-discriminatory and transparent access. One prerequisite for implementing these principles is effective unbundling of the supply and network operations.

## ELECTRICITY MARKET REFORM

The electricity market in Portugal has developed significantly since the last in-depth review, but remains dominated by Electricidade de Portugal (EDP). However, there are several initiatives to induce electricity market competition in Portugal and at the Iberian level. Increasing physical interconnections with Spain would improve competition and security of supply. The development of the natural gas network has increased the feasibility of independent entry into power generation in Portugal. Particularly, the political initiative to create a common Iberian electricity market is an important step in creating a competitive market but progress is behind schedule. The creation of the Iberian market requires adequate legislation in both countries to make them compatible but it is yet to be detailed and published. Furthermore, close monitoring of the prices and bidding behaviour of the major players in the Iberian market, particularly in terms of wholesale prices in Portugal, will be necessary.

The need to unwind the long-term power purchase agreements (CAEs) between Rede Eléctrica Nacional (REN) and main suppliers creates an important opportunity to enhance competition in the Portuguese market. One possible way would be auctioning the contractual obligations by REN to new suppliers, which would make more electricity available to new entrants. This would have the impact of reducing EDP's market share until a better interconnection can be achieved. However, the issue of concentrated generation in the Iberian electricity market can only really be dealt with at the Iberian level.

On 1 July 2004, Portugal plans to open the electricity market to all consumers in the country, as already exists in Spain. However, it is still uncertain that meaningful competition will develop quickly. Legislation and regulations will be needed to clarify the rules for small consumers to switch suppliers. While it is proposed to eliminate the regulated tariff option for all consumers, this

process should take place at the Iberian level, starting with the largest consumers and allowing for the existence of suppliers of last resort.

A policy of capacity payments, which places obligations on retailers to acquire more than sufficient capacity to supply consumers, has not been proven to be an effective or efficient policy to secure adequate supply. More efficient instruments should be considered. Enhancing the demand response of consumers to the market price of electricity would reduce the need to invest in new generating capacity while increasing the efficiency of the market and reducing price volatility.

## RESEARCH AND DEVELOPMENT

Given that Portugal is facing significant energy and environment policy challenges, the government needs to explore all possible means to respond to these challenges, including formulating an effective energy R&D policy. To implement such a policy, a coherent energy R&D strategy with adequate financing, as well as better co-operation between the different ministries and the research laboratories under them, are necessary. To increase the cost-effectiveness of energy R&D and to make better use of the results, it is necessary to improve monitoring and assessment mechanisms.

## RECOMMENDATIONS

*The government of Portugal should:*

### General Energy Policy

- ▶ *Continue efforts to diversify the energy mix and closely monitor progress to improve security of supply and enhance climate change mitigation and environmental protection.*
- ▶ *Enhance co-ordination of energy policy measures between the different ministries and appropriate organisations to take better account of energy in other policies and to increase efficiency.*
- ▶ *Involve all stakeholders, including consumers, in developing energy policies and disseminate information to them.*
- ▶ *Continue the close co-operation with the government of Spain to develop consistent policies for the Iberian energy markets. This includes electricity tariff schemes, the access and availability of natural gas, the allocation of CO<sub>2</sub> emission permits, and the policies regarding renewables and security of supply.*

- ▶ *Scrutinise the impacts of EDP's acquisition of GALP's gas supply and retailing activities on competition in the electricity and natural gas markets.*
- ▶ *Make sure that ERSE is given the necessary means to conduct its duties, also in the gas sector.*

## **Energy and the Environment**

- ▶ *Finalise the Climate Change National Programme (PNAC) and adopt a time schedule for the policies and measures with reasonable and achievable goals at each step. Periodically review on the basis of recent GHG projections and the progress of various policies and measures.*
- ▶ *Further examine the cost-effectiveness of climate change policies and measures.*
- ▶ *Clarify the role which Kyoto flexible mechanisms should have in meeting the emissions targets and accelerate the preparation for their utilisation.*
- ▶ *Increase the use of fiscal instruments to internalise the externalities related to climate change and air pollution.*

## **Energy Efficiency**

- ▶ *Establish an integrated national energy efficiency strategy as soon as possible. This should incorporate, at the national and sectoral levels, targets and strong cost-effective measures, including full implementation of the measures in the EU framework.*
- ▶ *Evaluate the cost-effectiveness and achieved energy savings of the energy efficiency projects.*
- ▶ *Enhance efforts to address the sectors not covered by the EU emissions trading scheme by, for example, the CO<sub>2</sub> tax and reimbursement in the case of taking appropriate measures such as more effective voluntary agreements and measures in the building sector.*
- ▶ *Curb energy demand growth in the transport sector by:*
  - *Decoupling transport activity growth from economic growth, considering a wide range of policies such as better urban planning, promoting teleworking, road pricing and modernisation of the economy away from transport-intensive activities.*
  - *Fostering more energy-efficient modes such as railways.*
  - *Encouraging car buyers to choose fuel-efficient cars and to retire old and inefficient cars by economic and regulatory measures, in particular vehicle taxation.*

## Fossil Fuels

- ▶ *Continue to evaluate the competition situation in the oil market.*
- ▶ *On the basis of the newly established emergency legislation and the new Stockholding Agency (EGREP), make all necessary efforts, together with the oil industry, so that Portugal will be constantly compliant with the IEA emergency stockholding obligation in the future.*
- ▶ *Maintain the policy for diversified supply sources of natural gas and the balance between pipeline gas and LNG.*
- ▶ *Phase out subsidies and tax benefits for natural gas.*
- ▶ *Finalise the regulatory framework for the partial market liberalisation in July 2004. Set the schedule for the next steps of liberalisation.*
- ▶ *Make sure that third-party access to the facilities, including the pipelines, the LNG terminal and gas storage, is on a fair, non-discriminatory and transparent basis.*
- ▶ *Closely co-operate with Spain to introduce an Iberian gas market, preferably in pace with domestic market opening, and present a realistic time schedule for the market players.*

## Renewables

- ▶ *Review the current feed-in tariff scheme in order to assure cost minimisation to consumers while ensuring investor confidence. Assess the benefits of incorporating incentives for cost reduction through gradually reducing the tariff level and the duration of the buy-back period. Also review the interaction of the feed-in tariffs and subsidies to determine when and which incentives can best be reduced.*
- ▶ *Assess progress towards a competitive renewable energy sector with a view to ensuring a stable investment environment until targets are met. Phase out the subsidies in the longer term when the different positive and negative externalities of renewables and other energy forms have been internalised.*
- ▶ *Continue efforts to streamline licensing procedures, including the environmental impact assessment, for renewable energy projects.*
- ▶ *Investigate the requirements of reliability and stability of the future electricity network, given the indicative goal of connecting large amounts of wind power to the grid.*

## Electricity and Co-generation

- ▶ *Finalise the new legislation to carry out the objective of creating an Iberian market and to open the market to all consumers.*
- ▶ *Ensure the development of adequate interconnection capacity and its fair allocation.*
- ▶ *Consider at the Iberian level a mechanism to increase competition in generation through the use of "virtual power plant auctions" to make the energy available to suppliers other than major Iberian players.*
- ▶ *Monitor price developments in the Iberian electricity market, and be prepared and able to act promptly should concerns about manipulation of electricity prices arise.*
- ▶ *Develop a timetable for the phase-out of regulated power supply tariffs at the Iberian level and consistent with the 2003 EU Electricity Directive.*
- ▶ *Monitor generation investment developments in the Iberian electricity market. Consider removing the capacity payment or, as a temporary measure, replacing it with a more efficient instrument.*
- ▶ *Encourage the development of demand response mechanisms to enhance the security of supply and decrease the volatility of electricity prices.*
- ▶ *Re-evaluate the feasibility of the co-generation target to ensure that it is based on useful heat demand. Improve the environmental performance of some co-generation projects by encouraging the use of natural gas instead of oil.*

## Research and Development

- ▶ *Develop a coherent energy R&D strategy with adequate financing to support energy policy objectives.*
- ▶ *Better monitor and assess the R&D projects.*
- ▶ *Improve the co-ordination between the different ministries involved in energy and related R&D.*
- ▶ *Improve the collection of data on governmental R&D funding.*