

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

The IEA in-depth review of the energy policy of the United Kingdom focuses on two major themes. The first is the market's ability to provide for security of energy supply or, alternatively, the need for government to play a more active role in guaranteeing reliable supply. The second is energy efficiency and the government's policies to curb energy demand. While the review covers the entire spectrum of energy issues, the greatest attention is given to these two themes.

The UK government has been a pioneer in many aspects of energy policy. It was the first country to liberalise gas and electricity markets through privatisation, competition and open access to networks. The UK case has been used as a model by numerous countries following in its path. The UK energy regulator, Ofgem, set the standard for qualified, independent regulators which are recognised as essential components of any competitive market. The UK was the first country to announce a major long-term carbon emission goal – 60% reduction by 2050 – and has been active in bringing climate change to the centre of global political discussions. The UK was also one of the first countries to develop a certificates obligation programme for renewable energy and is currently leading the way with a similar type of programme to support energy efficiency in the household sector. While there have been setbacks in some of these initiatives, the overall policy trend is a positive one. The government deserves credit for the fresh approach and new ideas it has brought to the energy sector.

The one overarching theme in these and other energy policy developments has been the use of the market to achieve policy goals. The UK is among those IEA countries that most rely on market actors, responses to price signals and private participation. Even when the government identifies a market failure (*e.g.* the negative externality of greenhouse gas emissions), it is quite likely to use a market-based instrument to correct it. This market approach has worked well for the UK and the government indicated it will continue with the same philosophy to meet future energy goals.

One of the primary challenges facing energy policy makers is energy security. This issue has numerous components based on several fundamental concerns, including: depletion of the country's oil and gas resources and resultant growing reliance on other countries to export to the UK; volatility in international energy markets – primarily crude oil; and ways to ensure the country does not suffer economically as a result. On the domestic front, energy security will require massive infrastructure investments in the next ten to

fifteen years. The most pressing infrastructure need is natural gas import facilities in the form of subsea pipelines and liquefied natural gas (LNG) regasification terminals. Additional infrastructure investment will be needed to replace the coming wave of power plant retirements, primarily nuclear and coal-fired plants.

The 2006 UK Energy Review

In July 2006, the government released "The Energy Challenge," the first report from its Energy Review launched in late 2005. The visit of the IEA review team to London and the writing of this review took place prior to the release of the Energy Challenge and, thus, most of this book concerns policies in place prior to the UK Energy Review. However, we do provide a brief summary and assessment of the July 2006 report below and have changed the text of the book in those areas addressed or likely to be changed by the ongoing Energy Review.

Based on the July 2006 report – a more detailed White Paper is expected in the first half of 2007 – the Energy Review does not represent a major shift in approach or philosophy for the UK. Instead, it reinforces the UK's use of the market to meet energy goals. While details of some programmes are still to be released, no dramatically new policy tools will be introduced. Market forces and market tools – individual decision-making, prices set by supply and demand, and active trading between market participants – will continue to factor heavily in all energy policies. The continued embrace of a market philosophy is shown in the following aspects of the review report.

For energy security, the government will:

- Promote more open and competitive international markets.
- Further develop a domestic market framework that is positive for investment and diversity of supplies and allows the private sector to make the necessary investment decisions.
- Remove barriers to nuclear power, but leave the private sector to initiate, fund, construct and operate nuclear plants, covering the full cost of decommissioning and waste storage.
- Create a framework to promote diversity, but leave the decision on how much gas the country uses to energy producers and consumers.

For GHG emissions reduction, the government will:

- Strengthen and expand the Renewables Obligation (RO), a market-based certificate trading scheme.
- Maintain an approach to energy savings that gives consumers more information and clearer incentives to make better use of energy, letting individuals take decisions.

- Consult on an emissions trading scheme for large non energy-intensive industries not covered by the EU-ETS and Climate Change Agreements.
- Work to develop the European Union Emissions Trading Scheme (EU-ETS) into a long-term international framework for pricing carbon.
- Press the European Commission to consider the inclusion of road transport and aviation in the EU-ETS.
- Have trials to determine the wider benefits of smart meters, testing their effectiveness in terms of reduced energy use and improved security of supply against cheaper options such as improved billing and real-time displays.

Although the IEA was unable to examine the details of the report, we would generally support its major tenets. In fact, many of the steps outlined in the Energy Challenge are consistent with the recommendations made in this in-depth review. Such shared conclusions include government plans to:

- Provide more certainty for market players on, among other areas, climate change, renewable energy and nuclear power.
- Look for ways to streamline the planning process for new energy infrastructure.
- Improve quality of energy-related data provided to the market.
- Provide framework for new nuclear plants and plan for dealing with legacy costs, but leave decision and financing of new nuclear plants to the private sector without subsidy.
- Expand energy-saving programmes to small and medium-sized enterprises (SMEs).
- Increase efforts to improve energy efficiency in the transport sector.

The natural gas supply problems in the winter of 2005/06 prompted some concerns about the market's ability to respond to tightening supply-demand balances in a timely fashion that avoids shortages. This report finds that the market is capable of providing adequate supply although the energy sector may occasionally face tighter supply-demand balances under a market-oriented system than under command-and-control. While such tightness will likely lead to temporary price spikes, the overall prices seen by consumers in the long run will be less in a market system. At the same time, trust in market mechanisms to provide energy supply in no way implies that the government has no role to play in energy security. The government must constantly monitor supply security and create an appropriate regulatory environment in which private players can act. Suggestions on further steps the government should take in this area are discussed below.

The winter 2005/06 represented an extraordinary series of events for the UK gas market: less domestic production, unutilised import capacity on the Belgium Interconnector and a fire at the Rough storage facility. Despite the combined effect of these events, there were no involuntary gas supply interruptions and the market continued to function well. In fact, it was the government's admirable restraint in not interfering with the market through price caps or other distortions that helped to spare the UK from shortages. Instead, high gas prices brought substantial demand reduction as users switched to other fuels or, more rarely, temporarily curtailed their gas-related activities. While colder temperatures would have further tested the system further, the demand response to high prices constituted an effective means of dealing with a highly unusual series of supply shortfalls.

The market also responded on the supply side with numerous initiatives for new infrastructure. Large investments in LNG regasification terminals, subsea gas pipelines, energy networks, domestic oil and gas production, and power plants are being planned to meet the country's energy infrastructure needs. While the majority will not be brought on line for several years, it appears that – despite sporadic delays in various projects – sufficient gas import infrastructure will be in place by the winter of 2006/07 to alleviate the supply tightness and price spikes of the winter, except in the event of extreme weather conditions. The government should continue to monitor these supply projects as well as the overall supply-demand balance for the winter of 2006/07.

- Although this report encourages the UK to maintain its core trust in the market as an important guarantor of energy security, there are still a number of steps the government should take to provide the proper framework:
- Provide as much certainty as possible for future policy directions.
- Improve availability and transparency of data on energy supply, demand and pricing.
- Allow demand to respond as much as possible to prices and/or supply tightness.
- Streamline the planning and consents process for new energy infrastructure.

Perhaps the primary action the government should take is to provide long-term clarity and certainty on policies affecting energy investments. This applies primarily to rules on GHG emissions, the treatment of nuclear power and long-term support for renewable energy. Uncertainty pushes investors to delay investment, which has important energy security implications. Providing policy certainty can be difficult, however. Government and political conditions are constantly evolving and over the lifetime of most energy infrastructure, these can be expected to change substantially. Nevertheless, there are steps

the government should take to provide more guidance for future policy. These include being as transparent as possible in setting long-term energy goals and ensuring that all objectives and targets are pursued to the end with changes only if absolutely necessary. As many issues involve international co-operation, the UK government should continue to work with other countries to create clear investment conditions and frameworks such as the future framework of climate change mitigation post-2012.

The UK Energy Review has attempted to provide this certainty. The Renewables Obligation (RO) has been strengthened and very strong language in support of a post-2012 climate change framework is included. However, the nuclear sector has benefited the most from added clarity and certainty. In addition to giving the general signal that the government would not oppose new nuclear plants, specific proposals include:

- Setting out a framework for the consideration of issues relevant to planning and new nuclear plant construction.
- Providing the basis for long-term waste management.
- Developing guidance for potential promoters of new nuclear stations.

At present, these proposals are too vague to provide the required certainty and will need to be clarified – especially for the financing of decommissioning and waste storage. Further information is expected in the coming months or in the White Paper released at the turn of the year. However, the approach seen in the Energy Review report represents a positive start in providing clarity to investors on nuclear while still leaving the investment decisions to the private sector with no subsidies, guarantees or other explicit government support. The government is urged to provide more details on these proposals as soon as possible.

The second step the government should take is to improve wherever possible the availability of information. While the UK energy market has a high degree of transparency vis-à-vis other IEA countries, and a great deal of information is already available, more should be done in this area. Market players will not add supply if they do not have good information on which to make decisions. The UK government recognises the benefits that greater information can bring. One of the recommendations in the Energy Review is for the government to introduce new arrangements for the provision of forward-looking energy market information and analysis relating to security of supply. We encourage policy makers to follow through on this sound initiative.

In the natural gas sector, a great deal of information is available on the flows through the interconnector and from the United Kingdom Continental Shelf (UKCS) production. However, greater focus on predicting future

production from the UKCS could be helpful. The Department of Trade and Industry (DTI) and the National Grid play an important role in assembling projections of future production from North Sea producers but they have no means to independently verify these projections. Further efforts to improve the quality of these projections would send signals to market participants about the coming need for gas supply infrastructure. In the electricity sector, three types of data could be made more readily apparent. The first would be the establishment of an actual market price of electricity. When the UK moved away from the electricity pool, policy makers expected that liquid forward markets would develop through commercial exchanges, including a day-ahead spot market. This has not materialised and, as a result, there is no clear market price that investors – particularly new entrants – can reference. The second way to improve information in the electricity sector is to extend the National Grid's electricity forecast. The current forecast of seven years is an excellent source of information to potential investors but it should be extended to ten years – matching the gas forecast – since many new power plants (*i.e.* possible nuclear or coal units) have development and lead times greater than seven years. The third area where more information would be helpful is real-time data on power plant operating status.

Information on the international energy sector would also be helpful. As the UK increases import dependence, knowledge of foreign activity will be increasingly important, especially in the natural gas sector. For example, problems from the winter of 2005/06 stemmed in part from actions taken on the continent and in Russia, together with the state of the global LNG market. The UK energy sector must adapt to the idea of greater interdependence with other countries and the government should play a role in facilitating that adaptation by providing relevant information on energy developments in other countries.

The third step the government should take is to create conditions where energy demand can respond to high prices. The winter of 2005/06 demonstrates how demand response is a key element to security of supply. The cost of supply infrastructure that meets demand under all scenarios is extremely high. While demand response is essentially a market decision taken by private consumers, the government has an important role in allowing that response to take place, particularly in addressing those market failures that dampen demand response.

A number of policy options are available in this area, the simplest probably being information campaigns. In periods of high prices and/or supply-demand tightness, the government should have a media campaign to alert people to the situation and encourage less energy use. The experience of the winter of 2005/06 – when many customers decreased demand even though their gas prices did not actually rise – shows how powerful public awareness can be. During the power shortfalls in California, media campaigns had even

more profound effects. Another possibility includes more directly exposing consumers to changes in the wholesale market prices and giving them the information and ability to change their behaviour accordingly. The Office of Gas and Electricity Markets (Ofgem) is already working on smart meters and is encouraged to pursue this, especially in light of the cheaper smart meters currently being used. Another way to trigger greater demand response is by linking retail rates more closely to wholesale rates for both gas and electricity. Government work in this area poses some challenges since the contracts governing tariffs are private. However, the government should encourage a greater number of customers to pay tariffs linked real-time to wholesale markets. Another possibility involves dual fuel-firing at power plants and industrial facilities. A factory that switches from gas to fuel oil during high gas prices not only gives itself lower fuel costs, but also decreases the use of gas, a highly valued commodity, thus lowering prices and increasing availability for other users.

The fourth step the government should take is to streamline the process for infrastructure projects to obtain the necessary planning consents. Many potential investors in infrastructure have delayed or abandoned plans owing to difficulties with planning permits and consents. Such projects include gas storage facilities, LNG terminals and wind plants. Difficulties and delays in making such investments hamper the ability of the market to respond quickly to demand and thus jeopardise energy security. Local communities can and should have a degree of permitting authority for new facilities. However, since these facilities benefit the country as a whole, the UK government has a role in ensuring that permitting is not unduly delayed. The Energy Review also identifies planning as a major issue to be addressed. It describes the planning barriers facing new energy infrastructure and begins to develop a more effective, better co-ordinated planning process for such projects. While more needs to be done to flesh out and implement these ideas, we commend the government for addressing this issue and encourage it to move swiftly to resolve it.

Concerning the second major theme of this review – energy efficiency – the UK government places a very high emphasis on this area and plans to continue using energy efficiency as a major tool in achieving energy goals. The team commends the UK's focus on the demand side as a crucial component of a sound energy policy.

The government has implemented a wide range of energy efficiency policies and measures in the household, business and public sectors. While such a wide range of measures and programmes may lead to complications, dispersion of resources and occasional bureaucratic infighting, it also allows each programme to specialise in a particular area and to operate more independently and, ideally, more effectively. The government manages this inherent tension relatively well. The wide range of measures also makes comparing the cost-effectiveness of each measure

more difficult, although the government has taken steps to address this problem through a Defra study released in April 2006.¹ Conclusions in the Defra study mirror analyses done in other countries, namely that efficiency and demand reduction measures generally offer more cost-effective solutions than supply-side measures. This validates the UK's focus on the demand side as a sound strategy. The government is encouraged to expand on such cost-effectiveness analysis and, more importantly, use it to determine the proper allocation of resources.

A major policy pillar in the household sector is the Energy Efficiency Commitment (EEC). Under the EEC, electricity and gas suppliers must achieve targets for demand reduction in the household sector by carrying out a combination of approved measures, including insulation, low-energy light bulbs, high-efficiency appliances and boilers. The programme's success can be attributed to various factors. First, putting obligations on a limited number of energy suppliers instead of numerous end-users has made system management relatively easy. Second, the regulator, Ofgem, publishes a list of pre-approved measures available to suppliers and how much energy savings each measure is worth. This simplifies the system and reduces administrative burdens for everybody. Third, there have been plenty of "low hanging fruit" for achieving the targets. Fourth, there have been various initiatives by the Energy Saving Trust involving consumers and manufacturers/retailers of energy-efficient equipments to supplement the EEC.

Despite its success, there are several challenges to be addressed in the EEC. First, given that low hanging fruit will be gradually exploited, broader measures such as microgeneration, behavioural changes and smart metering will need to be incorporated. At the same time, the government and Ofgem should ensure that such a wider scope will not result in unduly complicated and cumbersome administrative procedures. Of course, it is a challenge to broaden the scope while minimising administrative burdens. For this purpose, continuing the use of standardised and simple methodology for calculating energy savings from any newly introduced measure is essential.

In addition, the efficacy of incorporating social policy objectives in the EEC should be carefully evaluated. Currently, energy suppliers must realise at least half of their energy savings in the priority sector (*i.e.* low-income households). However, imposing such constraints likely reduces the overall cost-effectiveness of the system since attractive demand reduction in higher-income households may not be exploited. There is an equity issue to be considered. Since all consumers contribute equally to the cost of the EEC (through higher energy rates), supplier activity weighted towards upper-income customers would result in a subsidy from the less well-off to the better-off. However, EEC was launched as an energy efficiency programme and the 50% requirement hampers its

1. *Synthesis of Climate Change Policy Evaluations*, Department for Environment, Food and Rural Affairs (Defra), April 2006. Discussed more in Chapter 4.

ability to achieve its goals. While equity and fuel poverty are important issues, they can be pursued more effectively through more direct and targeted policies that are not incorporated in the EEC programme itself.

Improving the energy efficiency of large non energy-intensive industries and small and medium-sized enterprises (SMEs) is a challenge. The household sector has the EEC, as well as fuel poverty programmes for the disadvantaged, and the energy-intensive users have the Climate Change Levy (CCL), Climate Change Agreements (CCAs) and the EU-ETS, but there are fewer programmes for medium-size consumers. Increasing government efforts to fit energy users that fall between these two groups could be a cost-effective way to reduce demand. The Carbon Trust has proposed development of a new emissions trading scheme for large non energy-intensive industries and expansion of the EEC to SMEs. The Energy Review 2006 appears to favour the emissions trading option with the goal of reducing emissions by 1.2 MtC per year by 2020. The Review proposes an Energy Performance Commitment whereby some 5 000 organisations such as supermarket chains, hotel chains and government departments are required to participate in a trading scheme. Consultations and final decisions are expected during the first half of 2007. We caution the government to the complexity of such a trading scheme and encourage it to keep the minimum size of mandatory participants sufficiently large, so as not to unduly burden small companies that lack the resources and expertise to be active in such a scheme. The expansion of the EEC to SMEs should remain a possibility in the consultations. While this would also raise the administrative burden for participants and government, the success of the EEC in minimising such costs so far suggests that these challenges could be overcome. Another solution could be to expand the scope of CCAs to non energy-intensive industries and SMEs.

The government should do more to improve efficiency in the transport sector which has the highest rate of energy growth in the UK. While the government, largely through the Department of Transport, has a number of programmes to address transport energy demand, these efforts are not as substantial as those found in other sectors. In fact, efficiency transport measures at the Energy Savings Trust have recently been curtailed. The recent budget announcement that the vehicle excise duty (VED) will be further differentiated by vehicle efficiency is welcome but the sums involved remain minor and thus unlikely to have a great effect. For example, the introduction of a higher band of VED for the least efficient cars set at GBP 210 will only sway a small number of car buyers when considering the purchase of a vehicle that is already extremely expensive. In addition, shielding customers from high and/or volatile oil prices by deferring agreed, inflation-based tax increases – in effect lowering the real level of the tax – acts to increase transport demand at the exact time it should be reduced via a market response to price pressures.

The congestion charge in London is an innovative approach to traffic management. While not intended primarily as a means of curbing transport energy use,

it does make operating a motor vehicle more costly and thus encourages environment-friendly travel such as public transport and bicycles. This provides a good example for other countries, a number of which are looking into similar programmes. While such congestion zones only make sense in large urban areas and their impact would be minimal on a national scale, the congestion zone nevertheless shows how transport projects aimed at easing traffic flow and improving the quality of life can, and normally do, also reduce energy demand. In this way, reducing transport demand should very much be a goal in all transport planning such as the the Department of Transport's (DfT) activities related to its 2004 White Paper, *Future of Transport: A Network for 2030*.

RECOMMENDATIONS

The government of the UK should:

General Energy Policy

- ▶ *Continue its stated and actual commitment to competitive energy markets as the primary tool for achieving energy policy goals while ensuring a clear and predictable framework for all market participants.*
- ▶ *Clearly define ways to achieve long-term emissions reduction targets in order to reduce uncertainty and to facilitate investments in supply infrastructure needed to ensure security of supply.*
- ▶ *Clarify further and provide more details on the investment framework for nuclear power, particularly in the treatment of nuclear waste and decommissioning for new and existing plants.*
- ▶ *Further improve the availability and quality of data on energy supply, demand and prices to better enable the market to meet security of supply objectives.*
- ▶ *Seek ways to accelerate planning and licensing procedures for new energy infrastructure.*
- ▶ *Continue to evaluate the long-term implications of the coming new wave of electricity generating stations in terms of both the effects of long-range carbon reduction objectives and potential over-reliance on certain fuels and technologies (i.e. gas-fired combined-cycle gas turbines).*
- ▶ *Ensure careful co-ordination between the various departments and authorities with responsibilities for energy and environment-related policy.*
- ▶ *Continue to take a proactive role in the full implementation of the EU internal energy market while at the same time considering the implications of possible delays in this process for the UK energy policy.*

Energy and Climate Change

- ▶ *Develop a clear and streamlined strategy to achieve its objective of reducing carbon emissions by 60% by 2050.*
- ▶ *Follow through and expand on analysis of the relative cost-effectiveness of the wide variety of measures brought forward in the Climate Change Programme 2006. Concentrate policies in sectors where emissions can be reduced the most and at the lowest cost.*
- ▶ *Carefully consider the ongoing use of multiple instruments (e.g. Climate Change Levy, EU Emissions Trading Scheme and Renewables Obligation) to reduce emissions from electricity generation.*
- ▶ *Avoid any overlaps in coverage between the Emissions Trading Scheme (ETS) and installations covered by Climate Change Agreements in phase 2 of the ETS.*

Energy Efficiency

- ▶ *Ensure that energy efficiency policies will be pursued not only from a climate change perspective but also from broader energy policy perspectives, including security of supply concerns, through close co-ordination between, the Department of Environment and that of Transport.*
- ▶ *Expand the cost-effectiveness analysis of energy efficiency policies and reflect the outcome in the portfolio of efficiency measures.*
- ▶ *Further improve the Energy Efficiency Commitment (EEC) by incorporating a wider range of measures, with the scope of promoting innovative energy efficiency technologies, while striving to simplify administrative procedures as much as possible through developing standardised methodology for calculating energy savings.*
- ▶ *Consider a tax incentive for households to supplement the effectiveness of the EEC.*
- ▶ *Reconsider the effect of ring-fencing 50% of EEC investment for priority groups on the overall cost-effectiveness of the programme and compare this with more direct and targeted measures to reduce fuel poverty.*
- ▶ *Examine experiences of White Certificate schemes in other countries and consider the feasibility of such a scheme in the UK.*
- ▶ *Increase predictability of future development of building codes, for example through advanced notice of proposed changes. Consider a time frame to incorporate the Code of Sustainable Homes in the building code.*
- ▶ *Improve enforcement of the building code by local authorities.*

- ▶ *Enhance the availability and quality of energy efficiency data in the household sector.*
- ▶ *Look for ways to fully include non energy-intensive industry and SMEs in the government's efficiency efforts, for example by expanding the EEC to allow suppliers to realise savings in the commercial sector, or by expanding the scope of Climate Change Agreements (CCAs).*
- ▶ *Take appropriate measures to capture energy efficiency potential in the sectors not covered by EU-ETS, CCA or EEC.*
- ▶ *Pursue additional means of curbing transport energy demand, and consider taxation, integration of demand concerns in a larger transport planning framework and other measures.*

Renewable Energy

- ▶ *Check for oversubsidisation of renewable energy technologies receiving high prices for Renewables Obligation Certificates (ROCs) and electricity prices as well as capital grants or other schemes.*
- ▶ *Look for lessons from other countries where renewables certificate schemes have achieved desired compliance rates at costs below current UK conditions.*
- ▶ *Examine more fully the costs and benefits of biofuels, including accurate assessments of carbon savings and benefits to national and global supply security coming from decreased oil demand.*

Electricity

- ▶ *Closely monitor the development of vertical integration of retail and generation in relation to the impact on competition and liquidity.*
- ▶ *Continue efforts to make fundamental information and analysis on supply and demand readily available to the market in order to ensure the investment environment is as transparent as possible.*
- ▶ *Consider ways to improve the framework for enhanced electricity market liquidity and enable the establishment of a strong reference price, e.g. through:

 - *Working with the regulator Ofgem to adjust the pricing principles in the balancing mechanism with particular attention paid to the impact on the ability for new independent market players to take positions in the market.*
 - *Extending the locational signals, currently embedded in the network charges for generation, to traded electricity in the balancing mechanism in order to enhance transparency in the real-time wholesale pricing of electricity.**

Fossil Fuels

- ▶ *Increase resources to provide reports on the crude oil and natural gas sectors, particularly on the likely future production, to provide the best possible signal to investors in the gas supply infrastructure.*
- ▶ *Ensure an upstream fiscal regime that stresses predictability in order to meet the twin goals of promoting investment and achieving a balance between oil producers and the country's interest.*
- ▶ *Examine the conditions required to encourage more natural gas storage, removing obstacles as much as possible, given the growing import dependence and the expected increase in gas-fired electricity generation.*

Nuclear Energy

- ▶ *Clarify the UK position regarding nuclear energy and, if applicable, establish a legal and regulatory framework for potential investors to assess with a reasonable degree of confidence the short- and long-term risks and benefits of building a new nuclear unit.*
- ▶ *Define a national policy covering the disposal of all types of radioactive waste and take steps towards its implementation to allow the industry to assess and fully internalise corresponding costs for existing and, if applicable, future nuclear power plants and fuel cycle facilities.*
- ▶ *Provide a robust and stable scheme for the accumulation, management and control of a fund for covering future financial liabilities (decommissioning and waste disposal) for existing and, if applicable, future nuclear power plants and fuel cycle facilities.*
- ▶ *Assess the adequacy of education and training for developing the human resources/qualified manpower needed to ensure the safe operation and decommissioning of existing nuclear units and, if applicable, the licensing and operation of new units.*

Energy R&D

- ▶ *Clearly define the government's role in the development and innovation of energy technologies with a view towards promoting a more active role in support of research, development, demonstration and deployment of energy technologies.*
- ▶ *Develop a strategy for energy RD&D consistent with energy policy goals.*
- ▶ *Consider an increase in the government budget for research and development to align it more closely with that of other IEA member countries.*

- ▶ *Improve the oversight of public and privately funded RD&D (actors, funds, technologies) to enable the design of more cost-effective RD&D programmes and avoid overlap.*
- ▶ *Improve co-ordination between funding and priority-setting entities of public-funded energy RD&D programmes.*
- ▶ *Promote the role of the private sector in the definition and implementation of RD&D and continue to involve business in the design and targeting of public technology policy.*
- ▶ *Remain active in international collaboration to share technology development costs with other countries and to deal with problems that are essentially global, requiring significant funding over a long period of time.*