

EXECUTIVE SUMMARY AND KEY RECOMMENDATIONS

EXECUTIVE SUMMARY

During the past five years, important developments have taken place that have affected the United States' energy policy. The new Energy Policy Act, EPAct 2005, is the first comprehensive energy policy act since 1992 and has set important new directions in the area of clean energy use. There is increasing public concern about global warming caused by anthropogenic CO₂ emissions. New and expanded RD&D programmes have been implemented to support the development and deployment of clean energy technologies such as coal-fired power stations with carbon capture and storage (CCS), solar photovoltaics, and next-generation nuclear plants. Nevertheless, important challenges remain for energy policy makers to address.

There are two key issues now affecting all debates on the future energy supply of the United States. One is how to increase energy security by reducing the currently growing dependence on imported supplies. The other is how to address growing emissions of greenhouse gases (GHGs), notably whether and how to introduce a consistent value on CO₂ emissions. These two challenges are closely connected. The United States is the only major IEA member country where the share of fossil fuel consumption in total energy supply is expected to increase and one of the few without a policy designed to internalise the external cost of CO₂ emissions.

At present, the United States is moving to address these two challenges, in large part through the development and deployment of cleaner energy technologies. In the area of energy R&D, the United States is a world leader in many technologies, and has contributed greatly to the development of new and advanced energy technology. It is today the largest provider of funds for research into new technologies in the world, and is driving the development of technologies relating to CCS, second-generation (such as cellulose-derived) biofuels, and fourth-generation nuclear power stations. It also has substantial R&D efforts under way to improve the fuel efficiency of vehicles and lower the costs of renewable electricity sources such as wind and photovoltaics. Substantial financial support is available at the federal and/or state level for the deployment of some of these technologies. The potential medium-term global impact of programmes, such as FutureGen or the Hydrogen Initiative, is very high, and the United States government has done well in taking a lead in these

and other technology projects. Of particular interest is the well-funded Climate Change Technology Program, authorised by EAct and guided by a recently released visionary strategic plan. The multi-agency nature of this programme, by its design, should help to integrate research on technology across organisational boundaries.

But thus far, no comprehensive federal government action is planned to place a value on CO₂ emissions, leaving industry facing uncertainty about project development decisions that may be affected by the introduction of such a policy. Individual states, such as Colorado, have already moved ahead, applying a shadow price for CO₂ in project appraisals, while others are considering developing different regulatory mechanisms to value CO₂ emissions. The view expressed now by a number of stakeholders in the US energy sector is that an explicit pricing mechanism for CO₂ is a question of "when, not if", and that it will be required to bring forward clean technology investment. The uncertainty generated by this expectation is holding back investments in new technologies and projects that are urgently required by the United States' economy, such as refineries and power stations. While the established policy of decreasing GHG emissions intensity in relation to gross domestic product (GDP) has been successful, the time may now have come for the government to pursue more aggressive policies regarding GHG emissions reductions.

A further source of uncertainty is the lack of close co-operation on this question between the government institutions in Washington, most importantly the Administration and the Congress, and between the federal government and the states. In Washington, the different policy agendas and the approval procedures for energy R&D funding are hampering the smooth long-term development of solutions to the energy challenges in the United States. For example, the periodic lapse of the tax credit for wind power production has caused sharp fluctuations in investment. In some regions, difficulties in co-ordinating federal and state roles have caused delays in developing important infrastructure, such as LNG terminals, in opening up new areas of the outer continental shelf (OCS) for exploration and production, and in developing new unconventional resources of oil and gas in the Rocky Mountain states. It will be of high importance for the development of these technologies, projects and resources that closer co-ordination between the federal and state governments will develop to help ensure that regulatory oversight is streamlined, while still recognising the state concerns that only sound, cost-effective projects should go forward in an environmentally sustainable manner.

One such area where the country could benefit from federal guidance is in renewables, where 25 states and the District of Columbia have now established renewable portfolio standards (RPS), using differing design principles and goals. These policies, together with the federal tax credit

for wind power production, have helped the United States renewables industry to grow considerably, in particular in the area of wind power generation, but the different standards are also imposing a cost on the economy through their lack of consistency. The federal government has stated that it has no intention to introduce an RPS for electricity, and has only outlined relatively modest goals for the contribution of renewables to future electricity supply, a policy different from that in vehicle fuels, where a federal standard has been established with EPCA 2005. The federal government's concern is that establishing a uniform federal power standard may not be appropriate because of the significant geographical variations in renewable resource endowments. On the other hand, trading green certificates across state borders, to the extent that transmission capacity permits, would help to overcome this perceived barrier, as has been seen in other IEA member countries. The federal government should, therefore, consider the establishment of a federal electricity RPS covering the whole of the United States, to mirror the policy in the transport fuels sector, taking into account cross-border trade of electricity. As a minimum, it would be useful to establish at least a common basis for the design of RPS across the country, to ensure their compatibility, and to establish a federal registry for RPS credits, so that they can be traded nationally.

There is a major policy gap with respect to the promotion of energy efficiency, even though there are strong federal programmes to boost the energy efficiency of buildings and appliances as well as industry, which have had some effect. More could, however, be done to encourage greater efficiency in electricity generation, and very significant room remains for speeding the introduction of efficiency improvements in transport, which would immediately contribute to energy and environmental security. Addressing the gaps on the demand side is one of the most important challenges faced by United States energy policy overall, not just efficiency policy.

In the transport sector, reducing fuel demand through more efficiency will increase security of supply by reducing import dependence, and lower CO₂ and other emissions. Bringing fuel efficiency standards to levels more in line with other countries would significantly reduce growth in oil demand and thereby help energy security, and relieve the tightness in international oil markets. The current proposals for an increase in the vehicle fuel standards will eventually boost fuel efficiency substantially. However, they will take effect gradually, leaving United States consumers with vehicles that are far below the fuel efficiency standards in other IEA member countries and even in important non-member countries such as China and India. At the same time the current proposals, compared to the impact of bolder action, will increase the cost of achieving the ambitious goal of switching the consumption of a significant amount of traditional gasoline to biomass-derived gasoline.

EPA Act 2005 contains a commendable range of supply measures to stimulate the exploration for, and production of, oil and gas, both from conventional resources offshore and unconventional resources, as well as to encourage investment in refining. Because of difficulties in aligning federal interests and a diversity of state interests, little progress has been made in opening further areas of the OCS, which are expected to contain significant amounts of recoverable resources. It will be an important contribution to the future security of supply in the United States to find the compromises required to open these areas to environmentally sustainable exploration and production.

The introduction by the Environmental Protection Agency (EPA) of the Clean Air Interstate Rule and the Clean Air Mercury Rule are commendable moves in the absence of legislative action. Nevertheless, creating a firm legislative basis for the introduction of a more stringent air pollution framework is an important task for the Administration and Congress.

Natural gas use is rapidly growing in the United States, in particular in power generation, where it has now overtaken nuclear to become the second most important generation source. The growing use of gas, however, has placed increasing demands on constrained domestic supply, driving natural gas prices to historically high levels, to an extent that market pressures are now driving down demand for this clean fossil fuel. The growing demand has also started to change the dynamics of the United States' gas market, exposing it to international competition and pricing. Increasing imports from diverse sources may nevertheless be an option to bring down prices in the longer term, and a number of new liquefied natural gas (LNG) terminals, both in the United States and close to its borders, have been opened or licensed, but further diversification of import routes for gas is desired. The 2002 Hackberry LNG terminal decision by the Federal Energy Regulatory Commission (FERC) was a most important and commendable decision in enabling this investment to go ahead. Investment in LNG terminals should also be geographically diversified, by trying to locate as many terminals as possible outside the Gulf of Mexico region. Such diversification is a development which can only happen when regional or local interests are balanced with national interests. Strong local opposition in many regions hampers diversification, and needs to be addressed in a constructive manner.

Coal is an important fuel in the United States, representing half of the nation's electricity generation, and contributing in particular to the economies of the western states. In order to ensure a continued role for coal, even in a time of more stringent environmental requirements, it will become necessary to move towards cleaner and advanced technology for coal combustion. While gasification is one possibility, important efficiency increases can be realised by more widespread use of ultra-supercritical pulverised coal technology, which

is well proven in other IEA member countries. This would reduce emissions from coal generators by up to 20%, compared to pulverised coal technology, without requiring the introduction of unproven technology. Coal in the past has also benefited from up to USD 2 billion per year government subsidy through the synfuel tax credit, which is now commendably being abolished. The government should consider using this money to support low- and zero-emission coal technologies to allow coal to compete in its own right against alternative fuels such as natural gas, renewables, and nuclear.

With the increasing use of electricity in all sectors of the economy, it is vital to take steps to improve generating efficiency and reduce power-sector CO₂ emissions. In recent years, despite a doubling of highly efficient gas-fired generating capacity, there has been more intensive use of coal-fired capacity, due largely to fuel cost differentials as gas prices have increased sharply and a carbon value on fossil fuels has not been imposed. More aggressive steps need to be taken to encourage more efficient use of fossil plants in the generating mix and the use of best available technology for new coal plants going forward. The lack of a meaningful increase in the efficiency of power generation is contributing to a continued high ratio of emissions to GDP in the United States, and is in the medium to long term threatening the goal of the government to reduce emissions intensity.

The United States has traditionally played an important leadership role in the world in the area of competition. Nevertheless, its electricity markets have experienced a retreat from market reform in recent years. In order to ensure that consumers are paying competitive rates for electricity in the future, FERC and the federal government should continue to push state regulators to further open up markets. In the area of transmission investment, the 2003 blackout clearly showed the weaknesses of the transmission systems. The establishment of a reliability organisation and mandatory reliability standards in response to this event is very commendable. Encouraging adequate transmission investment in competitive markets is an important and continuing challenge for the industry and the regulator, not just to increase system reliability, but also to enable these markets to work effectively and to allow the most cost-effective investments in electricity generation to go ahead.

A nuclear renaissance in the United States is now not only possible, but likely. This is very welcome. Nevertheless, the first new plants will not enter service until at least 2015, and then only in small numbers. There is competition by a number of consortia to gain from the provisions of EAct 2005 supporting new nuclear construction. It will be important for the United States energy supply to follow through on this significant interest, by developing a framework that will allow the market-driven construction of new nuclear plants beyond the first few units of capacity for which generous support mechanisms were included in EAct 2005.

KEY RECOMMENDATIONS

The government of the United States should:

- ▶ *Reduce fossil fuel dependence and GHG emissions by pursuing more aggressive demand-side and clean energy policies. In particular, introduce policies that go beyond those currently proposed to increase the efficiency of the power, transport and building sectors.*
- ▶ *Consider the introduction of a consistent value for CO₂ and other GHG emissions to speed the more rapid introduction of clean energy technology projects and reduce investor risks.*
- ▶ *Pursue closer co-ordination between Congress, Administration, and state governments, as well as between executive and legislative branches of the federal government, in order to ensure that energy policy challenges facing the country are addressed in a consistent manner.*