

PIU ENERGY POLICY REVIEW

SUBMISSION BY POWERGEN

SUMMARY

- where possible, energy markets should be allowed to deliver the Government's wider energy policy objectives, but will not always be able to do so;
- the Government should retain or acquire the ability to steer markets in a way which will achieve security of supply as well as environmental objectives;
- the UK should retain a significantly higher capability to generate electricity from coal than envisaged in Energy Paper 68 as the most effective means of mitigating growing dependence on gas;
- this can be achieved without risk to the Government's Kyoto protocol commitments, provided the CO₂ emission reduction measures in the UK Climate Change programme are delivered; it is therefore important that the Government's renewable targets are met; premature closure of AGR plant should also be avoided;
- co-firing of coal-fired capacity with biomass and waste will enable it also to make a contribution to CO₂ emission reduction and should be encouraged; we welcome the provision for this in the Renewables Obligation Statutory Obligation, although the proposed restrictions on this are too inflexible and may inhibit investment;
- the main constraint on UK coal-fired generation is the implementation of the EU Large Combustion Plants Directive; the Government must implement this in a way which does not prejudice the contribution of UK coal plant to fuel diversity;
- investment in electricity distribution networks supports the range of the Government's energy policy objectives; more investment is required to maintain adequate supply continuity beyond the timescale of the current distribution price controls, to support the Government's objectives for embedded generation, and to enable distributors to move toward the more active system operational role that this will require.

Introduction

1 Powergen is an Anglo-American energy company and one of the UK's leading integrated electricity and gas businesses. Its UK operations are focussed on electricity generation and distribution, electricity and gas trading and the supply of electricity, gas, telecommunications and other services to residential and industrial customers. It currently generates about 10% of UK electricity requirements from a mix of coal, gas, oil, renewable and combined heat and power plants.

2 In this note, Powergen provides its high level response to the issues raised in the PIU project scoping note published in June 2001. Additional scoping notes on specific issues have been published during August and Powergen will provide more detailed responses to some of the questions raised in these.

3 During the 1990s the Government's energy policy objectives have coincided with market developments. The availability of cheap gas for power generation coupled with the development of efficient, modular, CCGT technology have been key factors in the growth of the use of gas for power generation which has contributed to

lower CO₂ emissions, increased diversity, and increased competition. The regulatory regime focussed on the promotion of competition and cost reduction in network operations.

4 The PIU review is timely as it is increasingly unlikely that energy markets, left to themselves, will deliver outcomes consistent with the Government's energy policy objectives. There are also potential conflicts between the Government's wider policy goals and the objectives of independent regulators, particularly in network regulation.

5 Powergen's submission deals with:

- the nature of the energy policy framework, the role of markets and the need for Government to retain the ability to steer markets;
- the need to maintain adequate diversity of fuel supply in power generation, given the UK's growing dependence on gas, and how potential conflicts with environmental objectives can be reconciled;
- the requirement for additional investment in energy network investment to support the whole range of Government energy policy objectives;
- implications for retail markets.

Energy Policy Objectives

6 The Government has rightly identified security and diversity of energy supply, environmental objectives (particularly the reduction of CO₂ emissions) and internationally competitive prices as key objectives of energy policy.

7 Wherever possible, energy markets should be allowed to deliver these objectives. This will help ensure they are delivered in the most efficient manner. Markets should continue to play a key role in delivering Government energy policy. Certainly markets, coupled with RPI-X regulation of network operations, have been highly effective in delivering lower prices.

8 However, it is unlikely that markets will be able to deliver all the Government's objectives. In particular they may not be able to deliver security of supply or environmental objectives, achieve the right balance between these and competitive prices and reconcile the conflicts which exist. This is because the costs of failure to meet environmental or security of supply objectives are not borne by market participants.

9 The Government has recognised explicitly that markets cannot deliver environmental objectives and has intervened in a number of ways. Markets can to some extent factor in security of supply concerns but are likely to attach a premium to short term delivery against contractual obligations. The risks to market participants of interruptions in supply over longer periods are significantly less than to society as a whole. Furthermore, market participants will assume that the Government will intervene to deliver supply security whether it has stated that it will or not.

10 On the other hand direct Government intervention to specify required energy outcomes is likely to be too inflexible and will inhibit competition. This suggests that the Government should retain or acquire the ability to steer markets to achieve both

security of supply and environmental objectives, where they appear to be at risk, and to be able to respond flexibly to developments. It should also seek to ensure that the regulatory framework operates in a manner consistent with these objectives.

11 As the UK becomes increasingly integrated within the EU electricity and gas markets and at the same time becomes increasingly dependent on external sources of fuel, particularly gas, the UK Government may be able to exert less influence over energy market developments. This reinforces the need on the one hand to continue to play an active role in EU energy policy and on the other to ensure that the UK's own energy infrastructure is robust to uncertain external developments in the price and availability of fuel.

Fuel Diversity and Environmental Objectives

12 Diversity is an important element in achieving security of supply and can also contribute to lower prices over time by reducing reliance on a single fuel source, supplier or delivery route. This means access to a range of economically priced fuels from a range of suppliers and the reliable delivery of energy across networks. The value of alternative sources for power generation is also affected by the flexibility and predictability with which power can be delivered to consumers.

13 Over the next ten to fifteen years, the most significant variable affecting the UK's fuel mix is the relative contribution of coal and gas-fired generation. This variable is determined not only by international fuel prices which are largely outside the control of the UK policy machine but also by the nature of environmental restrictions on emissions of sulphur dioxide and nitrogen oxides from coal-fired plant over which the UK has more influence.

14 Over the next ten years, gas is predicted to remain the largest single source of fuel for power generation and under the DTI low gas price scenario will provide the majority of the UK's power by 2005. The continued increase in gas-fired generation will reduce fuel diversity with the system set to become less diverse in 2020 than in 1990 with gas replacing coal as the dominant fuel. Also, taking energy consumption as a whole, the domestic, service and industrial sectors of the economy are likely to become increasingly reliant on gas, with domestic consumers particularly vulnerable. This arises in part from the increasing integration of the power and gas markets as electricity supplies are increasingly sourced from gas-fired power generation as a result of which the UK electricity and gas system is best regarded as a single integrated network.

15 The vulnerability of the system to interruption will increase as both gas and power (unlike coal) are delivered 'just in time' and a significant disruption to gas supplies will affect power generation as well as direct gas consumption within hours. The vulnerability of the UK to just in time energy supply was illustrated by the fuel blockades in September 2000.

16 Increasing reliance on gas is not necessarily a problem in itself provided the sources of supply and the infrastructure to deliver gas are robust. However, the UK's gas supplies may become less robust because:

- by 2010, the UK electricity and gas system will be vulnerable to the failure of one of the two major gas terminals as gas accounts for a larger proportion of power generation and the UK becomes more reliant on imports; the loss of St. Fergus in particular could lead to a serious shortfall in gas during winter peak leading to an interruption of gas supply to most or all CCGTs;
- the UK will become increasingly reliant on gas imports from outside the EU and will become more exposed to international variations in price whether arising from shortfalls in gas production capacity, inadequate infrastructure, upstream market power, or politically motivated action.

17 Powergen believes it would be prudent for the UK Government to mitigate these risks and to consider the potential role of alternative sources of generation in reducing this dependence. While renewables, nuclear and electricity imports have a role, coal-fired generation will need to continue to make a significant contribution to maintaining an adequately diverse UK fuel mix.

Renewables

18 Over the next ten to fifteen years, the UK should see a steady growth of renewables, particularly if some of the institutional obstacles, notably the difficulties in obtaining planning permission, as Powergen has already suggested to the PIU, are removed. However, much renewable output is unpredictable in nature and cannot respond flexibly to changes in demand or other market developments. Over the period in question, its contribution to fuel diversity, as opposed to environmental targets, is likely to be limited.

Nuclear

19 Nuclear power makes an important contribution to fuel diversity but this contribution is likely to decline as Magnox and some AGR plant close. It is also unlikely that any new nuclear plant will be commissioned in the medium term. The public acceptability and economics of nuclear construction may also be open to question, while no route for the disposal of irradiated waste has been identified and the economics of new reactor types remain unproven. Nuclear power is unlikely, therefore, to compensate in fuel diversity terms for an increasing reliance on gas-fired generation. However, where a safety case can be made to maintain existing nuclear plants in operation, life extension of existing plants should be achievable at relatively low cost.

Interconnections

20 Increased interconnection with EU electricity networks may also address supply diversity but further investment will depend on the scale of arbitrage opportunities between markets. Its effectiveness as a contribution to UK supply security will depend on other countries having surplus generating capacity when the UK needs it. This surplus capacity would also need to be fuelled from a different source to the capacity in the UK. The availability of links with adjoining electricity markets was not sufficient to maintain adequate supply security in California and indeed over-reliance on external power sources and inadequate investment within California were a major contributor to current problems.

Coal-fired generation

21 This suggests that UK coal-fired generation has a continuing important role to play. As with nuclear, the UK retains a substantial asset base of coal-fired generation which is capable of generating economically and flexibly in response to variations in demand and the price of alternative fuels. This has been illustrated by the recent increase in coal-fired generation, and the effect that this has had in mitigating the effect of higher gas prices on final electricity consumers. Retention of coal-fired capacity will help insulate the UK from the direct effects of a rise in European gas prices. In the absence of coal-fired generation, electricity prices will rise with gas prices and are capped only by the price of generation from gas oil. With sufficient coal-fired generation, electricity prices are capped by the price of generation from coal. With a potential difference of up to 1p/kWh between the two at current prices, this could deliver savings to consumers of up to £4 billion per year.

22 The UK also retains a small but commercially viable coal industry (although Powergen expects UK production to fall below 20M tonnes by 2010 without further investment), while the UK has good access to international coal markets which are highly diverse, and unlike gas, truly global.

23 To provide adequate fuel diversity to mitigate the consequences of a major disruption in gas supplies, significantly more coal-fired capacity will be needed on the system in 2010 than the 9 - 12 GW predicted by the DTI in EP 68. Powergen would expect this to come from the life extension of existing coal-fired units, given the substantial additional cost of construction of clean coal plants and the limited additional environmental benefits these would deliver. There are no fundamental engineering obstacles to continued operation of existing coal-fired plants.

The Implications of Maintaining Fuel Diversity for the UK's Environmental Objectives

24 A continuing significant role for coal raises questions about whether the UK's CO₂ emission reduction targets can be achieved, particularly if coal-fired generation is higher than predicted in EP 68 which suggested that UK coal-fired generation could fall from an estimated 130 TWh in 2001 to between 38 and 83 TWh by 2010.

25 To preserve sufficient fuel diversity, the UK should ensure that it has the capability to generate significantly higher volumes of power from coal than envisaged in EP 68 without breaching its CO₂ or other environmental limits. EP 68 together with the UK Climate Change Programme show that the UK would achieve a substantially larger reduction in CO₂ emissions than required to meet its Kyoto protocol target with no reduction in coal-fired output from current levels, provided the projected and additional measures envisaged in the Programme are delivered. The significant potential constraint on coal-fired generation in 2010 arises more from the way in which the revised Large Combustion Plants Directive is implemented in the UK.

26 To maintain a UK capability to generate power from coal sufficient to make a substantive contribution to UK fuel diversity, while enabling it to meet or exceed its CO₂ targets, it will be necessary to:

- avoid premature implementation of SO₂ and NO_x emission controls which would constrain output or force early closure of coal-fired capacity, where the environmental benefits are disproportionately small; this is a matter for Government and the Environment Agency following EU agreement on a revised Large Combustion Plants Directive;
- facilitate the co-firing of existing coal-fired generation with biomass to enhance the contribution coal-fired plant can make to both security of supply and environmental objectives; in this way coal plant can make a significant contribution to reliable and predictable renewable output; the Renewables Obligation provides for this but the restrictions imposed are too inflexible and may inhibit investment; this needs to be reviewed as part of the current statutory consultation;
- ensure that the renewable investment envisaged under the UK's Renewables Obligations is delivered;
- avoid premature closure of existing AGR nuclear plant.

Longer Term Perspectives

27 Beyond 2010, the scientific consensus is that continued reductions in CO₂ emissions are likely to be required, but the UK will have some flexibility in the pace and extent of further CO₂ reductions, which will need to reflect the evolving scientific evidence, changing technology, the extent of co-ordinated action by the international community, and the impact of policy decisions on other energy policy objectives. The Government should retain the ability to steer markets through flexible mechanisms in the light of these developments but should avoid premature and inflexible intervention.

28 The 60% reduction in CO₂ emissions envisaged by the Royal Commission on Environmental Pollution would require a combination of quite radical measures, some of which may be difficult to predict now given the potential pace of technological change. At this stage the Government should continue to encourage a range of options which have the potential to achieve reductions on this scale.

29 As part of this, the preservation of coal-firing in the UK, together with continuing research and development into clean coal technology, will facilitate the development of carbon sequestration technologies which can play a major role in delivering the CO₂ emission reductions that may be required over the next fifty years.

Investment in Networks

30 The ability of electricity and gas networks to deliver energy to consumers is a key component of security of supply and supports the effective operation of competitive markets. At the distribution level, networks have a key role to play in facilitating additional embedded renewable and CHP generation which is not given sufficient attention in the PIU scoping note. Powergen believes that increased investment will be required in electricity distribution networks if they are to meet the increasing demands being placed on them as a result of Government policy initiatives. Even without these demands quality of supply is likely to suffer particularly if the UK climate becomes more extreme.

31 Powergen, trading as East Midlands Electricity (EME), manages the distribution networks in the East Midlands area and has developed a sophisticated approach to asset and risk management as part of its drive to achieve world class standards in distribution. As a result it is at or near the limits of achievable operating and capital investment efficiencies for a network of its size. There is limited further scope for cost savings.

32 RPI - X price regulation has been highly effective in encouraging efficiency savings but the emphasis must now shift to meeting the demands that distribution networks are now facing. EME has supported regulatory initiatives intended to align investment more closely with performance under the Information and Incentives project, but this is still limited to relatively short time horizons.

33 EME has raised with Ofgem the need to maintain adequate levels of investment to maintain the robustness of the network. Our particular concerns are that:

- necessary network investment is being deferred. EME's requirement for non-load related capital expenditure was cut by about £34M annually over the five year period of DR3 and has in effect been deferred, creating a bow wave of needed expenditure in future;
- price controls give too much emphasis to short-term performance targets and discourage the investment needed to sustain performance improvement in the long term;
- investment and policy priorities are unclear.

34 As a result of the accumulating backlog of investment and the increasing average age of assets, the network is becoming more prone to failure and less robust to damage from storms and floods. Networks are becoming less rather than more capable of coping with increased embedded generation and the more active system operational role that distributors will progressively need to take if the Government's targets are realised and then extended. In the short to medium term, Powergen is concerned that the Government's targets for renewable and CHP embedded generation and the Government's electricity safety quality and continuity regulations are inconsistent with Ofgem's framework of lowest cost regulation.

35 The Government, Ofgem and the industry need to work together to deliver a broad strategic framework for electricity distribution which:

- continues to focus on distribution company efficiency and effectiveness;
- encourages better risk evaluation and adequate network capital expenditure over longer time scales;
- facilitates the Government's embedded generation objectives;
- lays the foundation for a more active operational role for distributors given the extension of embedded generation;
- provides distribution companies with incentives to commit the investment needed to enable them to manage networks more actively and facilitate the delivery of Government energy policy objectives, whilst maintaining the drivers for innovation that RPI-X incentive based regulation has delivered.

Retail Markets

36 There is substantial scope for further energy efficiency savings in the retail sector which will contribute to the Government's CO₂ reduction targets, although energy intensive consumers already have strong economic incentives to deliver these. In the domestic sector, Government intervention is likely to continue to be required to secure these savings, as consumers have at present inadequate motivation to make the necessary investments.

37 Market intervention by Government to achieve wider policy objectives may, however, incur higher costs for consumers and it is for the Government to judge the acceptability of doing so. In our view energy policy should aim to minimise the impact on competitive retail markets by using simple and transparent market based mechanisms, which are focussed on specific objectives, minimise costs and provide suppliers with the ability to innovate and respond flexibly. There is a limit to which the Government can use these mechanisms without substantially affecting competition and the Government should keep this under review.

Powergen

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