

# **Scottish and Southern Electric's Acquisition of Fiddler's Ferry and Ferrybridge**

## **Ofgem's advice to the Office of Fair Trading**

### **1. Summary**

Ofgem considers the electricity generation sector in GB remains competitive following this acquisition. Based on the analysis of the acquired generation in question and the alternative generation sources which constitute competitive supply side substitutes, we do not consider the acquisition would result in a substantial lessening of competition.

### **2. Introduction**

On 30 July 2004 Scottish and Southern Electric (SSE) plc announced its agreement to acquire from AEP Energy Services UK Ltd the Ferrybridge and Fiddler's Ferry power stations as well as associated coal stock (1.6 m tonnes) and contracts to supply fuel to power stations.

The purpose of this note is to set out Ofgem's views on this transaction, in accordance with the Concordat between our two offices, so that you may take them into account in deciding whether the acquisition may result in a substantial lessening of competition.

### **3. Consultation**

On 30 July 2004, Ofgem placed an overview of the acquisition on its website, and invited views on the issues raised by the acquisition. Ofgem opted for this approach to its consultation to give parties more time to respond.

There was one respondent to the consultation. They did not consider that the acquisition raised any competition concerns.

### **4. Assessing mergers and acquisitions in the wholesale electricity market**

This acquisition relates to the market for wholesale electricity. There are a number of features of the wholesale energy markets that affect the analysis of the competitive effects that could emerge from a merger in the generation market. However, not all of these features will be relevant in every situation. We highlight in section 5 the features that we consider to be most relevant in this case. Ofgem's Draft Competition Act guidelines discuss these features, which include, among others:

- The presence of monopoly network owners and monopoly system operators;
- The economic linkages between, in particular, the electricity and gas markets;
- The limited potential for economic storage of electricity and the resulting need to balance supply and demand on a continuous basis; and
- The existence of central balancing rules.

It is also important to consider the extent to which the existing regulatory framework could be expected to mitigate any likely adverse effects of the acquisition.

## **Assessment of Market power**

The inelastic nature of supply and demand, particularly over short-time periods, means that undertakings in gas and electricity markets could have market power at lower levels of market concentration than in many other industries and markets. As such, whilst the traditional benchmarks for market shares and HHI indices will be important considerations, their usefulness is heavily conditioned by a range of other important factors, including, in particular, the magnitudes of demand and supply elasticity.

Furthermore, structural indicators are unlikely to reflect all of the relevant incentive and competitive effects that may be generated by an acquisition, for example due to the incentives put in place by the market trading rules.

Contractual arrangements between electricity buyers and sellers for the output from power plants will also be relevant to any assessment, as these can give exclusive control without ownership. For example, under tolling agreements for generation, parties supply the input fuel (e.g. gas or coal) to a generator, in return for the electricity (or an agreed volume of the electricity) produced using this fuel. Such contracts can extend an entity's control over a wider generation portfolio than is reflected in unadjusted structural indicators.

In assessing market power, relevant constraints either to entry or output are potentially a further consideration. Existing and future environmental constraints may act as a limit on effective capacity and cost characteristics of plant. The EU-Emission Trading Scheme (ETS) aims to limit greenhouse gas emissions by providing tradable emission allowances to each electricity generator. Generators wishing to generate above their allocated allowances will need to procure additional permits. In addition, the Large Combustion Plant Directive requires Member States to introduce measures to limit pollutants that affect air quality such as sulphur dioxide. Prior to the introduction of the LCPD, the Environment Agency and Scottish Environment Protection Agency set emission limits for sulphur dioxide from coal and oil fired generators.

## **Market definition**

The existence of monopoly provision of network transmission frequently results in Great Britain being defined as the relevant geographic market. However, it is important to have regard to the interconnection between GB and neighbouring electricity markets, and the possibility of locational aspects given the finite nature of transmission capacity over the medium term. This latter point is of particular relevance given that transmission constraints can generate situations where the elasticity of supply and demand can be very low in specific locations.

Since electricity cannot be stored and demand and supply needs to be balanced in an instantaneous manner, it is necessary to consider the power plant's physical ability to respond quickly to changes in demand and whether contracts with other parties for the plant's output affect its ability to respond to these changes. Power stations have different physical abilities to respond to changes in electricity demand with nuclear power stations being the least flexible and pumped storage the most flexible in producing increased output at short notice. It is necessary to consider how these commercial and physical realities impact upon competition at different times of day and year.

### **Duration of conduct and the magnitude of effects**

Electricity demand is highly seasonal and varies substantially within each day. The system balancing rules provide participants with an incentive (avoidance of financial penalties) to balance their contractual positions with their actual physical positions at the end of each half-hour. These factors give rise to the possibility that market power could be exploited by effecting small and sustained; small and repeated; or large but transitory price increases, all of which could potentially have the same effect on consumers<sup>1</sup>. The repeated interaction that half-hourly balancing introduces may also increase the need to consider the potential for coordinated effects.

### **Effects on related markets or market segments**

Conduct in the wholesale electricity market affects the opportunity cost of supplying electricity to end consumers and the value of input fuels. As such, there is a need to consider potential vertical effects of an acquisition and the incentives that may be generated due to the interactions between the wholesale electricity market and, in particular, the wholesale gas market and the electricity and gas retail markets.

### **Other competitive effects**

The electricity market is such that there are a number of forms of new entry, with differing entry barriers, including newly built plants, the return of mothballed plant and the replacement and refurbishment of existing generation assets. Competition is also affected by the existence and extent of environmental constraints and the need for statutory maintenance<sup>2</sup>.

## **5. *Ofgem's analysis***

### **The transaction**

Ferrybridge is a 1,995MW coal fired station in West Yorkshire built in 1966. Fiddler's Ferry is a 1,989MW coal fired station in Cheshire built in 1971.

The transaction involves SSE's acquisition of Fiddler's Ferry and Ferrybridge power stations and associated coal stocks of 1.6m tonnes. In addition, SSE will acquire fuel in transit and contracts to supply fuel for the power stations.

### **SSE's interests**

SSE is a vertically integrated company and has significant interests in the supply of electricity and gas to end consumers; electricity transmission and distribution; gas and electricity trading; and gas storage as well as electricity generation in Great Britain.

The SSE Group holds the following licences:

- a generation licence held by SSE Generation Ltd
- a transmission licence held by Scottish Hydro-Electric Transmission Ltd
- a distribution licence held by Scottish Hydro-Electric Power Distribution Ltd ; and

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<sup>1</sup> Ofgem's Draft Guidelines "Competition Act 1998: application in the energy sector" discuss further the importance of market definition of duration and magnitude.

<sup>2</sup> Statutory maintenance arises from operational or relevant health and safety requirements, such as The Electricity Safety, Quality and Continuity Regulations 2002 or requirements of Nuclear Installation Inspectorate.

- a supply licence held by SSE Energy Supply Ltd.

SSE's transmission arm also operates the high voltage interconnection with Scottish Power over which energy is traded for onward transmission to the energy markets in England and Wales. Access to the interconnector by third parties is currently on application to the capacity holders. Under BETTA, currently scheduled for introduction in April 2005, the interconnector will become an integral part of the GB transmission system and users will no longer need to arrange for access to the interconnector.

### **Relevant issues**

#### **a) Market Definition: GB and E&W generation markets**

The Energy Act 2004 introduced the legislative framework necessary to introduce British Electricity Trading and Transmission Arrangements (BETTA). BETTA is currently scheduled to "go-live" in April 2005.

BETTA reforms will introduce wholesale electricity trading and transmission arrangements for Great Britain which enable competitive markets to develop, based on:

- a common set of trading rules so that electricity can be traded freely across GB
- a common set of rules for access to, and charging for, the transmission network, and
- a GB system operator, independent of generation and supply interests so that those who seek to use the system and access the market can be confident the system operator has no incentives in favouring a particular interests.

Ofgem considers the market on a forward-looking basis. Therefore, the acquisition is considered in relation to GB in the first instance.

#### **b) Cost and physical characteristics of electricity generation assets**

The physical and cost characteristics of electricity generation from different fuel sources can vary quite significantly and therefore are important considerations in assessing the potential usage of any plant and the market (for example peak or off-peak market) in which it will be able to compete.

More flexible plant will be able to generate and respond to changes in expected demand and/or available generation. In deciding the relevant output for its plant, generators would be expected to weigh up the returns from increasing output now against the potential for revenue to be earned by providing flexibility to the market or system operator.

Inflexible generation plants, such as nuclear, are unable to provide significant short-term flexibility. The operating decisions of such plants are predominantly affected by the average price of electricity over longer periods, reflecting their inability to vary output to generate only at peak periods, and the need to undertake maintenance. The marginal cost of nuclear generation also tends to be relatively low, which results in nuclear generation providing base-load (constant) supplies.

Highly flexible plant, such as pumped storage<sup>3</sup> (or “hydro”) are more likely to earn a larger proportion of their revenues from providing flexibility to the market and system operator. In addition, the limited duration of the plant results in the dominating opportunity cost of generating being the cost of not being able to generate in other periods. As a result, hydro plant will tend to generate only in periods of high peak demand.

The capacity for substitution in relation to generation based on primary fuel sources such as oil, gas and coal tends to be relatively more complex as, to a greater or lesser extent, these are physically capable of providing more flexibility, and thus able to earn revenues from the provision of flexibility. However, the generating pattern of such generation is largely determined by the marginal cost of input fuel. The greater the marginal cost, the greater the expectation that such plants will tend to generate only at times of relatively high demand when prices are relatively higher.

Based on these observations it is possible to construct a stylised set of factors that drive generating output decisions and hence provide a picture of the likely generation able to compete in particular periods or for example in peak or off-peak markets.

Turning to the FFF acquisition, based on its characteristics as a coal-fired plant (this includes the environmental factors highlighted further below), this plant will tend to have relatively high marginal costs and will tend to be used to generate electricity in periods with higher demand and price.

#### **c) Environmental considerations**

A particular consideration for this analysis is the environmental constraints, which place limits on SO<sub>2</sub> emissions, a by-product of burning coal. Actual SO<sub>2</sub> emissions will depend on a number of factors, including the sulphur content of coal and whether the generation plant is fitted with cleaning technologies, such as Flue Gas Desulphurization (FGD). Neither Ferrybridge nor Fiddler’s Ferry are fitted with FGD.

A non-FGD plant will tend to face binding emission constraints and may face higher opportunity costs of generating than a FGD fitted plant. Although there are a number of factors that will determine a particular generator’s commercial decisions regarding the use of their plant, all other things being equal the non-FGD plant is more likely to generate at peak periods rather than at non-peak periods, when demand can be met by base-load supplies from (in SO<sub>2</sub> terms) cleaner generation sources. On this basis, environmental limits may provide further justification to consider peak periods.

#### **d) Ancillary services**

As SSE does not have any other generation in its portfolio to provide such services at these locations, the pre and post acquisition situation is unchanged. The potential locational importance of FFF for system constraints purposes remains constant and (for this service) the change of ownership should not be expected to impact adversely in the provision of these services. Figures supplied by NGT for the equivalent period in 2003/04 show that total ancillary service payments were £11.5m, around 5% of total ancillary service payments over this period.

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<sup>3</sup> Pumped storage operates by using electricity in off-peak periods to pump water up to a raised reservoir, enabling electricity to be generated at very short notice but with a limited duration.

## Structural indicators

Market share in electricity generation can be measured either in terms of installed capacity owned or in terms of the metered volume of output from the generator. In light of the discussion above, Ofgem has constructed scenarios based on GB markets and including within these markets potential contractual arrangements.

In relation to this acquisition, for the reasons given above, it is useful to consider structural indicators that measure the concentration in the market as a whole and also when inflexible and highly flexible plant are excluded, as these can only provide a limited competitive constraint on FFF and its closer substitutes.

As such, Ofgem has considered a scenario including flexible generation based on oil, gas and coal generation<sup>4</sup>. This might be considered a narrow definition, given that hydro may be relevant albeit for short durations. However, this consideration has been balanced against the fact that this analysis includes all gas and coal plant, some of which are likely to have materially lower marginal costs than the FFF plant.

Tables 1 and 2 present market concentration analysis for a range of different scenarios, based on capacity and output respectively. Scenario 1 assumes that there are no offtake contracts (contracts which allocate the output from the power station to another party) and all capacity and output is allocated to generators on the basis of equity ownership (where there is shared ownership of power stations). Scenario 2 includes all known offtake contracts. Scenario 3 recalculates market concentration excluding hydro and nuclear generation.

There are some differences between the data presented by SSE and data collected by Ofgem. With respect to capacity figures, for example, SSE's analysis is based on Dukes' data whereas Ofgem has constructed its data based on 03/04 transmission export capacities provided by NGC. The output calculations are broadly similar.

There is one very important caveat to note with respect to the capacity and output figures presented here for SSE. SSE has a significant number of joint ventures and sharing arrangements with a number of power stations. Ofgem has apportioned capacity and output on the basis of SSE's equity share in each power station.

## Tables Deleted for Confidentiality

The tables shows SSE currently has around 5.7GW of capacity GB wide. In terms of output, in 2003/4, SSE generated XTWh GB wide. If all known offtake contracts are included, these figures rise to XGW and XTWh respectively. Finally, excluding hydro and nuclear SSE's share rises to X% and X% GB wide. This results in HHI's of between 885 and 937.

Post acquisition SSE becomes the second largest generator for both electricity output and capacity. The analysis post acquisition includes an assumption that International

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<sup>4</sup> The capacity figures include any generator that has contracted with NGC for transmission capacity, and is therefore currently physically and contractually able to generate. Operational plant that have not contracted for transmission capacity have been treated as "mothballed", as these plant must apply for transmission capacity prior to delivering any energy to the system.

Power completes its takeover of First Hydro<sup>5</sup>. Under most capacity scenarios HHI's are between 900 and 950. However, if we exclude hydro and nuclear both capacity and output HHI figures are slightly above 1000.

## **Impact on competition**

### **a) Available substitutes**

A relevant question in considering whether the acquisition results in a substantial lessening of competition is whether sufficient available substitutes remain post acquisition. Notwithstanding existing available capacity on the network, it is possible for previously mothballed plant to be returned to the system should prices be increased above competitive levels in any significant, non-transitory manner. There is evidence of mothballed plant returning quickly to the system. For example, following the increase in forward prices during 2003/04 winter, in part as a response to expectations of a tighter supply-demand balance, a number of plants returned.

At present, approximately 2.8 GW<sup>6</sup> of capacity is mothballed, the majority of which is relatively flexible in nature. The construction of new generation assets provides a further competitive constraint, albeit subject to lead times related to planning consents and construction. However, 11,772 MW of new generation capacity has received planning consent, of which around 10% of this capacity is currently under construction<sup>7</sup>. As such, this generation is a relevant consideration to this acquisition. Ofgem can provide more analysis on the ability of this new generation to act as a competitive constraint on SSE if required.

Although the nature of demand is such that it tends to be relatively inelastic, particularly over short periods, there are a number of consumers who can respond to price movements and thus provide flexibility to the system.<sup>8</sup>

### **b) Effects on related markets**

Given the competitive constraints discussed above, Ofgem has not considered any vertical issues arising from this merger. In particular, considering the interactions with the downstream market, based on our current assessment of the wholesale and retail market, retail supply companies are able to contract for relevant electricity supplies or enter the market for generation without facing undue entry-barriers.

### **c) Locational factors**

As described above in relation to ancillary services, the Fiddler's Ferry plant received a significant proportion of the payments that NGT made to generators to reduce output to

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<sup>5</sup> This merger remains subject to competition approval and any assumption made here is no indication of approval or not of this acquisition by the relevant competition authority.

<sup>6</sup> For the latest figures on mothballed capacity please see NGT's Winter Outlook report.

<sup>7</sup> Figures taken from "Joint energy security of supply working group: Fourth report" May 2004

<sup>8</sup> Figures taken from "Joint energy security of supply working group: Fourth report" May 2004  
For instance, during a peak winter period on 28 January 2004, it is estimated that demand management contributed approximately 1GW, reducing the severity of the rate of increase in demand. This represents around 2% of total demand at that time. This provides a specific example of demand-side response, but should not be construed as an upper limit on demand-side potential, as a number of factors, notably market prices will influence any actual responses observed.

overcome transmission constraints between April 2002 and September 2003. Constraint contracts between NGT and SSE for 2003/04 are not of the same magnitude. Based on the fact that SSE does not have any other generation in its portfolio able to provide such services, Ofgem does not consider that locational factors should give rise to competition concerns.

## **6. Assessment of competitive impact of the acquisition**

Ofgem considers, based on our current assessment, the market for wholesale electricity generation in GB to be competitive at present. The level of competitive activity and increases in the ownership of assets by SSE do not appear to raise any significant competition concerns, whether we look at total GB capacity or when hydro and nuclear are excluded. Therefore, based on the analysis of the generation in question and hence the issues relevant to this acquisition and the alternative generation sources able to compete with SSE, we do not consider the acquisition would result in substantial lessening of competition. Ofgem has not considered it necessary to analyse vertical effects arising from the acquisition.

Ofgem has noted previously<sup>9</sup> in its advice to the OFT regarding the proposed arrangements between International Power and Drax that the market shares that may be likely to give rise to competition concerns in the electricity generation sector may be lower than in other markets, due to the inelastic nature of short-run supply and demand for electricity. Nevertheless, on the information available, Ofgem's view is that there are no competition concerns arising from this acquisition.

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<sup>9</sup> Proposed arrangements between International Power plc and Drax Holdings Limited – Report to the Office of Fair Trading, October 2003.