E3G

European Commission, Directorate-General for Competition
State aid Registry
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March 2014

E3G comments on State Aid case:

SA34947 Electricity Market Reform - Investment Contract (early Contract for Difference) for the Hinkley Point C New Nuclear Power Station

Context

The administration of compliance with state aid laws is a vital element in the effective functioning of the internal energy market. E3G has separately commented on consultations relating to the draft Environmental and Energy Aid Guidelines and draft General Block Exemption Regulation[1]. These responses have highlighted the role that state aid can play in encouraging the development of a well-functioning internal energy market, thereby reducing over time the temptation for Member State governments to intervene in the market. In particular, it is important that the potential for demand side solutions and resource sharing between Member States should be explored and encouraged before resorting to traditional supply-side subsidies.

The current investigation into the proposed investment contract for a new nuclear power station at Hinkley Point C provides an excellent example of how these principles could be applied to inform the decision on state aid. This note contains comments on the letter (ref. C(2013) 9073 final) sent to the UK Government and is focused on the extent to which demand side solutions and resource sharing have been fully explored before pursuing the investment contract with EDF. In particular, we fear that their potential has been overlooked

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[1] Manon Dufour, *Recommendations for a state aid framework consistent with a resource efficient Europe,* E3G, 14 February 2014, http://e3g.org/x6pV

despite their significant impact on cost-effectively achieving the UK government's energy policy objectives.

Demand side solutions

Paragraph number 254 lists a series of measures that the UK government has implemented to improve energy efficiency (primarily relating to space heating rather than electrical consumption) and concludes:

…the UK considers that gains from demand-side response which go beyond those achieved through existing policies cannot be considered certain, in particular since the demand-side response market might take time before becoming effective.

The Commission does not make any comment relating to this statement. However, the statement appears to contradict considerable amounts of analysis and practical experience, both from within the UK and elsewhere, and directly contradicts many of the policy statements made by the UK Government.

Demand side response traditionally refers to the temporary reduction in demand, usually in response to high prices and/or system security concerns. However, potential demand side solutions go beyond temporary demand side response and also include the permanent reduction in demand and the deployment of small scale generation in homes and businesses (distributed generation). Indeed, these two aspects are arguably more relevant when considering alternatives to an investment in a new nuclear power plant than demand response.

Demand reduction

The White Paper on electricity market reform published in 2011[2] recognised that electricity demand reduction has a key role to play in reducing the costs of decarbonising the power system through avoiding significant investment and operational system costs. A project was initiated by the Government to explore the potential for electricity demand reduction and how this might be most effectively delivered.

Various analytical studies have been undertaken that all clearly demonstrate there is significant potential for using electricity more efficiently in the UK and that, even after taking account of existing and planned policy, it is unlikely that this potential will be realised without new policy initiatives. The most recent analysis[3] suggests that this potential is around 36TWh per year. In light of these conclusions, the UK Government has decided to include electricity demand reduction within the proposed capacity mechanism as a new policy initiative, initially through a pilot auction that is due to be undertaken in 2015.

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[2] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48129/2176-emr-white-paper.pdf

[3] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/245121/Review_of_EDR_technical_potential_by_Nick_Eyre.pdf

There is considerable evidence from international power markets that appropriately designed mechanisms, such as capacity markets, can deliver a surprisingly large and valuable system resource through reductions in demand. Indeed, there is strong evidence from many examples that electric demand can be reduced by an incremental 2% per year over the course of many years (see, for example, recent reports by the Lawrence Berkley National Laboratory and the American Council for an Energy Efficient Economy reviewing the current situation in the USA[4]).

Therefore, both analysis relating the UK and practical international experience with electrical efficiency programmes suggest that a demand much greater than the potential output from Hinkley Point power station could be avoided long before the proposed commissioning date.

Demand response

The UK Government has recognised the significant potential of temporary demand response to improve system security. Traditionally, demand response services have been restricted to large energy intensive consumers. However, the deployment of smart meters now opens up the prospect of demand response services being provided by all categories of consumers, including domestic (see report commissioned by the UK Government from Frontier Economics and Sustainability First in 2012[5]). In light of this potential, the UK Government has decided to include demand response in the capacity mechanism that is currently being introduced[6]. Moreover, it has encouraged National Grid to introduce new demand response system services specifically designed to address near term security of supply concerns[7].

There is now increasing evidence, particularly from the USA, that a well-designed capacity mechanism can reduce system peak demand by as much as 10-12%[8]. Moreover, this demand response has been delivered at much lower costs than the alternative of additional generation resources.

It is, therefore, reasonable to expect that the new capacity mechanisms being introduced in the UK should give rise to several GWs of demand response which is more than equivalent to the capacity provided by Hinkley Point power station. Indeed, by the date that Hinkley Point is due to commission, this could increase significantly with the deployment of new smart technologies and the refinement of the capacity mechanism design.

Distributed generation

There is an increasing trend for end consumers to invest in their own locally based generation resources, often acting together in community based projects. Although this

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[4] http://emp.lbl.gov/sites/all/files/lbnl-5803e.pdf, http://aceee.org/files/pdf/policy-brief/eers-07-2014.pdf

[5] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48552/5756-demand-side-response-in-the-domestic-sector-a-lit.pdf

[6] https://www.gov.uk/government/publications/electricity-market-reform-capacity-market-proposals

[7] http://www.nationalgrid.com/uk/Electricity/AdditionalMeasures

[8] See, for example, 'Demand Response as a Power System Resource, Program Designs, Performance, and Lessons Learned in the United States, Synapse Energy Economics Inc., May 2013

change has hitherto been less marked in the UK than in some other EU member states such as Germany, the introduction of feed-in-tariff support for small scale renewables projects in 2010 has led to a significant growth in deployment of locally based generation. By the end of the third year of the scheme in March 2013, 1.8GW of small scale renewable generation had been installed with an annual electricity production of 1.7TWh[9].

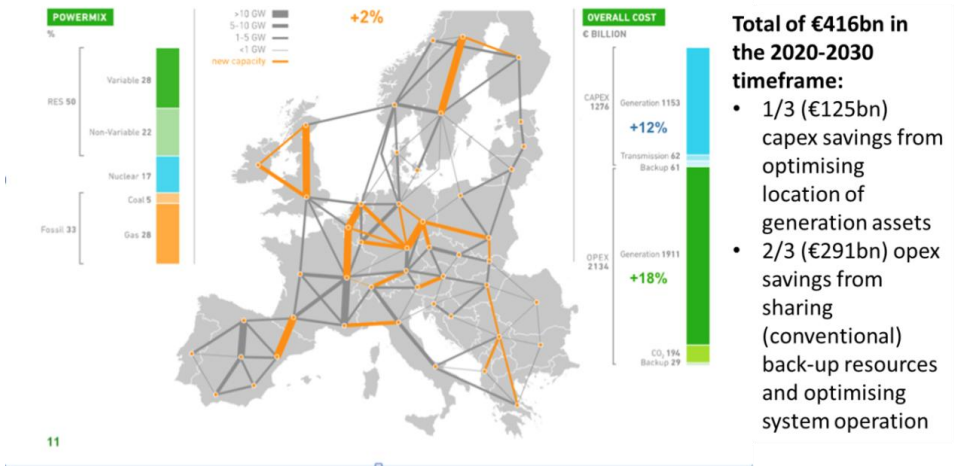
The UK Government is committed to continue to promote the development of small scale generation and has agreed a strategy to drive forward deployment[10]. If the same level of deployment is maintained over the next ten years, by the time Hinkley Point power station is due to commission the amount of small scale generation will have increased significantly to around 6TWh. Increased rates of deployment and improvements in technology have the potential to increase this level much further.

Resource sharing between Member States

Paragraph 259 identifies that the UK Government has not considered how interconnection may contribute towards meeting energy policy goals on the basis that '*flows will be difficult to predict*'. The Commission invites views on how the UK Government might take into account the role that interconnection could play over timescales relevant to Hinkley Point.

There is now a considerable body of evidence that more interconnection can significantly reduce the costs of meeting policy objectives provided that this interconnection enables the sharing and efficient usage of resources between Member States. The analysis undertaken recently for the EU Commission by Booz & Co.[11] identified that integration of energy markets and resource sharing can reduce costs by up to €70bn per year by 2030.

Chart 1: Cost savings from optimal resource sharing



Source: ECF Roadmap 2050 analysis

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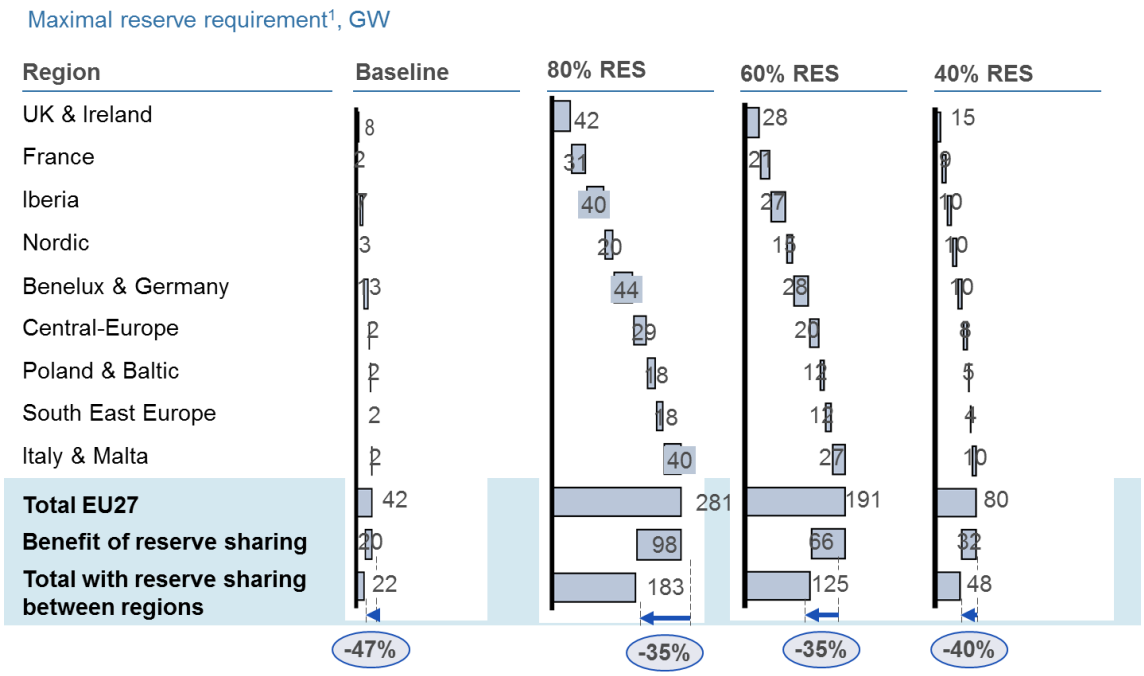
[9] https://www.ofgem.gov.uk/ofgem-publications/85271/fityear3annualreport-finaledition.pdf
[10] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48114/2015-microgeneration-strategy.pdf
[11] Booz & Co. and Imperial College, London, Benefits of an Integrated European Energy Market, September 2013

E3G has been closely involved in the European Climate Foundation (ECF) Roadmap 2050 analysis[12] that has also explored the issue of resource sharing in depth. This analysis suggested a total saving of €416bn in the decade from 2020 to 2030 is achievable where around two thirds of this saving arises from more efficient utilisation of assets (see chart 1). In other words, significantly less capacity is required and the capacity that is on the system can be utilised more efficiently.

The reduction in capacity required to maintain a robustly secure power system can be significant. Chart 2 summarises the reduction in capacity required to provide system reserve for a range of energy mix scenarios in the period out to 2050[13]. This shows typical reductions in reserve capacity of around 40% which, for UK and Ireland combined, would equate to a reduction in capacity of between 7GW and 17GW.

Chart 2: Resource sharing between regions reduces total reserve requirements by ~40%



1 Reserve refers to reserve required at four hour ahead of real-time. This is required to manage the larger changes in generation (due to plant outages and expected uncertainty in intermittent output) expected over that four hour period that could require starting additional (or switching off) generation

Source: ECF Roadmap 2050 analysis

Therefore, the potential for a more integrated EU energy market to significantly reduce the capacity required to maintain a secure power system can clearly be demonstrated over timescales relevant to the Hinkley Point power station investment. However, this potential will not be realised without concrete actions on the part of Member State Governments. In particular:

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[12] www.roadmap2050.eu

[13] Although Hinkley Point is unlikely to provide reserve itself, it would add capacity to the system and displace other capacity that might otherwise continue to generate economically and/or provide flexible system resources.

- Sufficient physical interconnection must be built to enable efficient resource sharing
- New governance arrangements for regulation and cost allocation in a fully interconnected power system need to be introduced
- System Operators must be mandated to optimise the power system within physical constraints rather than national borders.

These represent major changes and may take many years to materialise. However, they represent necessary and essential developments if the EU internal energy market is to achieve its full potential. Moreover, analysis shows that the cost penalties of failing to integrate markets will become increasingly severe over the next two decades as the proportion of intermittent renewables on the system increases.

It is, therefore, reasonable to expect that the UK Government is in dialogue with neighbouring Member States to explore the potential for sharing of resources and identify appropriate timescales and delivery plans to take advantage of the potential opportunities. Indeed, the UK Government has stated: '*it is clear from the analysis that GB's security of supply would be enhanced by further interconnection, providing that electricity prices reflect scarcity and interconnector flows reflect prices. Interconnection is also one of the technologies that can assist with the integration of further low-carbon generation*'[14]. Only in light of understanding these options and implications is it appropriate to consider the need for major interventions such as that required to build Hinkley Point power station.

E3G has undertaken analysis that has demonstrated that the UK has a strong project pipeline for interconnection and renewables trading projects, as shown in Table 1 below[15].

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https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/266460/More_interconnection_-_improving_energy_security_and_lowering_bills.pdf)

[15] http://www.e3g.org/docs/E3G_NSG_Project_Pipeline_Analysis_-_Key_Findings.pdf

Table 1: UK interconnection project pipeline

Interconnector	Name	Capacity (MW)	Developer(s)	Expected commissioning date	PCI?[16]
Interconnection projects linked to the UK					
France-GB	ElecLink	1000	Eurotunnel, Star Capital Partners	2016	Yes
Belgium GB	Nemo Link	1000	National Grid, Elia	2018	Yes
France-GB	IFA2	1000	National Grid, RTE	2020	Yes
France-GB	FABLink	1000	ARE, Transmission Investment	2020	Yes
GB-Norway	Norwegian	1400	Statnett, National Grid	2020	Yes
GB-Norway	NorthConnect	1400	Agder Energi, E-CO, Lyse, Vattenfall AB	2021	No
Denmark-GB		Tbc	National Grid, Energinet.dk	After 2020	No
GB-Ireland	EW1	350	IMERA	After 2020	No
Total interconnector pipeline capacity		**7,150+**			
Renewables trading / combined offshore wind-interconnection projects					
GB-Ireland	Greenwire	3000	Element Power, Hudson Clean Energy Partners	2018	Yes
GB-Ireland	Codling Bank	1100	Fred Olsen Renewables / Hazel Shore Ltd	2019	Yes
GB-Ireland	Energy Bridge	5000 (1200 phase I)	Mainstream Renewable Power, National Grid, REN	2017	Yes
GB-Ireland/ Northern Ireland	ISLES	4800	Scottish Government, Northern Ireland Executive, Government of Ireland	tbc	Yes
Total renewables trading pipeline capacity		**13,900**			
Total					
Total interconnection/ combined project pipeline for UK		**21,050+**			
Total interconnection/ combined project pipeline that could be developed before Hinkley Point C is commissioned		**12,100**			

Source: Baringa Partners for E3G and ECF

The conclusion of this analysis is that the main barriers to interconnection are political and regulatory and, if interconnection were to be given the same political priority as Hinkley Point, there is good reason to believe that many of these projects would progress through to completion. Therefore, demonstration of progress with these cross-border initiatives should be a necessary prerequisite before a major supply-side subsidy, such as that for Hinkley Point, is permitted.

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[16] 'Project of Common Interest' – which would mean it should therefore have priority status according to the TEN-E Guidelines regulation last year http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:115:0039:0075:EN:PDF

Conclusions

The proposed subsidy arrangements to support the construction of Hinkley Point power station represent a major market intervention that should be avoided if possible. The Commission has pointed out to the UK Government that demand side solutions and sharing resources with neighbouring Member States may represent more cost-effective alternative means to achieve policy objectives.

The UK Government is undertaking a range of initiatives to improve the choice, efficiency and price responsiveness in the demand side of the market. These initiatives cover demand reduction, demand response and small-scale generation. There is ample evidence, both from the UK Government's own analysis and from international experience, that the UK can confidently expect to significantly reduce the requirement for electricity generated by large transmission-connected power plant as a result of new policies. It is inappropriate to discount the effect of these new policies in the justification of the subsidy to support Hinkley Point power station provided by the UK Government.

It is beyond dispute that an integrated EU power system with full sharing of resources can save Member States considerable amounts of money and offset the requirement for significant amounts new generation capacity. However, this situation will not arise without Members States being extremely proactive in working together to overcome the barriers that currently prevent these benefits from being realised. The UK has a strong project pipeline for interconnection and renewables trading projects and many of these could come to fruition with the benefit of political and regulatory support. Member States should not be able to resort directly to major interventions to support supply-side resources without demonstrating that a programme of actions is underway to allow full sharing of resources with neighbouring countries in the years ahead.

The extent and timing of the benefits achievable through demand side solutions and resource sharing with other Member States are uncertain. However, there is no evidence that these uncertainties are any greater than those associated with the construction and commissioning of a relatively new design of nuclear power plant and, indeed, much evidence to suggest that they are likely to be somewhat more reliable.

About E3G

E3G is an independent, non-profit European organisation operating in the public interest to accelerate the global transition to sustainable development.

E3G builds cross-sectoral coalitions to achieve carefully defined outcomes, chosen for their capacity to leverage change.

E3G works closely with like-minded partners in government, politics, business, civil society, science, the media, public interest foundations and elsewhere.

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