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The role of electricity demand reduction in managing Levy Control Framework costs

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- There is a risk that offshore wind projects will not be developed at the support rates included in the draft Electricity Market Reform (EMR) Delivery Plan and this puts delivery of 2020 renewables target at risk.
- However, if support rates increase, the levy control framework (LCF) spending cap may be exceeded.
- An additional target for electricity demand reduction within the EMR Delivery Plan could provide the key to increasing support levels if necessary and/or reducing LCF spending.

Context

Energy policy is now at the heart of the political debate with particular focus on controlling costs to consumers. This increased attention coincides with final parliamentary scrutiny of the Energy Bill and the Government finalising details of the Electricity Market Reform (EMR) Delivery Plan.

The EMR Delivery Plan is a particularly important document since it provides instructions to National Grid relating to subsidy levels for renewable generators in the period out to 2020. These subsidy levels must be sufficient to achieve levels of renewable generation consistent with statutory targets for renewable energy by 2020. In addition, the Government has established a cap on the overall level of subsidies through the Levy Control Framework (LCF). The LCF cap allows total subsidies to rise to a level of £7.6bn by the year 2020/21.

The Government has already published a draft EMR Delivery Plan (July 2013) that proposes a set of subsidy levels that will allow these two objectives to be simultaneously achieved. This draft plan has received a mixed response from industry with particular concern being expressed over the level of subsidy available for offshore wind. There appears to be a significant chance that the Government will need to increase subsidy levels to achieve the

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necessary deployment of offshore wind and this, in turn, could put the LCF spending cap at risk.

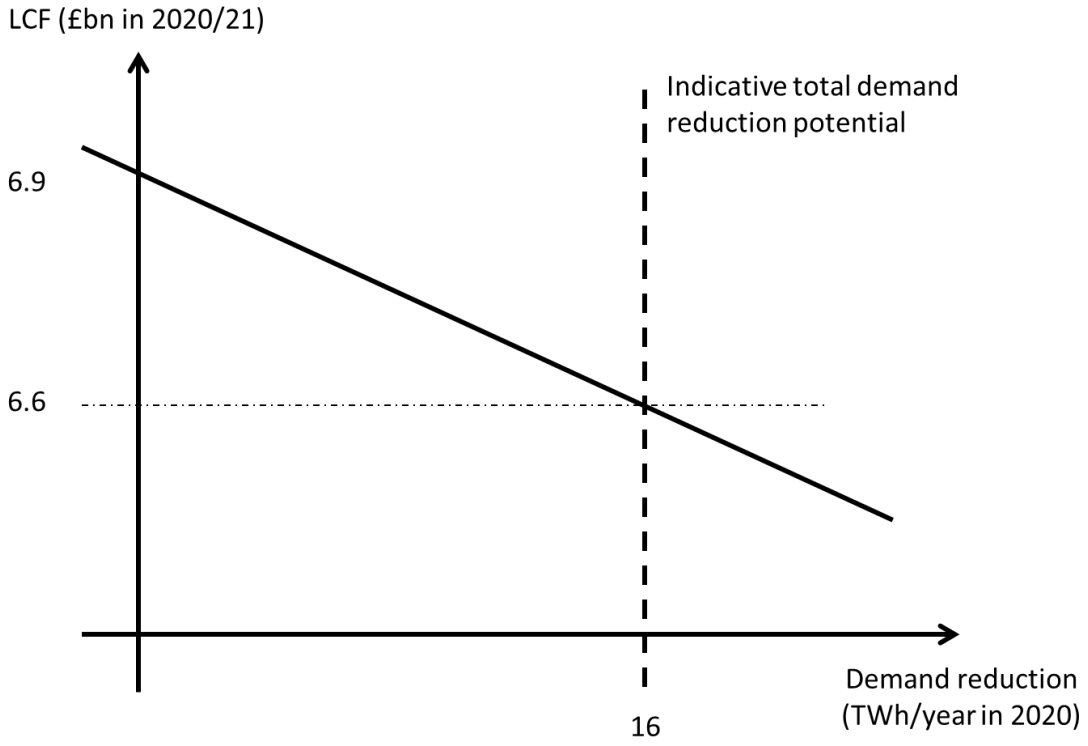
The Government will want to ensure that it is not forced to choose between the spending cap and the 2020 renewable target. This paper explains how an additional target for electricity demand reduction within the EMR Delivery Plan can provide considerable room for manoeuvre in setting strike prices in addition to providing a better overall value proposition for consumers.

Analysis of the Draft EMR Delivery Plan

The draft EMR Delivery Plan was underpinned with analysis undertaken by National Grid in its role as EMR delivery agent (National Grid Analytical Report, Annex E of Draft Delivery Plan). This analysis developed a series of scenarios that can be used to infer the impact on total LCF spending of system demand and offshore wind subsidy levels. The Annex to this paper describes how these relationships have been derived.

Demand reduction will reduce LCF spending since a smaller amount of subsidy will be required to deliver targets based on a percentage of overall demand. Chart 1 below illustrates the relationship between demand reduction and LCF spending that has been derived from the National Grid analysis. The figure for the indicative total demand reduction potential has been inferred from the recent review undertaken for DECC by Nick Eyre (Environmental Change Institute, University of Oxford). This review calculates that 32TWh/year is a conservative estimate of the reduction achievable by 2030. Half of this total amount (16TWh/year) is, therefore, assumed to provide a reasonable indication of the demand reduction potential available by 2020.

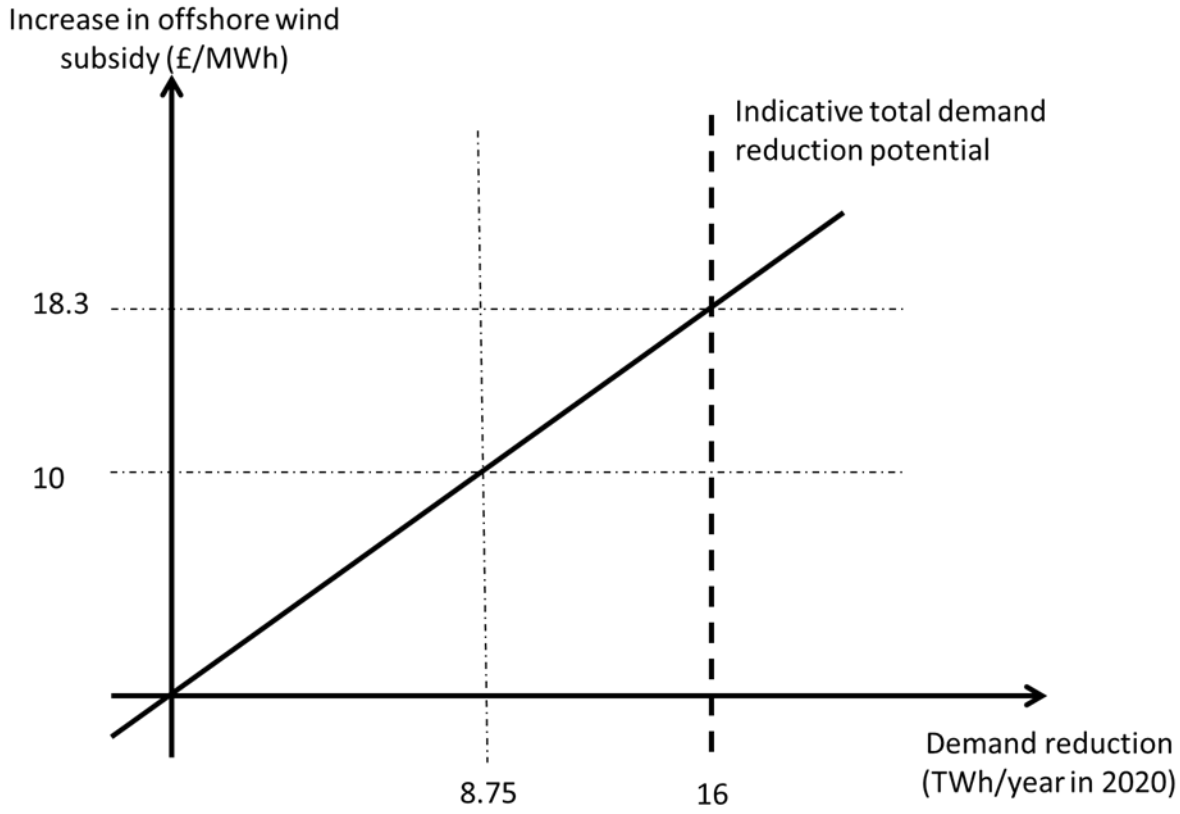
Chart 1: Relationship between demand reduction and LCF spending



This chart illustrates that if half of the maximum 2030 potential of additional demand reduction could be achieved by 2020, the LCF payments in 2020/21 would reduce by £0.3bn from £6.9bn to £6.6bn.

It may be necessary to increase the level of subsidy for offshore wind in order to achieve the desired level of new build. The impact of an increase in subsidy levels for offshore wind on the LCF payments can be offset by demand reduction such that the overall level of LCF payments remains unchanged. The amount of demand reduction needed to offset increases in subsidy for offshore wind is illustrated in Chart 2 below:

Chart 2: Relationship between increase in offshore wind subsidy and demand reduction



This chart illustrates that there would be no change in LCF payments if increases in subsidy levels of £10/MWh were accompanied by additional demand reduction of 8.75TWh/year. Alternatively, realisation of half of the maximum 2030 potential of additional demand reduction by 2020 (16TWh) would allow strike prices to be increased by £18.3/MWh without impacting LCF payments.

Policy implications

The wide-ranging benefits of a successful programme of cost-effective demand reduction in reducing consumer bills have been well documented (e.g. DECC Initial Electricity Demand Reduction Impact Assessment, November 2012). The simple analysis presented in this paper highlights how demand reduction provides the additional room for manoeuvre that will avoid the unpalatable prospect of choosing between statutory renewable energy targets and keeping subsidy payments within the LCF spending cap. However, this solution is only available to Government if demand reduction is adopted as a key outcome that must be

delivered by National Grid through its role as EMR delivery agent and this, in turn, requires that it becomes a specified objective of the EMR delivery plan[2].

The draft delivery plan already includes a reliability standard that National Grid must deliver via the capacity mechanism along with contract for difference feed-in-tariff (CfD) allocation rules (strike prices and auctioning). It would be a relatively minor addition to include a minimum demand reduction target that must also be delivered using the capacity mechanism auction processes.

One of the key objections to introducing such a target is that the ability to deliver demand reduction remains unproven and difficult to verify. However, extensive analysis has already been undertaken by DECC that highlights a series of discrete and quantified abatement opportunities and estimates of indicative potential provide plenty of headroom for a substantial, yet credible, target. Moreover, the introduction of an explicit target would incentivise National Grid to proactively seek out sources of demand reduction, thereby rebalancing the emphasis placed on the supply and demand sides of the market. For example, it would encourage National Grid to become a much more active participant in the demand reduction pilot scheme that was recently launched by the Government, thereby building the internal capability to subsequently deliver the target.

Recommendation

The Government should introduce a demand reduction target into the EMR Delivery Plan. The target should be set alongside CfD strike prices such that they provide a robust package that will simultaneously deliver all Government policy objectives, including consistency with the LCF spending cap.

The analysis in this paper suggests that a target of up to 16TWh/year by 2020 is both credible and provides ample scope to increase CfD strike prices and/or reduce LCF spending.

[2] Any deficiency in the strike price levels might only become apparent during the Delivery Plan period. However, it would be difficult to insert a new target into the Delivery Plan through the annual review process and therefore this option should be adopted at the outset.

Annex: Analysis of potential impact of electricity demand reduction on Levy Control Framework costs

National Grid Analysis

The following data is taken from National Grid Analytical Report (Annex E of Draft Delivery Plan) published in July 2013.

Central case

The central case is assumed to be: 'Core Scenario 32%'.

The scenario assumes that the total system demand in 2020/21 will be 327TWh.

The scenario calculates that the Levy Control Framework (LCF) payments in 2020/21 will be £6.9bn.

High demand

A high demand scenario is presented in which the demand in 2020/21 is assumed to be 343TWh (16TWh higher than the central case). All other assumptions are the same as Core Scenario 32%

This scenario calculates that the LCF payments in 2020/21 will be £7.2bn.

Offshore wind

In Core Scenario 32%, the total capacity of offshore wind by 2020 is 8GW. Of this, 5.4GW is built in the period from 2013.

Total generation from offshore wind in 2020 is 24.3TWh. Therefore, 16.4TWh (24.3*5.4/8) is assumed to be produced by plant built in the period from 2013 to 2020 and this is used as an approximation of the volume of generation that would be affected by increases in offshore wind strike prices (this represents an upper limit on the impact that increases in strike prices would have on the LCF payments).

Other data sources

Nick Eyre (Environmental Change Institute, University of Oxford) has recently undertaken a review of the technical potential for electricity demand reduction for DECC. This has concluded that 32TWh/year is a reasonable estimate for the UK of additional demand reduction potential that is not addressed by existing measures. The estimated timescales for delivering this reduction is 2030 and the report emphasises that this calculated reduction potential is conservative. It therefore provides an indication of the extent of the demand reduction potential available.

Analysis of impact of demand reduction of LCF payments

The National Grid scenarios show that an increase in demand of 16TWh can increase the LCF payments by £0.3bn.

The current EMR proposals state that demand reduction contracts should be allocated via the capacity mechanism. Any costs arising from the allocation of demand reduction contracts will not, therefore, lead to an increase in LCF payments (as would be the case if a 'premium FiT' were to be adopted for demand reduction).

This suggests the following relationship between LCF payments and demand reduction:

LCF payments (£bn) = 6.9 – ΔD*0.3/16 where ΔD is demand reduction in TWh.

Therefore, if half of the maximum 2030 potential of additional demand reduction could be achieved by 2020 (16TWh), the LCF payments in 2020/21 would reduce by £0.3bn to £6.6bn.

Offshore wind strike price analysis

It may be necessary to increase the strike price for offshore wind in order to achieve the desired level of new build.

Assuming that all the new capacity built after 2013 is in receipt of increased subsidy levels, the 'worst case' impact on the LCF payments would be:

LCF payments (£bn) = 6.9 + 16.4*ΔP/103 where ΔP is the increase in subsidy levels in £/MWh.

Combining this relationship with that for demand reduction, suggests the impact of an increase in subsidy levels for offshore wind on the LCF payments would be exactly offset by additional demand reduction as follows:

$16.4*\Delta P/103 = \Delta D*0.3/16$

Or $\Delta D = 0.875* \Delta P$

Therefore, for example, there would be no change in LCF payments if increases in subsidy levels of £10/MWh were accompanied by additional demand reduction of 8.75TWh. Alternatively, realisation of half of the maximum 2030 potential of additional demand reduction by 2020 (16TWh) would allow strike prices to be increased by £18.3/MWh without impacting LCF payments.