ESB Customer Supply response to

DEMAND SIDE VISION FOR 2020

SEM-10-052

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Introduction

We have taken the option of responding to the consultation by answering the questions summarised in the response template. These answers together with overall comments and suggestions for ranking of options and policy priorities and timescales are contained below.

General Comments

The paper is well structured and is comprehensive with good analysis. There are good initial attempts at quantification of the measures. In general we agree with the thrust of the conclusions but would change some of the priorities in the policy options

Summary

We have a number of high level points (outlined below) which we believe are worth considering.

- One of the fundamental problems in encouraging DSM is that the correct signals are not in the market to make DSM economic. The values associated with the various benefits of DSM are not properly rewarded e.g.
    - Primary operating reserve (as provided by interruptible load) is undervalued under SEM
    - The price profile under SEM is too flat to incentivise load shifting. It would be worth reviewing the price profile of capacity payments as the price profile of energy payments is already determined by the marginal energy costs.
- In general ancillary services, DSM and flexibility are undervalued.
- Mechanisms need to be developed to pass the value on to the supplier and then on to the customer.
- Running an island system with over 40% intermittent wind generation and limited interconnection will be very challenging in terms of standby plant requirements, operating reserve (primary, secondary and tertiary) and inertia. Ireland is almost unique in this respect and the value of DSM should be higher here than in other countries. This provides us with an opportunity to be at the forefront of DSM technologies and innovation but this will only happen if the correct values are attached to these services. The value of these services will increase as the penetration of wind increases. To accommodate high levels of wind will require DSM to have been developed and be in the process of being rolled out. Such developments will only take place if the industry knows what will be paid for DSM services so these signals need to be in the market in advance. Ideally the value of DSM services should be based on over 40% wind rather than the level of wind we have at any point in time. As a minimalist alternative, there will need to be certainty in the market that payments for DSM will increase and a clear indication of what they will be when we reach 40% wind.
- The value of DSM in the context of a high level of intermittent wind generation is not only that demand can be reduced when there is little or no wind. It is also that demand can be increased when there is a high level of wind generation which otherwise would have to be curtailed.. Research on the impact of DSM on curtailment at high wind penetration is required to quantify this.
- On a more localised scale, micro-generation will be limited by local network constraints which can be alleviated by DSM. Answer Q10) The value of DSM to the Networks needs to be assessed and a mechanism found to pass this on to the customer.
- As the consultation document points out, energy efficiency is the best type of DSM to the extent that the reduction in demand is ongoing. This saves the considerable cost of additional generation which would otherwise feed into the cost of electricity. Such savings should be taken into account in providing subsidies for energy efficiency measures.
- Smart metering should be viewed as an infrastructure to facilitate DSM rather than a DSM measure in its own right. If customers reduce demand at particular times or move demand from one time to another, they must be rewarded on the basis of the prices in each time period. This requires their

demand being metered in each time period which is achieved by the Smart meters. However, the price signals, whether static or dynamic Time of Use (ToU) Pricing, do not need to go through the Smart meter. It would provide more flexibility if these were to be routed to customers via the internet. Furthermore the original Smart meters are likely to be in place for 15 years or more which would limit the development of new offerings to customers if everything was designed to be routed through the meter. Using the internet which is an infrastructure which is likely to continue to develop technologically would provide more scope for new innovations which may not be feasible now but will be in the future.

- The main driver in Ireland for DSM is to accommodate the intermittency of wind generation. To achieve this, dynamic ToU pricing is needed as the times during which demand needs to be reduced or increased is not predictable and will become increasingly unpredictable. This is a fundamental change to the current situation where most schemes (with the exception of Powersave) are designed to incentivise customers to reduce demand over known peak hours.
- The Networks peak may still be over known hours (except to the extent that there is significant distributed small wind and PV) so static ToU tariffs may still have some value for this purpose but this is a lesser driver.
- The electrification of heat and transport are policies required to meet a number of objectives such as CO_2 targets and renewable heat targets. Hence a growing penetration of Electric Vehicles and heat pumps (primarily air source) should be anticipated and facilitated. Both have DSM benefits which can be used to accommodate more wind generation. The consultation paper regards their initial contribution as small and hence tends to disregard them. However they are likely to make a significant contribution as time goes on so it is important that the capabilities to extract DSM benefits from these technologies are developed from the start and included in the design of electric heating (mainly heat pumps) and transport systems.
- The consultation paper assumes that a DSM contribution from heat pumps requires heat storage. Heat storage would increase the capability to move demand from one time of the day to another and to increase demand during the night valley. However, even without the provision of additional heat storage, heat pumps can provide demand response as they can be switched off for some time (say ½ hour) without seriously affecting customer comfort.

ESBCS CONSULTATION RESPONSE - SEM-10-052	
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TYPE OF COMPANY	Electricity Supplier
INTEREST IN DSM	

SECTION 2 – ROLE AND BENEFITS OF DEMAND SIDE RESPONSE

QUESTION 1: Do you agree with our characterisation of the four types of benefits that demand side management can provide?

ANSWER:

While the *flexible measures* categiorisation may capture some elements of the value of DSM, in the context of a high level of intermittent wind generation, the benefit is not only that demand can be reduced when there is little or no wind. It is also that demand can be increased when there is a high level of wind generation which otherwise would have to be curtailed. Research on the impact of DSM on curtailment at high wind penetration is required to quantify this.

DSM has an additional value as a facilitator of wind generation and the achievement of the associated targets.

QUESTION 2: Are there other cost savings which you believe demand side management can deliver?

ANSWER: No

QUESTION 3: Are there additional studies and reports (to those listed in Annex B) which you are aware of and believe we should review?

ANSWER: No

QUESTION 4: What other insights do you have from your experience of demand side management

adopted internationally?

ANSWER: The Pacific Northwest Gridwise demonstration project on the Olympic peninsula, which was an internet based real-time pricing demand response programme, showed positive results. See http://gridwise.pnl.gov/docs/pnnl_gridwiseoverview.pdf

QUESTION 5: Are you aware of other quantitative findings from international experience which you believe are important for us to capture and consider?

ANSWER: No

QUESTION 6: Do you agree with our identified drivers of future value for demand side response/management? Are there any additional drivers we should consider?

ANSWER:

- The main driver in Ireland for DSM is to accommodate the intermittency of wind generation. To achieve this, dynamic ToU pricing is needed as the times during which demand needs to be reduced or increased is not predictable and will become increasingly unpredictable. This is a fundamental change to the current situation where most schemes (with the exception of Powersave) are designed to incentivise customers to reduce demand over known peak hours.
- The value of DSM to the Network needs to be assessed and a mechanism found to pass this on to the customer e.g. alleviating Network constraints which might on a localized scale otherwise be limited
- In general ancillary services, DSM and flexibility are undervalued. Mechanisms need to be developed to pass the value on to the supplier and then on to the customer.
- As for Transmission Network constraints in 2.5.4, the expectation that the cost of managing distribution network constraints will increase over time, should be included in 2.5.5
- DSM may have a varying geographic/localised effect across the system depending on local constraints

SECTION 3 - DEMAND SIDE POTENTIAL IN THE ALL ISLAND MARKET

QUESTION 7: Are there any other aspects of current demand side activity in Ireland which should be captured?

ANSWER: Powersave, while mentioned in 4.1.6.2 should be included in section 3.2

QUESTION 8: Do you agree with our high level assessment of the potential for demand side management in Ireland by 2020?

ANSWER:

The electrification of heat and transport are policies required to meet a number of objectives such as CO_2

targets and renewable heat targets. Hence a growing penetration of Electric Vehicles and heat pumps (primarily air source) should be anticipated and facilitated. Both have DSM benefits which can be used to accommodate more wind generation. The consultation paper regards their initial contribution as small and hence tends to disregard them. However they are likely to make a significant contribution as time goes on so it is important that the capabilities to extract DSM benefits from these technologies are developed from the start and included in the design of electric heating (mainly heat pumps) and transport systems.

Even if The potential for flexibility from electric vehicles is relatively small in absolute terms we should capture this given its growth potential and also the need to build knowledge to leverage this potential

The Estimated flexible demands in capacity terms for all of the entries in Table 4 look high with the exception of Electric Vehicles which could be low. However, take-up rates may only be a fraction of these values

SECTION 4 – SUPPORTING DEVELOPMENT OF DEMAND SIDE ACTIVITY

QUESTION 9: Do you agree with our definition of each individual demand side measure?

ANSWER:

- Adding controllable load is a measure in its own right and should be added to the list
- Smart metering should be viewed as an infrastructure to facilitate DSM rather than a DSM measure in its own right. If customers reduce demand at particular times or move demand from one time to another, they must be rewarded on the basis of the prices in each time period. This requires their demand being metered in each time period which is achieved by the Smart meters. However, the price signals, whether static or dynamic Time of Use (ToU) Pricing, do not need to go through the Smart meter. It would provide more flexibility if these were to be routed to customers via the internet. Furthermore the original Smart meters are likely to be in place for 15 years or more which would limit the development of new offerings to customers if everything was designed to be routed through the meter. Using the internet which is an infrastructure which is likely to continue to develop technologically would provide more scope for new innovations which may not be feasible now but will be in the future.
- Within the definition of Renewable heat in section 4.1.7.1, there is an assumption that Heat storage would increase the capability to move demand from one time of the day to another and to increase demand during the night valley. However, even without the provision of additional heat storage, heat pumps can provide demand response as they can be switched off for some time (say ½ hour) without seriously affecting customer comfort.
- In relation to Section 4.1.5.1: Smart meters may not necessarily be the vehicle for providing time-varying prices and therefore acting as a hub for home area networks (HANs)

QUESTION 10: Is our description of the current policy baseline for each demand side measure accurate and complete. If there are omissions please point them out.

ANSWER: Yes with two additions:

- Section 4.1.9.1: Micro-generation will be limited by local network constraints which can be alleviated by DSM
- Section 4.1.4.2: Other participants should be included I.e. *"CER and ESB Customer Supply/BGE ES are currently conducting a large-scale technical and behavioural trial of smart-meters" in order to ascertain the costs and benefits and to inform the technologies chosen for the roll-out.*

QUESTION 11: Do you agree with our categorisation of different types of "market issue" and typical remedies for each?

ANSWER: We agree with the categorisation of different types of "market issue" however in relation to Section 4.2.4.1, we believe that Insufficient competition relates only to Northern Ireland, and also the typical remedy outlined is the deliverable of a fully liberalised market as exists in the Republic of Ireland.

The inability to finance investments due to short-term view of benefits is particularly important issue

QUESTION 12: Do you agree with our identified barriers and enablers for each of the specific demand side measures we have identified?

ANSWER:

One of the fundamental barriers in encouraging DSM is that the correct signals are not in the market to make DSM economic. The values associated with the various benefits of DSM are not properly rewarded e.g.

1. Primary operating reserve (as provided by interruptible load) is undervalued under SEM
2. The price profile under SEM is too flat to incentivise load shifting. It would be worth reviewing the price profile of capacity payments as the price profile of energy payments is already determined by the marginal energy costs.

Section 4.2.4.1: (Smart Meters)

- The simplest option being trialled in the in the Smart Meter trials is a detailed Time-of-use based bill and does not include an in-home display. One of the objectives of the trial is to establish whether the in-home display does help. Therefore the baseline is pre-judging the outcome of the Smart Meter Trial
- We don't see the presence of vertically integrated utilities as being a barrier to experimentation with dynamic or static time-of-use tariffs. We don't agree with the inclusion of paragraph 4, since as stated later in the section " in the current context ….it is not meaningful to speak of specific barriers to realising any of the options that form part of the Demand Side Vision".

Section 4.2.4.3: Recommendation 2 - The specification for Smart Meters needs thought to ensure we don't close off any options including the possibility of delivering all non-metering communications through a separate communications channel.

Section 4.2.4.3: Recommendation 3 - As outlined in our response to question 11 above, we believe that lack of competition relates only to Northern Ireland, and also the typical remedy outlined is the deliverable of a fully liberalised market as exists in the Republic of Ireland.

Section 4.2.5.1: The smart meter may not necessarily be the gateway to the home for the delivery of price information. This choice of channel should be driven by customers and delivered by suppliers particularly in a competitive market.

QUESTION 13: Do you agree with our identified market issues for each specific demand side measure and our proposed remedies to address these?

ANSWER:

In relation to Remedies:

4.2.2.3: Recommendation 1 – Agree - as the consultation document points out, energy efficiency is the best type of DSM to the extent that the reduction in demand is ongoing. This saves the considerable cost of additional generation which would otherwise feed into the cost of electricity. Such savings should be taken into account in providing subsidies for energy efficiency measures

4.2.3.3: Recommendation 1 – Agree however Suppliers play a major role in customer education and should be included in the statement of the remedy

4.2.4.3: Recommendation 1 – Agree, however education of customers is likely to be more cost effectively implemented by suppliers through direct channels, there is evidence of this from cases in e.g. Montreal Hydro 2 year education campaign before ToU implementation.

4.2.4.3: Recommendation 2 –

- Including the facility (at least in future) for dynamic time-of-use tariffs which vary with the conditions on each day, may unnecessarily complicate the Smart Meter specification and as outlined in our response to Section 4.1.5.1 on enablers, Smart meters may not necessarily be the vehicle for providing time-varying prices to customers.

- Static time-of-use tariffs are currently being trialled by CER (add Suppliers/ESB CS/ESBIE/BGE ES in Republic of Ireland)

4.2.4.3: Recommendation 3 – lack of competition relates only to Northern Ireland, and where this is not a barrier, mandating of ToU tariffs is unlikely to be warranted

4.2.5.3: Recommendation 1 – Agree, however, the absence of agreement on Home Area Networking standards is likely to limit the degree to which the needs of domestic appliances can be accommodated in the near-term.

4.2.5.3: Recommendation 2 – While we agree, we do need to see the results of the static ToU trials currently underway

4.2.5.3: Recommendation 3 – Agree

4.2.5.3: Recommendation 4 – Agree, inability to finance in the current (and likely short to medium term economic climate is likely to be a very significant issue which is likely to warrant additional support measures

4.2.5.3: Recommendation 5 – Agree

4.2.5.3: Recommendation 6 – Agree

4.2.6.3: Recommendation 1 - Suppliers have to pay the actual in-day price, so implementation will need to consider which party bears the risk for the differential between the day-ahead and in-day prices.

4.2.6.3: Recommendation 2 – Agree

4.2.6.3: Recommendation 3 – Agree

4.2.6.3: Recommendation 4 – Agree

4.2.7.3: Recommendation 1 - Agree As outlined earlier Suppliers have to pay the actual in-day price so implementation will need to consider which party bears the risk for the differential between the day-ahead and in-day prices.

4.2.7.3: Recommendation 2 - Agree

4.2.7.3: Recommendation 3 - Agree

4.2.7.3: Recommendation 4 – ESB Networks as Distribution System Operator, may be best positioned to assess this impact over time.

4.2.7.3: Recommendation 5 - Agree

4.2.8.3: Recommendation 1 – Agree

4.2.9.3: Recommendation 1 – Agree

4.2.9.3: Recommendation 2 – Agree with the remedy however, ESB Networks as Distribution System Operator, may be best positioned to assess this impact over time.

4.2.9.3: Recommendation 3 - We think that there will have to be an interface but this does not necessarily have to be through the meter, and could have a limiting effect on the meter functionality over its lifetime.

4.2.10.3: Recommendation 1 –

- This recommendation could equally apply to Heat Pumps
- We think that there will have to be an interface but this does not necessarily have to be through the meter, and could have a limiting effect on the meter functionality over its lifetime.

4.2.11.3: Recommendation 1 - Agree

4.2.11.3: Recommendation 2 - Agree

QUESTION 14: What are your views on the likelihood and effectiveness of the identified policy options addressing the specified market issue and delivering the desired change?

ANSWER:

4.2.2.3: Recommendation 1 – Is likely to address the issue of split incentives and imperfect information

and deliver the desired change

4.2.3.3: Recommendation 1 – Is likely to address the issue of imperfect information and deliver the desired change providing direct channels through suppliers continue to be used to deliver this information

4.2.4.3: Recommendation 1 – While an education campaign can address the issue of imperfect information by informing customers this education is likely to be more cost effectively implemented by suppliers through direct channels, there is evidence of this from cases in e.g. Montreal Hydro - 2 year education campaign before ToU implementation.

4.2.4.3: Recommendation 2 – While this remedy for the issue of economies of scale has some merit, Smart meters may not necessarily be the vehicle for providing time-varying prices to customers.

4.2.4.3: Recommendation 3 – this remedy addresses a market issue of lack of competition which relates only to Northern Ireland, and where this is not a barrier, mandating of ToU tariffs is unlikely to be warranted

4.2.5.3: Recommendation 1 – Implementation of this remedy to the issue of economies of scale as it effects home and office automation is likely to be limited by the absence of agreement on Home Area Networking standards and constrain the degree to which the needs of domestic appliances can be accommodated.

4.2.5.3: Recommendation 2 – the likelihood and effectiveness of this remedy will be better understood when we see the results of the static ToU trials currently underway

4.2.5.3: Recommendation 3 – There is some evidence that the likelihood of this remedy succeeding is high but the effectiveness of this remedy is best judged by the results of previous appliance labelling schemes.

4.2.5.3: Recommendation 4 – the likelihood of this remedy addressing the issue of inability to finance in the current (and likely short to medium term economic climate will be a very significant issue which is likely to warrant additional support measures

4.2.5.3: Recommendation 5 – This is a sensible remedy which is likely to effectively address the potential issue of split incentives

4.2.5.3: Recommendation 6 – While this remedy seems a sensible approach, the likelihood and effectiveness of this remedy addressing the potential issue of split incentives and economies of scale is difficult to assess

4.2.6.3: Recommendation 1 – The likelihood and effectiveness of this remedy addressing the issues of imperfect information and overly restrictive regulation will be influenced by which party bears the risk for the differential between the day-ahead and in-day prices.

4.2.6.3: Recommendation 2 – This option is likely to address the issue of overly restrictive regulation effectively

4.2.6.3: Recommendation 3 – This option is likely to address the issue of imperfect information effectively

4.2.6.3: Recommendation 4 – This option is likely to address the issue of imperfect information

effectively

4.2.7.3: Recommendation 1 - The likelihood and effectiveness of this remedy addressing the issues of imperfect information will be influenced by which party bears the risk for the differential between the day-ahead and in-day prices.

4.2.7.3: Recommendation 2 - This option is likely to address the issue of overly restrictive regulation effectively

4.2.7.3: Recommendation 3 - This option is likely to address the issue of imperfect information effectively

4.2.7.3: Recommendation 4 - ESB Networks as Distribution System Operator, may be best positioned to assess this impact over time

4.2.7.3: Recommendation 5 - This option is likely to address the issue of overly restrictive regulation effectively

4.2.8.3: Recommendation 1 - There would be significant benefits if advances are made in heat storage. This will facilitate wind and helps achieve renewable generation and renewable heat targets.

4.2.9.3: Recommendation 1 - ESB Networks as Distribution System Operator, may be best positioned to assess these implications.

4.2.9.3: Recommendation 2 - ESB Networks as Distribution System Operator, may be best positioned to assess the likelihood of this option addressing the issue of split incentive effectively

4.2.9.3: Recommendation 3 - We think that there will have to be an interface but this does not necessarily have to be through the meter, and could have a limiting effect on the meter functionality over its lifetime.

4.2.10.3: Recommendation 1 - We think that there will have to be an interface but this does not necessarily have to be through the meter, and could have a limiting effect on the meter functionality over its lifetime.

4.2.11.3: Recommendation 1 - This option is likely to address the issue of overly restrictive regulation effectively

4.2.11.3: Recommendation 2 - This option is likely to address the issue of inability to finance investments effectively

QUESTION 15: Are there any unintended undesirable consequences that any of the options might create elsewhere?

ANSWER:

No

SECTION 5 – ASSESSMENT OF OPTIONS AND PRIORITIES

QUESTION 16: Do you agree with our identified specific demand side measures and our assessment of the different types of benefits each demand side measure provides?

ANSWER: Yes with one addition Heat Pumps without storage.

QUESTION 17: Are there any additional demand side measures that we should individually identify and assess? If so, what type of benefit(s) is it felt they provide?

ANSWER: Heat pumps as even without the provision of additional storage, can provide demand response as they can be switched off for some time (say ½ hour) without seriously affecting customer comfort

QUESTION 18: Have we identified all of the relevant criteria for assessing the individual and comparative merits of the demand side measures?

ANSWER: Yes

QUESTION 19: What are your views about our approach to high level assessment of different demand side options?

ANSWER: While we agree with the approach, noting that it is highly subjective:

- we take a different view on the costing attributed to Heat pumps with storage which we assess should be allocated an indicative cost category of Medium rather than High
- While electric vehicles and heat pumps are relatively small resources, we should optimise the demand side benefit from these resources and they should be taken into account
- The low installed base of micro-generation and the lack of electrical storage solutions for Micro-generation would suggest that the benefit would be lower
- Given that it is more likely that solutions will be developed for both heat pump and Electric Vehicle storage we should concentrate on these two options equally with Micro-generation
- The effectiveness of Smart Meter options as an enabler of change is heavily determined by customer behaviour. In our view smaller proportions of customers will respond to smart meter options than can take-up energy efficiency initiatives.

QUESTION 20: Do you agree with our assessment of each demand side measure against each of the identified factors?

ANSWER: While the relativities are correct, the cost estimates in Table 8 seem to be extremely low.

Smart Meters, while enablers of DSM do not provide DSM in their own right. Their reliance on behavioural change weakens their effectiveness as an option without some levels of home automation. In addition, the duration of behaviour change may challenge the value of advanced displays as the

changes may be short-lived

In addition we would suggest the following amendments as outlined in Annex 1 :

- Increase the green job creation potential of Heat Pumps from low to medium - given the likelihood of the storage challenge being resolved
- Increase the energy efficiency rating for heat pumps given the predominance of Ground-source units and their high CoP ratings
- Reduce the cost of delivery of Heat pumps from High to Medium given the necessity for replacement expenditure irrespective of technology thereby defraying the differential cost of heat pumps
- Reduce both of the security of supply ratings for advanced displays from High to Low given the dependence on behavioural changes

QUESTION 21: Do you agree with our overall assessment of the relative merits of the different demand side options?

ANSWER: See suggest the amendments outlined in Annex 1 below

- While static ToU tariffs rightly have a lower ranking than Dynamic ToU tariffs, Static ToU tariffs may still have some value in dealing with Networks peaks which may still be over known hours (except to the extent that there is significant distributed small wind and PV) We suggest increasing the ranking of Smart meters with static ToU Tariffs from Low to Medium
- Increase the overall ranking of heat pumps from Neutral to medium

QUESTION 22: Do you have any comments on our high level assessment of the benefits of different demand side measures?

ANSWER: See suggest the amendments outlined in Annex 1 below

SECTION 6 – THE 2020 DSV AND ASSOCIATED POLICY RECOMMENDATIONS

QUESTION 23: Do you agree with our assessment of the relative priorities of different demand side options in developing a 2020 Demand Side Vision?

ANSWER: As above

QUESTION 24: What alternative views do you have on relative (merits and) priorities?

ANSWER: Specifically – add heat pumps with storage as a potential in the longer term which we need to start now in order to realize these benefits. This is backed up in the vision – heat pumps and Electric Vehicles have to be part of the vision for de-carbonisation and should be included as part of DSM

QUESTION 25: Do you agree with our proposed high level 2020 Demand Side Vision as described above?

ANSWER: Yes subject to be points raised above

QUESTION 26: What alternative vision would you put forward?

ANSWER: The vision is close to what it needs to be subject to consideration of the changes in emphasis outlined in Annex 1 & Annex 2

QUESTION 27: Do you agree with our proposed policy pathways for implementation of the identified different policy options for realising our proposed 2020 Demand Side Vision?

ANSWER: We agree with the thrust of the policy pathways, however see amendment outlined in Annex 2

QUESTION 28: What alternative policy pathways would you propose based on your previous comments and responses?

ANSWER: See amendment outlined in Annex 2

SECTION 7 – NEXT STEPS

QUESTION 29: Do you have any additional view or comments you feel are important/useful for us in (a) establishing a Demand Side Vision for 2020; (b) identifying associated policy development and (c) determining policy pathways?

ANSWER: Running an island system with over 40% intermittent wind generation and limited interconnection will be very challenging in terms of standby plant requirements, operating reserve (primary, secondary and tertiary) and inertia. Ireland is almost unique in this respect and the value of DSM should be higher here than in other countries. This provides us with an opportunity to be at the forefront of DSM technologies and innovation but this will only happen if the correct values are attached to these services. The value of these services will increase as the penetration of wind increases. To accommodate high levels of wind will require DSM to have been developed and be in the process of being rolled out. Such developments will only take place if the industry knows what will be paid for DSM services so these signals need to be in the market in advance. Ideally the value of DSM services should be based on over 40% wind rather than the level of wind we have at any point in time. As a minimalist alternative, there will need to be certainty in the market that payments for DSM will increase and a clear indication of what they will be when we reach 40% wind.

QUESTION 30: Are there any final comments industry stakeholders wish to make about this consultation and the proposed next steps in the consultation process?

ANSWER: See summary at the top of this response

Annex 1 Evaluation of Options *

	Competitiveness		Security of Supply		Sustainability		Electricity market Metrics				
	Competition & Consumer Choice	Green Job Creation	Generation Capacity margin	Transmission capacity	Energy Efficiency	Accelerated growth of RES	Generation costs/CO2 emissions	Generation Capacity Costs	Frequency Response	Cost of Delivery	Overall Ranking
Energy efficiency - Industrial	Neutral --> Low/Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	No	Medium	High
Energy efficiency - Commercial	Neutral --> Low/Medium	Medium	Medium	Medium	Medium	Medium	Medium	Low	No	Medium	Medium
Energy efficiency - Domestic	Neutral	Medium	High	High	Medium	Medium	High	High	No	Medium	High
Behavioural change - Education	Neutral	Medium	Medium	Medium	Medium	Medium	Medium	Low	No	Low	Low
Smart meters - Advanced displays	Medium	Medium	High --> Low	High --> Low	Medium	Low	High	High	No	Low	Medium
Smart meters - Static ToU tariff	Medium	Medium	High	High	Medium	Medium	High	High	No	Low	Low --> Medium
Smart meters - Dynamic ToU tariff	Medium	Medium	High	High	Medium	High	High	High	No	Medium	High
Home & office automation - Direct load control	Medium	Medium	High	High	Neutral	High	Medium	High	?	Medium	Medium
Home & office automation - Autonomous	Medium	Medium	High	High	Neutral	High	Medium	High	No	Low	Medium
Home & office automation - Frequency-responsive relays	Medium	Medium	Neutral	Neutral	Medium	Neutral	Low	Low	Yes	Medium	Medium
Industrial & Commercial DSR - Interruption contracts	Medium	Neutral	High	High	Neutral	High	Medium	High	No	Low	High
Industrial & Commercial DSR - Direct load control	Medium	Neutral	High	High	Neutral	High	Medium	High	?	High	High
Industrial & Commercial DSR - Demand-side bidding	Medium	Neutral	High	High	Neutral	High	Medium	High	No	High	High
Industrial & Commercial DSR - Autonomous	Medium	Neutral	High	High	Neutral	High	Medium	High	No	Medium	High
Heat pumps - Heat pumps are fitted with storage	Neutral	Low --> Medium	Medium	Medium	Neutral --> High	High	Medium	Medium	No	High --> Medium	Neutral --> Medium
Electric vehicles - Night charge	Neutral	Medium	Medium	Neutral	Neutral	Low	Low	Medium	No	Low	Neutral
Electric vehicles - Hybrid vehicles	Neutral	Medium	Medium	Medium	Neutral	Medium	Low	Medium	No	Medium	Neutral
Electric vehicles - Intelligent (price-reponsive) charging	Neutral	Medium	Medium	Medium	Neutral	Medium	Low	Medium	No	Medium	Medium
Microgeneration - Controllable	Neutral	Neutral	Medium	Medium	Neutral	Low	Low	Medium	?	Low	Neutral
Aggregation of DG	Low	Neutral	Medium	Medium	Neutral	Medium	Medium	High	?	Low	Medium
Storage Neutral	Neutral	Medium	Medium	Neutral	Negative	Medium	Low	Medium	Yes	High	Low

* Key: Suggested changes in yellow highlight (old value → new value)

Annex 2 - Table 10 **

	Demand-Side Measure	Immediate	Short to Mid Term	Long Term
High Value	Energy efficiency		More ambitious roll-out of energy efficiency measures	
	Smart meters	Smart meter specifications to allow for advanced displays & in future dynamic ToU tariffs	Education programme on benefits of smart meters	
			Interventions to accelerate adoption of ToU tariffs	
	Industrial / commercial demand side response	Create visible / firm day-ahead price and schedule for	Study on volume and natures of flexible demand available in the I&C sectors	
		Review the value attributed in SEM to ancilliary services and DSM		
		Review of TSC & Grid Code to identify barriers to participation of I&C demand	Programme of engagement with I&C sectors to increase awareness of potential for demand-side participation	
Medium Value	Home & office automation	Smart meter specifications to allow for future needs of smart appliances	Smart meter trial with focus on home & office automation	Mandatory standards &/or subsidies to encourage adoption of smart appliances
				Review the impacts of demand-side management on distribution networks
				Assess value of dynamic demand based on GB trials
	New demand – electric vehicles	Smart meter specifications to allow for interaction with EV charging systems	Review the impact of EVs for the electricity system	Review in detail the impacts of demand-side management on distribution networks
	New demand – heat pumps	Incentivise storage technologies for heat pumps		
	Aggregation of distributed generation	Create visible / firm day-ahead price and schedule for the SEM	Develop standard contract structures and/or other measures to facilitate participation from DG	Detailed review of barriers facing distributed generators
		Review of TSC & Grid Code to identify barriers to participation of I&C demand	Review of network design standards or practices – identify barriers	
Low Value	Behavioural change		Labelling scheme & education programme for smart appliances	
	Storage	Review payments to pumped storage through the SEM	Review support for R&D activities relating to distribution-level storage	
	Home & office automation		Labelling scheme for smart appliances	
Limited Value	Microgeneration	Smart meters required to control and interact with microgenerators		

** Key: Suggested changes in yellow highlight (to Value assessment and/or timeline)