The customer-focused smart grid: Next steps for regulatory policy and commercial issues in GB

Report of Workstream Six of the Smart Grid Forum, 2015

Annex 2: Supplementary papers

These annexes contains further background on WS6, its subgroups, as well as the supporting evidence and analysis used to inform the subgroup chapters in Annex 1 and the recommendations and actions in the main report. Each of the actions in the main report stemmed from the work of the subgroups. However, the final actions in the main report have been agreed by the plenary WS6 body and so the wording between the main report and the annexes main not align precisely.

1. WS6 Annex

1.1. This annex includes:

- Terms of reference and membership. The original terms of reference for WS6 were set in 2012, these were later updated in 2014 to reflect its updated objectives following the SGF vision and routemap publication.

- LCNF workshops table identifying how subgroups have taken actions against relevant learning points (covering all). This table was used to stimulate discussions amongst the subgroups about the LCNF projects.

TERMS OF REFERENCE (Original ToR 2012):

Introduction

1.2. In its first year, the Smart Grid Forum focussed on identifying the type of smart grid solutions, (i.e. demand side response, storage, technical interventions, active network management etc.) which might be viable to address the uncertainties associated with the volume of low carbon technologies such as heat pumps and electric vehicles and renewable distributed generation which are expected to connect to the distribution network.

1.3. This work stream will build on this work and investigate the commercial and regulatory challenges of implementing the smart grid solutions identified for the RIIO ED1 period. The immediate work of this group will take place before the RIIO ED1 Strategy Consultation takes place (September).

Purpose of Initial Work

1.4. The initial purpose of this work stream is to produce a report prior to September 2012 which:

i) identifies potential regulatory barriers to implementing the smart grid solutions which may be deployed in RIIO ED1 (2015 - 2023) and proposes methods for removing these barriers;

ii) outlines regulatory options that balance objectives related to cost reflectivity of network charges and equitable treatment of network customers;

iii) identifies options for the commercial arrangements (i.e. the contractual arrangements between customers, DNOs, suppliers and other industry parties) to provide the most efficient outcomes, across the value chain, for the smart grid solutions which may be implemented in RIIO ED1;

iv) outlines options for the customer engagement required to implement smart grid solutions for RIIO ED1 and the potential parties (supplier, DNO, system operator, aggregator) in the supply chain to undertake this engagement; and

v) highlights the potential barriers to the most efficient development of the commercial arrangements to support smart grid solutions in the longer term.

Approach

1.5. This work stream will meet 5 times between the start of May and end of July.

1.6. Stage 1 of this work will take the emerging outputs from work streams 2 and 3 to identify the type of smart grid solutions which may be implemented in RIIO ED1. It will look to outline the various ways in which these solutions may be implemented.

1.7. Stage 2 of this work will involve examining the outputs of stage 1 against the current commercial and regulatory framework. It will produce a report identifying;

- Potential regulatory barriers to implementing smart grid solutions and steps which can be taken to remove them;
- Potential regulatory options that balance objectives related to cost reflectivity of network charges and equitable treatment of network customers;
- Potential options for the commercial arrangements to support the implementation of smart grid solutions;
- the customer engagement required to support the options for commercial arrangements and the parties best placed to engage directly with customers to support these arrangements;
- Options for ensuring a non-discriminatory approach for implementing smart grid solutions and how costs should be recovered by customers; and
- Risks to the roll out of commercial and regulatory frameworks associated with the deployment of smart grid solutions.

Dependencies

1.8. As part of the RIIO ED1 process, the Flexibility and Capacity working group will assess the outputs and incentives required to encourage DNOs to use smart grid solutions where they can help provide timely connection service at lower cost.

1.9. The outputs of the Regulatory and Commercial Issues work stream will be fed into and inform both the work of the Flexibility and Capacity Working Group and the work of SGF's Work Stream 3 – Developing Networks for Low Carbon.

1.10. Any views from the Flexibility and Capacity working group and SGF's Work Stream 3 on potential regulatory and commercial barriers will be fed into this work stream.

1.11. The options produced in the report referred to in section 3 above will also help inform the RIIO ED1 strategy consultation which will be published in September 2012.

Resources, Funding and Support

1.12. Ofgem will initially lead the work of this WS and support all members by providing a secretariat function. However, all members who take responsibility for areas of work will be responsible for resourcing and funding these pieces of work.

Ongoing scope

1.13. The ongoing scope, direction and leadership of this work stream will be reviewed beyond July. Further meetings of the work stream will be scheduled beyond the end of

July to develop a proposal for the scope of this further work, including specific outputs and their respective timeframes. Ofgem and DECC will have a formal role in governing the work (including project scope, approach and sign-off).

UPDATED TERMS OF REFERENCE - 2014

1.14. Work stream 6 was established identify the types of smart grid solutions DNOs may deploy in RIIO ED1 and identify any regulatory or commercial barriers to their implementation. Stage one, to develop a number of options for the development of and consumer engagement with smart grids has been completed. Stage two, to develop the roles and relationships for relevant parties under different options for these roles, has also been completed.

1.15. The DECC Vision and Routemap identified several gaps, some of which relate to work undertaken by WS6. WS6 has mapped these gaps and identified were gaps are beyond the scope of the work stream and where work will be taken forward to fill these gaps by the work stream. In a number of cases, the gaps will be covered by the next two stages of the work stream's work.

1.16. The work stream has an ambitious work programme with tight deadlines for delivery. Consequently it has taken care to review the gaps in the routemap and to consider which fit neatly within the existing programme and which would expand the scope in a manner which would endanger delivery.

Identification of gaps

1.17. The DECC Vision and Routemap identified several gaps on the consumers' engagement with smart grids which could be taken forward by WS6. In the majority of cases, the areas identified in the report are covered by the next stages of the work stream's work. Stage three will assess the commercial and regulatory arrangements for each option to effectively discharge roles and identify barriers to and enablers for these arrangements. Stage 4 will define the roles and relationships with the supporting commercial and regulatory arrangements across a range of options and trigger points.

1.18. The following lists the gaps that have been identified by the report:

i) Further understanding of factors which influence customer behaviour and what incentives are needed to achieve lasting change to ensure consumer offers are tailored to customer needs

ii) Improve understanding about who is best placed to engage and inform consumers to help them participate in new smart electricity markets

iii) Explore the opportunities to articulate the wider benefits of smart grids alongside the roll-out of smart meters with the Smart Meter Central Delivery Body

iv) Improve understanding of how best to balance benefits among active 'smart' customers and the customer base as a whole

v) Explore different smart pathways to deliver DSR and examine the commercial and regulatory arrangements and requirements for consumer engagement

Gaps assessed by the work stream that will be addressed through future stages of the work

i) "Further understanding of factors which influence customer behaviour and what incentives are needed to achieve lasting change to ensure consumers offers are tailored to customer needs"

1.19. This work will be undertaken as part of incorporating the learning from LCN Fund projects as is currently planned by the work stream. WS6 continues to ensure that learning is incorporated into its analysis and this work is explicitly within the terms of reference for the Consumer Protection subgroup. This group has been set up to ensure that the commercial arrangements developed for each option have been considered thoroughly from a consumer perspective.

1.20. Specifically, the subgroup will:

i) Examine each smart grid option in the WS6 report from a consumer perspective against the various consumer types identified by WS6 and highlight key customer issues. The group will identify which options may be unviable without consumer protection measures being put in place and will define what these measures may be. The group will undertake this (or assess as many options as possible) and update the wider group at 9th July meeting

ii) Examine any new options developed. The group will provide an update at August meeting.

iii) Analyse the factors that influence consumer behaviour (including on the assessment of learning from the LCN Fund projects) and identify the incentives that are needed to achieve lasting change to ensure consumer offers are tailored to customer needs. The group will organise a series of LCNF workshops and will update the Work Stream at the September meeting.

iv) To consider the commercial arrangements between each party and the consumer for each domestic option (to provide input after the LCNF Conference meeting).

1.21. Learning from other projects may also be incorporated, for instance CAB's 'Extra Help Service' and Papers from Sustainability First. The complexity of offering and the impact on domestic consumers (including vulnerable consumers) will be considered as a factor in the assessment.

ii) "Improve understanding about who is best placed to engage and inform consumers to help them participate in new smart electricity markets"

1.22. The work stream has started to consider third parties such as aggregators, local councils or others as part of its work on roles and relationships. This will be taken forward as it considers commercial arrangements and who is best placed to engage with a customer and what the contractual arrangements between the consumer and industry parties should look like. The work stream will consider the commercial arrangements between each party and the consumer for each domestic option.This analysis will take place after the LCN Fund Conference meeting.

iv) "Improve understanding of how best to balance benefits amongst active 'smart' customers and the customer base as a whole"

1.23. The Work Stream's ongoing work on the distribution of value will address this issue, although we note that this work has not yet reached conclusion. Learning from the LCN Fund is also an important input.

1.24. The Distribution of value subgroup will assess specifically how the benefits of DSR are distributes across different users of the services, either direct participants or those affected by DSR actions, under different scenarios. The group will develop understanding of how benefits are distributed, in order to inform the development and assessment of options, regulatory and commercial arrangements and any barriers to be addressed. The group will also develop an understanding of mechanisms for value to flow back to consumers, individual and across the customer base as a whole. The subgroup will complete this group between June and October 2014.

v) "Explore different smart pathways to deliver DSR and examine the commercial and regulatory arrangements and requirements for consumer engagement"

1.25. This issue is part of the core purpose of Work Stream 6 and will be covered in full. The work Stream is progressing this work and has already completed stage one, developing options or pathways to deliver DSR. The next stage of this work will examine the commercial and regulatory arrangements that are required for effective consumer engagement.

Gaps assessed by the work stream as falling outside of scope

i) "Further understanding of factors which influence customer behaviour and what incentives are needed to achieve lasting change to ensure consumers offers are tailored to customer needs"

1.26. This issue is a part of a broader retail market review question. A detailed look at the simplicity of retail tariff offerings is beyond the scope of the work stream. A detailed behavioural analysis of engagement with consumers, particularly vulnerable consumers is also not addressed.

iii) "Explore the opportunities to articulate the wider benefits of smart grids alongside the roll-out of smart meters with the Smart Meter Central Delivery Body"

1.27. Work Stream six should be aware of potential risks and opportunities of the smart meter rollout for informing consumers and their perspectives on smart grids, but the work stream does not intend to cover this point in a detailed way. To focus on the role of the CBD is out of scope of WS6.

Mechanism

1.28. WS6 has put together several subgroups which will seek to take forward this work, where appropriate. These subgroups will have clear deliverables and provide a series of inputs into the main work stream. This work will contribute to the Third Annual Report.

1.29. These subgroups are as follows:

- Distribution of Value Subgroup
- Consumer Subgroup
- Smart Metering Data subgroup
- Visibility subgroup
- Storage and Distrusted Generation subgroup
- Community Energy subgroup

1.30. The subgroups that will take forwards work to fill the gaps identified by the DECC Vision and Routemap.

WS6 Membership

This is a non-exhaustive list of the wide variety of participation in WS6.

Apxgroup	Elexon	OLEV
BEAMA	eMeter	Open Energi
British Gas	Energy Savings Trust	Regen SW
Bird and Bird	Engage Consulting	RenewableUK
Camborne Captial	ENWL	SEA
CHPA	ETI	Siemens
Citizens Advice	Evolve Analytics	SmartGrid GB
Community Energy Scotland	Frontier Economics	SPEN
Cooperative Energy	Good Energy	Spencer Mills
DECC	KiwiPower	SSE
E.On	Logica	Sustainability First
EDF	National Energy Action	UKDRA
Electralink	National Grid	UKPN
ESN	Northern Powergrid	OLEV
Element Energy	Npower	Open Energi

Monitoring of issues arising from LCNF Workshops

This table represents a summary of the issues discussed at two workshops from 2014 on how learning from the LCNF trials relates to WS6 work. It is a working document and does not reach any definitive conclusions nor are the findings endorsed by all WS6 members.

Learning points	**Subgroup(s) that will investigate?**	**Subgroup actions taken**
Smarter Network Storage		
Potential double charging of FiT and RO payments on energy temporarily held by electrical storage. This disadvantages storage operators vs generators due to additional opex costs.	SNS to propose solution but inform following groups: • Distribution of Value • DG and Storage	This does not impact the value of DSR for the industry but impacts the cost of the solution to capture the value. DG and Storage WG to look at SNS to report on these issues late 2015. **S&DG to ensure issues raised to WS6 and to determine if earlier action needed.**
The Climate Charge Levy (CCL) is applied by default to storage operators on import. On subsequent export CCL is levied a second time on subsequent consumption. This results in double charging of CCL on energy held by storage operators.	SNS to propose solution but inform following groups: • Distribution of Value • DG and Storage	This does not impact the value of DSR for the industry but impacts the cost of the solution to capture the value. DG and Storage WG to look at SNS to report on these issues late 2015. **S&DG to ensure issues raised to WS6 and to determine if earlier action needed.**
Reactive power charges are levied by DNOs,	SNS to propose	SNS to report on these

Learning points	Subgroup(s) that will investigate?	Subgroup actions taken
but there is no mechanism for recognising the provision of reactive power when it is delivered for network support.	solution but inform following groups: • DG and Storage	issues late 2015. S&DG to ensure issues raised to WS6 and to determine if earlier action needed. **DNO working group? ESOF?**
How to make DUoS work for storage – the need for charging to be more reflective of location.	SNS to propose solution but inform following groups: • DG and Storage	SNS to report on these issues late 2015. S&DG to ensure issues raised to WS6 and to determine if earlier action needed. **MIG/DCUSA?** **S&DG to raise issue with appropriate group/make own change proposal?**
Who has priority to use storage –DNO or National Grid?	• Distribution of Value • DG and Storage • Visibility	This is a commercial decision. It should be based on contractual agreements Not covered by SNS. But assessed as part of ENA Shared Services consultation. S&DG to ensure issues reported to these groups NG comfortable with DNO having first call due to their more geographically aligned constraints. This is part of the ENA shared services framework and has been noted as a key finding in the WS6 report.
Solvent Achieving Value from Efficiency		
Would be useful to understand how customers chose to use the LED lights given to them in the project i.e. do they install them and in which rooms.	• SSE to feed into Community Energy & Energy efficiency group	
A DNO rebate could go through the supplier bill or through a purpose built DNO system. There needs to be a balance between the best way to magnify the signal and the expense of doing this. In a smart new world it will need to be seen how the supplier and DNO interact and complement each other.	• Distribution of Value • Visibility	We answer this in the paper If this was an ad-hoc service then a 'cheque in the post' approach would be best. Regular payments should be via supplier to avoid customer confusion, though there should be no restrictions to other innovative payment methods. Noted in the report under key finding.
Flexible plug & play		
Generators had not been willing to commit to	• DG and storage	**S&DG ToR**: explored in

Learning points	Subgroup(s) that will investigate?	Subgroup actions taken
fund future reinforcement, even where reinforcement would lead to lower overall constraint costs.		Flexible connection papers
Thames Valley Vision		
There is a need to balance customers expectation of hot water availability with what is needed on the network	• Consumer Protection • Distribution of Value	Discussed in the consumer subgroup chapter under: Managing expectations around complex offers This should be a commercial agreement between actor and customer. Customer should be correctly incentivised if it is to expect a lower level of service
Nines		
Responsibility of maintenance/fixing of equipment	• Consumer Protection • Distribution of value	Discussed in cross – sub group meeting with DG – looking at the current regulation around PV installation and maintenance This is being looked at by the customer working group. Not relevant to DOV
There are arrangements in place for the end of each trial, which has been set out in the consumer engagement strategy. Once consumers come off these trials, they will revert to the original tariff they were on. Customers may be charged more under this tariff and so thought needs to be given to enduring arrangements.	• SSE to propose solution in consultation with Consumer Protection group	***DSR on Nines will be a bid in as part of Shetland energy solution – therefore a more enduring solution may be offered under this***
ARC		
The connection charging tool doesn't include an updates for the impact of microgeneration. It was felt that this should be added	SPEN to keep the DG & Storage subgroup updated	Does this issue affect all DNOs? Should charging tool be modified? Who has responsibility for this tool (DCUSA? MIG?). **S&DG to follow up.**
Customer Led Network Revolution		
40% of customers would have been worse off through the ToU on the trial. Need to understand if wider system savings would counterbalance this.	• Distribution of Value • Consumer Protection	DOV has looked at the issue of coordinated actor savings in the paper Covered in the price- risk consideration in the chapter and DSR protections toolkit for ToU tariffs.
Trial produced a 10% peak reduction and an average saving of 3%. Worth sharing this experience with LCL and understanding locations where it could be applied in the future	• Distribution of Value	Key is winter peak saving is not as much as the rest of the year so the value to the industry of the saving is reduced
I&C: Engagement direct with customers and via aggregators Implications of different contract forms and	• Consumer participation group	Covered under the complexity risk which is considered in the draft chapter and in the protection toolkit under tariff

Learning points	Subgroup(s) that will investigate?	Subgroup actions taken
response types for notification and learning on feedback on level and timing of response provided through Flexitricity	• Visibility	accreditation tool. Aggregators discussed in consumer sub-group chapter as Third Party Intermediaries who have no operational regulatory framework . tbc
Learning on different forms of contract (benchmark vs floor) incentivising response and overall level of pricing comparable to STOR	• Distribution of Value	This is noted by the DOV group, but does not impact the paper
Spare capacity on network higher than previously estimated. How can the benefits of this be captured?	• Smart Metering • Distribution of Value	Addressed within separate note produced on demand diversity, appended to the chapter. This is good for EV. However HP growth removes diversity in winter which is a counter issue.
Low Carbon London		
Should DNOs release data on G83 and G59 installs to other parties? This would allow other parties to know who had flexible load.	• Visibility • Consumer Protection	DNOs don't get all notifications and data privacy may be at risk if information is widely available. This has been identified as an issue in the report. Considered as part of the autonomy/privacy loss in the consumer sub-group chapter
DNOs may ToU tariff to be mandatory to secure a sufficient level of response to avoid reinforcement	• Consumer Protection	In consumer sub-group chapter assumed that DSR at the domestic and small business level would be voluntary and rewarded
Trial paid prices higher than STOR and UKPN confident they can compete with STOR prices.	UKPN to feed into • Distribution of Value	This is noted by the DOV group, but does not impact the paper
Research shows that 20% of conflict events may have a negative impact on DNOs. To feed analysis on conflicts and synergies between DNO & supplier DSR to Distribution of value group	• Distribution of Value • DG and Storage • Visibility	This is noted by the DOV group and is included in the paper **Refer issue to ENA Shared Services group.** The merit order will be discussed in the DoV sub-group, otherwise visibility in the ENA shared services group should prevent this being an issue.
DNOs will need a robust process for heat pump notification. Current process is linked to RHI but there may need to be adapted	• Visibility	DNOs don't get all notifications and data privacy may be at risk if information is widely available. This has been identified as an issue in the

Learning points	Subgroup(s) that will investigate?	Subgroup actions taken
		report.
Spare capacity on network higher than previously estimated. How can the benefits of this be captured?	• Smart Metering • Distribution of Value	Addressed within separate note produced on demand diversity, appended to the chapter. This is good for EV. However HP growth removes diversity in winter which is a counter issue.
Sola Bristol		
One customer claimed that DC lighting saved £5 a week. Worth pursuing further	• WPD to confirm and follow up with Community Energy & Energy efficiency groups	
Customers incentivised to join through free equipment (tablet computer) and rebate on the bill. Are these viable propositions for roll-out?	• Consumer protection group	Innovative approaches to business models to engage consumers of the first approach
Customer Load Active System Services		
Customers don't notice changes in voltage on the network and yet the changes in voltage can lead to large savings for System Operator. Is this is a viable solution to be rolled out as customers would not be able to opt out.	• Consumer protection group	Considered by subgroup to only be a consumer issue if it goes wrong. Ideally no consumer impact. Therefore key point is confidence in avoiding unforeseen impact.
Energy control for household optimisation		
Trial will look at level of payments required for households to participate in DSR	• WPD to feed into Distribution of value	WPD is under taking this and will be important item to add to the paper once the findings are published
Vulnerable customers and energy efficiency		
Trial still being developed but will involve DNOs working directly with vulnerable customers and providing advice on energy efficiency	UKPN to feed learning into • Consumer protection • Community energy and energy efficiency	Change in circumstance is considered in "Managing expectations around complex offers" in the consumer sub-group chapter. This discusses a requirement that any physical installation of new equipment for DSR, or building survey for this purpose, is combined with or preceded by an in person explanation of what effects this might have on the consumer, as an enabler.
Community Energy Action		
Engagement needs to be tailored to community and financial incentives have not been as strong a driver as expected, with communities not necessarily aligning with	• Community Energy group	

Learning points	Subgroup(s) that will investigate?	Subgroup actions taken
network grouped areas		

2. Community Energy and Energy Efficiency Annex

2.1. This annex includes:

- Terms of reference and member of the community energy and energy efficiency subgroup
- List of smart community energy projects
- Energy Efficiency support mechanisms across the UK

TERMS OF REFERENCE: BACKGROUND AND PURPOSE OF THE SUBGROUP

2.2. The CE and EE Sub-Group consists of representatives from industry parties, community energy, energy efficiency, consumer organisations and government.

2.3. The purpose of the subgroup is to assess how community energy schemes can engage with the smart grid options developed by work stream 6 (WS6)[1]. When exploring options for smart community energy projects, the sub group ensured that unique characteristics of community energy were taken into account.

2.4. In parallel, the subgroup identified synergies with energy efficiency and heat projects and further developed Option 6 of the WS6 report *Deployment of Energy Efficiency Measures*.

SUMMARY OF APPROACH

2.5. The sub group used project-based learning to identify some of the key commercial and regulatory barriers community energy schemes face. The group also reviewed the findings of the Community Grid Connections Working Group[2]. The group then identified potential enablers drawing on the smart grid options developed by WS6, and also exploring options outside the WS6 Report. The subgroup has made recommendations for how to tackle each barrier, including who should take on the work to address them forward and by when.

2.6. A general issue that cuts across all the areas considered is ensuring the communities have access to clear, independent advice as well as opportunities for networking with other community groups. The sub-group welcomed the approach adopted by some DNOs in terms of providing dedicated advice and guides for community energy groups. Furthermore it is hoped that the soon to be launched Community Energy Hub [3]will become a coordinating point for relevant information, although actual performance will need to be monitored to determine whether more bespoke advice services are also provided.

SCOPE

2.7. The subgroup will be focusing on the following three strands of community energy as identified in DECC's 2014 Community Energy Strategy, with focus placed on electricity:

- Generating energy
- Reducing energy use
- Managing energy demand

[1] https://www.ofgem.gov.uk/publications-and-updates/working-documents-work-stream-six
[2] https://www.ofgem.gov.uk/publications-and-updates/community-energy-grid-connections-working-group-report
[3] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/414446/CESU_FINAL.pdf

2.8. In addition, the Community Energy Grid Connections Working group report to the Secretary of State of July 2014 highlights the key characteristics of community energy groups and projects. In particular, community energy groups:

- cannot change location in order to connect in an area where the grid is not constrained
- are unlikely to have significant finance available for the early stages of project development, although they have proved they can raise finance at later stages
- are less likely to have expertise
- use governance models which mean that projects will typically take longer to develop and may, therefore, find it difficult to respond as quickly as commercial developers when capacity becomes available
- employ atypical, often shared, ownership models
- are often established with social objectives.

2.9. When developing options for community energy projects, the sub group will seek to ensure that these characteristics are taken into account, in particular when examining roles and relationships and identifying potential barriers.

TERMS OF REFERENCE

Community Energy

- Identify existing barriers or enablers using project-based learning
- Identify options from the WS6 report to which each issue applies
- Propose recommendations/solutions for addressing each issue. This may include developing alternative options for arrangements to those in the WS6 report. Proposals should identify recommendations noting which party (or parties) should be taking the work forward and by when.

Energy Efficiency

- Develop Option 6 of the WS6 report on energy efficiency measures and explore the roles and relationships of various parties
- Identify any commercial or regulatory barriers and engagement issues to the options developed and which parties are best placed to take them forward.

Final output

- Final output: draft sub group report chapter to feed into main WS6 report, combining the outputs above.

MEMBERSHIP

The group consists of representatives from different industry parties, community energy, consumer group representatives and government. Ofgem will provide secretariat support to the subgroup: attend each meeting, help to arrange meetings, book rooms/teleconferences and provide minutes etc.

UK Powernetworks
Community Energy England
Northern Powergrid
Northern Powergrid
Welsh Government
Community Energy Wales
Community Energy Scotland
DECC
SSE Power Distribution

EST
Welsh Government
Swanbarton
University of Leeds
Citizens Advice
N Power
British Gas
Western Power Distribution
DECC
Siemens
NEA
ETI
EDF Energy
ENWL
UK Powernetworks
SSE Power Distribution
Regen SW
Citizens Advice

SUPPLEMENTARY MATERIAL

The following documents can be found in the 'Community Energy and Energy Efficiency" subgroup supplementary material' zip folder, published alongside this document:

- List of Smart Community Energy Projects
- Energy Efficiency support mechanisms across the UK

3. Consumer Protection Annex

BACKGROUND AND PURPOSE OF THE SUBGROUP

3.1. Consumers could gain benefit from DSR. Participating domestic and SME consumers should receive a financial reward, and all bill payers could benefit from DSR's ability to enable decarbonisation and security of supply at a lower cost than traditional alternatives. It is important any regulation does not curtail innovation or the growth in the market unnecessarily. The consumer subgroup was established to ensure that the commercial arrangements developed for all proposed DSR options were considered thoroughly from a consumer perspective. Specifically, the subgroup had three main deliverables:

i. To examine each smart grid option in the WS6 report from a consumer perspective against the various consumer types identified by WS6 and highlight key customer issues. The group was to identify which options may not be viable without consumer protection measures being put in place, and define what these measures may be.

ii. To analyse the factors that influence consumer behaviour (including the assessment of learning from the LCN Fund projects) and identify the incentives that are needed to ensure consumer offers are tailored to customer needs.

iii. To consider the commercial arrangements between each party and the consumer for each domestic option.

SUMMARY OF APPROACH

3.2. The group initially produced an assessment of the key consumer issues, protections and necessary commercial arrangements, to complete its deliverables (i) and (iii). The group also helped to arrange a series of workshop presentations from the most relevant Low Carbon Networks Fund projects, towards deliverable (ii). The conclusions of all three deliverables are contained in the Consumer Protections Toolkit and Risk Matrix document included in the supplementary material below. This document includes:

i. A risk matrix assessing the risk of each option in four categories: volume (i.e. continuity of supply), complexity, privacy/autonomy and cost.
ii. A 'protections toolkit' identifying possible protection measures to mitigate these risks.

3.1. The group also produced a longer 'consumer risk register', which forms the basis of this chapter.

3.2. Various work has already been carried out on how the risk of possible consumer detriment could be overcome to include domestic consumers in the DSR market. Citizens Advice have published a paper on 'making electricity demand-side response work for domestic and small business consumers',[4] Sustainability First have looked at the household demand side and associated commercial and consumer issues,[5] and a

[4] http://www.citizensadvice.org.uk/take_a_walk_on_the_demand_side
[5] http://www.sustainabilityfirst.org.uk/docs/2014/Sustainability%20First%20-%20Paper%2012%20-%20Household%20Electricity%20Demand-Side%20%20Participation%20in%20the%20GB%20Electricity%20Markets%20-%2031%20July%202014%20-%20FINAL.pdf

European report by THINK includes a useful overview of the possible ways domestic DSR could work and the issues consumers might have.[6]

3.3. Identification of the incentives is needed to ensure consumer offers are tailored to customer needs. This should in part be the role of the market. DSR in reality for domestic and SME customers is starting from a very low base. As it develops, new business models and types of offer may emerge to present an attractive new proposition to consumers (building on the work begun by various Low Carbon Networks Fund projects).

3.4. The Distribution of Value subgroup has pointed out that at present demand for flexibility may be filled by DSR from industrial and commercial customers, which is easier to obtain at scale and more reliable than household or small business DSR (Annex 1, 3.15 - implementation costs for DSR from domestic consumers). However, a number of factors may make the proposition of domestic DSR more appealing over time, especially if different market actors find a way to pool the value they could obtain from it (Annex 1, 3.12 – combining value).

3.5. This chapter therefore aims to identify the basic consumer requirements around DSR, which leaves the question of specific incentives or models open. A basis of consumer confidence will be a key requirement for a broader group to engage. Any approach to DSR needs to combine consumer protection with scope for innovation which benefits and engages consumers, and these should be mutually complementary.

MEMBERSHIP

Ofgem will provide secretariat support to the subgroup: attend each meeting, help to arrange meetings, book rooms/teleconferences and provide minutes etc. The group consists of representatives from different industry parties:

Citizens Advice
EDF Energy
British Gas
SSE Power Distribution
Electralink
Northern PowerGrid
Sustainability First
Energy Technologies Institute
Ofgem

SUPPLEMENTARY MATERIAL

The documents listed below can be found in the 'Consumer Protection supplementary material' zip folder, published alongside this document.

- Consumer Protections Toolkit and Risk Matrix
- Note on use of load limiting or control in emergency situations

[6] http://www.eui.eu/Projects/THINK/Documents/Thinktopic/Topic11digital.pdf

4. Distribution of Value Annex

BACKGROUND AND PURPOSE

4.1. WS6 established the Distribution of Value subgroup to consider how the benefits of DSR are distributed across different users of the services – either direct participants or those affected by DSR actions - under different scenarios. This was to establish the economic value to consumers which may be created by DSR. It also assessed how these benefits will flow back to consumers. The group has developed understanding of how benefits are distributed, in order to inform the development and assessment of options, regulatory and commercial arrangements and identify any barriers that need to be addressed. The group has also developed an understanding of mechanisms for value to flow back to both individual consumers and across the customer base as a whole.

SUMMARY OF APPROACH

4.2. The group looked at the following uses for DSR, to evaluate their value to the TO, SO, supplier / aggregator and the DNO and look at possible interactions, conflicts and other findings.

i. National system peak

ii. Local network peak load

iii. Local peak generation, low demand

iv. Post fault management by the DNO

v. Wholesale market

vi. Capacity market

vii. Customer value

4.3. Further details on the assumptions and conclusions for these use cases are provided in the supplementary material.

4.4. The group then considered key, likely uses of DSR by market actor. DSR for industrial and commercial customers is not the primary focus of the work group as an operational market is already in place and many of the issues and barriers do not apply. All market actors see themselves either able to contract directly or via another actor / aggregator to procure these services today. Most growth in DSR is expected via the industrial and commercial market until the easiest loads to contract have been exhausted. The group was agnostic to the options for engagement with consumers in its work.

4.5. For all actors there are alternative options to DSR and so DSR will have to provide the most cost effective solution for it to be used. For instance, there will be occasions when the cost of upgrading the local network capacity relative to the cost of DSR makes reinforcement the most efficient option in the interest of all customers.

4.6. Even if an actor does not procure DSR services but benefits from the actions of others then the industry has mechanisms in place to ensure distribution of value back to the customer; either via competition for suppliers and aggregators or the regulated price controls for other actors. The work considered the following groups of actors:

i. Transmission Network Operator (TO)

ii. System Operator (SO)

iii. Distribution Network Operator (DNO)

iv. Supplier

v. Aggregator

4.7. Further details on each of these parties are provided in the supplementary material.

4.8. The work group is assuming large scale deployment of DSR to smart metered customers will be post 2020. Pre 2020 most DSR is expected to be static TOU tariffs set out in the DECC Smart Meter Impact Assessment, and energy efficiency.

4.9. The work also assumes uptakes of LCTs in line with the projections within the transform model so the industry impacts are expected to become prominent post 2020.

4.10. While the work focuses on the customers covered by the smart meter rollout, DSR focused on the gas market is out of scope

MEMBERSHIP

Ofgem will provide secretariat support to the subgroup: attend each meeting, help to arrange meetings, book rooms/teleconferences and provide minutes etc. The group includes representatives from different industry parties:

- EDF
- British Gas
- Engage Consulting
- National Grid
- Northern Powergrid
- SSEPD
- Citizens Advice
- Sustainability First
- WPD

SUPPLEMENTARY MATERIAL

The documents listed below can be found in the 'Distribution of Value subgroup supplementary material' zip folder, published alongside this document.

- Distribution of Value summary
- Scenario-based findings
- Actors' relationship with DSR
- Flow of benefits between industry parties

5. Smart Metering Annex

BACKGROUND AND PURPOSE

5.1. The purpose of the smart metering subgroup (SMSG) was to identify, and provide recommendations to address any barriers and enablers relating to DNOs realising smart meter (SM) benefits in the interests of consumers.

5.2. The SMSG did this by developing, and working though, a terms of reference (TOR) – see below to:

1) Consider what SM benefits relate to the DNOs, covering those which flow:
   - directly to DNOs (and then to consumers), and
   - to consumers directly but are within the control of DNOs; and
2) For each SM benefit, identify potential barriers and enablers (eg commercial and regulatory) to realising them and, where possible, provide recommendations to address them.

SUMMARY OF APPROACH

5.3. The SMSG met monthly to develop each of the items on the TOR with DNOs working closely with the separate ENA smart meter group (SMG) to carry out additional analysis as required. The starting point was the existing detailed analysis of the potential SM benefits published by the ENA and DECC:

- ENA (2012): Analysis of Network Benefits from Smart Meter Message Flows.[7]
- ENA (2013): Review of Analysis of Network Benefits from Smart Meter Message Flows.[8]
- DECC (2014): Smart meter roll-out for the domestic and small and medium non-domestic sectors (GB): Impact Assessment.[9]

5.4. Using these publications the SMSG followed three steps to completing the actions under the TOR:

1. It first considered whether there are other potential SM benefits that are missing from the existing publications.
2. For each identified SM benefit, the SMSG produced a standardised question and answers template to consider potential barriers and enablers.
3. Where barriers and enablers were identified, potential solutions and recommendations for how take them forward were developed.

5.5. The 'Supplementary material' section below sets out the work that the SMSG completed to fulfil its TOR and produce the actions set out in the 'Report of Workstream 6 of the Smart Grid Forum 2015'.

[7] http://www.energynetworks.org/modx/assets/files/electricity/futures/Network%20benefits%20of%20smart%20meter%20message%20flows%20V1%200%20300312.pdf
[8] http://www.energynetworks.org/modx/assets/files/electricity/futures/smart_meters/Review%20of%20Analysis%20of%20Network%20Benefits%20from%20Smart%20Meter%20Message%20Flows%20-%20Final%20ENA%20Report%20130702.pdf
[9] https://www.gov.uk/government/publications/smart-meter-roll-out-for-the-domestic-and-small-and-medium-non-domestic-sectors-gb-impact-assessment

5.6. The 'Supplementary material' section below sets out:

- a brief summary of all the papers that were produced by the SMSG to understand the barriers and enablers to DNOs realising SM benefits
- the full set of papers produced for readers who are interested in further detail.

TERMS OF REFERENCE

i) **Present Workplan**

ii) **Compile a range of Network Benefits from Smart Meter data**

- Compile list of the network benefits that can be obtained using smart meter data (use ENA reports, DECC IA and RIIO-ED1 business plans).

iii) **Smart meter data and delivery of consumer benefits**

- Based on the list compiled under (ii), develop high-level use cases on how smart meter data can be used to deliver benefits directly to customers?
- This includes establishing what smart meter data, at what granularity, are required to achieve benefits?

iv) **Losses**

a. Assess the use of smart meter data for modelling and measuring losses**.**
b. Produce options for how smart metering data might be used to develop an output based losses incentive for RIIO-ED2**.**

v) **Load control:**

a. Develop analysis to inform a future decision as to whether DNOs should have access to load control and other SM functionality. This includes:
    i. Benefits/Costs of DNOs having load control and other functionality
    ii. Technical feasibility of load control
    iii. How might DNOs get access to load control
    iv. Options for DNOs to use load control via the CAD and DCC – feasibility and comparison.

Membership
Beama
CGI
Citizens Advice
DECC
EDF
Electralink
ENA
ENWL
NPg
Ofgem
Privacy International
SEA
SP
SSE
UKPN
WPD

5.7. Ofgem will provide secretariat support to the subgroup: attend each meeting, help to arrange meetings, book rooms/teleconferences and provide minutes etc.

SUPPLEMENTARY MATERIAL

5.8. The SMSG produced detailed papers to fulfil each of the TOR items. The table below lists the documents/spreadsheets that have contributed towards the identification of the issues set out in this paper. These documents can be found in the 'Smart metering subgroup supplementary material' zip folder, published alongside this document.

TOR # (see above)	Summary/Key findings	Associated file(s)
TOR (i): Present SMSG workplan	*See above.	NA
TOR (ii): Compile a range of Network Benefits from Smart Meter data	***'SM benefits'** spreadsheet produced to consolidate the potential SM benefits. *Using the latest publications from DECC, ENA and DNO's business plans the group considered whether there are other potential SM benefits that are missing. *The SMSG identified two additional benefits which were considered further as part of TOR (iii): • Use of smart meter load control/limiting switches to mitigate the need for global; demand control actions under Grid Code OC6 and ESEC. • Use of SM demand control to mitigate the number of customers remaining off supply during network fault events.	See 'Smart metering subgroup supplementary material' zip folder. **'TORii SM benefits' spreadsheet**
TOR (iii): PART 1: Smart meter data and delivery of consumer benefits	1) The SMSG produced a standardised question and answers template and used this to consider potential barriers and enablers for the SM benefits identified in TOR (ii). See '**Q&A sheets**'. 2) The 'Q&A sheets' fed into the main conclusions for this TOR, the Excel worksheet '**barriers and enablers summary'.** This worksheet draws out the key barriers and enablers from the Q&A sheets, identifying potential solutions and way forward.	See 'Smart metering subgroup supplementary material' zip folder. **1) 'TOR iii Q&A sheets' pdf** **2) See 'TORiii Barriers & enablers summary' spreadsheet**

TOR # (see above)	Summary/Key findings	Associated file(s)
TOR (iii) PART 2: Focus on SM data aggregation and privacy	The ENA SMG assessed SM data aggregation and privacy as a potential barrier to realising DNO SM benefits. * The ENA work along with further discussion amongst the SMSG, has concluded that further consideration needs to be given to SM data aggregation and data privacy more widely. * Data aggregation alone may not be the solution to ensure compliance with licence condition SLC 10A (Smart Metering – Matters Relating to Obtaining and Using Consumption Data), so that DNOs can utilise more granular SM data. * The ENA SMG is now investigating options to comply with licence condition 10A and also maximise the potential benefits of SM data. This includes looking to develop an industry wide standard (including for gas distribution) for SM data privacy which would include data aggregation levels and the approach to ensure anonymity.	The ENA commissioned two reports by EATL on this issue and have published them here. See 'EA Technology Smart Meter Aggregation Assessment - July 2015'.
TOR (iii) PART 3: Focus on demand diversity related to the DNO SM benefit of proactive planning of HV & LV networks – New Connections	The SMSG were asked to investigate the relevance of learning from recent Low Carbon Network Fund trails, around the use of SM data to inform demand diversity assessments that from part of the DNOs' process for planning new connections. The '**Demand Diversity'** note concludes that: * at present, there are no substantive issues to improving and applying diversity assessments following the national rollout of SMs *enhanced demand diversity assumptions should help enable the delivery of consumer benefits for new connections.	See 'Smart metering subgroup supplementary material' zip folder**.** **See 'TORiii Demand Diversity' pdf**

TOR # (see above)	Summary/Key findings	Associated file(s)
TOR (iv): SM data, measuring losses and DNO incentives	**'Losses note'** looks at: *potential measuring and modelling approaches using SM data - DNOs should explore modelling of losses on a consistent approach *potential barriers/enablers to measuring and modelling losses *questions to aid design of a future losses regulatory incentive (eg ex ante/ex post funding, caps/collars, modelled or measured losses).	See 'Smart metering subgroup supplementary material' zip folder. **See 'TORiv Losses note'**
TOR (v): DNO access to load control	**'Load control'** note looks at some of the potential scenarios where SMs and SM infrastructure can assist DNOs in load control.[10] DNOs can obtain access through Suppliers to load control switches. The note recognises some of the challenges of this arrangement. It does not seek a change in the SEC to allow DNOs direct access to load control switches. However, it considers that this should be kept under review. If, in future, multiple stakeholders like Suppliers, TSO, or DNO access load control or load limiting functionality through SMs then some coordination between requests will be required.	See 'Smart metering subgroup supplementary material' zip folder. **See 'TORv Load control'**

[10] Scenarios, where SM infrastructure is not used are mentioned in this note, eg the possibility of DNOs/or aggregators on their behalf, using Consumer Access Devices (CADs) to manage load. However, they are considered out of scope for this paper.

6. Storage and DG Annex

BACKGROUND AND PURPOSE OF THE SUBGROUP

6.1. The purpose of the storage and DG subgroup has been to set out any issues or barriers to providing smart grid services specific to storage and DG.

6.2. Additionally, the group has also sought to identify any options for storage and DG[11] to offer smart grid services which have not already been captured in the WS6 April 2014 interim report.

6.3. The scope of the subgroup was limited to distribution-connected assets, albeit these may offer system services wider than the distribution network.

6.4. Finally the subgroup has looked at risk management issues associated with flexible DG connections, as part of the development of smart grids solutions.

SUMMARY OF APPROACH

6.5. The subgroup considered the range of potential services from storage and DG providers to Suppliers, DNOs, TOs and the SO and identified where these services are being used now and where there are apparent obstacles for their implementation, both for providers as well as for parties interested in these services. The results can be found in the annexes to this chapter.

6.6. The group assessed the risks and benefits of flexible connection agreements for DNOs, DG and DUoS customers as a whole. Within this assessment the subgroup considered potential means of managing the risk that arises from these arrangements with regards to uncertain levels of curtailment as well as the obstacles to sharing reinforcement costs triggered by DG. .

6.7. Based on this work, the subgroup produced two papers: One covering issues related to smart grid services provided by storage and by DG, the second looking at the options for connecting flexible DG connections as well as the associated risk management issues (see Annex).

6.8. This chapter outlines the issues identified in these two papers and develops recommendations for addressing them or proposes further work where these might be covered.

6.9. Owing to developments in thinking since publication of the 2014 WS6 paper, this section does not attempt to map across the individual categorisations of that paper.

TERMS OF REFERENCE

6.10. To review of storage and DG work completed through Work Stream Six so far, identifying any gaps. (Report back to WS6 at August meeting).

6.11. To identify options which for any new services which DG or Storage can offer additional to the existing list of WS6 options. (Report back to WS6 at August meeting).

6.12. To identify options for commercial and regulatory arrangements for the new DG and storage options. (Report back to WS6 at October/November meeting).

[11] Conceptually, demand, generation, and storage are the three categories of connectee. Demand and its role in smart grids is addressed in other sections by other sub-groups. Use of storage 'behind the meter' is addressed by the Consumer section.

6.13. To propose options for risk sharing and curtailment agreements in commercial arrangements. (Report back to WS6 at October/ November meeting).

6.14. To identify barriers to storage and propose options for addressing them. (Report back to WS6 at October/ November meeting).

6.15. Identify which are near time barriers which need removing, or enablers which need deploying and which are longer term. Propose next steps for removing the barriers identified, suggesting who should take them forward and when they might be completed by.

MEMBERSHIP

Ofgem will provide secretariat support to the subgroup: attend each meeting, help to arrange meetings, book rooms/teleconferences and provide minutes etc. The group includes representatives from different industry parties:

- RenewableUK (Chair)
- Electricity Storage Network (Deputy Chair)
- BEAMA
- EDF
- Electricity Storage Network
- ETI
- ITM Power
- National Grid
- RES
- SSEPD
- UKPN

SUPPLEMENTARY MATERIAL

The documents listed below can be found in the 'Storage and DG subgroup supplementary material' zip folder, published alongside this document.

- Storage and DG Services table
- Flexible connections paper

7. Visibility Annex

BACKGROUND AND PURPOSE

7.1. This report sets out how notification may happen between parties, what is possible using today's industry processes and what new communication channels and processes may be needed to enable DSR to take place while minimising adverse impacts.

7.2. There is recognition that most DSR actions are likely to align in benefits, i.e. it is safe to assume that both DNOs and suppliers will benefit from moving usage away from the evening peak. However, there will be occasions when this will not be the case and for these occasions visibility will be vital to prevent adverse costs being borne by market participants.

7.3. In this chapter we refer to the 'DSR provider' – this is the entity that manages a customer's DSR, whether it be a network operators, supplier, aggregator or any other third party.

7.4. Visibility is a wider issue that cuts across more than just DSR, for example the take-up of all low carbon technologies, but the focus of this chapter is purely on the ability to offer DSR.

7.5. The key drivers of visibility requirements are:

- **Value of DSR:** visibility of the value of specific DSR actions to all relevant market actors will ensure the DSR is used by those in most need of it.
- ***Why it's needed?:*** *Without a clear picture of the value that can be assigned to a DSR action, it will be unclear to the purchaser of the DSR whether it is the most cost effective option available to them (i.e. versus network reinforcement or the spot market).*

- **Clarity of DSR offering**: Efficient use of DSR will only result if all market actors are aware of who is willing to offer DSR under what circumstances, and with what level of certainty. This will ensure non-discrimination and facilitate certainty of response / availability where needed.
- ***Why it's needed?:*** *Without this information multiple DSR contracts could be established that fail to deliver when called upon. These 'subprime' contracts could result in cost impact on the owner of the DSR contracts, as they are not aware of the level of risk of non-delivery.*

- **Efficient use of DSR**: If there are conflicting signals (i.e. one DSR provider wanting increased consumption and the other wanting decreased consumption, from the same customer) then DSR should be used where it is most effective and/or delivers the greatest value.
- ***Why it's needed?:*** *Conflicting signals may result in DSR being used for one purpose when it could have been more effectively allocated elsewhere, this is an inefficient allocation of costs and resource.*

- **System security**: For wholesale market as well as transmission / distribution system security ensuring coordination of access.
- ***Why it's needed?:*** *If network companies cannot forecast when and where large amounts of DSR may be called upon, there is a risk of network failure or significant costs incurred for network reinforcement.*

SUMMARY OF APPROACH

7.6. This chapter focuses on the visibility of actions between various market actors – the system operator (SO), distribution network operator (DNO), aggregator and embedded generators[12]. Although the consumer is the most important part of this ecosystem, it has been agreed that the challenges of signals being visible to consumers will be contained within the consumer chapter.

7.7. A matrix (Annex 2) was devised to map out the potential conflicts between market actors and to identify where sufficient notification exists and where it may be built upon. This was explored diagrammatically (Annex 3) and discussed at several meetings. All of this information has fed into this report.

Assumptions

In compiling this report, several assumptions have been made:

- This report addresses visibility requirements in a market where there is a significant take-up of demand side response and half-hourly settlement is available to all[13].
- The smart metering Data and Communications Company (DCC) will be live and active, managing smart meters and centralised registration.
- The Retail Market Review (RMR) will have been re-visited to better facilitate time of use tariffs on an appropriate scale. This is in line with Ofgem's work within the consumer empowerment and protection project.
- DSR will evolve as a natural marketplace with bilateral contracts and possibly trading platforms as it grows.
- In many cases the relevant parties would be incentivised to shift generation and/or demand in the same direction but this may not always align – i.e. both the supplier and DNO are likely to want to shift usage away from peak. This report considers the 'worst case' of parties wanting to shift load in opposite directions and how visibility will function in these scenarios.
- The assumption is that DSR will be more cost effecitve in the large business market before becoming commercially viable for for small business and domestic customers as well.DSR covers both reducing and increasing demand and generation; storage is also included within this definition.
- The greater notice a party has of DSR actions, the less adverse the consequences will be to the affected party and therefore this will decrease the cost they are likely to incur
- DNOs will largely use post gate closure actions for post-fault management and other DSR uses will have a longer notice period.
- DNOs will only operate in their own geographical area.

TERMS OF REFERENCE

Introduction

7.8. Work Stream 6 has formed a number of subgroups which aim to build on the work that has been documented in the second Workstream Report to the Smart Grid Forum. The

[12] These are generators within the DNO network and not the large transmission connected generators.
[13] It may not be mandated for all.

Visibility Subgroup will support the next stage of work, the development of commercial arrangements for options for consumer engagement with smart grids.

Purpose and key deliverables

7.9. The purpose of the subgroup is to explore the requirements of various parties involved in DSR for visibility of DSR actions taken by other parties, particularly regarding data flows between different participating in DSR or affected by DSR. This will provide a key input into the development of commercial arrangements.

i) To identify key scenarios with implications for visibility requirements, including considering whether there are additional options.
ii) To revisit the data types and functionality for each option and the information required by each party and the necessary visibility of actions. To consider granularity of data required and verification needed. **(Update to July WS6 meeting)**
iii) To develop a detailed view of existing data flows between parties potentially involved in or affected by DSR actions, progressing work to review options following presentation by Baringa at June WS6 (visibility for generation curtailment) to identify where any new data flows may be required and building on potential presentation by Frontier, Baringa and Poyry at July WS6. **(August 2014)**
iv) To identify which data flows will be needed by relevant parties to facilitate and maximise the value of DSR. To assess these requirements against existing arrangements and identify changes needed to ensure other (potentially impacted) parties have the necessary visibility. To identify any associated issues with providing this visibility (eg relating to confidentiality or commercial sensitivity of actions).
v) To consider and review existing and any new options identified from Smart Metering, Storage and DG and Community Energy groups with a focus on the necessary data flows for new options developed. **(September – Assessment of any impact of new options).**
vi) To consider and compare requirements identified with existing commercial and relevant regulatory arrangements and identify requirements for changes to the commercial and regulatory framework, assessing barriers or enablers which may be needed to ensure necessary parties have visibility of key actions. (**Input into summary for October meeting)**

MEMBERSHIP

Ofgem will provide secretariat support to the subgroup: attend each meeting, help to arrange meetings, book rooms/teleconferences and provide minutes etc. The group includes representatives from different industry parties:

- British Gas
- EDF
- Elexon
- National Grid
- Northern Powergrid
- Openenergi
- UKPN
- WPD

SUPPLEMENTARY MATERIAL

The documents listed below can be found in the 'Visibility subgroup supplementary material' zip folder, published alongside this document.

- Matrix of visibility impacts
- Visibility diagrams