Flexibility Innovation: Market Engagement Questionnaire

Section B

1. **What are the key innovation needs to enable a smart and flexible energy system and why?**

    - Innovation in Power Purchase Agreements is needed to properly reward the value that comes from flexibility, this includes rewarding: capacity, balancing, ancillary, stability and other benefits which are not recognised by Power Purchase Agreements.
    - A range of contract lengths are needed, Some flexibility systems value short durations, while longer duration storage need longer length contracts in order to be bankable.
    - contracts also need to recognise the interconnectedness of some ancillary services meaning that they should both be rewarded. Currently some services are not adequately renumerated because of a separate connected service being the contracted benefit. This limits the ability for sites providing flexibility to appropriately stack revenue streams.
    - Black Start inaccessible as there is a lack of clarity over whether energy storage's role in the mechanism (for example, if is considered the primary plant or the main plant, with each having different requirements).
    - Some services e.g. inertia, stability services or reactive power not adequately renumerated
    - Innovation in existing support mechanism (such as the CfD and Capacity Market) is needed to properly incentivise colocation of renewable generation with storage.
    - Innovation required on substation monitoring and visibility at the grid 'edge'. There need to be greater Data Sharing at DNO and National Grid Transmission levels. Providing clarity on generation and grid restrictions.
    - Further innovation in smart tariffs and encouraging suppliers to introduce them to the market in order to drive consumer benefits and they can benefit from smart services connected to their smart meter, electric vehicle, heat pump or further energy use.

2. **It is anticipated that the innovation programme may cover a range of focus areas from the list below. Please indicate which areas are considered a priority for government to focus innovation support (if any) and why?**

Integration & interoperability of demand-side response systems ☑ Enabling access to a future smart energy system for vulnerable consumers ☐ Vehicle-to-X technology ☑ Smart meter technology ☑ Data solutions ☑ Digital solutions ☐ Market solutions ☑ Laboratory-scale demonstration of an integrated and interoperable smart and flexible system ☐ Real-world demonstration of an integrated and interoperable smart and flexible system ☑ Other

3. **What level of funding would you require to support innovation activity in each of the following areas?: (same options as above, <100k, 100-500k, 500k-1m, 1m-2m, 2-5m, 5-10m- >10m)**

Section c 1

1. **What are the key innovation requirements to enable flexible system integration and interoperability?**

There are several innovation requirements in the low voltage infrastructure, including:

Transparency of data on low voltage network

Visibility at substations

In addition to that, market rewards for other benefits from storage including: black start, frequency stabilisation.....

Wide scale adoption of SEG tariffs, which can provide financial benefits to the consumer and wider benefits to the grid for flexibility.

2. **What are the key barriers to innovation in this area?**

Barriers on the low voltage distribution network restrict the accessibility of flexibility technologies to access the network and provide system benefits. For example no data exists at substation level which makes it hard for domestic scale flexibility assets to contribute system benefits.

3. **Do you foresee any innovation gaps within the proposed Areas 1-4 outlined above? If so, please outline other areas that should be considered.**

4. **What would be the key barriers (if any) to participation in innovation activity focused on the area of integrated and interoperable DSR?**

It is currently difficult to make such projects bankable as flexibility markets do not properly reward the range of services provided by DSR systems. As such there is not the confidence in revenue streams to enable to make such projects bankable.

Minimum project size could preclude smaller companies, and in a similar way, time limits which are too short could stop projects which do not already have a well-established supply chain.

5. **Do you foresee any gaps in UK market capabilities to deliver innovation in the proposed Areas 1-4 above? (Please include the area(s) you are referring to in your answer)**

6. **What is the level of interest from your organisation in participating in innovation activity focused on Areas 1-4 above?** Very high ◉ High ○ Medium ○ Low ○ Not interested

7. **Are there any key dependencies we should consider in the development and/or delivery of innovation activity in this area?**

8. **What do you envisage as a suitable approach for testing a DSR system against defined use cases in a real-world setting?**

Establishing demonstrator across domestic and commercial users to discover unknown barriers to deployment. This would lead to a better understanding of costs, energy savings and changes which can be made to load and usage.

9. **What elements of a DSR system would be key to test? What could be derived beyond that established through laboratory-scale testing?**

Including:
- Real world demand and supply issues could influence how the DSR is designed impacting how it actually responds to market signals/
- Understand physical infrastructure restrictions, such as three phase power or local grid constraints.
-coordination with other infrastructure or onsite demand (heat pumps, -solar PV and electrical storage).
-the scale of potential energy saving/ time shifting in real world usage

-producing data for further research and development of a larger scale project

10. **What are the minimum number of devices and/or homes required to be tested in real-world settings to achieve an acceptable level of confidence?**

11. **Are you aware of any suitable pre-established 'real-world' UK testing facilities that could facilitate testing against proposed requirements set out in questions (9 and 10) above? If so, please give further details. Please consider both in the context of PAS 1878 and 1879 and the GB Smart Metering SAPC specification.**

12. **Please outline any further comments you have on the proposed areas outlined above.**

Section c1 area 1

1. **What is your current knowledge of British Standards Institute (BSI) Energy Smart Appliance Programme including the PAS 1878 and PAS 1879 standards published in May 2021?**

   We are aware of these standards

2. **Is there any guidance or capability you would need to implement PAS 1878 or PAS 1879 requirements in Area 1?**

3. **What is the gap (if any) between your organisation's current activities in this sector versus the activities outlined in Area 1?**

4. **What barriers are currently preventing you from developing ESAs and/or DSR platforms in accordance with the PAS 1878 and PAS 1879 standards published in May 2021?**

5. **Are there other standards in addition to PAS 1878 and PAS 1879 where innovation funding could help develop secure and interoperable ESAs and/or DSR platforms? If so, what are they? What are the barriers to adoption that innovation funding could help overcome? Please explain your answer.**

6. **Have you carried out any similar projects to that proposed under Area 1, such as development of ESAs and/or DSR platforms? If so, please specify details.**

7. **What timescales do you envisage are required to undertake the activities outlined in Area 1?**

8. **Do you have the resource and capability within your organisation to carry out all the activities outlined in Area 1, or would you need to be part of a consortium?**

9. **How difficult would it be to form consortia (if required)? How long would it take to build required consortia relationships?**

10. **Are you aware of suitable organisations you could approach to form a consortium?**

11. **If no, what would be useful to facilitate consortia relationships?**

12. **Is it feasible for the market to supply a consortium covering a DSRSP, an EV charge point, a heat pump, battery storage and a "white goods" appliance? How many such consortiums could the market supply? What could enable the market to supply such a consortium?**

13. **Please outline any further comments you have on Area 1.**

<u>C1 area 2</u>

1. **What is your current knowledge of SAPC GB smart metering functionality, including the SAPC Technical Specification published in November 2020?**
2. **Is there any guidance or capability you would need to implement SAPC requirements in Area 2?**
3. **What is the gap (if any) between your organisation's current activities in this sector versus the activities outlined in Area 2?**
4. **What barriers are currently preventing you from developing ESAs in accordance with the SAPC GB Smart Metering functionality, including the SAPC technical specification?**
5. **Have you carried out any similar projects such as the development of ESAs? If so, please specify details.**
6. **What timescales do you envisage are required to undertake the activities outlined in Area 2?**
7. **Do you have the resource and capability within your organisation to carry out all the activities outlined in Area 2, or would you need to be part of a consortium?**
8. **How difficult would it be to form consortia (if required)? How long would it take to build required consortia relationships?**

9. **Are you aware of suitable organisations you could approach to form a consortium?**
10. **If no, what would be useful to facilitate consortia relationships?**
11. **Is it feasible for the market to supply a consortium covering a supplier, an EV charge point, a heat pump, battery storage and a "white goods" appliance? How many such consortiums could the market supply? What could enable the market to supply such a consortium?**
12. **Please outline further comments (if any) you have on Area 2.**

C1 area 3

1. **We are considering options to enable the creation of interoperable energy management systems (including Home Energy Management Systems, HEMS) in line with architecture outlined in PAS 1878, including potential recommendations for Interface C (see PAS 1878, Figure B.5). Do you have any views on this?**

2. **Do you believe Interface C (see PAS 1878) could be operated using the same protocols and data exchanges as Interface A (see PAS 1878) and what is your reasoning? If so, do you believe your HEMS could coordinate control of ESAs energy usage without modification to the customer energy manager (CEM)?**
3. **What is the gap (if any) between your organisation's current activities in this sector versus the activities outlined in Area 3?**
4. **What timescales do you envisage are required to undertake the activities outlined in Area 3?**
5. **Do you have resource and capability within your organisation to carry out all the activities outlined in Area 3, or would you need to be part of a consortium?**
6. **How difficult would it be to form consortia (if required)? How long would it take to build required consortia relationships?**
7. **Are you aware of suitable organisations you could approach?**
8. **If no, what would be useful to facilitate consortia relationships?**
9. **Please outline further comments (if any) you have on Area 3.**

C1 section 4

1. **What challenges do you foresee (if any) in the testing against PAS 1878 and PAS 1879?**
2. **What challenges do you foresee (if any) in the testing of SAPC?**
3. **What do you consider could be high-cost activities within Area 4? How much would you estimate the costs of these activities to be? Please include your reasoning.**

4. **Do you agree that the options under consideration for DSR use cases below are appropriate for demonstration in Area 4? Are there any additional use cases you would suggest?**

    1. Consumer registering DSR appliance with CEM (where not integrated)
    2. Consumer registering with the appointed DSRSP
    3. Consumer defining DSR preferences
    4. Routine DSR mode of operation based on consumer's preferences and time-of- use tariff (TOUT)
    5. Response DSR mode of operation based on authenticated and validated Flexibility offers from DSRSP
    6. Consumer over-ride of DSR mode
    7. DSRSP maintaining DSR service delivery despite availability changes
    8. Consumer changing DSRSP (de-registration)
    9. Consumer changes TOUT/signal provider (including energy supplier)

5. **Do you currently have, or would you consider developing for the purposes of this work, testing, and demonstration facilities for the requirements of PAS 1878 and PAS 1879 (note this will likely require some OpenADR testing capability)?**

6. **Do you currently have, or would you consider developing for the purposes of this work, testing and demonstration facilities for the requirements of GB Smart Metering?**
7. **What timescales do you envisage are required to undertake the activities outlined in Area 4?**
8. **Do you have the resource and capability within your organisation to carry out all the activities outlined in area 4, or would you need to be part of a consortium? Please especially consider knowledge of Open Automated Demand Response (OpenADR) testing and GB smart metering testing.**

Using a consortium would ensure wider industry participation, and a range of perspectives.

9. **How difficult would it be to form consortia (if required)? How long would it take to build required consortia relationships?**

    The REA would be happy to help in enabling industry to form consortiums and establish relationships. In the past we have run short pitching and networking sessions between stakeholder groups. These have been successful in establishing consortium.

10. **Are you aware of suitable organisations you could approach to form a consortium?**

The REA have suitable organisations as part of their membership

11. **If no, what would be useful to facilitate consortia relationships?**

Events operated through Trade Associations that can bring stakeholder together.

12. **Please outline further comments (if any) you have on Area 4.**

C2 enabling access to a future smart energy system for vulnerable consumers

1. **How can innovation play a role in ensuring an inclusive smart energy transition? Please give details.**

Innovation is required to advertise the cost benefits and make them more widely applicable to all people, including vulnerable consumers. For example, there are several ways smart energy flexibility can lower costs to consumers:

- Innovation in smart tariffs should be encouraged amongst suppliers, specific tariffs could be targeted for use by vulnerable customers, recognising their needs and constraints.

- Automation and aggregation of smart benefits through IT systems, without significant decisions having to be made on behalf of the consumer will be key.

- Once beneficial tariff models are found to work in the market, Government should consider how these could be adopted by all suppliers and applied to all customers. Large number of market do not engage with the market, so it remains important that it is not only those who engage that should benefit.

-Access to low-cost energy and timing of usage to make the most of lower prices

-The ability to sell energy to the grid in times of system demand as started with the SEG tariffs

-Better usage of 'free' electricity from domestic solar panels via home energy storage and smart appliances.

2. **How does your organisation define 'vulnerable consumers' in the context of the smart energy transition? Please give details.**

We would encourage a consistency of definition across energy policy, so would want to avoid a separate definition being defined just for the purpose of this innovation competition.

3. **In the context of the smart energy transition, what type of energy consumers would your organisation consider to be the 'most vulnerable'? Please give details.**
4. **Which areas do you feel would benefit the most from targeted innovation for vulnerable consumers? (For example, smart electric vehicle charging, smart meters, smart appliances, smart tariffs)**

Smart technologies have to be used in combination to make the most of their potential. Hence all of the technologies listed in conjunction would provide a reduction in electricity bills and benefit vulnerable customers. However, as a starting point Smart meters and smart tariffs, which can be accessed by all through their supplier should be considered the priority.

5. **What barriers are currently preventing your organisation from developing innovation solutions to increase access, purchase or use of smart products or services by vulnerable consumers?**

The REA would not directly provide solutions, but we do represent members who do. It is our understanding that vulnerable consumers currently struggle to purchase smart technologies due to a lack of good financing options which are available (zero interest loans, grants, VAT rate cuts). This is especially important due to the pay off period being very long for most people to consider.

6. **What is the level of interest from your organisation in participating in an innovation activity in this focus area?**

○ Very high ◉ High ○ Medium ○ Low ○ Not interested

7. **As outlined above, we are minded to support innovation activity in this focus area through two phases. Do you foresee any gaps in UK market capabilities to deliver proposed phased innovation activity as outlined above? (Please include the area(s) you are referring to in your answer).**

8. **What timescales do you envisage are required to undertake the activities outlined in Phase 1 and Phase 2, respectively, and why?**

9. **What would be the key barriers (if any) to participation in the innovation activity proposed above? That is, how difficult would it be to form consortia (if required)? How long would it take to build required consortia relationships?**

Further research should be completed (see below), which should be done by a public body to avoid conflicts of interest. Forming a group of stakeholders to design a series of questions to better understand the needs of vulnerable customers would be difficult.

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10. **What technical and/or social research expertise is required to deliver innovation in this focus area? Does your organisation have this expertise? Please give details.**

A more detailed understanding of the demographic groups which are most vulnerable, and research into there greatest barriers to using smart technologies to directly benefit them.

11. **Has your organisation worked with vulnerable consumers before? If yes, please give details.**

12. **If you answered Yes to the above, what steps did your organisation take to protect these consumers and implement appropriate ethical principles?**

13. **From your experience what are the key design and delivery considerations that need to be taken into account in an innovation activity focused on vulnerable consumers?**
14. **Do you have any further comments? Please give details.**

    The REA has previously led calls to lower VAT rates on renewable and smart technologies to make them more affordable, which is of benefit to vulnerable consumers

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C3 vehicle to x technology

1. **What are the key barriers to innovation in V2X technologies?**
2. **Where could innovation funding make a substantial difference to the development of V2X?**

3. **Are there any areas of the V2X capability where lack of competition or some other distortion could prevent collaboration for innovation?**
4. **Are there any areas of the V2X capability where lack of competition or some other distortion could prevent deployment of the technology to the market?**

5. **Are there aspects of any of the international innovation programmes that the V2G innovation programme failed to address? Scale, integration with other aspects of transport or energy systems, or funding model?**
6. **What is the level of interest from your organisation in participating in an innovation activity focused in this area?**

   (•) Very high ( ) High ( ) Medium ( ) Low ( ) Not interested

7. **How difficult would it be to form consortia to participate in an innovation activity (if required)? How long would it take to build required consortia relationships?**

8. **Are you aware of suitable organisations you could approach to form a consortium?**

9. **If no, what would be useful to facilitate consortia relationships?**

10. **Do you have any further comments? Please give details.**

C4 smart meter technology

1. **What barriers to smart tariff adoption amongst non-domestic organisations could be addressed through this innovation activity?**

Greater variety of tariffs that would incentivise smart tariff use. This could include Identification of industrial hubs where specifically designed smart tariffs could be promoted around specific industry needs. For Time of use Tariffs this could provide benefits to industries like bakeries or breweries to help shift their energy demand.

Support for installation of smart devices and onsite generation that would enable a non-domestic site to make the most out of smart tariffs.

Increased awareness amongst businesses about smart tariffs and potential benefits.

Tie in support for business to adopted electric vehicle fleets, install low carbon heating and onsite generation, with promotion of smart tariffs.

Encouraging greater information of energy requirements being shared with suppliers when tendering for energy contract, to enable design of bespoke business smart tariffs.

Greater promotion and availability of three phase power connections to businesses.

2. **Which business sectors have the most potential to be early adopters of smart tariffs?**

Businesses where demand for energy can be shifted in time to non-peak times, or those which can turn off their supply for short periods with little consequence. In addition those which have a large roof area and benefit from solar PV, such as warehouses and light industrial sites which are not consuming large amounts of energy at the weekends can export energy onto the grid. Those businesses which have a large number of electric vehicles in their fleet such as courier companies, which are often have access to chargers overnight.

3. **What types of additional data do you think could usefully be retrieved from the home via DCC (to support net zero objectives)?**

Evidence of demand shifting because of smart tariffs and highlighting average savings.

Impact of increasing numbers of EV's and heat pump systems, plus impact on local demand.

Impact on demand when automated aggregations systems are in place to benefit consumers.

Different customer types and ability to be gain advantages from smart tariffs.

4. **What barriers or challenges with accessing DCC data could be addressed through this innovation activity?**

Greater transparency of data at DNO level. While working within the requirements of data protection legislation, greater availability of where there are areas of high demand, or high constraints, would greatly help in the identification of where greater flexibility solutions could be delivered.

5. **How could innovations enabled by the smart metering system address barriers to energy efficiency and decarbonisation in the public sector, including schools?**

Smart meters could reduce the financial burden of heating or cooling a large building, especially when used in conjunction with smart systems (including onsite generation, low carbon heating or DSR) so would be directly incentivised. It could also act as a gateway to other technologies and SEG tariffs.

6. **To what extent could social/non-technological innovations (for example, organisational and behavioural incentives, marketing, consumer engagement, advice and support) a) enable public sector organisations to get the most out of existing technology or future innovations and b) facilitate the spread of innovations throughout the public sector?**

7. **What is the level of interest from your organisation in participating in an innovation activity in this focus area?**

○ Very high ○ High ◉ Medium ○ Low ○ Not interested

8. **Do you have any further comments? Please give details.**

C5 data and digital solutions

1. **What are the key innovation requirements to enable energy system digitalisation?**

Encouraged participation in digitalisation with shared standards across all asset types.

Greater data sharing facilitated between parties, including DCC, DNOs and ESOs.

2. **What are the current barriers to innovation in this area?**

Agreed standards for data sharing.

Highly controlled data sharing systems that take a long time to be accredited for DCC file sharing. This is obviously necessary for data security, however could also be streamlined without compromising data security.

Encouraging the energy system aggregators to be the ones to focus delivery of services at the domestic level.

Infrastructure issues mentioned in C1 restrict the quantity of data available to be shared.

3. **What are the current technology options (hardware or software) that could be leveraged to achieve automatic registration of energy assets?**

4. **What are the current technology barriers to achieving automatic registration of energy assets below 1MW?**

Data from energy assets this small should be left to be dealt with by aggregators offering specific services. Innovation in market products that make it viable for such companies to operate is needed. Larger assets of 10mw-100mw need to be the priority for grid level innovation.

5. **To achieve automated registration of energy assets below 1MW, who are the key stakeholders that would need to participate? What would their roles be?**

DNOs, asset owners.

6. **Which existing standards and regulations associated with this technology (hardware and software) could, or should, be used?**

7. **What static data and associated metadata should be collected when an asset is automatically registered? Please give details and indicate the use-case you are envisioning.**

8. **What organisation(s) should own and be responsible for the security of the static data and associated metadata collected when an asset is automatically registered?**

9. **What organisation(s) should have access to the static data and associated metadata collected when an asset is automatically registered? How? For what purpose?**

   Accredited aggregators should be able to utilise the data to provide appropriate services.

   Greater data sharing should be facilitated between DNOs, the DCC and ESO.

10. **What business models and commercial structures could be used to ensure sustained and consistent collection, access and use of the static data and associated metadata collected when an asset is automatically registered? Please give details.**

The costs involved with data reporting would vary depending on the size and nature of the asset. Business models should take this into account and not unduly affect profitability of some assets.

11. **What are the current technology options (hardware or software) that could be leveraged to facilitate the generation and sharing of live asset data?**

12. **What technology options could be leveraged to achieve both asset registration, and generation and sharing of live asset data?**

13. **What are the current technology barriers to facilitating the generation and sharing of live asset data?**

14. **What live data and associated metadata should be collected after an asset has been registered? Please detail your envisioned use case. For example, for network planning or demand side response.**

15. **What organisation(s) should own and be responsible for the security of the live data and associated metadata collected after an asset is registered?**

16. **What organisations should have access to the live data and associated metadata collected after an asset has been registered? For what purpose?**

17. **Over what intervals would your organisation find live asset data and associated metadata most useful? Please give a reason for your answer.**

18. **To what extent does the scope of the proposed innovation activity help to enable system digitalisation?**

19. **What would be the level of interest from your organisation in participating in an innovation activity focused on facilitating the automatic registration of low-voltage (<1MW) generation, storage and demand assets?**

    ○ Very high ○ High ◉ Medium ○ Low ○ Not interested

20. **Do you foresee any challenges in delivering against any of the proposed options outlined above?**

21. **Do you foresee any gaps in UK market capabilities to deliver innovation in the proposed area of focus? (Please include the area(s) you are referring to in your answer)**

22. **What would be the key barriers (if any) to participation in innovation activity focused on facilitating the automatic registration of low-voltage (<1MW) generation, storage and demand assets?**

23. **Do you have any other comments? Please give details.**

C6 market solutions

1. **What innovation is needed to recognise and reward the true value of flexibility through markets?**

- The most significant barrier to deployment is the current lack of revenue certainty for the development of projects. Through either development of support mechanisms or regulatory changes, the enablement of long term and predictable revenue certainty will enable projects to become bankable and allow private investment into the market. In turn, this will allow a market to address the other identified barriers thanks to having revenue certainty. This includes providing finance for high upfront capital costs; creating a business model that takes account of long lead times; establishing a successful track record for commercialised projects and providing further evidence to determine the right changes to market signals. It is the REA's view that the introduction of an income floor price would provide the revenue certainty required to invest in LLES technologies.
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- Their inconsistency between DNOs in how flexibility services are rewarded.

- The Market does not have the range of contracts required. A range of market contracts are needed for both long-term large-scale storage and short term immediate response storage, recognising different flexibility benefits.

- Markets for flexibility are contradictory. Longer duration storage rewarded for the balancing service but penalised for inertia. Products need to be developed to appropriately reward all forms of storage and flexibility service.

- Storage assets are currently double charged for participating in the gird. They pay for access when they charge up, and pay to discharge and provide services to the grid.

- An at scale demonstrator project could serve as a great publicity exercise, where local councils, DNOs and consumers could see the potential benefits of flexibility and demand side response which would help the market recognise the full value that flexibility assets can provide.

2. **What are the key barriers to innovation in this area?**

Much of the value of energy storage comes from its capacity, balancing, ancillary, stability and other services, benefits of which are not currently well recognised within market contracts or grid payments. This includes:

- Short contract durations of a day, week or month for balancing and ancillary services do not enable bankable business cases for projects with an operational lifetime of several decades, significantly as investments in such large scale infrastructure projects depreciate over many years (15 – 25 years). Therefore, long term stable contracts are required.
- Separate procurement of different services makes it challenging to stack contracts or revenue streams effectively. This procurement process also fails to recognise that some separately procured services cannot be provided independently by longer duration energy storage plants, such as inertia. If a plant wins a contract for one service but not for another that can't be separated, the plant will not be fully renumerated for the services it provides. As a result, services become significantly under-priced, with some being provided for free, depreciating it's value to system stability and diluting market signals.
- Ancillary services markets are relatively shallow and illiquid. In addition, they are often location-specific (e.g. reactive power) and come with specific technical requirements set by National Grid ESO. This means investors cannot estimate with confidence how their value will evolve over long horizons.
- It is difficult to create a revenue stack that goes to more than one body. For example, suppose you were to get benefits from the grid. In that case, you could not simultaneously get a revenue stack that involves contracts with the system operator, despite the mutual benefits realised.
- Within the Black Start / Distributed ReStart project, there is a lack of clarity over whether energy storage's role in the mechanism (for example, if it's considered the primary plant or the main plant, with each having different requirements) making it difficult for plants to benefit from this mechanism.

The introduction of an income floor will help to de-risk some of these barriers by ensuring a predictable revenue stream, allowing ancillary service markets to develop that properly value each service.

3. What are the key market barriers faced by your organisation when looking to provide or procure system benefits from demand-side flexibility resources?

4. How could innovation help tackle these market barriers?

- Long term revenue certainty is needed to enable projects to be brought to market. The REA favour a income floor model being introduced.

- A range of contract lengths need to be to reward different forms of flexibility.
- All forms of flexibility need to be compensated for, often contracts only pay for one, nit recignising additional benefits associated with that form of flexibility, meaning projects are underfunded.

5. **To what extent would improving access to multiple revenue streams in energy markets remove barriers to investment in distributed energy resources/flexibility resources?**

This would be hugely beneficial, however, they may not successfully address the fundamental and market-wide need for revenue certainty. Better access to multiple revenue streams are useful, but they will likely only benefit small areas of the potential market, due a to a salami sliced approach to addressing specific LLES benefits or barriers. The delivery of a mechanism that could provide revenue certainty to all potential LLES technologies and a variety of business models, is required to successful de-risk investment and grow investor confidence to allow further private finance into the market.

6. **To fund new and/or existing flexibility projects, do you access multiple different revenue streams at once? Please give details. For example, DNO tenders, energy efficiency schemes, local authority schemes.**

7. **If your response to question 6 was 'No', why? Please give details.**

8. **What issues, if any, do you encounter when accessing DNO flexibility markets (meaning accessing DNO flexibility tenders)? How could these issues be resolved? Please give details.**

Inconsistency in how DNOs flexibility systems, the services paid for and the contracts provided, making it difficult to design projects.

DNO not contracting for all the flexibility services provided, despite services being linked. The result is projects are under-rewarded for the flexibility provided.

9. **For schemes you either run, or have previously accessed, what were the key entry requirements/pre-qualification criteria? Please give details. For example, project capacity, load factors, location, technical service requirements.**

10. **Do you think there are opportunities for standardisation and/or simplification of entry requirements/pre-qualification criteria? Please give details.**

Yes, greater standardisation across DNOs would help facilitate more consistent business models and greater transparency around what is required.

11. **If you answered yes to the above, do you think a digital platform could be used to simplify entry requirements/pre-qualification criteria?**

Yes a single digital platform would streamline the process as well as allow all DNOs a better picture of the types of projects and services available.

12. **Is there a long-term commercial incentive for running a market platform that brings together multiple revenue streams? What types of organisation(s) could do this?**

    There have been attempts at delivering such platforms, but the inability to ensure all flexibility services are appropriately rewarded makes such aggregation services difficult to deliver. A better market design would ensure that such a service could be commercially viable.

13. **To what extent are flexibility resources currently able to capture whole system value in the market?**

For some flexibility assets, the full value they can provide is not currently recognised. Indeed this point was raised in our response to the LLES consultation, which highlighted the services currently not always appropriately rewarded by the grid. They are repeated here for your convenience:

-Benefits to Short Circuit level (SCL) - Storage can contribute to SCL during the occurrence of a fault, vital to maintaining system voltage and enabling faster system recovery. As well as helping to replace the levels of SCL lost as fossil-fuelled synchronous generation is fully phased out.

- Voltage frequency regulation – Storage provides the ability to respond in seconds, rather than minutes to maintain voltage, providing greater value to the grid.

- Phase Lock Loops – Energy storage can support voltage and frequency control through PLL methods. - Reactive power and load – Energy storage provides a quick responsive source to immediate reactive power and load.

- Black Start – Allowing the restarting of a generation station without the support of an external power station in the event of an outage or blackout situation. The technical requirement for doing so requires energy storage duration that goes well beyond 4 hours.

- Voltage Angle Stability - The active and reactive power support from storage systems can stabilise the electricity system's angle and voltage profiles.

14. **If new revenue streams incentivised investment in demand-side flexibility projects, what business models would you adopt and why?**

We direct you to the REA report on long duration storage, which has a detailed discussion of the different pricing mechanisms available to supporting local and grid scale flexibility services. The mechanism which offers the most benefits is an income floor as it provides certainty in the market, but does not distort market signals and drives competition.

https://www.r-e-a.net/wp-content/uploads/2021/03/Longer-Duration-Energy-Storage-The-missing-piece-to-a-Net-Zero-reliable-and-low-cost-energy-future.pdf

15. **To what extent does the proposed scope of innovation activity help to recognise the true value of flexibility?**

The proposed scope would be a positive development in delivering a more flexible market.

16. **What would be the key barriers (if any) to your organisation participating in an innovation activity focused in this area?**

The REA would be happy to help facilitate member engagement to help BEIS address barriers stopping participation.

17. **Do you foresee any gaps in UK market capabilities to deliver innovation in this area? (Please include the area(s) you are referring to in your answer).**

18. **What is the level of interest from your organisation in participating in innovation activity in this area?**

(•) Very high ( ) High ( ) Medium ( ) Low ( ) Not interested

19. **Do you have resource and capability within your organisation to carry out the activities proposed above, or would you need to form a consortium?**

The REA would both be happy to help industry form relevant consortiums and look consider how we can contribute to such discussions.

20. **How difficult would it be to form consortia (if required)? How long would it take to build required consortia relationships?**

The REA have previously run pitching and networking events that could help facilitate building consortiums.

21. **Are you aware of suitable organisations you could approach?**

◉ Yes ○ No

22. **If no, what would be useful to facilitate consortia relationships?**

Working with Trade Associations.

23. **Do you have any other comments? Please give details.**

C7 design of a demonstration programme: innovative 'flexibility' solutions in real-world settings

1. **How could such a demonstration programme build on previous demonstrations, such as under UKRI's Prospering from the Energy Revolution challenge?**

The LEO project has direct project outcomes which could inform the development of further demonstration projects as part of this competition including the minimum viable system trails.

Focus should be on a demonstrator project which have the potential for commercialisation after learnings are made from the demonstrator project.

2. **Do you think there is value from bringing together innovative solutions and demonstrating them in an integrated manner in real-world settings? Please include your reasoning.**

Yes, there would be value in demonstrating large scale flexibility project across domestic and commercial sites. The learnings from this project could be analysed to speed up and make more efficient the wider scale adoption of these technologies.

3. **What should be the objectives for demonstrating innovative solutions in an integrated manner in real-world settings (for example, demonstrating system level integration/impact, understanding consumer behaviour)? Please include your reasoning**

-Understanding the approximate impact of flexibility integration over a range of use cases. This would allow for more accurate estimates and use case studies for other instances and produce project efficiencies.

-Produce data, with costings, timelines which could make the outcomes of the project scalable and learnings more transferable.

4. **What scale of demonstration would be required to achieve the objectives outlined in question 2?**

5. **How could such a demonstration programme be delivered to achieve objectives set out in question 2?**

6. **What timescales do you anticipate would be needed for the demonstration activity to achieve the objectives set out in question 2?**

7. **What types of organisations/stakeholders would need to be involved in such a demonstration programme?**

Homeowners, local councils/authorities, companies providing and installing flexibility services

8. **What challenges do you foresee in the delivery of such a demonstration programme?**

Missed opportunities for results to be clear and transferable due to unclear objectives or a failure to properly share with industry the key lessons learned in the demonstration. The objectives of the programme need to be set around finding bottle necks which are common to other areas of the country or other similar applications to have the largest applicability after learnings are made from the demonstrator programme.

Failure of policy to address market barriers identified during the demonstration.

C8 Design of a Demonstration Programme: Innovative 'Flexibility' Solutions in Real-World Settings

1. **What challenges could be faced when designing a programme to demonstrate innovative flexibility solutions working together in an integrated manner in real world settings?**

Making sure that all technologies which should be part of a flexibility system are included. That a range of scenarios are tested during the demonstration, so a ‘full picture’ is provided.

2. **What information would be needed to design an effective demonstration programme ?**

3. **How long do you anticipate it would take to design a demonstration programme? Please include your reasoning.**

As a previous case study, the LEO programme would be a good example of a demonstration project were time lines would be similar.

4. **Please outline any further comments you might have on the design of a demonstration programme.**