

Notes on Completion: Please refer to the appropriate NIA Governance Document to assist in the completion of this form. The full completed submission should not exceed 6 pages in total. Network Licensees must publish the required Project Progress information on the Smarter Networks Portal by 31st July 2014 and each year thereafter. The Network Licensee(s) must publish Project Progress information for each NIA Project that has developed new learning in the preceding relevant year.

## NIA Project Annual Progress Report Document

### Date of Submission

Jul 2024

### Project Reference Number

NIA2\_NGESO043

## Project Progress

### Project Title

Demand Flexibility Service Evaluation

### Project Reference Number

NIA2\_NGESO043

### Project Start Date

May 2023

### Project Duration

1 year and 0 months

### Nominated Project Contact(s)

James Kerr

## Scope

The project will last approximately twelve months with two project partners. The project will evaluate the DFS using a mixed-methods approach. A programme of social research will deliver insights on customer motivation and experiences, while analysis of smart meter data will provide insight into flexed demand profiles, linking these to household smart energy capabilities where possible.

The social research programme aims to capture households' flexibility strategies and motivations, relevant socio-demographics, smart energy capabilities and any longer-term changes that may have resulted. The social research will use a combination of diaries, interviews, DFS smart meter data, and a post-trial survey to capture this information. The social research will focus on households, but participating SMEs will be included where possible. In addition, a short opinion poll conducted at the start of the evaluation (Jan 2023) will allow us to capture a snapshot of energy behaviours across the UK population during what is already an exceptional period. The social research team will design the research tools and work with approved DFS suppliers to recruit participants. The team aims to document participating customer MPANs to link the social research data to DFS smart meter data.

To carry out the analysis this research project will also design and develop a set of tools needed to support both quantitative and qualitative analysis of the effects of the DFS scheme.

The smart meter qualitative analysis will deliver insights into the DFS scheme through the following analyses, which will be done for domestic consumers: event analysis, flexibility offered, impact outside of DFS delivery window, predictability, effectiveness of DFS design and future recommendations, informing future workstreams.

## Objectives

The goal of this research is to understand more about how consumers participated in the Demand Flexibility Service over winter 2022/23. Key areas to explore are:

1. **Awareness:** The level of awareness and understanding consumers have about flex services, and where consumers first came across the offering.
2. **Motivation:** The key drivers behind signing-up (or not signing up) for flex services.
3. **Onboarding & Engagement:** The onboarding experience, consistency of engagement with flex services and key factors which

caused drop-offs to occur.

4. **Implementation (logistical):** The level of ease at which consumers could respond to flex signals, and their knowledge around reducing demand.
5. **Implementation (commercial):** The impact incentives have on engagement, including the type of incentive used, and how and when it is delivered.
6. **Implementation (comms):** The impact of varying communication mechanisms on engagement with flex services, including the influence of automation in the process.
7. **Implementation (barriers):** The key factors behind non-participation or disengagement with the service.
8. **Experience:** The variation in consumer satisfaction with their participation, if participants would engage with flex services in the future, and how engagement could be increased further.
9. **Second-order consequences:** The presence of positive or adverse knock-on effects that can be attributed to participation in flex services.

## Success Criteria

The following will be considered when assessing whether the project is successful:

- A representative sample of consumers across multiple DFS Providers has been analysed.
- We understand how consumers have participated including strategies to reduce demand and barriers to participation
- There are clear recommendations following analysis of the data and responses to improve and evolve flexibility services and offers in the future
- Findings from the research directly inform the Demand Flexibility Service for 2023/24.

## Performance Compared to the Original Project Aims, Objectives and Success Criteria

National Grid Electricity System Operator (“NGESO”) has endeavoured to prepare the published report (“Report”) in respect of Demand Flexibility Service Evaluation, NIA2\_NGESO043 (“Project”) in a manner which is, as far as possible, objective, using information collected and compiled by NG and its Project partners (“Publishers”). Any intellectual property rights developed in the course of the Project and used in the Report shall be owned by the Publishers (as agreed between NG and the Project partners).

The Report provided is for information only and viewers of the Report should not place any reliance on any of the contents of this Report including (without limitation) any data, recommendations or conclusions and should take all appropriate steps to verify this information before acting upon it and rely on their own information. None of the Publishers nor its affiliated companies make any representations nor give any warranties or undertakings in relation to the content of the Report in relation to the quality, accuracy, completeness or fitness for purpose of such content. To the fullest extent permitted by law, the Publishers shall not be liable howsoever arising (including negligence) in respect of or in relation to any reliance on information contained in the Report

Copyright © National Grid Electricity System Operator 2024

### Project Summary

The Demand Flexibility Service Evaluation (DFS) project aims to evaluate the effectiveness of DFS using a mixed-methods approach. This comprehensive evaluation will combine social research insights on customer motivations and experiences with smart meter data analysis to provide a detailed understanding of flexed demand profiles and household smart energy capabilities.

The project can be split into two main phases consisting of four work packages:

#### Phase 1: Social Research

**Objectives and Methods:** The social research component aims to capture households' flexibility strategies, motivations, socio-demographic profiles, smart energy capabilities, and any long-term changes resulting from participation in DFS. This will be achieved through a combination of diaries, interviews, DFS smart meter data analysis, and post-trial surveys, supplemented by an opinion poll conducted at the project's outset in January 2023. The research targets both households and participating SMEs, aiming to link social research data to DFS smart meter data via documented customer MPANs.

**Progress to Date:** As of July 6, 2023, the social research findings were published and presented in a webinar attended by numerous stakeholders. The research engaged over 23,500 participants through online diaries, surveys, and an opinion poll. Although the participant sample was skewed towards older demographics, the insights gathered have been instrumental in understanding consumer motivations and participation strategies. Financial incentives emerged as the primary motivator, with altruistic and social factors also playing significant roles. These insights have already influenced the design of DFS for the second year, particularly in eliminating the in-day adjustment mechanism.

#### Phase 2: Software Development & Smart Meter Data Analysis

**Objectives and Methods:** The smart meter data analysis aims to provide in-depth insights into the DFS scheme's effectiveness by examining event participation, flexibility offered, impacts outside the DFS delivery window, predictability, and overall design effectiveness. The analysis will inform future recommendations and workstreams.

**Progress to Date:** This phase commenced in January 2024 following a delay due to contractual and security negotiations. Currently, data collection is underway, and a secure data analysis environment is being developed. Efforts are focused on acquiring data from DFS providers and smart meter data services, with survey participants from phase one being re-contacted for consent to share their

MPAN data. This phase is critical as it involves potentially millions of data lines requiring analysis in a bespoke secure system.

### **Conclusion and Next Steps**

To date, the project has made significant progress in understanding consumer behaviors and motivations through social research, influencing the second year DFS design. The next steps involve completing the data collection and analysis phases of the smart meter data, integrating the insights from both research components, and developing recommendations to enhance future DFS trials and products. The final phases will focus on disseminating findings, refining data analysis tools, and ensuring that the insights directly inform future Demand Flexibility Services. The project continues to attract significant interest from the energy industry and policy-makers, promising substantial contributions to the field of energy flexibility services.

### **Required Modifications to the Planned Approach During the Course of the Project**

The project was originally scheduled for a twelve-month duration but has encountered delays due to contractual negotiations and the implementation of enhanced security protocols. As a result, the project timeline will need to be extended to ensure that all aspects are thoroughly completed and evaluated. The core aim of the project remains to assess the effectiveness of DFS through a combination of social research and smart meter data analysis, with a focus on understanding consumer behaviors, flexibility strategies, and the overall impact of the service.

The delay has necessitated several modifications to the planned approach. The start of the smart meter data analysis phase was postponed to January 2024 to address delays in securing a data handling environment that meets rigorous security standards. This phase now includes extra time for establishing secure data protocols and completing data collection and analysis. These adjustments are essential to maintaining the integrity of the project's findings and ensuring that the results effectively guide future flexibility services and innovations.

Moving forward, the project will focus on integrating the insights from both social research and smart meter data, extending the analysis period, and aligning all efforts to meet the revised schedule and objectives.

### **Lessons Learnt for Future Projects**

The project has highlighted several critical lessons regarding the handling of data and the management of extensive data volumes. One of the key challenges encountered was navigating the complexities of GDPR compliance while ensuring that data handling and analysis met the highest security standards. The necessity for secure data environments and rigorous consent processes significantly extended the project timeline, underscoring the need for early and thorough planning in these areas. Future projects should incorporate robust data protection strategies from the outset, including clear protocols for managing consent, data anonymisation, and secure storage to mitigate potential delays and ensure compliance.

Additionally, the scale of data generated by the DFS project emphasised the importance of having a well-defined framework for data management and analysis. The sheer volume of data, combined with the need for detailed and accurate evaluation, revealed potential challenges for future projects in this area. To address this, future projects should invest in scalable data processing solutions and consider the integration of advanced data management tools early in the project lifecycle.

Note: The following sections are only required for those projects which have been completed since 1st April 2013, or since the previous Project Progress information was reported.

### **The Outcomes of the Project**

As of now, the DFS Evaluation project has made substantial progress despite the delays. The social research phase, which captured the perspectives of over 23,500 participants, has provided valuable insights into consumer motivations and engagement with flexibility services. The findings have already influenced key design modifications for the DFS, such as the removal of the in-day adjustment mechanism. This early outcome underscores the project's ability to generate actionable insights that can directly impact the development and refinement of flexibility services.

In parallel, the smart meter data analysis phase has begun, with data collection and the establishment of secure analysis environments underway. Although this phase has faced delays due to necessary enhancements in data security protocols, it is expected to yield comprehensive insights into the effectiveness of DFS in real-world settings. The integration of data from both social research and smart meters will soon provide a holistic view of how consumers interact with demand flexibility services. These combined insights are anticipated to drive future recommendations and innovations, shaping the next generation of flexibility services and contributing to more effective energy management strategies.

## Data Access

Details on how network or consumption data arising in the course of NIA funded projects can be requested by interested parties, and the terms on which such data will be made available by National Grid can be found in our publicly available “Data sharing policy related to NIC/NIA projects” and [www.nationalgrideso.com/innovation](http://www.nationalgrideso.com/innovation).

National Grid Electricity System Operator already publishes much of the data arising from our NIC/NIA projects at [www.smarternetworks.org](http://www.smarternetworks.org). You may wish to check this website before making an application under this policy, in case the data which you are seeking has already been published.

## Foreground IPR

The following is expected to be generated:

- Report and conclusions on Social Research Findings, which will be published on the Smarter Networks Portal