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NIA Project Close Down Report Document

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NIA2_NGESO029

Project Progress

Project Title

DER Visibility

Project Reference Number

NIA2_NGESO029

Project Start Date

March 2023

Project Duration

0 years and 3 months

Nominated Project Contact(s)

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Scope

There is an Increasing volume of service providers connected to distribution networks which are seen as key enablers in unlocking flexibility on the network. Whereas previously they have had a relatively small impact, we are now seeing this growing rapidly. Although there is some data on DERs, a lot of the information is siloed or in formats that are not easily implemented into existing processes. One of the key challenges is increased DER operational visibility being made available to industry stakeholders.

The proposed project will be split into two phases; the first phase will consist of engaging industry stakeholders internally and externally to understand what sources of DER data are currently available, where the data is stored, data security requirements and how easily accessible it is. It will also look at potential use cases for the data and how different industry organisations could use it. If then deemed that there is sufficiently accessible data, the second phase of the project will look at potential ways to aggregate the data and develop a tool that could be used across the industry to increase the visibility of DER data such as utilisation, locations, power outputs etc. It also looks to develop a forecasting tool to highlight when and where new DERs could be used for flexibility on the network.

Objectives

- Analyse the various data sources, their granularity, accessibility and security requirements.

If deemed that the appropriate data sources are accessible, Phase 2 will:

- Develop a tool to map the DER's by both geographical and grid location, forecast the likelihood of more appearing in various locations, and approximating when they will be connected to the grid, power outputs, utilisation, and accessibility.

Success Criteria

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

- A set of core documents as defined by the deliverables including initial Phase 2 project plan with use-stories, use-cases, roadmap, risk assessment, proposed solution architecture and WP breakdown.
- A good understanding of the Phase 2 requirements and feasibility is reached.

- Agreement to proceed with Phase 2 of the project.

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

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Project Summary

The rapid growth of Distributed Energy Resources (DERs) is transforming the electricity network landscape in Great Britain. This project aimed to address the significant gaps in visibility and data related to DERs, specifically those connected to distribution networks and sized at 1MW or above. While consumer energy resources were considered, they were a secondary focus. The project plan consisted of a feasibility study delivered through four key work packages (WPs), each designed to meet the original aims, objectives, and success criteria.

Work Package 1: Data Mapping and Stakeholder Engagement

The initial phase of the project, Work Package 1, focused on understanding the current sources and formats of DER data. A comprehensive data mapping exercise was conducted, engaging a wide range of stakeholders across the Electricity System Operator (ESO) and the industry. This engagement was crucial in identifying and mapping all potential data sources, ensuring a thorough understanding of the existing data landscape. The success of this work package was evidenced by the comprehensive inventory of DER data sources that were identified, which laid the groundwork for subsequent analysis.

Work Package 2: Data Volume, Velocity, and Variability

Work Package 2 aimed to delve deeper into the characteristics of the data required to achieve the core user stories. Detailed discussions with key stakeholders provided insights into the volume, velocity, and variability of the data, as well as the necessary access methods and security standards. This phase highlighted the complexities and challenges associated with data access and the stringent security measures needed for future projects. The successful identification of these parameters was instrumental in shaping the scope and feasibility of a potential follow on project, ensuring that any future developments would be both realistic and secure.

Work Package 3: Technology Mapping and System Architecture

The third phase, Work Package 3, focused on the technology and system architecture needed to implement the core user stories. Initial efforts to map out a solution for data aggregation and presentation to the ESO were undertaken. However, it became evident that more extensive engagement with licensed entities and external stakeholders would be required. The limited availability of key stakeholders posed challenges, but significant progress was made in outlining the potential technology solutions. This work package established a clear understanding of the technological requirements, which is crucial for the next phase of the project.

Work Package 4: Feasibility and Requirements for Phase 2

The final work package, Work Package 4, aimed to establish the feasibility of developing a software tool in Phase 2. By reviewing the data compiled through the earlier work packages, the project team was able to assess the practicality of proceeding with a follow on project. The feasibility study confirmed the need for a structured, phased approach to data aggregation and tool development. This stage underscored the importance of securing technical expertise and additional resources for the next phase, ensuring the project's continued progress and alignment with its original objectives.

Conclusion and Future Work

The project has successfully progressed in line with its initial aims and objectives. The project has delivered valuable insights into DER data sources, data characteristics, and the technological requirements needed for effective data management. Despite challenges such as stakeholder availability and data quality issues, the project has laid a strong foundation for future work.

Looking ahead, follow on projects could focus on data aggregation and the development of a versatile tool to enhance DER visibility. This would prioritize making DER data accessible in a user-friendly format for the ESO and wider network licensees. Continued stakeholder engagement, strategic resource allocation, and ongoing technology evaluation will be pivotal to the success of future work. By addressing these critical areas, the project aims to significantly improve the visibility of DER data, supporting the transition to a more resilient and efficient energy network.

The project has also highlighted the importance of continuous data mapping, regulatory compliance, and industry collaboration. These lessons will inform future projects, ensuring that the DER visibility program remains adaptive and aligned with evolving industry standards and technological advancements. If a follow on project is deemed suitable, it will continue to explore additional use cases, potentially evolving into individual projects that further enhance the program's impact and reach.

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

The project has proceeded broadly in line with the scope of the original plan. Due to the broad nature of DER data available as well as to ensure a follow-on project scope is realistic and deliverable, the project has adopted the scope parameters as asset size 1MW or above and the time frame as 2 – 8 years.

The project has delivered use cases for DER data grouped across 4 categories – data, system, visualization, and modelling. These use cases have been prioritized using the MOSCOW framework. However, the project was presented with key challenges which manifested with stakeholder availability, data quality and availability as well as technology platform requirements for developing a proof of concept in future phases. These challenges are attributed to unstructured and siloed data availability. Technology platform requirements present a challenge due to ongoing concurrent change programmes underway as well as the data attributes itself.

Progress has been made with key internal stakeholders to secure support of technical expertise required to progress development of the proof-of-concept application in follow-on phases which is also reflected in identifying additional resource requirements for the next phase.

Lessons Learnt for Future Projects

This project is the first of its kind to undertake a whole system DER data visualization and evaluate the feasibility of using ML/AI methods to produce value added actionable insight for the ESO and wider network entities. Future work will build upon the work done in this project and address the challenges through securing requisite data architecture/engineer technical and project management expertise to ensure any follow-on work is resourced appropriately to deliver its objectives.

In addition to the foundational use case, several other use cases have been identified, some of which may be progressed as individual projects within the DER visibility programme of work.

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

The project has now completed and achieved its initial success criteria:

- Developing set of core documents including data management plan to address security and GDPR obligations.
- Delivered use cases for DER data grouped across 4 categories – data, system, visualization, and modelling.
- Producing a robust understanding of follow-on requirements with an informed decision to proceed with future phases to follow after ensuring technical and project resources availability.

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.

National Grid Electricity System Operator already publishes much of the data arising from our NIC/NIA projects at 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

A set of core documents including data management plans to address security and GDPR obligations and a final report which will be published on to the ENA Smarter Networks Portal.

Planned Implementation

Planned Implementation:

- **Phased Approach:** The DER Visibility project was setup as a two-stage project, designed to address the burgeoning challenge of increasing service providers connected to distribution networks and the limited visibility of Distributed Energy Resources (DERs). This part of the project focused on the first stage:

- Phase 1 – Feasibility Study: During this initial phase, internal and external stakeholders will be extensively engaged to identify the sources of DER data, assess data storage infrastructure, comprehend data security requirements, and evaluate potential use cases. The objective is to determine the feasibility of accessing the required data.

- **Data Security and Access:** Given the sensitivity and critical nature of the data, a paramount focus will be placed on data security and access. Robust data governance and security measures will be diligently implemented to safeguard data integrity and adhere to established security standards.

- **Stakeholder Collaboration:** Collaboration with a diverse range of industry stakeholders, including ESO, DNOs, market participants, and regulatory bodies, will remain pivotal. Seamless engagement with stakeholders will ensure that data access, usage, and governance align seamlessly with industry requirements.

Recommendations:

- **Continuous Data Mapping:** To ensure data relevancy and accuracy, continuous data mapping will be an ongoing effort. The data inventory will be periodically updated, keeping it current and reflective of the evolving data landscape.

- **Technology Evaluation:** Ongoing evaluation of technology requirements and changes is essential. The project will maintain adaptability to evolving technology platforms and requirements in the dynamic energy sector.

- **Regulatory Compliance:** The program will stay attuned to evolving regulatory landscapes, especially concerning data security, privacy, and access. Adherence to legal requirements will be of paramount importance.

- **Stakeholder Engagement:** Continuous engagement with stakeholders, industry organizations, and licensed entities will be a cornerstone of the project. Fostering industry-wide collaboration and data sharing will be a consistent endeavour.

Next Steps:

- **Phase 2 Initiation:** With a thorough assessment conducted in Phase 1, including the feasibility of developing a software tool, Phase 2 will be explored: This stage will focus on making data accessible and creating a user-friendly tool for the ESO and wider network licensees.

- **Recourse Allocation:** Strategic allocation of technical and project management resources for follow-on work is critical. The project team will ensure that they possess the requisite expertise to address data architecture, security, and data quality challenges.

- **Continued Use Cases:** Beyond the foundational use case, further exploration of additional use cases will be undertaken to enhance the DER data visibility program. Some of these use cases may evolve into individual projects as the program progresses.

Other Comments

The DER Visibility Programme represents a significant initiative in the dynamic landscape of Distributed Energy Resources (DERs) and Consumer Energy Resources (CERs). The program's objectives, structured approach, and commitment to industry collaboration have yielded substantial net benefits across multiple dimensions:

Enhanced Industry Visibility:

By addressing the challenge of limited DER operational visibility, the program has laid the foundation for a transformation in the energy

sector. The increased visibility of DERs and CERs offers greater insight into power outputs, locations, utilization patterns, and forecasting, ultimately contributing to more effective planning and operation of the energy system.

Improved System Resilience:

The program's success equates to enhanced system resilience through greater coordination between the Electricity System Operator (ESO) and Distribution System Operators (DSOs). This improved coordination fosters a more robust and reliable energy system, aligning with the transition to Net Zero and the increasing integration of renewable energy sources.

Economic Benefits:

Initial assessments have indicated substantial economic benefits, with projected consumer benefits of up to £150 million per year solely from enhanced DER visibility for the ESO. These benefits extend to the entire industry, including Distribution Network Operators (DNOs), Transmission Operators (TOs), Market Participants, and Market Platforms, fostering market liquidity and growth.

In summary, the DER Visibility Programme stands as a transformative force in the energy sector. The program's structured approach, collaboration with stakeholder, and meticulous planning demonstrate a clear commitment to delivering net benefits that extend far beyond the initial objectives. By increasing DER visibility and data availability, the program has created a path to a more resilient, efficient, and responsive energy system, thereby contributing to the industry's successful transition to Net Zero.

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