Project Initiation Document (PID)

Regional Development Programme

MW Dispatch

UKPN South-East Coast

UK Power Networks
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Contents

1. Purpose and Scope of this Document

The purpose of this document is to outline the overall project scope, key deliverables, milestones, and estimate timelines for delivery of the 'MW Dispatch' project between National Grid Electricity System Operator (ESO) and partner Distribution Network Operator (DNO), UK Power Networks (UKPN) for South-eastern Networks (SPN) as part of the Regional Development Programme (RDP). The MW Dispatch scheme follows the first RDP scheme called N-3 intertripping that was successfully implemented in SPN in 2020. ESO and UKPN have jointly agreed a three workstream approach to enable progress of the project whereby, workstreams 1 and 2 will deliver a simple solution as part of the Minimum Viable Product (MVP) and workstream 3 will continue in parallel to deliver more complex data exchange elements and necessary and / or desirable (as agreed by all parties) enhanced solutions.

The primary intended use of the document includes, to:

- Act as a base document against which the RDP project can assess progress, risks, issues against an agreed scope.
- Provide a single source of reference about the RDP project so that so that interested stakeholders can understand the agreed scope of delivery.
- This document will be kept up-to-date through-out the life of the programme and will be formally re-issued if significant changes are agreed to be made to the programme by all parties. The Project Initiation Document (PID) is to be supported by an overall project plan and subsequent delivery and implementation plans.

2. Project Purpose, Background and Vision Statement

The primary purpose is to allow the continued connection and growth of Distributed Energy Resources (DER), across specific areas where transmission limits would otherwise be breached. The MW Dispatch project will deliver a whole system operational solution which will enable a coordinated approach to managing transmission network constraints between ESO and each partner DNO. To ensure continued regional operability of the transmission system, the dispatch of non- Balancing Mechanism (BM) DER closer to / near real time[1] will be developed in conjunction with an appropriate commercial arrangement to provide a curtailment service to manage transmission thermal constraints.

The MVP solution will deliver a dispatch service that will involve a reduction in active power for the DER when exporting for pre fault transmission system conditions closer to / near real time, meeting a predefined turn-to-zero instruction at the early stage (MVP) for simplicity but could be considered to include a non-zero instruction at a later stage. The service will then be further developed (as part of future enhancements), for example, to enable dispatch during post fault scenarios on the transmission network.

3. Whole system approach

The principles of the MW Dispatch projects are to build on the Distributed Energy Resources Management System (DERMS) infrastructure across various distribution networks in GB, with the aim of providing an alternative route for DER to assist the ESO in managing an increasing number of regional transmission constraints. Due to the volume of new connections across distribution networks, for example the South Coast, under certain scenarios (e.g. times of low regional demand and high renewable DER output), there may be a need to manage transmission constraints with a combination of traditional BM actions and this new Transmission Constraint Management service, where the ESO is bound to use actions in economic merit order, especially in areas where larger BM units are being replaced with numerous, smaller DER.

A supplementary benefit in deploying DERMS technology by the DNO to manage transmission constraints will be to enable DER to provide transmission constraint management services to the ESO. The aim here is to cater for DERs that are required to connect under such terms in the South Coast. These parties may not wish to provide high levels of flexibility in markets such as full Balancing Mechanism (BM) and therefore this RDP will make use of the infrastructure that the DNO is rolling out.

Additional whole system benefits that will potentially be realised as a result of this project include:

[1] In this document the term 'real time' refers to real time data exchanges or process completion that is initiated by an automated system, an interface or (where necessary) a manual process that is completed in the normal time by which the system or interface capability allows, or the process can be manually undertaken without any artificial delay having been built or designed into the system specification or the manual process.

- The development of whole-system coordination processes between ESO and the partner DNO to ensure economic and efficient dispatch of Transmission-Distribution (T–D) services.
- The development of systems and processes, including (where possible) the mutual exchange of information that will allow both the ESO and the DNO to forecast accurately the power flows at T and D networks. This is the basis the implementation of Primacy Rules between ESO and partner DNOs. The provision of increased operational visibility and situational awareness to the Electricity National Control Centre (ENCC) for DER providing the MW Dispatch service.
- Improve whole system resilience by avoiding unintended consequences that may occur with uncoordinated T-D scheduling and dispatch processes. For example, a T-D coordinated scheduling and dispatch can avoid nullification of DSO flexibility service if ESO service (unknown to DSO) conflicts with the DER dispatch and may impact system stability.

More broadly, it is expected that RDP projects in general will benefit DER by:

- Enabling faster connections for DER
- Making use of DNO infrastructure already required as part of their distribution connection.
- Providing potential financial benefits for new services provided

There is a clear benefit to DNO and their customers by enabling DERs to connect into the distribution network that otherwise would not be able to connect due to transmission constraints. The following tables outline key benefits for ESO and UKPN that have been recorded for the project. This will be regularly reviewed and tracked during the project and post implementation.

ID	Benefit	Type	Description
B001	Ensure Network Operability through implementation of DER MW dispatch	Regulatory Compliance	ESO has a licence obligation to provide economic and efficient connection offers to Customers. These connections are offered under the 'Connect and Manage' regime whereby certain criteria must be met. The Cost Benefit Analysis showed that the most economic outcome for GB consumers was to utilise a 'Whole System' approach to operationally manage DER, as opposed to building expensive new transmission infrastructure. By completing this work, ESO will continue to meet its regulatory obligations.
B002	Ensure Network Operability through implementation of DER MW dispatch	Financial: Reduce expenditure	Provision of a system to dispatch DER MW output will enhance the current situational awareness and provide flexibility to the ENCC. Improved situational awareness and flexibility service will lead to more informed real-time decisions, which will ultimately drive down the overall cost of operating the network.
B003	Ensure Network Operability through implementation MW dispatch	Financial: Reduce OPEX spend	DER MW dispatch will increase the pool of participants providing transmission constraint management services to the ESO, leading to better market liquidity (thus reducing control centre constraint costs for the ESO and, ultimately, the end consumer).
B004	Ensure Network Operability through implementation DER MW dispatch	Enables ESO 2025 Ambition (Non-Financial)	Application of 'Whole System' approach to enabling low carbon connections in a timely and controllable manner will ensure the ESO meets the ambition of being able to operate a 'carbon free' network by 2025.
B005	Improved "Whole System" Outcomes	Tx and Dx SCADA Network Visibility	Delivery of the RDPs will improve awareness between ESO and the respective DNO. This will ultimately lead to more efficient and timely connections for Customers, and improved utilisation of existing network assets.
B006	Ensure Network Operability through implementation of DER MW dispatch	Financial: Reduce expenditure	Delivery of this RDP provides benefit in helping provide system access both for maintenance and system reinforcements by providing an enhanced suite of actions that can be taken to secure the system. This could be a major factor in improving our ability to transform the power system.

Table 1: Key benefits for ESO

ID	Benefit	Type	Description
UB01	Ensure Network Operability	Regulatory Compliance	UKPN has a licence obligation to provide connection offers to all customers wishing to connect to its network in timely and efficient manner. Implementation of RDP DER MW dispatch will facilitate quicker and cheaper connection of DER in congested areas with regional transmission constraints. Under this project, DER will be managed more efficiently while ensuring the safe operation of the distribution network; and while meeting UKPN's regulatory obligations.
UB02		Improved D-network operation	DER MW dispatch will improve outage coordination; and minimise duration or even avoid customer outages. This will increase network access to DERs; and enhance security and resilience of D-network.
UB03	Whole-system benefit	Improve system coordination and service conflict management	Implementation of DER MW dispatch will enhance conflict management between T-D services (for e.g. avoid service nullification, reduce service costs). Provision of transmission and distribution network visibility through RDP will enable a coordinated system and process for efficient DER management. This has also been acknowledged by all parties as part of the Open Networks workstream 1a product 5 – Primacy rules.
UB04	Support Net-Zero target	Financial: Reduce expenditure	Delivery of RDP MW Dispatch will improve UKPN Flexibility services scheduling to optimise cost and effectiveness. This will lead to more informed decision-makings, which will ultimately drive down the overall cost of operating the network.
UB05		Meet UKPN objectives in DSO strategy	Through RDP, more DER can connect to the D- networks cheaper and faster which will help UKPN to meet its carbon emission targets.

Table 2: Key benefits for UKPN

4. Project Deliverables

The project delivery has been broken down into two key stages as Interim (WS1 & 2) and Enduring (WS3) solutions that will be progressed in parallel – although we do anticipate the delivery of the MVP to come ahead of delivery of the Enduring solution. The interim solution will aim to plan, develop and deliver a MVP which is based on the utilisation of automated processes wherever possible (although manual processes may be considered, subject to stakeholder approval, where automation is not possible within the anticipated delivery timescales), learnings/functionality from RDP1 with National Grid Electricity Distribution (NGED) and already available tools that aims to establish baseline capability in shorter timescales by avoiding heavy IT-systems development and delivery wherever possible. In addition, more complex areas of the enduring solution, such as transmission and distribution data exchange, will be progressed in parallel. This will ensure a fast, de-risked delivery for the MVP phase. In order to define the key scope for each area, Figure 1 denotes the intended output following completion of each workstream.

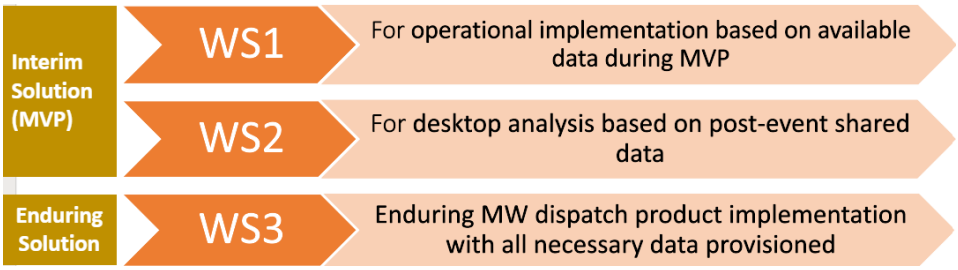

Figure 1 Project Work streams

The MVP solution will deliver a dispatch service that will involve a reduction in active power for the DER when exporting for pre-fault transmission system conditions, meeting a predefined turn-down instruction. The service will then be further developed (as part of enduring solution), for example, to enable dispatch during post fault scenarios on the transmission network. The MVP solution is expected to begin transitioning to the enduring solution (as part of WS3) once the MVP is tested and proven through the delivery of agreed enhancements as new IT functionality and data exchange avenues are developed.

5. Project Scope

The core project deliverables as part of the MVP are:

1) The definition of the commercial service, ensuring commitment of UKPN, DERs and ESO organisations in agreeing to the technical and commercial service as well as agreeing to develop the technical dispatch solution and contractual framework.

2) Work to deliver a technical solution incorporating process, data, software and hardware systems, and industry communications according to the service architecture designed and developed internally and with industry partners.

3) To deliver a new service that delivers increased options to the ESO Control Room to provide enhanced System security.

4) Enable ESO-DSO service coordination to achieve whole system outcomes through data sharing, implementation of basic primacy rules and collaborative cross – organisation working.

The project deliverables beyond the MVP will be progressed as part of the third workstream and are summarised at the end of this section. WS3 will undertake further assessment of requirements that will be updated in a revised version of the PID.

This project will utilise a business and IT delivery team consisting of IT, ESO/UKPN and Legal experts, to put in place the technical tools, data architecture, Commercial Contracts and stakeholder communications required to enable the end-to-end solution. Additionally, to put in place the necessary information exchange, information models and system adaptations to enable ESO/UKPN commercial and network security analysis tools to successfully evaluate and utilise the service.

Initially, it is proposed that an MVP is implemented. The MVP is a version of IT delivery with enough features to be usable as an initial phase to facilitate the operational requirements and allows for stakeholders to provide feedback for future product development. As described above, future enhancements are also considered and progressed in parallel in a three workstreams approach whereby, workstream 3 will focus on delivering an enduring business solution, although these will be delivered beyond the initial MVP timelines.

Principles:

I. The purpose of the MW Dispatch service is to resolve pre-fault transmission thermal constraint.
II. Transmission Constraint Management (TCM) service, as part of the ancillary services is the market route (as opposed to a flexible connections management approach) offered to the DERs as part of the MW dispatch product.
III. DER non-compliance to dispatch instruction is expected to be addressed post-event commercially as with other market-based dispatches and there will be no escalating action in the event of DER non-delivery.
IV. The purpose of the Distribution network assurance check is to avoid or minimise impact/conflict with the distribution network operation by the dispatch of DERs to resolve transmission constraints (comply with D-licence requirements). For MVP, D-assurance check is performed by DSO Control room any time between the time window from the receipt of Day-Ahead dispatch information from the ESO to the

start of the safety window. This check enables UKPN to carry out analysis considering possible participating DERs against the indicative dispatch windows to identify risk of conflicts and inform ESOs of unavailable DERs accordingly.

V. A 10 minute safety window is required initially for MVP solution to ensure there is no changes made to the DER dispatch instruction by dispatch purposes (both by ESO or DSO dispatch teams). The Safety window is time window between the ESO dispatch instruction to the start of DER service delivery which will allow confidence in "expected network behaviour" when UKPN Control Engineers are dealing with unplanned events or faults. DER service delivery equates to the time of DER dispatch instruction acceptance where they must provide service within agreed timescale specified in the commercial services agreement. The necessity for this 10 minute safety window will be reviewed and assessed during the MVP timeframe with an aspiration to move to a more immediate / real time dispatch of DER post ESO instruction, which would remove the safety window need.

VI. MVP approach will be based on a simple and conservative approach to deliver in faster timescales by minimising manual effort and IT changes, whilst still delivering a workable and value add solution. A Day in Life Of view of MVP MW Dispatch process is illustrated in Appendix 1.

VII. MVP solution will be capped on the maximum MW volume (or max DER number) due to incremental risk to D network/T-D conflicts as more DERs and MW volumes increase. This will be established at the design stage.

VIII. Mass ramping of DERs from MW dispatch is a potential risk to causing voltage deviation or network instability in the D-network but it will not be addressed in MVP considering the low volumes of DER MWs expected to cause any material impact. Post MVP, distribution network operational limits will need to be implemented to prevent any impact to the network. This will need to be reflected / factored into connections decisions and may inhibit future connections.

IX. The implementation of primacy rules in MVP will be based on UKPN applying the rules via the DER unavailability reporting activity to ESO. This assumes there is no other policy work being implemented from BEIS, Ofgem or ENA that has a potentially adverse impact on UKPN's operations.

X. Coordination and scheduling for MVP solution will be based on agreed two-ways data exchange between two parties as illustrated in appendix 2. The frequency, method, and format of sharing data will be addressed at design stage taking into account both side's dependencies.

XI. The potential benefits of Local Constraint Management (LCM) as a day-ahead market-based product will be investigated during MVP timescale without impacting on the delivery of TCM service.

Commercial service design:

Thermal Export Constraint

Where the increased connection of DER (in the form of generation assets and/or storage that are exporting MWs onto the distribution network) results in the coincident occurrence of low demand and high renewable output periods, ESO will need additional tools to take appropriate curtailment actions on these units. Initially the service will be used to manage high power flows across specific areas of the transmission system which is related to the immediate system need.

This project will use a combination of ESO tools and the UKPN dispatch solution and infrastructure to enable ESO to dispatch DER. There are existing technical and commercial ways for ESO to do this is (i.e., through the BM[2] or Wider Access[3]), however these options require substantial capital investment from smaller DERs in addition to the frequent submission of commercial operating parameters.

Proposed Service Parameters

- DER obliged by their connection terms and conditions must indicate which market route they intend to follow in order to satisfy these terms and conditions. They must not provide thermal constraint management service through multiple market routes to the ESO. However, the DER can provide constraint management services to UKPN, including thermal ones (subject to any service stackability restrictions).
- If choosing this basic MW Dispatch route, DER will need to follow a registration process set out by ESO and UKPN. This will collect basic technical and commercial information to enable the service to function and, as a minimum will include: Provider details, location, effective GSP, payment information and price.

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2 https://www.elexon.co.uk/operations-settlement/balancing-mechanism-units/

3 https://www.nationalgrideso.com/balancing-services/wider-access

- The MVP will require the service to be used to manage pre-fault thermal loading across the required constraint boundaries. The ability to instruct units in post-fault will be explored as an enhancement once the basic systems' functionality is in place.
- The design will be a basic thermal constraint management service and will only pay for utilisation (i.e., no availability payment will be provided). The price structure will not employ a cap.
- The minimum unit size will be 1MW. Each unit will need to be able to receive individual instructions via UKPN.
- For the MVP, the service will be established based on the last price submitted by each DER via an agreed scheduling process. For future enhancements, the service will be developed to allow closer-to-real-time price submissions, much in the same way as the BM operates today. DER who choose the basic MW Dispatch service route will be encouraged to provide a price and any updates to that price will be at the discretion of the DER. For those DER that do not choose a route to market (e.g., either BM, Wider Access, or MW Dispatch) then potentially, they could be curtailed for free.
- DER can update their prices up to a day ahead timeframe for MVP (with the eventual aim of aligning this with BM timescales).
- It will be assumed that DER are available 24/7 to provide the service (unless UKPN declares the unit unavailable via the appropriate process).
- Basic service coordination activities will take place between ESO and UKPN ahead of real-time to ensure service deliverability and conflict management within the scope of MVP that will be enhanced as part of WS3 delivery.
- The instruction format will instruct a participant from their actual current MW output fully to zero MWs as part of the initial design. There will be no incremental instructions as part of the MVP.
- Systems and providers should be able to deliver and respond to the instruction within agreed timescale specified in the commercial services agreement. These response delivery timescales will be compatible for the initial pre-fault thermal use of the service.
- Instructions will be issued from ESO to DERs, via UKPN systems.
- Issued instructions will be in the form of MW setpoint values (i.e. 0MW in the MVP).
- The exact calculation of settlement will be agreed during the design stage.
- For the MVP, DER will be settled against their metered output at the start of a dispatch instruction with UKPN.

Example Instruction

It is anticipated that the instruction, although simple, will ensure that even the most inflexible DER have a means of meeting their connection terms and conditions as part of the MVP.

Further development of the service may include coordination with additional third-party systems and capabilities as this will likely see the basic service design improved. However, this will follow the release of the MVP that will focus on delivering an integrated dispatch approach with RDP partner DNOs.

In addition, consideration will be given to more complex forms of instruction to that deployed under the MVP (e.g. non-zero MW instructions to either curtail DER or request an increase in DER output).

Primacy rules and principles:

Primacy rules are developed to manage the potential service conflict and to enable networks to be optimised efficiently and transparently. These rules will enable the End to End service including procurement, planning, scheduling and dispatch to be influenced by whole system value and ensure that the division between market/price-driven actions and the electricity system hierarchy of operational needs is clear and transparent.

The coordination process between ESO and UKPN will be detailed at the design stage. The table below summarises the rules to be implemented in MVP based on the output from ENA WS1A-P5 and agreed scope between ESO and UKPN.

- *Prior to the safety window*, all primacy rules will be applied by UKPN as part of the production of the DER unavailability report (weekly as minimum). The DERs with a likelihood of conflict with the related services as per table below will be indicated unavailable to the ESO.
- *During the safety window and service delivery*, no dispatch-based alterations are to be made by both UKPN and ESO. The standard network operational procedures will apply that in rare operational events, UKPN Control room or by instruction from (National Grid Electricity Transmission) NGET Control room, may need to take action to cancel or cease the dispatch instruction to protect the network or personnel or to meet Electricity Safety, Quality and Continuity Regulations (ESQCR) requirements.

Primacy [4]	Process (ENA WS1A-P5)	Relevant Organisation	Service/ Data	Data to Share (ENA WS1A-P5)	How	Purpose
1.1	DNO Forecast	UKPN	• DSO Flexibility Services (All) • Forecasted ANM action/ curtailment • DNO planned outages	Forecasted Risk of conflict	DER unavailability report (weekly as minimum)	Identify the potential conflict
1.2	ESO Forecast	ESO	• TCM (RDP) DER participants	TCM participants TCM Price – (if static price is agreed with DER)	Registration (registration & planning timeline)	Inform DNO of TCM participants
2	ESO Conflict Assessment	ESO	• ESO planned outages	N/A	ESO assessment	Remove the assets where there is a risk of conflict.
3.1	TCM Scheduling Process	ESO	• MW dispatch service	Forecasted CMZ requirements and merit order of TCM participants	Indication of potential merit order of DER dispatch stack (Day-ahead and Intra-day)	Inform UKPN of required TCM dispatch requirements
3.2	Wider ESO Planning Process	ESO	• Other ESO services	CMZ requirements	WS2/WS3	ESO inform actions on DNO constraints zones
4	DNO Scheduling	UKPN	• Fault outages • DERMS interactions • Flex services • DNO planned outages	CMZ requirements	UKPN assurance check process	Identify flex services zones for ESO
5[5]	TCM Activation	ESO	• MW dispatch service (Instruction)	Dispatch/Cease	DER MW Dispatch instruction	MW dispatch service delivery

Table 3 Primacy rules for MVP

[4] Numbering scheme does not imply sequence of actions. Theoretically, this needs to be an iterative process between the ESO and the DSO.

[5] This is not part of the outcome from ENA WS1A-P5 as the ENA product only covers the primacy rules prior to the dispatch of DERs.

In scope solution delivery (all workstreams):

Workstream 1

- Development of an end-to-end service for the full life-cycle from registration to decommissioning for Thermal Constraints ('System') purposes only.
- Connectivity of End-to-End systems to enable necessary data exchange as per data exchange Matrix provided in appendix 3, via ESO IT systems, UKPN IT systems and DER systems
- Sharing of real-time individual DER measurement (MW) via an automated process by UKPN to ESO Implement DER registration process through ESO and UKPN system
- A simple baselining approach in order to settle the TCM service
- Settlement information and payment process for the ESO TCM and Tri-lateral contract with DER
- A simplified process between ESO and UKPN for service scheduling. ESO to create a service stack and dispatch schedule Sharing of Day-ahead view of potential constraints for following day and potential merit order (based on cost) of DERs by ESO to UKPN
- Sharing of Intra-day view of constraints on rolling basis (Frequency of sharing data to be agreed at the design stage) by ESO to UKPN
- ESO to send dispatch instruction 10 minutes ahead of start of DER dispatch.
- Implement simple whole system coordination processes such as the implementation of primacy rules as defined by ENA (WS1A-P5) using relevant data.
- Market information publication of all DER instructed congestion management activities via appropriate market reports (to be determined at the design stage).

Workstream 2

- Post-event analysis of the data as per data exchange Matrix provided in appendix 3, that could not be shared in WS1 to assess the accuracy and effectiveness of WS1 solution
- Assess the impact, benefits and the practicality of implementing additional whole system coordination actions such as the implementation of more complex primacy rules as defined by ENA (WS1A-P5), using available post-event data
- Investigate the suitability and potential benefits of LCM product for MW Dispatch service to:
    - Identify required enhancements or variations to the existing process and design of LCM product to provide an efficient and effective MW dispatch solution
    - Identify the advantage of LCM product for MW dispatch service by evaluating and assessing the effectiveness of LCM vs TCM approach
- Review and assess the necessity of the 10 minute safety window to facilitate the move to real time dispatch of DERs

Workstream 3

The scope for WS3 is covered at high-level. A detailed scope will be defined and updated on the next revision of the PID.

- Test and embed the data sharing framework based on data exchange Matrix provided in appendix 3, between ESO and UKPN
- Explore the capabilities required for the ESO-UKPN to collectively create a global service stack based on sharing of the necessary bi-lateral industry data
- Further develop processes and IT system enhancements to facilitate an automated End-to-End solution (where this is possible and automation has not already been undertaken in WS1 and WS2)
- Use of registration platforms integrated with ESO and DSO systems
- Implement whole system coordination actions such as the implementation of primacy rules as defined by ENA (WS1A-P5) using closer-to-real time data

Out of Scope for MVP:

- Reactive power services
- Demand turn up
- Thermal Import Constraint for Storage DER (see below)
- Co-ordinated procurement of services between ESO/UKPN

- Use of the service for distribution constraints

Scope of the MW Dispatch overall Project Deliverables:

The delivery of the project has been outlined by defining the likely features across all the end-to-end service process steps. These end-to-end steps are shown and described in Figure 2 below, along with the scope and relative priorities for deliverables across each workstream.

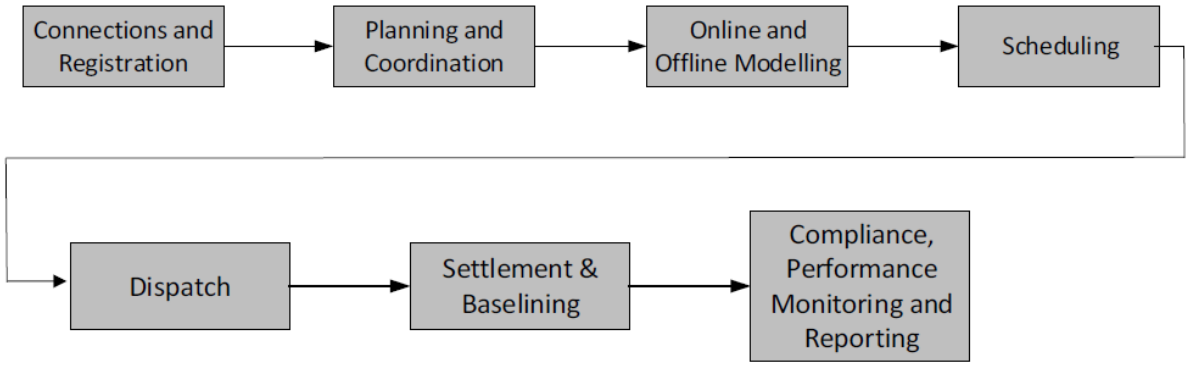


Figure 2 End-to-End service process steps

Table 4 below highlights the proposed deliverables required to successfully deliver a solution for each defined workstream:

Process Area	WS1	WS2	WS3
Contracts	Tri-lateral contract with DER	Same as WS1	Same as WS1
Connections and Registration	• Implement DER registration process based on ESO and UKPN systems	N/A	• Use of platform integrated with ESO and DSO systems
Planning and Coordination	• Real time individual DER measurement (MW) via an automated process • Use of manual processes (or automated where possible) for sharing available non-SCADA data in both planning and operational timescales • Implementation of whole-system actions such as primacy rules using ahead of real-time data	• Use of manual processes (or automated where possible) for sharing available post-event data • Establish more effective and efficient primacy rules and the processes and information sharing needed to support them for service conflicts • Develop and establish additional set of primacy rules, principles to resolve service conflicts defined by ENA (WS1A-P5) to promote whole system efficiencies	• Create data sharing framework • Use of automated processes for sharing all non-SCADA data in both planning and operational timescales • Implementation of primacy rules as defined using closer to real-time data
Online and Offline Modelling	• Share UKPN network model data via existing week 24/ 28 submission	Same as WS1	Same as WS1

Process Area	WS1	WS2	WS3
Scheduling and Dispatch	• A joint but simplified automated (manual may be considered, subject to stakeholder approval, where automation is not possible within the anticipated delivery timescales) process: • ESO to send proposed dispatch schedule (day-ahead and intra day) to UKPN • UKPN to send the dispatch automated instruction to DER upon assurance check confirmation (intra-day) • ESO to provide transparency on service stack generation process, delivered and implementation of primacy rules (day ahead) • UKPN to share the individual real time operational metering DER data with ESO	• Use of manual processes (or automated where possible) for sharing available post-event data • Establish more optimised and efficient dispatch scheduling methodology by assessing, analysing and comparing ESO dispatch scheduling versus ESO/UKPN global dispatch scheduling • Establish more accurate and effective solution by assessing and analysing accuracy and effectiveness of ESO MW requirements vs MW volume delivered and actual available network capacity • Facilitate closer to real time dispatch of DERs by reviewing, assessing and/or identifying requirements to enable reduction of the 10 minute safety window • Establish more effective and efficient UKPN/ESO coordination process including UKPN assurance check	• ESO-UKPN working to create a collective creating a global service stack based on full-sharing of bi-lateral data and industry data transparency (actual data items to be agreed and may be subject to commercial sensitivities) • Develop processes and IT systems to facilitate automated service scheduling and dispatch capability
Settlement and Baselining	• Manual settlement using the necessary systems and/or processes • Baselining based on an agreed simple approach to settle the TCM service • Define appropriate data to enable settlement using necessary systems and/or processes	• Establish more efficient and accurate baselining methodology by assessing and comparing WS1 baselining approach against other options	• Automated settlement using the necessary systems and/or processes • Baselining based on agreed approach from WS2
Compliance, Performance Monitoring and Reporting	• Use of manual processes for establish necessary reporting/ audit requirements • A performance monitoring policy is not required	N/A	• Use of automated processes for reporting/ audit requirements • Establish performance monitoring policy, processes and tools

Table 4 proposed deliverables for each defined workstream

Future Enhancements to the product (Workstream 3):

After the MVP end-to-end service has been delivered, there are several potential enhancements to the service that are to be considered and as such, the following is not an exhaustive list. The PID will be updated at a later stage once the Workstream 3 deliverables are clear.

Process Area	Enhanced Product Deliverable
Service coordination with UKPN	• Further development of primacy rules within the relevant IT systems • Further integration with broader IT systems • UKPN access to the MW Dispatch service • Alternative routes to participate in the MW Dispatch service
Connections and Registration	• Further digitisation and automation of existing data gathering processes (e.g. Appendix G, Week 24 etc) • Implementation of the registration process with new platforms (e.g. Digital Engagement Platform and/or Connections Portal)
Planning and Coordination	• Development of the basic coordination processes to ensure both ESO and DSO understand which services are likely to be dispatched under certain network outage conditions • Further improvement of data exchange activities to make better use of systems and platforms • Improvements in forecasting information and network study capability to make better use of DER service provision
Online and Offline Modelling	• Further development of how DER are modelled for the provision of different services • Improved and automated scripting of DER dispatch for different services, under a different outage/fault combination. • Development of post-fault capability within the MW Dispatch service and appropriate modelling of this within offline and online systems • Further modelling refinements associated with automated control schemes and dispatch advice to control engineers
Scheduling	• Extension to the technical capabilities of the MW Dispatch service to take account of storage providers switching to demand • Additional automatic sharing of scheduling information between the ESO and DSO to give improved visibility of service requirements ahead of real-time
Dispatch	• Expansion of dispatch systems to include improvements to the service design (e.g. MW decrements other than 'to zero') • Ability to incorporate storage acting as demand (for export constraints) • Refinement of new/existing dispatch algorithms to take account of DER services
Settlement and Baselining	• Improvement of the basic baselining approach based on work from Open Networks and improved data exchange techniques • Automation of the settlement process (depending on progress for the MVP release) • Enhanced publication (to the market) of displaced volumes and constraints information
Compliance, Performance Monitoring and Reporting	• Refinement and automation of the performance monitoring process • Integration with other platforms (where appropriate) to enable increased customer self-service for information on the services they've provided • Improved and more refined reporting information

6. Project Approval and Governance Structure

Key Roles and Responsibilities

- Project Manager
- Product Manager / Owner
- Key SMEs
- IT Resources (including IT Project Managers, Business Analysts, Solution Architects, Data Architects, Test Leads for both the RDP Project and any ESO System Products that require change to be implemented to deliver the RDP Project)
- UKPN-specific resources
- Legal

7. Delivery Methodology and how we will work together

Overview of Agile approach

The project will employ an Agile way of working (where possible) and this involves defining, planning, and completing tasks within a short time window called a sprint. An end-to-end process for the MW Dispatch service will be defined this will form a high-level view of the individual elements and constituent parts. These high-level elements are then further refined, developed, and validated with all stakeholders on a continuous basis throughout the project to ensure requirements are being met at each stage.

The project will initially deliver an MVP, which will subsequently be extended via Enhanced releases to deliver additional features, which will be prioritised by impacted stakeholders.

8. Governance structure and use of existing DNO meetings and Joint Forum

The DNO and ESO will hold regular bilateral meetings to monitor progress of the project. These meetings will also highlight any policy or stakeholder topics that may have an impact or need to be considered within the development stages of the project. Joint Project Management Board meetings will be also considered during the project in order to engage senior DNO/ESO management for prompt key decision making.

In addition, key outcomes from the bilateral meetings will be shared with all DNOs that are currently not part of this RDP, during monthly Joint Forums. This will provide visibility of technical and commercial developments, invite an open discussion on whether consistent technical approaches can be employed, and agree the best way forward across the group.

9. How does this project fit with wider RDP work/other projects?

The first cross boundary project linking distribution smart grid schemes and traditional transmission control systems was to develop the N-3 operational tripping schemes. The N-3 intertripping scheme with UKPN has gone live in November 2020 for the South East Coast. The work on N-3 intertripping schemes with SSEN and NGED in the South Coast are underway and the go live dates are anticipated ahead of the MW Dispatch MVP release. Under N-3 scenarios, DER will be curtailed to secure double circuit events if the network is already depleted by an outage. The intertripping system is only utilised post fault under N-3 conditions across the South Coast. This allows generation to operate freely pre-fault virtually all the time, because the probability of the fault is exceptionally low. The maximum generation intertrip will be set by the agreed largest system infeed for which primary and secondary response plant is scheduled. From a project delivery perspective, the MW Dispatch project may have some dependencies on N-3 for deliverables such as the Inter-Control Center Communications Protocol (ICCP) implementation for UKPN and NGED. Operationally, MW Dispatch may have some interaction with N-3 as part of Primacy Rules considerations.

In conjunction with this RPD, there is additional work underway to assess the impacts that storage may have on more localised constraints. It is expected that this RDP will benefit from this work in the future. This project is expected to benefit from many aspects of the NGED MW Dispatch roll-out; however, the needs case of this RDP differs sufficiently that this should be considered as an independent RDP project.

10. Joint Project Plan and risks

The project plan for MW Dispatch has been developed and agreed jointly between ESO and partner DNO, UKPN. It reflects the design and implementation phases for IT delivery and the associated activities that are required to produce the initial MVP and subsequent Enhanced service (see Appendix 4-6). Presently, planning is focused on delivery of the MVP. Detailed planning for Enhanced releases will be progressed during the project. Consequently, a key milestone is the delivery of the MVP which is planned to be in place in September 2023.

The scope and delivery planning for Storage Import dispatch provisioning is yet to be defined and links to the work being developed under RDP3.

A list of high-level risks currently identified are shown in Appendix 7.

11. Document Version and Tracking

The table below outlines current and previous document version, including appropriate sign-off from all parties.

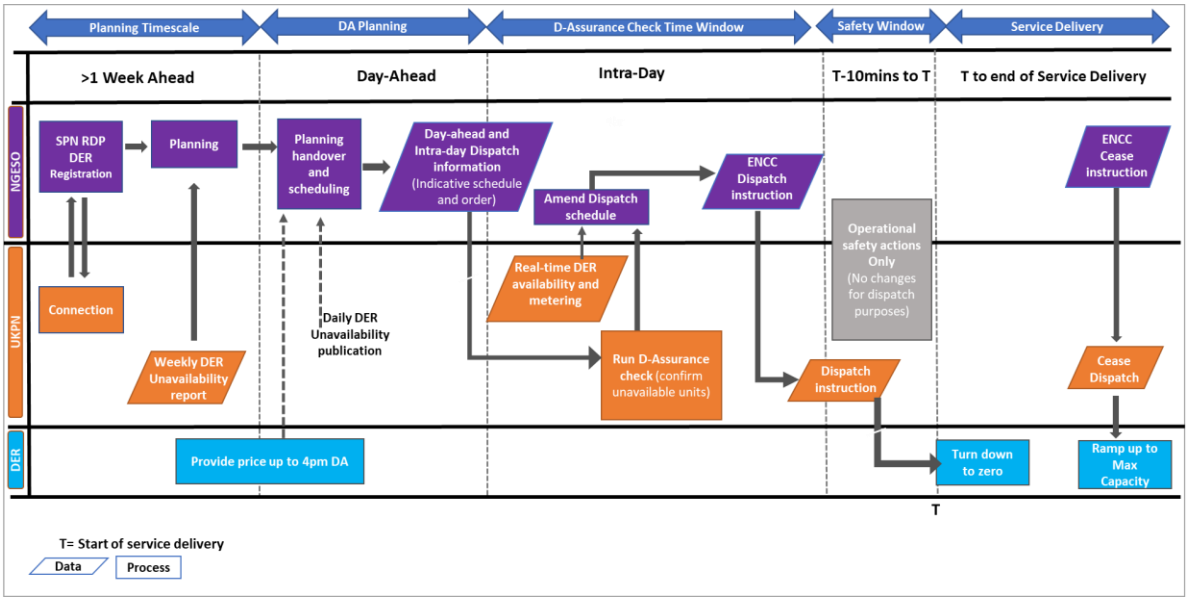
Version	Date	Change Overview	ESO Approved (Name and Signature)	UKPN Approved (Name and Signature)
V 1.0	12/05/22	Initial draft created		
V 1.1	17/06/22	Initial draft reviewed		
V1.2	14/07/2022	ESO comments on draft		
V1.3	19/08/2022	ESO comments on revised UKPN draft		
V1.3	26/08/22	UKPN comments on revised ESO draft		
V1.3.1	04/01/23	UKPN update on MVP principals, WS2 scope and Appendix 2		
V1.3.2	19/01/23	ESO update from December 2022 scope alignment		
V1.3.3	24/01/23	UKPN update on Primacy rules, scope and deliverables		
V1.3.4	7/2/23	ESO update on proposed service parameters.		
V1.3.5	13/02/2023	UKPN review		
V1.4	14/02/2023	Baselined version issued by ESO for approval		
V1.5	17/02/2023	Baselined version issued for approval		

12. Sign off

Name	Position / Role	Organisation	Date
Sotiris Georgiopoulos	DSO Director	UK Power Networks	21/2/23
Barry Hatton	Director Asset Management	UK Power Networks	21/2/23
Steve Wallace	Network Access Planning Manager	ESO	3/3/23

Gavin Brown	ENCC Future Design Senior Manager	ESO	2/3/23
Andy Wainwright	Head of Whole Electricity System	ESO	3/3/23

Appendix 1: Day in Life Of view of MVP MW Dispatch process



Appendix 2: High-level Data exchange for coordination and scheduling in WS1

Data	Source	Destination	Timescale
Individual DER metering data	UKPN	ESO	Real-time
DER unavailability report	UKPN	ESO	Weekly (as minimum)
DER unavailability signal	UKPN	ESO	Real-time
Data relating to potential merit order of DER dispatch if initiated / required	ESO	UKPN	Daily
Indication of which constraints could be activated for the following day	ESO	UKPN	Daily
Updated view of constraints that could be activated	ESO	UKPN	Intra day
Post event data to support WS2 analysis including (but not limited to) DER bids, Data for all parties signed up to ESO services, Transmission Generation data, Interconnector flows	ESO	UKPN	Post-event

Appendix 3: UKPN-ESO Data Exchange matrix and use cases

UKPN-ESO Data Exchange matrix and u

Appendix 4: MW Dispatch (and Dependencies) Roadmap

To be completed during initial Requirements Gathering phase

Appendix 5: MW Dispatch MVP Delivery Plan (ESO IT Implementation View)

To be completed during initial Requirements Gathering phase

Appendix 6: MW Dispatch MVP Delivery Plan (Business Change View)

To be completed during initial Requirements Gathering phase

Appendix 7: MW Dispatch project risks

Significant ESO risks identified at time of writing:

Risk	Risk Category	Probability (1-5)	Impact (1-5)	Risk Strategy
There is a risk that it is not possible to get consistent agreement on the content and format of the commercial contract structure for Dispatch Management, leading to impacts on other workstreams (dependent on contract terms), delays in the project or ultimately inability to deliver the project.	Commercial	3	4	Accept/Mitigate: Activities will be carefully tracked and where possible related details will be provided to other workstreams independently of contract finalisation.
There is a risk that the proposed technical design significantly changes due to feedback from UKPN, DER and ESO stakeholder engagement which may highlight the need to modify the technical design leading to project rework and delays	Commercial	1	4	Mitigate: Regular UKPN and ESO stakeholder engagements and close collaboration. Regular DER engagement to provide updates and seek feedback on proposals. Delivery of an MVP, to then be expanded in enhanced releases to reflect stakeholder feedback.
There is a risk that each DNO requires a different IT interface and service design leading to significantly increased complexity, costs, and timescales to deliver	Delivery	2	4	Accept/Mitigate: Actions to be taken to mitigate this risk and ideally secure a common solution across DNOs, however, ultimately some differences between solutions may be accepted where unavoidable.
There is a risk that resource requirements for the project cannot be secured leading to project delays and/or deliverable quality issues.	Delivery	3	4	Accept/Mitigate: Forward planning and early engagement with key resources will be employed to minimise this risk. ESO have secured dedicated RDP business and IT teams to drive the RDP projects and prioritisation calls to mitigate this risk for specific project needs will be employed where necessary.
There is a risk of DER confusion regarding the proposed service leading to a lack of participation	Commercial	2	2	Mitigate: ESO/UKPN to undertake regular Webinars / engagement to provide DER with information and project updates throughout the project duration.
There is a risk that ABSVD reporting requirement may apply to MW Dispatch such that additional requirements will need to be captured within the solution to comply with the necessary obligations leading to additional complexity for the MVP	Regulatory	2	4	Mitigate: ESO to progress discussions with relevant ESO leads and identify requirements

Significant UKPN risks identified at time of writing:

Risk	Risk Category	Probability (1-5)	Impact (1-5)	Risk Strategy
There is a risk that during the design stage a common data communication method between ESO and UKPN is not agreed or not implemented in time.	Delivery	2	4	Mitigate: Requirements gathering will concentrate efforts on agreeing a suitable communication method at an early stage. Delivery will be closely monitored to ensure it keeps on track.
There is a risk that the NGED solution is delayed. This can have implications on	Delivery	2	3	Mitigate: Regular communication with ESO on progress with NGED solution will allow risk level to be understood. Delivery to concentrate on

Risk	Risk Category	Probability (1-5)	Impact (1-5)	Risk Strategy
resource and delivery of the UKPN solution, which therefore can see similar delays.				areas that can be progressed in a timely manner.
There is a risk that the intra-day dispatch information cannot be delivered, thus reducing UKPNs ability to understand implications of potential dispatch on their network.	Delivery	2	4	Accept/Mitigate: Work closely to assist in delivering intraday rolling dispatch schedule. Accept MVP approach to gain initial data.
There is a risk that the service is not very effective due to conservative approach of discounting of DERs week ahead or due to ANM actions.	Delivery	3	4	Accept/Mitigate: Progress WS2 to allow a more effective solution to be delivered as part of WS3 that allows more real time dynamic dispatch.
There is a risk that WS2 and WS3 are not progressed due to too many reasons including resource, interest, mutual scope agreement and that the project remains at MVP with a cap on DERS joining service.	Commercial	2	4	Mitigate: Both parties to continue to work on WS2 and WS3 in parallel to WS1.
There is a risk that the UKPN operational resource plan is delayed due to the forming of the DSO. This can reduce the ability to move MVP forward and increase the effectiveness of the project	Delivery	2	4	Mitigate: UKPN to progress the forming of a DSO as per the project plan and review impact on project dependencies.

Appendix 8: Glossary and Abbreviations

Term	Definition
BM	Balancing Mechanism
DER	Distributed Energy Resources
DERMS	Distributed Energy Resources Management System
DNO	Distribution Network Operator
DSO	Distribution System Operator
ENCC	Electricity National Control Centre
ESO	National Grid Electricity System Operator
ICCP	Inter-Control Center Communications Protocol
LCM	Local Constraint Management
MVP	Minimum Viable Product
NGED	National Grid Electricity Distribution
NGET	National Grid Electricity Transmission
PID	Project Initiation Document
RDP	Regional Development Programme
SPN	South-eastern Networks
TCM	Transmission Constraint Management
T-D	Transmission-Distribution
UKPN	UK Power Networks