TRANSITION

Energy Innovation Summit 2023

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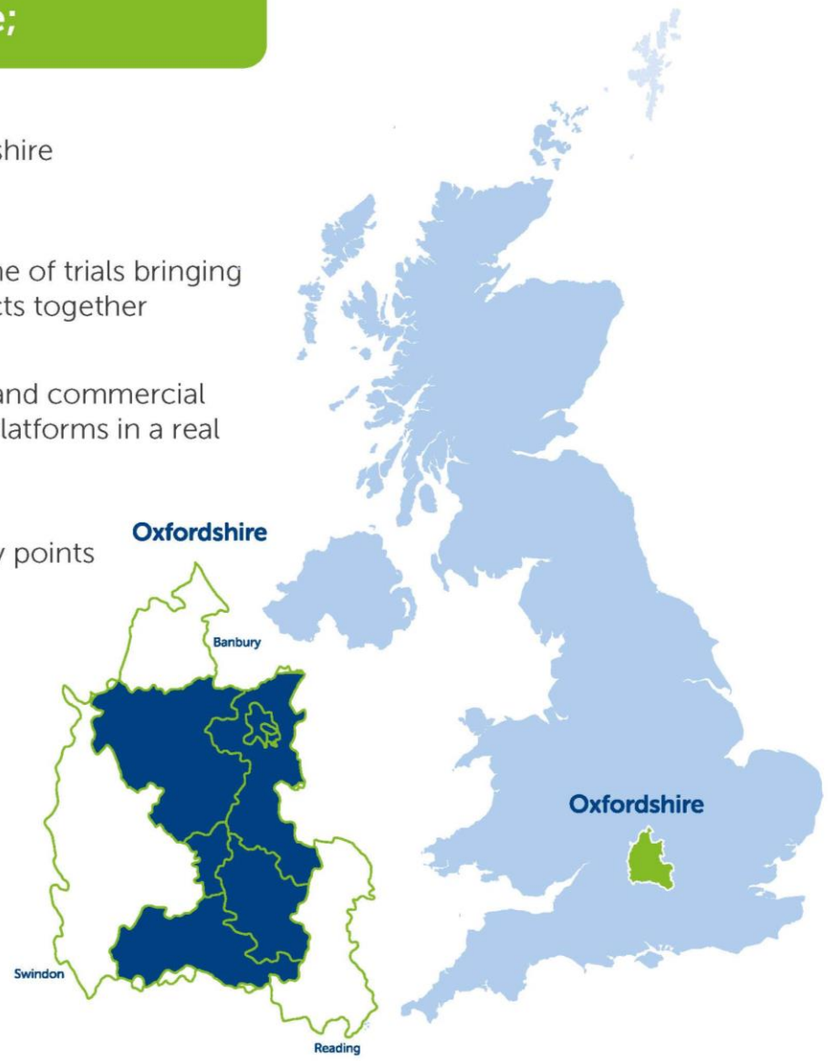
transition

Moving to a smart future

Project TRANSITION Background

Our flexibility market trials are;

- Being run in areas across Oxfordshire
- A unique collaborative programme of trials bringing two key energy innovation projects together
- Trialling new innovative markets and commercial approaches, smart systems and platforms in a real world environment
- Running across seven bulk supply points and 13 primary substation areas
- Open to businesses across the trial areas able to offer flexibility services
- Unique opportunities for peers to trade spare connection capacities between each other



[3] RIIO-ED2 Final Determinations Overview document (ofgem.gov.uk)
[4] National Grid - EFFS
[5] Fusion - SP Energy Networks

Flex Market Timeline - Services

Service
DSO Procured Services
Sustain Peak Management (SPM)
Sustain Export Peak Management (SEPM)
Secure DSO Constraint Management (pre-fault) (SCM) **- new**
Dynamic DSO Constraint Management (post-fault) (DCM) **- new**
DSO Enabled Services
Exceeding Maximum Export Capacity (MEC)
Exceeding Maximum Import Capacity (MIC) **- new**

Flex Market Timeline – Procure

DSO-Procured Services

Procurement Horizons

Season-ahead

Contracts cover all week-days within a season.

Less popular among participants.

Week-ahead.

Contracts cover all week-days the following week.

Procure e.g. 80% of identified requirement.

Day-ahead

Contracts cover only the following day.

Procure 100% of remaining requirement.

Primacy and Stacking

- The only viable business models for participants in DSO flex services at the prices offered during TRANSITION rely on stacking to maximise revenue.
- TRANSITION trialled stacking across multiple time-horizons and DSO services.
- Exclusivity clause in ESO services was sometimes a barrier to participation.

Key Learnings:

- Procurement closer to real time was preferred by participants.
- Service stacking is crucial to enable participants to maximise profits.
- Primacy rules between services will be important to enable maximum participation in DSO services.
- Important to ensure exclusivity clauses for some services do not become a barrier to participation.

Flex Market Timeline - Services

We trialled flexibility services on 6 BSPs and 4 primaries.

We also trialled some peer-to-peer services – the trading of Maximum Import Capacity (MIC) and Maximum Export Capacity (MEC).

- The procurement horizons are different than in the current business as usual flexibility procurement – we tested procuring much closer to real time. We are currently transferring learnings to BAU in order to increase tender rounds.
- Max Payment encompasses two payments – utilisation and availability.

Key Learnings:
- Pre-defining the availability parameters in the specific service contract meant the services were more transparent and easier to understand.
- Price ceilings are needed until the market is more liquid.

Service names	*Notice*	*Max. Payment £/MWh*
Sustain Peak Management Demand down Generation up	12hrs	**£600**
Sustain Export Peak Management Demand up Generation down	12hrs	**£850**
Secure DSO Constraint Management (pre fault) Demand down Generation up	4hrs	**£800**
Dynamic DSO Constraint Management (post fault) Demand down Generation up	30mins	**£1,200**

Flex Market Timeline - End to End Process

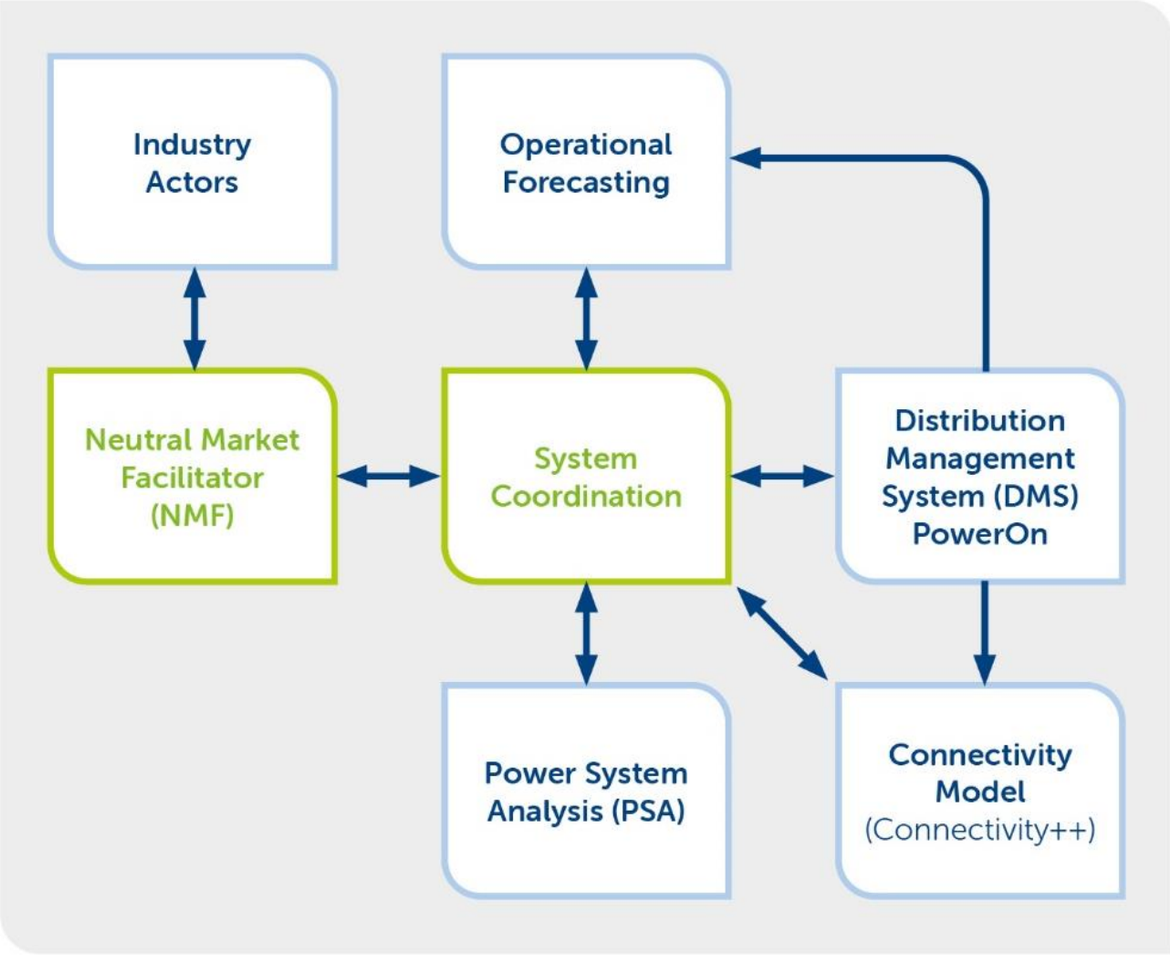
Step One: Register

Step Two: Procure

Step Three: Delivery

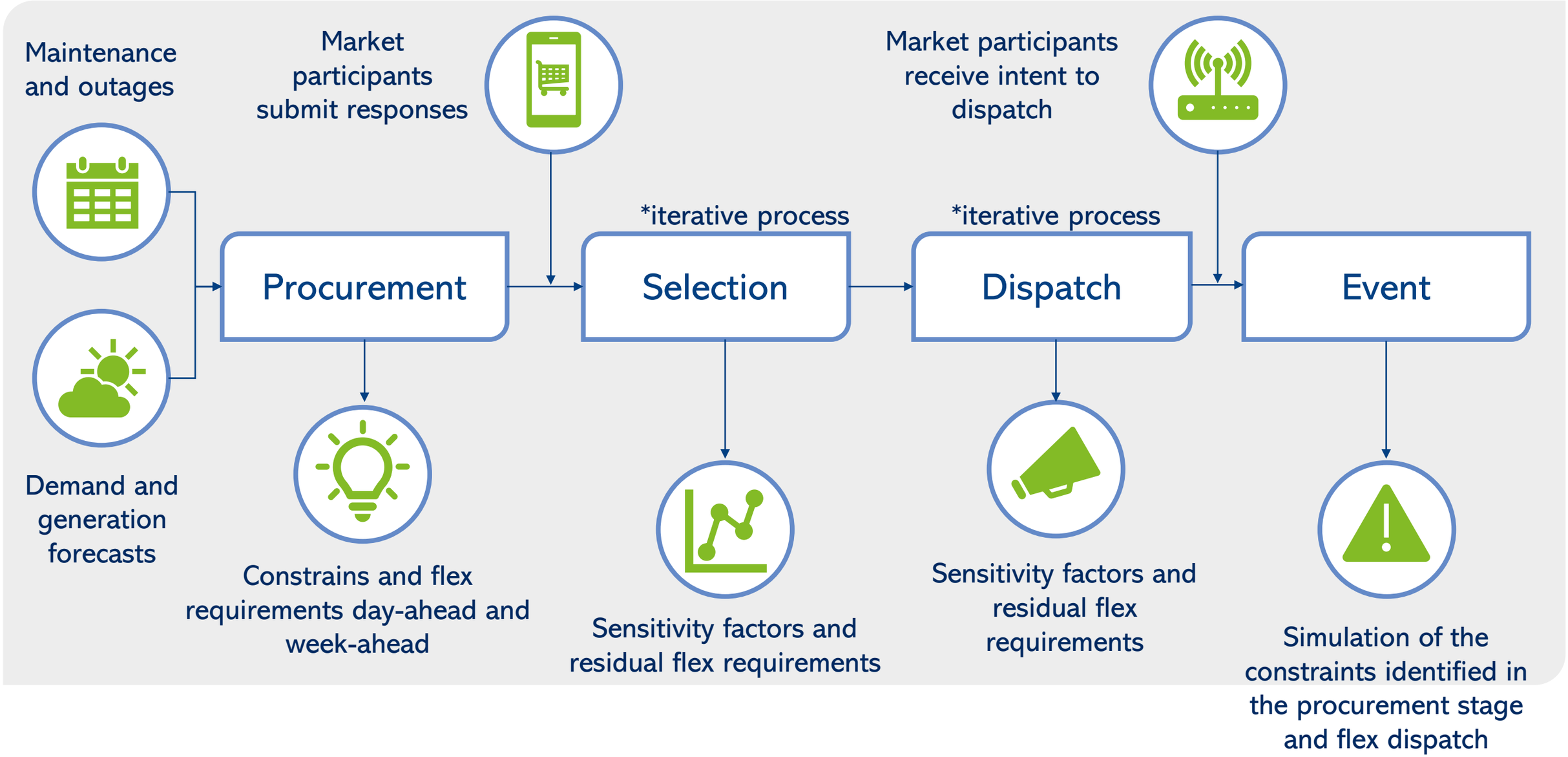
Step Four: Settlement

TRANSITION High Level Design of IT



- **Operational Forecasting:** provides a view of **demand/generation** profiles at granular nodal level for 0-10 days ahead of real-time
- **Distribution Management System (PowerOn):** Provides control room view of **live/real-time network connectivity** and power flows
- **Power System Analysis (PSA):** Computes anticipated **power flows** under different near-term topology change and forecast scenarios
- **System Coordinator (WSC):** Provides the core intelligence for **flex market decision making**, allows an input interface for control room, and manages automated data flows between sub-component DSO systems
- **Neutral Market Facilitator (NMF):** Provides a user interface **portal for DSO interaction with the Industry Actors** to enter/accept their available flex service volumes/costs, and for them to request approval for peer-to-peer (P2P) capacity trades
- **Connectivity model (Connectivity++):** The **master model that holds the network** and how customers relate to it and master repository for key **network parameters** (e.g., impedance, ratings and normal running arrangement).

Process Flow



Participation

Trials continued to build the complexity, scale, volume and number of events….successes and barriers.

- Market Stimuli Packages ✗
- Aggregators ✓
- Stacking service ✓
- Simplified paperwork ✓
- Automation ✓

- A clear understanding of the value flexible DERs can provide at any one time
- Greater real time co-ordination with the Energy System Operator (ESO) to ensure that DERs can be "optimised" across the energy system as a whole.

High Level Outcomes and Key Messages from TRANSITION

Informed Decisions on Market Design for Flexibility Services

TRANSITION has delivered an evidential base to inform decisions on market design for flexibility services and proven the value of collaboration and coordination, leading to a whole systems approach in ED2.

Developed Commercial Arrangements for Flexibility Services

Simplified contractual arrangements are key to enabling wider participation and unlocking flexibility from aggregators and suppliers.

Applied a Price Evaluation Methodology

A liquid market requires a price for flexibility that is reflective of the value across the energy supply chain including wider socio-economic benefits.

Developed and Tested the NMF Platform

TRANSITION successfully tested that the neutral facilitation of a marketplace can enable the delivery of a variety of flexibility and capacity services and products (delivery timescales).

Developed System Architecture and Data Exchanges for DSO Tools

A diverse range of data sources, from supply through delivery to use, can improve short term planning and decision making.

Developed an Integrated Network Model

Robust digital models of the LV network at the street level form the basis for accurate forecasts that can enable greater uptake of Low Carbon Technologies (LCTs).

Developed and Tested the PSA

The automation of PSA modelling at all voltage levels can facilitate the identification and communication of flexibility requirements within DNOs and to potential flexibility providers.

Developed and Tested the Select and Dispatch Tool

Automatic constraint prediction and economic optimisation tools are required to enable the efficient use of flexibility at scale.