

# DSO Transition

1st October 2019

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# Agenda



- **RIIO-ED2**
  - **Access, Flexibility, Charging and Investment Modelling**
  - **Oxfordshire Project (LEO and Transition)**
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# SSE Sustainability Goals for 2030



## Cut our carbon intensity by 50%

Reduce the carbon intensity of electricity generated by 50% by 2030, compared to 2018 levels, to around 150gCO<sub>2</sub>/kWh.

13 CLIMATE ACTION



## Treble renewable energy output

Develop and build by 2030 enough renewable energy to treble renewable output to 30TWh a year.

7 AFFORDABLE AND CLEAN ENERGY



## Help accommodate 10m electric vehicles

Build electricity network flexibility and infrastructure that helps accommodate 10 million electric vehicles in GB by 2030.

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



## Champion Fair Tax and a real Living Wage

Be the leading company in the UK and Ireland championing Fair Tax and a real Living Wage.

8 DECENT WORK AND ECONOMIC GROWTH



# Government Principles for the Energy Market



## The Market Principle

Using market mechanisms wherever possible to take full advantage of innovation and competition.



## The Insurance Principle

Given uncertainty about the future, government must be prepared to intervene to provide insurance and keep options open.



## The Agility Principle

Energy regulation must be agile and responsive if it is to reap the great opportunities of the smart, digital economy.



## The Fairness Principle

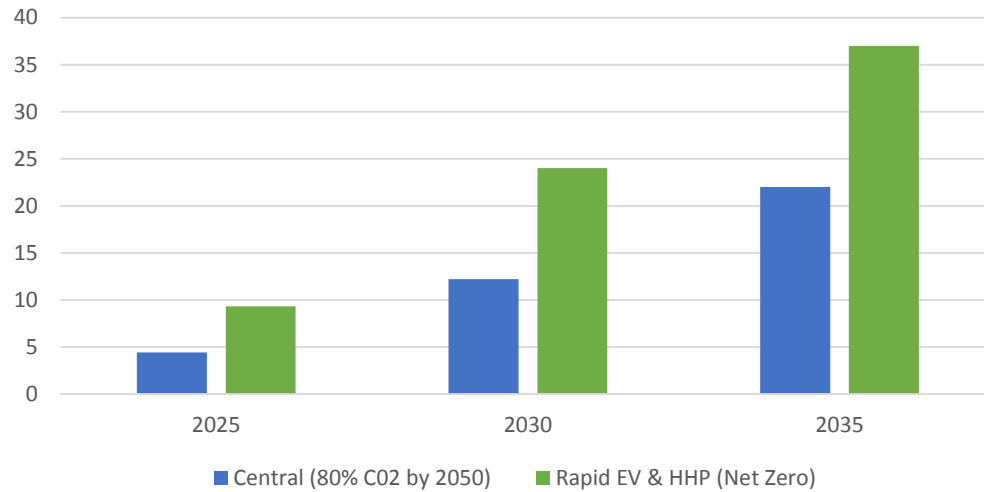
Consumers of all type should pay a fair share of the system costs.

# The Network's Low Carbon Revolution

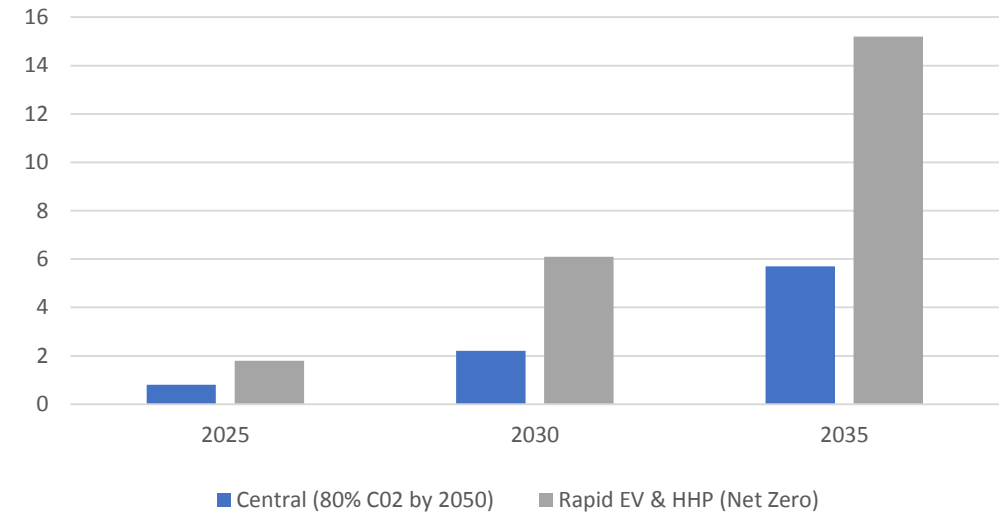


The UK Net Zero Carbon commitment requires a £50bn investment in GB distribution networks by 2035\*

Plug in Hybrid and Electric Vehicles (millions)



Heating by Heat Pump(HP) & Hybrid HP (millions)



Investment in distribution networks to support increasing numbers of electric vehicles benefits all energy consumers through social benefits of decarbonisation, reduced unit costs of electricity distribution and reduced transport fuel costs as we move away from diesel and petrol.

Multiple decarbonisation of heat pathways are possible including electrification, decarbonised gas and hybrid systems. These solutions will increase distribution electricity demand in varying degrees.

\* Source: *Accelerated electrification and GB electricity systems*, a report by Vivid Economics and Imperial College London for Committee on Climate Change, April 2019

# Strategic Approach to RIIO-ED2



- While **RIIO-ED2** will retain core elements of “business as usual”, delivery of carbon targets, DSO, Whole System and sustainability ambitions **will require a significant step change in approach.**
- A **clear and coordinated strategy and plan is needed** across Ofgem, Government and industry to define what needs to be delivered, when and how
- The legal and **regulatory framework must facilitate delivery** and not act as a barrier
- **Uncertainty** in how the needs of network users will develop **must to be effectively accommodated**; risks, opportunities and challenges need to be clearly understood and appropriately mitigated
- An **appropriate funding and incentive framework is required** to deliver commitments and drive efficiency.
- Carbon targets and future needs cannot be delivered through traditional network reinforcement alone - the importance of **active and flexible DSO-based whole-system approaches needs to be recognised** in regulation
- We cannot lose sight of what consumers want and are willing and able to pay for - we must ensure customer service continues to improve and **no one is left behind**

We recognise that electricity distribution networks are the linchpin of the GB decarbonisation commitment. Our application of leading-edge operational technology together with the valuable knowledge gained from our flagship low carbon innovation projects positions us to help lead GB decarbonisation. We need to unlock customer value at maximum pace. We accept the challenge, but need the right ED2 framework



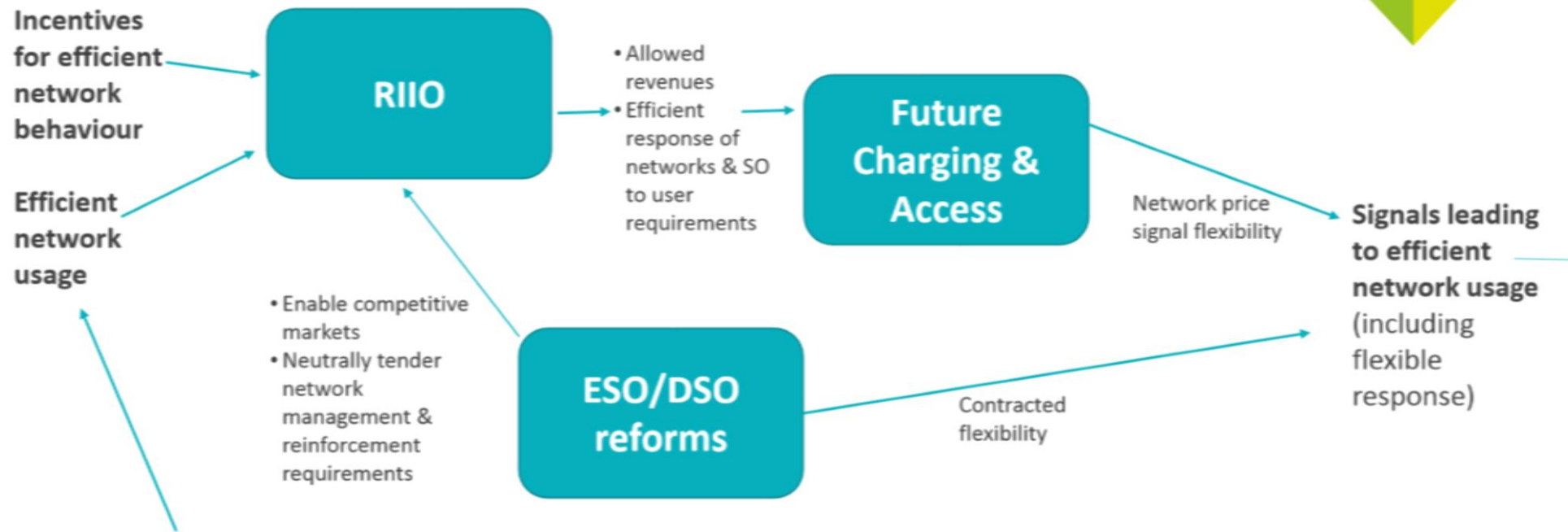
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# Ofgem's Work Programmes



## Our RIIO, FCA and System Operation reforms work together to deliver efficient network outcomes



### WE ALSO NEED:

- Key enablers are Smart Meter rollout and Settlement reform
- Future Retail reforms are key to ensuring appropriate signals are passed to consumers
  - To ensure consumers are protected, especially those in vulnerable situations

Energy Codes Review

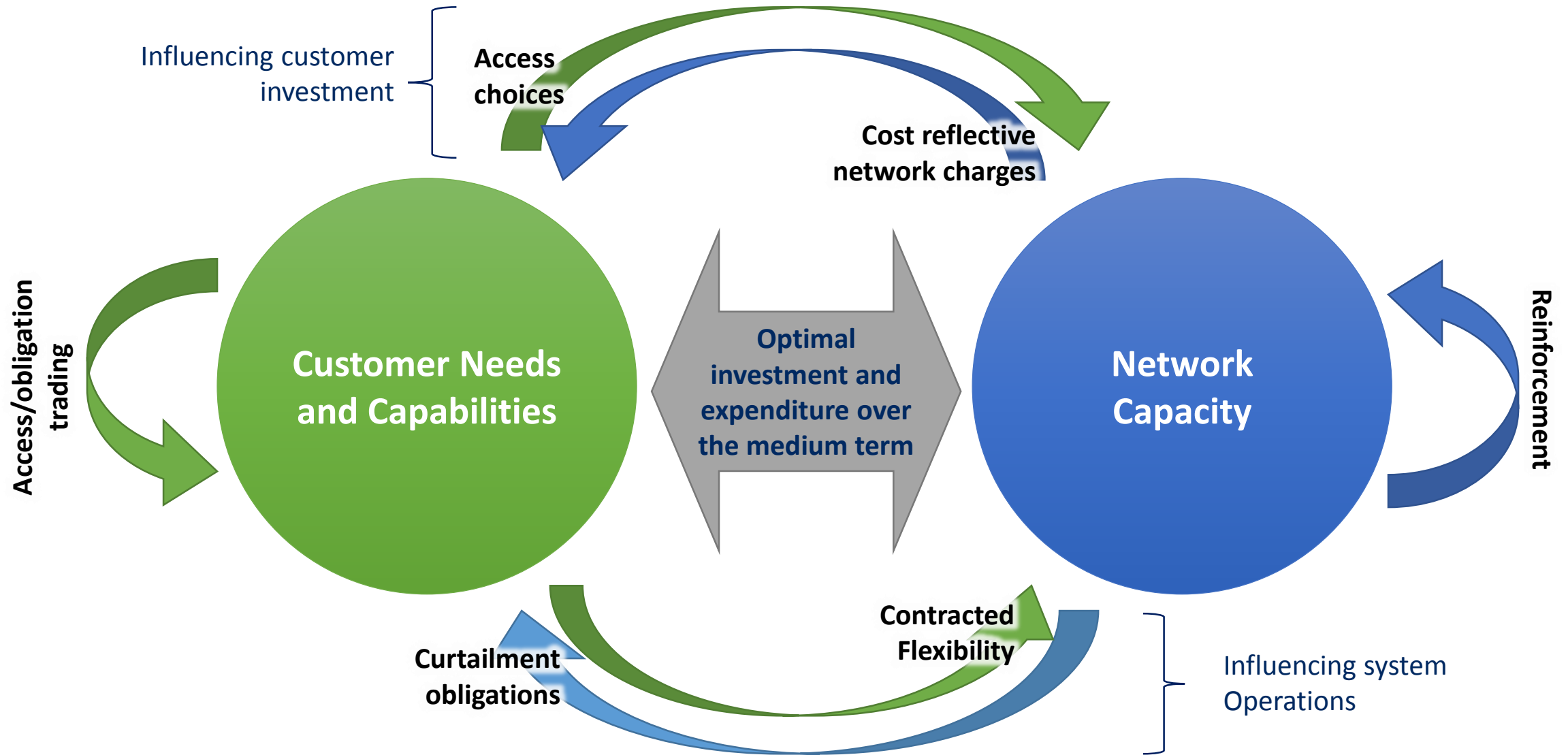
Faster Switching

Targeted Charging Review

BSUoS Task Force

HH Settlement Reform

# Matching needs, capabilities & capacity



# Making the Whole System Operate



## **ESO Responsible for:**

- Balancing GB supply and demand, maintaining frequency etc.
- Managing congestion on the transmission network

## **DSO Responsible for:**

- Managing congestion on the distribution network
- Ensuring GB balancing does not cause inefficient distribution outcomes or disproportionate detriment to customers

## **Coordinated Operations:**

- DSO monitors network below each GSP (SCP) to identify congestion
- ESO monitors transmission network up to each GSP to identify congestion
- DSO accepts bid/offers for services to manage congestion within the GSP
- ESO reviews DSO acceptances to assess if a consequential balancing action is required above the GSP
- If ESO balancing action uses BMUs within a GSP, DSO consulted to confirm no unintended consequences

Investment requirements considered on a holistic T & D basis e.g. Islands Needs Cases

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# SSEN Flexible Solutions

## Evolution & Improvement



2011 ORKNEY RPZ – ANM Genesis

SSEN Delivers first UK ANM System in the Orkney Registered Power Zone

2013 NINES – SHETLAND ANM

SSEN Delivers advanced ANM system, managing generation, demand and storage – effectively implementing the UK's first Smart-Grid

2016 Constraint Managed Zones

SSEN Delivers UK's first BAU Flexibility Contract Tender to defer traditional network reinforcement

SSEN now fields industry leading flexible connections suite

SSEN are now trialling/finalising pre & post fault, planned outage and social CMZ services

SSEN are developing Demand and Storage specific flexible connections to increase customer options

Traditional ANM connection costs were significant and were a key blocker to uptake

The ANM centralisation project will provide an average saving for each new scheme of around 30%

The Flexible Solutions team have negotiated through tenders to further reduce the costs for ANM connections, 'sole-use' element costs have now reduced 50% in 2 years (around a £30k saving to customers)

Against an expected TOTEX investment of £5m across the SWAN and ANM Centralisation Projects, design improvements and development are likely to realise savings of approximately £1m up to October 2021. Customer Savings are expected in the region of £2m.

SWAN Project in delivery (Completion due Oct 2021)

ANM Centralisation Project in delivery (completion due Jan 2020)

First Tender releases planned for CMZ Prepare, CMZ Restore and CMZ Respond in July/August 2019.



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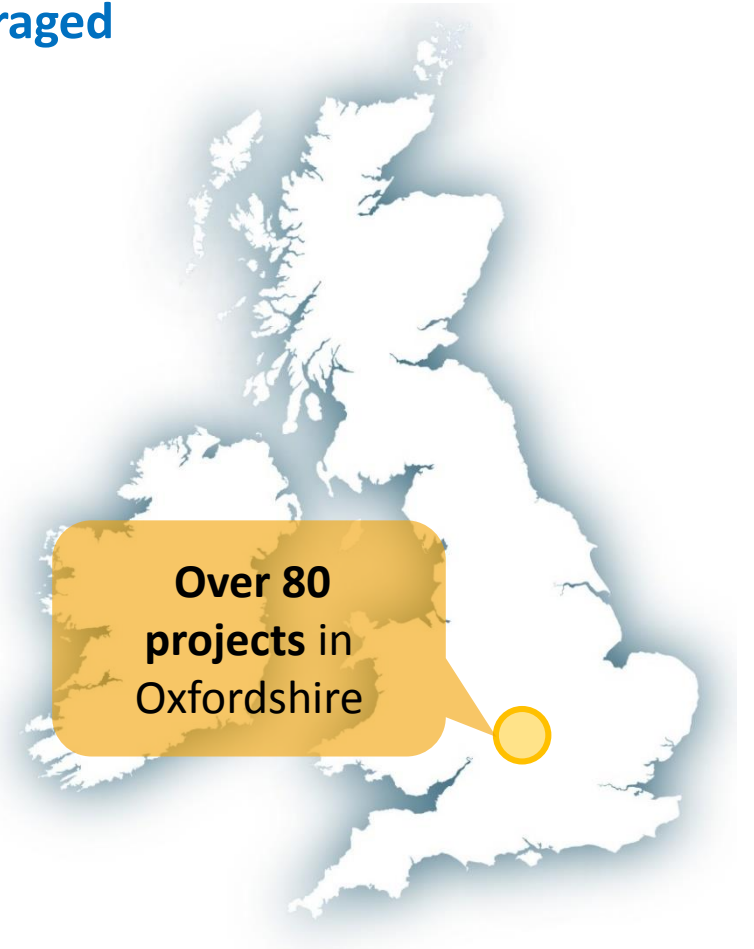
# DSO – Trial and Test

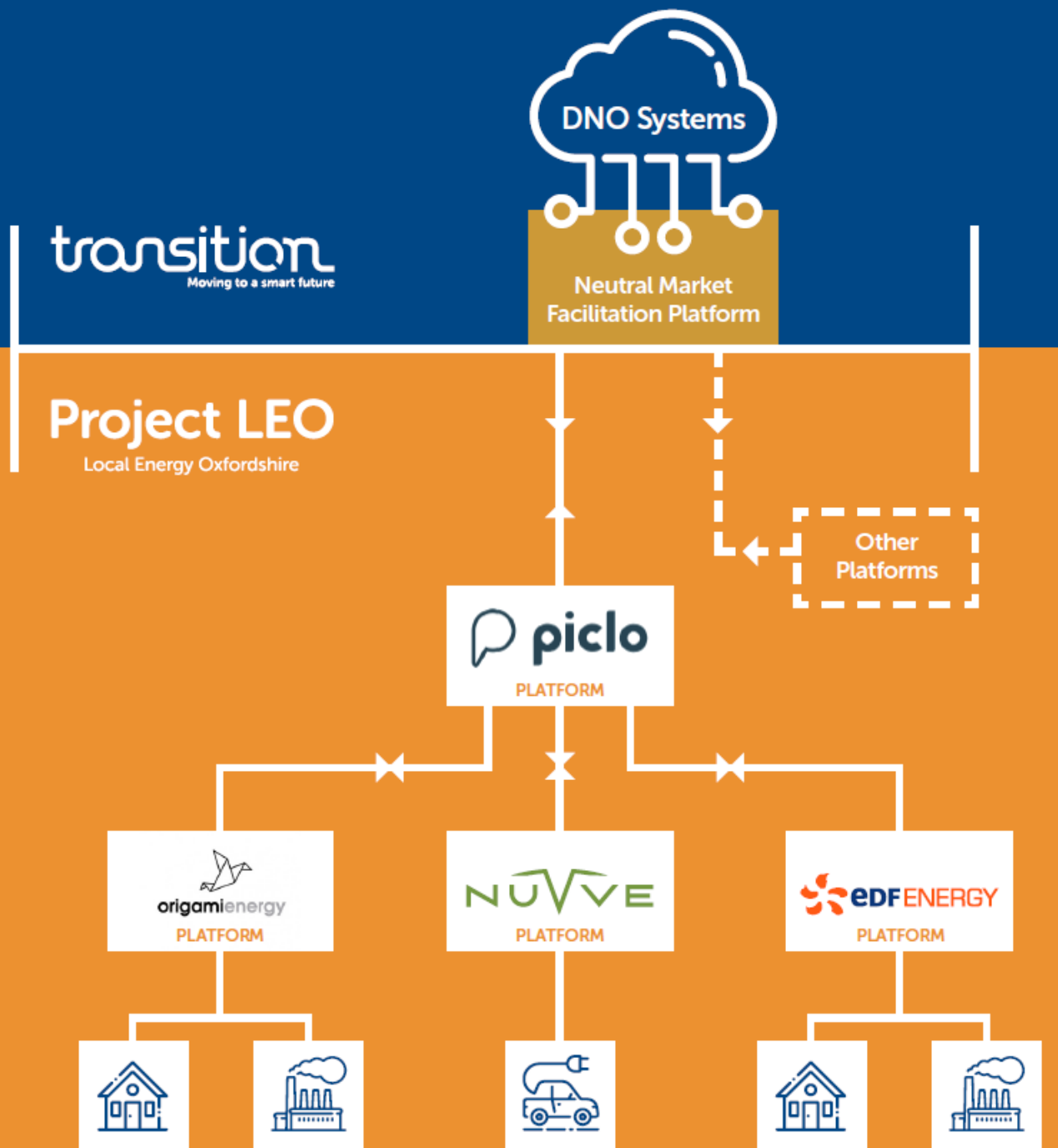


**LEO** and **transition** provide a £40m programme which is further leveraged by £46m public sector investment in Oxfordshire.

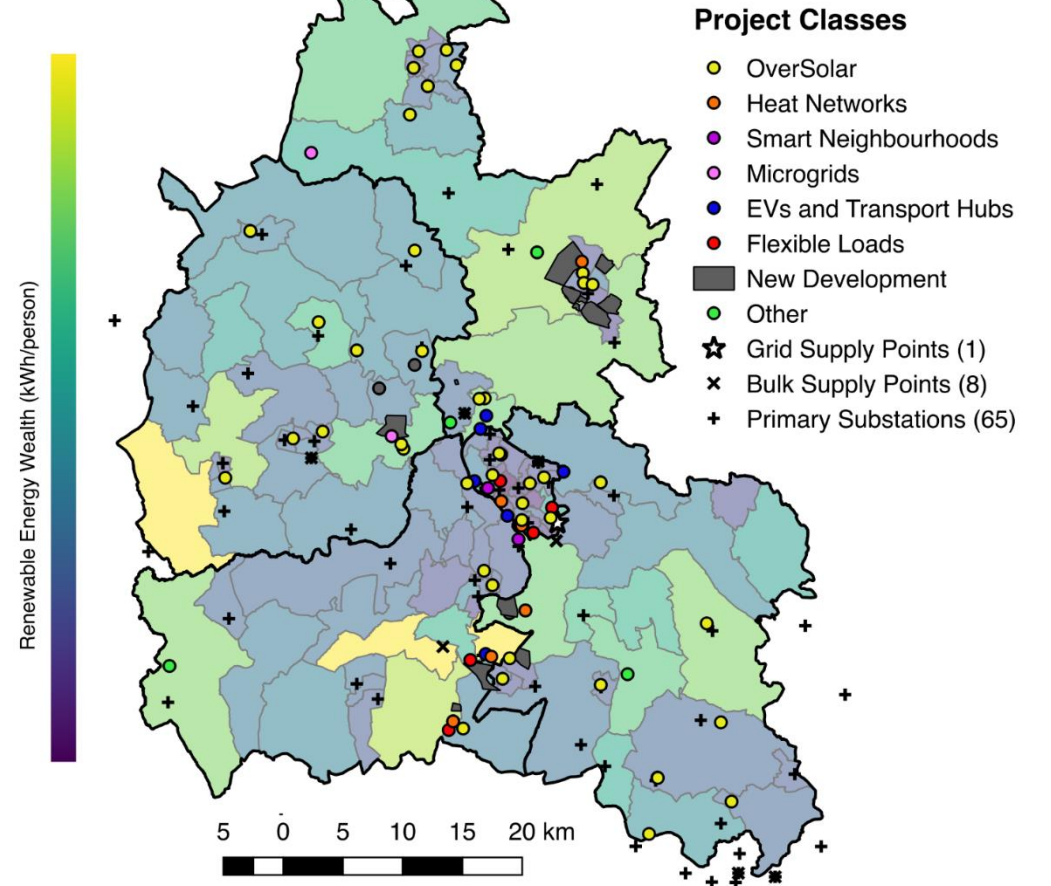
## Core Objectives

1. Develop new, local flexibility and energy markets
2. Maximise the utilisation of the distributed generation, load, storage and network assets
3. Enable innovative business models for investment for a low-carbon and smart energy system.





# Oxfordshire



**TRANSITION** delivers the network management system to facilitate the market and allow value of such projects to be realised by the local communities.

**Project LEO** would bring the participants, develops local system mapping and market platforms themselves (currently in bid phase).

# Case Study 1



**Example: Sandford Hydro** - The largest community owned hydro scheme on the River Thames helping Oxfordshire meet the UK carbon budget requiring 58% of electricity demand in the county to be generated from renewable sources.

## OPERATIONS

- **Installation of Protection Control and Monitoring :** Gathering Data at LV & HV
- **Flexibility Contracts :** Manage abnormal network conditions and limit customer impact
- **Unpredictable Demand Profiles :** Managing load flows and resilience
- **New Skills :** For IT/OT and the control room
- **Reinforcement :** A deferral of Reinforcement Projects as system balanced locally
- **More Complex OT systems :** More interactions and connections





# Case Study 2



**Project Pro Drive** : Partnering with EV Market Platform to provide smart EV Charging to local P&R, including Solar Canopy

## PRICING and FINANCE

- **How to value flexibility:** Deploy, measure, learn
- **Input on current arrangements** : Reduce charges due to reinforcement
- **Views on changes** : Fair, Transparent and Competitive
- **Peer to Peer Trading** : Facilitating local energy exchanges
- **Capacity Pricing** : Lower the cost of connecting to the system trading existing capacity



# Progress to date



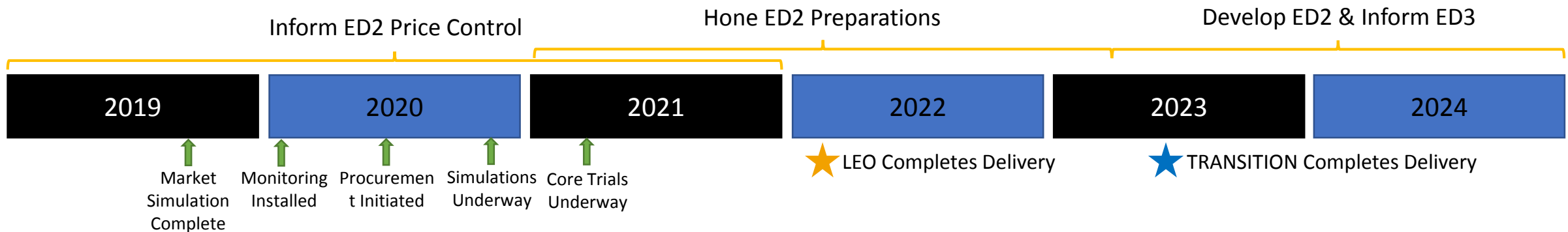
The Oxfordshire Programme can trial and test various elements of the Smart Grid transition, de-risking investment and informing regulatory decisions.

## Value added in the form of:

- **Neutral Market Facilitator Requirements Specification** – first of a kind baseline for the marketplace interface.
- **Neutral Market Facilitator Data Exchange and Governance** – outlines the anticipated market data transfer, building on the outputs of Open Networks and EFFS Project.
- **Market Facilitation of DSO Best Practice Report** – highlighting the international experience applicable to Oxfordshire.
- **Network Data Requirements** – identification of the core data needed by market participants. Iterative process.

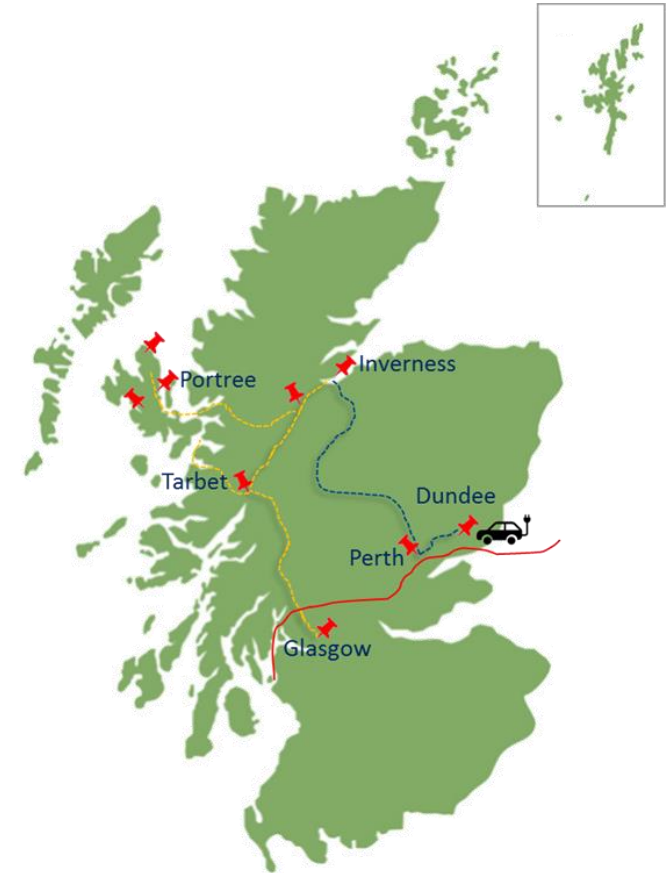
## Mitigated risks:

- **Changing Worlds** – the world we are moving to is not fixed, thus the project has been designed to focus on the Least Regrets and core services defined by Open Networks.
- **Complex interactions between various market players** – additional workshops with stage gates to monitor development and ensure demonstrator remains relevant.
- **Oxfordshire specific findings** – core trial locations being designed to deliver outputs that are replicable elsewhere.



# E – Tourism Project Objectives

- Understand how increased EV uptake and tourist patterns will impact seasonal peak demand
- Better understand the scale, location and duration of increased charging
- Highlight tourist hot spots where they may be network vulnerabilities
- Identify suitable local flexible solutions to assist in demand management
- Inform investment strategies for network development



# We can summarise our position as follows



- RIIO-ED2 will require a significant step change in approach. BAU regulation is unlikely to deliver the Government decarbonisation target.
- A clear and coordinated strategy and plan is needed
- Uncertainty must to be effectively accommodated
- Active and flexible DSO-based whole-system approaches need to be recognised in regulation. Appropriate funding and incentive framework is required
- Our application of leading-edge operational technology together with the valuable knowledge gained from our flagship low carbon innovation projects positions us to help lead GB decarbonisation
- We need to unlock customer value at maximum pace; but no one should be left behind

We have the knowledge and experience to deliver net-zero. We accept the challenge. We need the right ED2 framework



Thank you.  
Questions and discussion?

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