What digital infrastructure is needed to enable flexibility markets
- The Future of Distributed Flexibility
We need to transition to a **flex-centric energy system**:  

10mn EV = 3 Nucs  
10GW of EV flex potential, assuming 1kW per EV, by **2035**  

*Aurora Energy Research*  

**£5 billion /year**  
System cost savings from demand side flexibility in **2050**  

*Carbon Trust & Imperial modelling*
Flexibility: Where Are We Now

Call For Input
The Future of Distributed Flexibility
March – May 2023

Early policy development
- Diverging
- Converging
  - Policy discovery
  - Policy refinement

Develop and implement
- Diverging
- Converging
  - Industry exploration
  - Consensus building

Inflection point

Time
2015-2016
2017

2016 Ofgem & BEIS call for input: flexibility
2017 Smart Systems and Flexibility Plan

Common vision for distributed flexibility

Enabler
Enabler
Enabler

Flexibility Digital Infrastructure
Transparent, coordinated and trusted markets
Market failure 1: lack of information transparency

Market failure 2: lack of coordinated market access and operations

Market failure 3: lack of trust

Market failure 4: contextual market-specific issues

Part A: FDI

Flexibility Digital Infrastructure

1. Information Transparency
   - market rules and product data
   - asset capability and performance data
   - current and historic market data

2. Coordinated Market Access & Operations
   - streamline registration / procurement / qualification processes
   - improve coordination for multi-market stacking / primacy

3. Trusted Governance
   - uphold standard processes and security
   - participatory change management processes
   - transparency in decision making

Part B: Enablers (direct)

- Data standards
- Standardised market products
- Standardised contracts & pre-qual
- Stacking and primacy rules

Enablers (indirect)

- Operational metering
- Baselining methodologies
- Minimum 1MW limits
- Minimum liability amounts

To emphasise the importance and urgency of enablers delivery we published an Open Letter to the ENA Open Networks Project
Examples on a spectrum, to stimulate discussion:
*FDI formerly known as CDEI (common digital energy infrastructure)

1. BAU continues
   “individual markets”

2. Thin
   “directory”

3. Medium
   “flexibility exchange”

4. Thick
   “central platform”

*FDI formerly known as CDEI (common digital energy infrastructure)
## FDI: Business Use Cases

More granular functionalities, using IEC/SGAM standard approach:

<table>
<thead>
<tr>
<th>BUC #</th>
<th>Title</th>
<th>Narrative</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUC.1</td>
<td>Common data standardisation &amp; sharing mechanism</td>
<td>A dedicated coordinative mechanism (i.e. self-serve data sharing infrastructure or a central data warehouse) used for exchanging a range of standardised data types and formats and ensuring information integrity and cybersecurity.</td>
<td>N &gt; 20</td>
</tr>
<tr>
<td>BUC.1.1</td>
<td>Common data standards &amp; wider IT architecture</td>
<td>Users benefit from the definition and governance of harmonised information models, data formats and communication protocols for data exchange where needed, spanning across the SGAM interoperability layers via a set of evolving data standards.</td>
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<td>BUC.2</td>
<td>Common registration of assets</td>
<td>Users are able to register assets ‘once’ for all flexibility markets, by providing detailed information (such as asset type, location, asset size, connection point) common to all markets into a dedicated registry.</td>
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<tr>
<td>BUC.3</td>
<td>Common analytics services and information portal</td>
<td>Users can see all available markets, historic pricing, forecasted prices, volumes (i.e. more dynamic SLC31E data) and benefit from wider information provision (i.e. Fully Informing Consumer) and analytics services (i.e. Asset value based on historical data).</td>
<td>10 &lt; N &lt; 20</td>
</tr>
<tr>
<td>BUC.4</td>
<td>Common registration of buyers and sellers</td>
<td>Users benefit from some form of Unified Identity and Access Management system (such as a self-sovereign identity paradigm) for securely interacting with multiple markets and market services.</td>
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<tr>
<td>BUC.5</td>
<td>Common registration of products</td>
<td>Users get access to harmonised directory of products for all markets, including all the listed service requirements in an easily comparable format.</td>
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<td>BUC.6</td>
<td>Common TSO-DSO coordination services</td>
<td>A range of services including resolving primacy rules and ensuring transparent inter-market bid conflict resolution, making available grid topology data and standardised grid constraint representations, instantiating common market clearing processes, providing market coupling services (i.e. Transparency of DER positions and actions)</td>
<td></td>
</tr>
<tr>
<td>BUC.7</td>
<td>Common pre-qualification of assets</td>
<td>Users have a common mechanism for registering data that is required for the pre-qualification processes for many products ‘just once’. This could also enable more joined up digital contracting between MOs after successful pre-qual.</td>
<td>N &lt; 10</td>
</tr>
<tr>
<td>BUC.8</td>
<td>Common trust and market monitoring services</td>
<td>A range of services including Change Management, initiatives to prevent gaming, promote transparent decision-making, protecting consumers (tariff design visibility, data protection etc.), supporting 24/7 hourly REGO certification.</td>
<td></td>
</tr>
<tr>
<td>BUC.9</td>
<td>Common reporting services</td>
<td>A range of services for credit checking, reporting on dispatch and settlement, sharing asset performance data, enabling consistent baselining and metering standards.</td>
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</tbody>
</table>
CFI Responses and Next Steps

From 90(!) responses:
- 93% agreed with the case for change, wanting a common vision for enablers and unlocking flex value
- Most support some form of FDI, 63% want some form of medium (incl thin-med or thick-med)
- Near universal consensus that enablers are essential for distributed flex and FDI
- Lack of clarity on governance model preferences

We have a strong mandate to progress this work

We published a Response Letter alongside individual stakeholder responses

Initial forward plan to develop specific proposals across:

Technology - what a FDI could do, and how that might be implemented and iterated

Enablers – which are priorities to FDI delivery, and how to progress delivery

Governance - what structures and entities might be suitable (short and long term)

Roadmap how these fit together and develop iteratively

We are developing policy and engaging industry through workshops, intending to consult in Spring 2024 and progress delivery where possible
Actively aligning with ongoing industry, innovation and government work

**DESNZ Flex Markets Unlocked Innovation Programme**
- design and development of technical solutions that facilitate coordination and standardisation across multiple flexibility markets

**Ofgem Local Governance team**
- Proposing a Market Facilitator Role, single expert entity to standardise and align ESO-DSO markets
- Possible alignments and synergies with FDI governor role
- Intending to publish a decision in Autumn 2023, following previous consultation

**Ofgem Energy Digitalisation team**
- Developing overall Data Sharing Infrastructure (DSI) vision, drawing on EDiT and Digital Spine
- Could provide the broad digital foundations for flexibility specific FDI to align with
- Intending to publish a consultation in Spring 2024
Call For Input - The Future of Distributed Flexibility

https://www.ofgem.gov.uk/publications/call-input-future-distributed-flexibility
(closed 10th May 2023)

Subsidiary documents include:
IBM – Digital Design Study
OGS consortium – Market Standards Study

Join our mailing list!
Email us: flexibility@ofgem.gov.uk

Our next workshop is on Governance arrangements
Tuesday 7th November, online - email to register flexibility@ofgem.gov.uk
Ofgem is the Office of Gas and Electricity Markets. We are a non-ministerial government department and an independent National Regulatory Authority, recognised by EU Directives. Our role is to protect consumers now and in the future by working to deliver a greener, fairer energy system.

We do this by:

• working with Government, industry and consumer groups to deliver a net zero economy at the lowest cost to consumers.
• stamping out sharp and bad practice, ensuring fair treatment for all consumers, especially the vulnerable.
• enabling competition and innovation, which drives down prices and results in new products and services for consumers.