TRANSITION
Show and Tell Session 3
Market Development

2nd June 2023

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Host: Rory Brown

Agenda

Topic	Time
Introductions	5 mins
Summary of TRANSITION Project	5 mins
Flexibility Market Timeline	30 mins
Key Reflections	5 mins
Q & A Session	15 mins

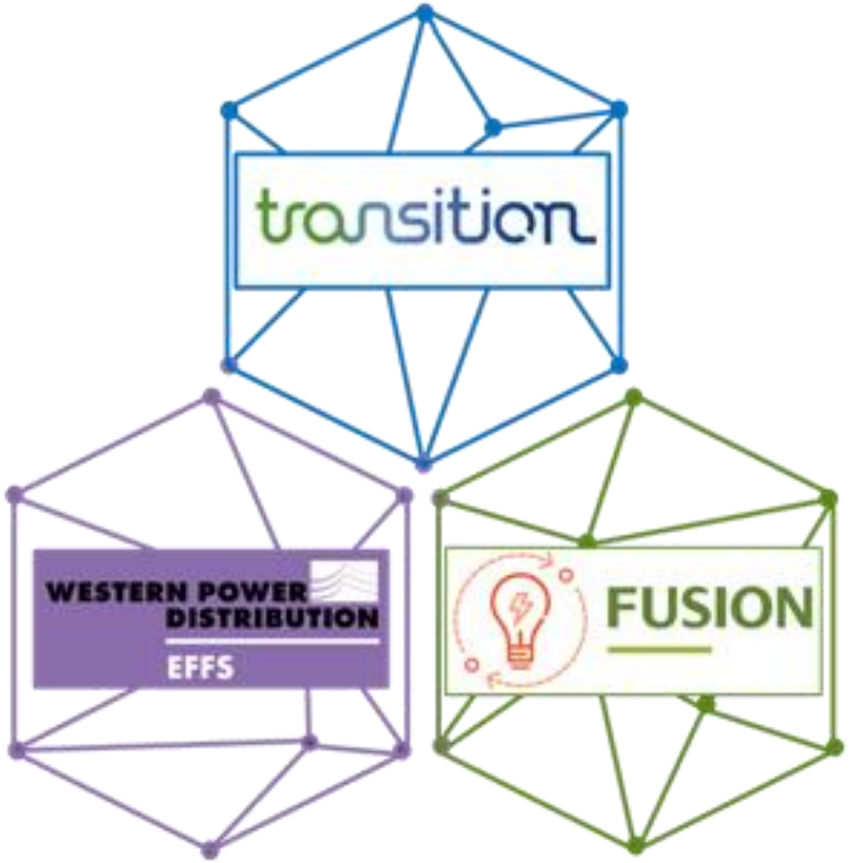
TRANSITION Summary

Working on understanding energy flexibility and its requirements for Smart Local Energy Systems. We're exploring the design requirements of a market for trading flexibility locally, understanding the roles of the marketplace and testing these through practical trials.

TRANSITION is working on…

- Market Development; Contracts, Services, Pricing
- Tools and Platforms; Market Platforms, Select and Dispatch
- Recruitment of Flexibility Providers; Aggregators, Assets

Through delivering energy flexibility trials, building system coordination tools and standardised markets.



TRANSITION Summary

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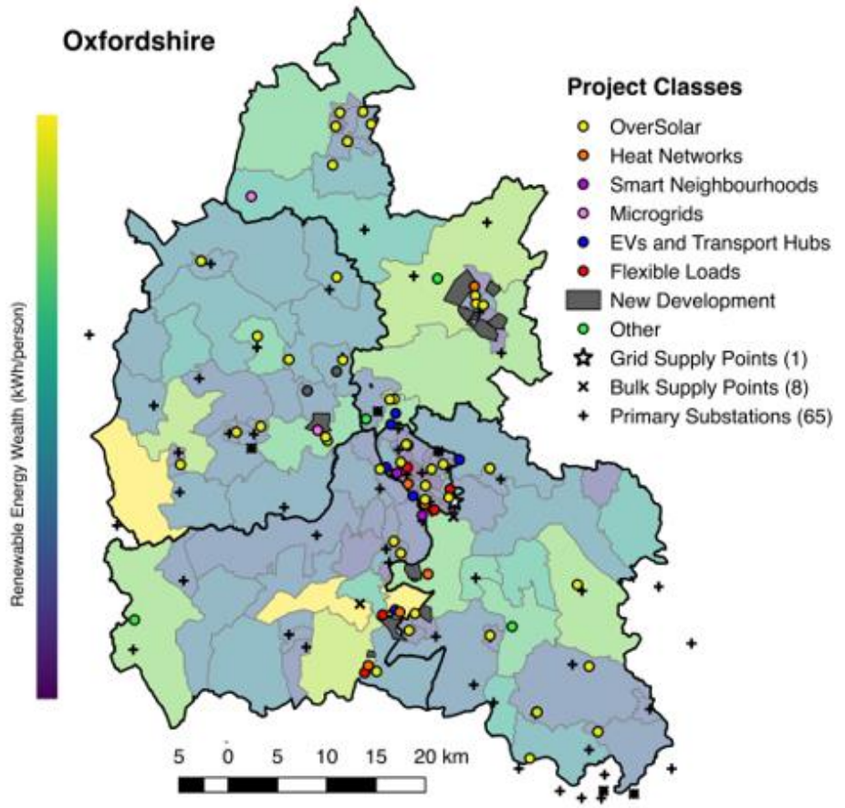
Increasing Complexity

Trial Period 1 (Winter)

Trial Period 2 (Summer)

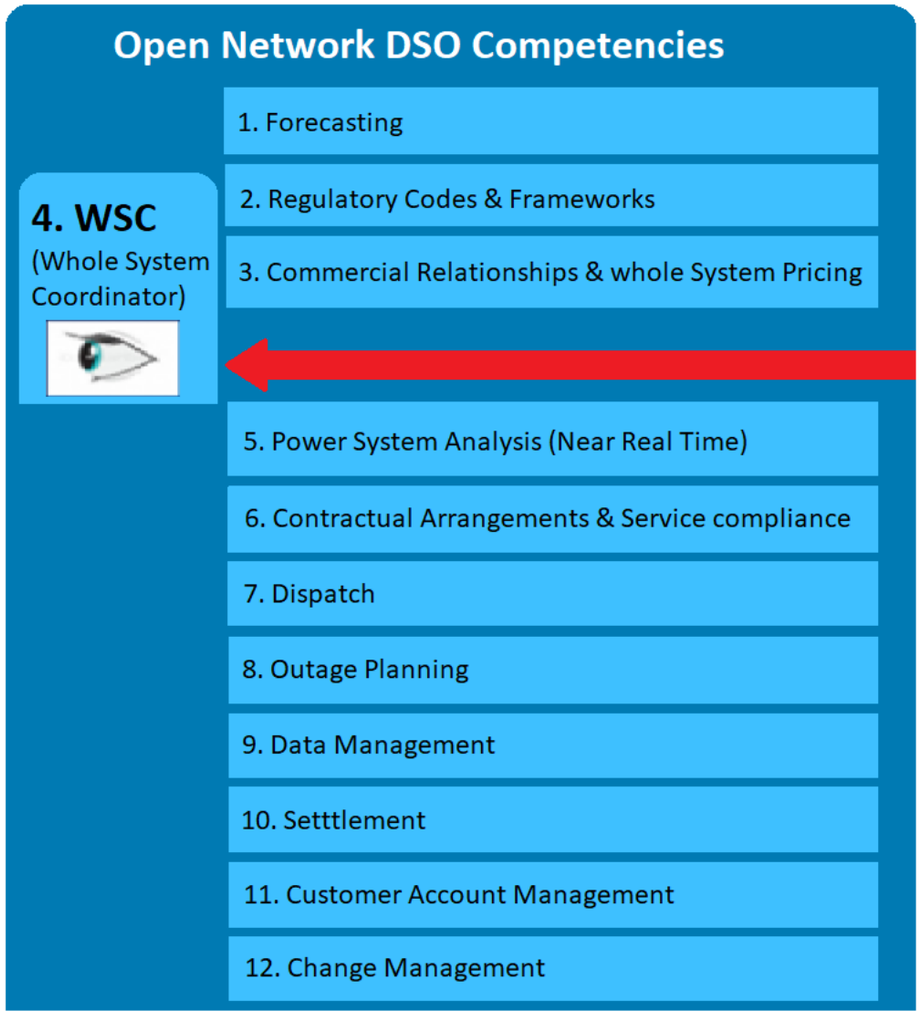
Trial Period 3 (Winter)

Technical Trials



Industry Perspective

- ENA Open Networks has defined a number of competencies that are necessary in support of DSO function development
- “Flexibility First”, and in particular flexibility procurement closer to real time, will require evolution of the DSO commercial processes
- TRANSITION has set out to explore these matters with a significant innovation programme looking at both DSO Procured and DSO Enabled services, and implementing real world trials to test these
- The TRANSITION project has both influenced and been informed by the ENA Open Networks work as part of the collaborative scope of the project
- There are also several ongoing industry discussions, e.g. about the future of local energy institutions and flexibility, that set the backdrop to this work.
  - Standardisation of flexibility markets to assist with increasing liquidity.
  - Centralised market facilitator to take forward the work done in the ENA working groups.



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.

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**

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.

Flex Market Timeline - End to End Process

Step One: Register

Step Two: Procure

Step Three: Delivery

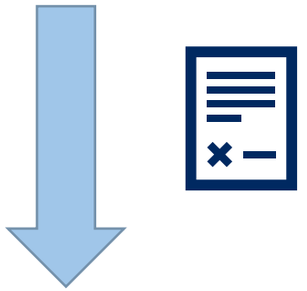
Step Four: Settlement

Flex Market Timeline – Register (1)

DSO-Procured Services

Benefits of using the FSA as a Framework Agreement:	Limitations of using the FSA as a Framework Agreement:
Separate the Pre-Qualification Questionnaire (PQQ) and asset registration. • Allows the flexibility service provider to continually update assets.	Needs to be reviewed so that it is aligned with aggregators. • This work has begun as part of the ENA Open Networks.
Reduces the time it takes to contract for a given flexibility service. • Allows for the procurement of flexibility services closer to real time.	Too long. • Need to consider putting some information into the service terms.
Standardised across all DSOs and FSOs.	Liabilities are too large for smaller local flexibility providers.

Bilateral Agreement



Framework Agreement

Key Learnings:

- We should move to a framework agreement.
- The FSA needs further work to work for all stakeholders, especially aggregators.

Flex Market Timeline – Register (2)
DSO-Enabled Services

Both P2P services (MIC/MEC) require a **Temporary Capacity Variation Notice** (TCVN):

- Requires system planning to perform study to ensure system safety.
- May require installation of LV monitoring devices on the network.
- May require the DER to disable/adjust their export/import control systems.
- Acquiring TCVNs is therefore costly and time-consuming.

There is lots of interest in P2P services, however:

- Most DERs had 'spare' import/export capacity to sell – fewer DERs want to purchase it. This may change with Access SCR and DSO review of connection capacities.
- Those who did want to purchase MIC or MEC struggled to get TCVNs approved during the trials.

Key Learnings:

- TCVN approval process needs to be reviewed.
- Without suitable interest in buying of capacity as well as selling in localised market zones, P2P capacity trading will struggle to get off the ground.

Flex Market Timeline – Procure (1)

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 is 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 – Procure (2)

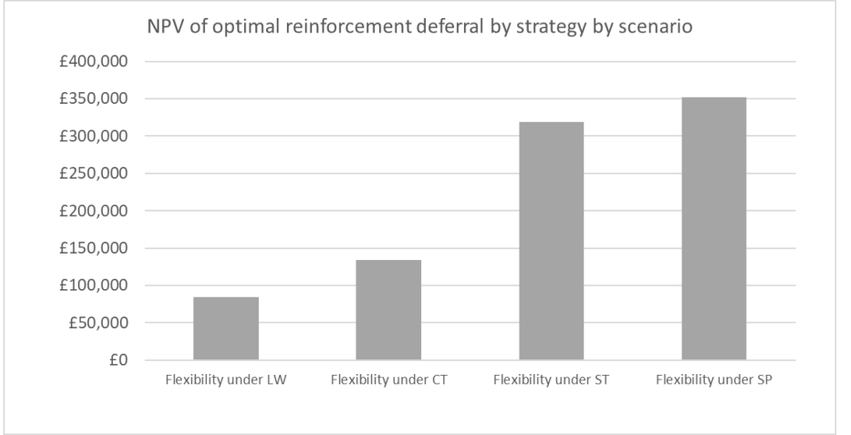
DSO-Procured Pricing

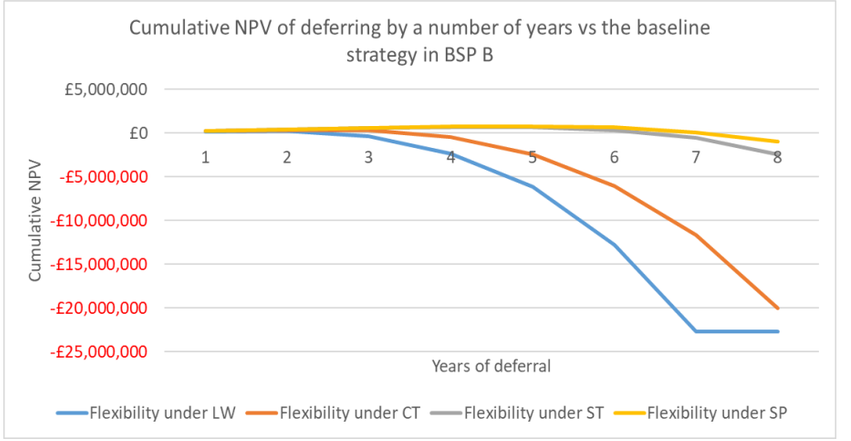
- Due to low liquidity at auctions, price ceilings were used in TRANSITION markets. These were determined by the ENA's Common Evaluation Methodology (CEM) Tool.

- Data inputs include:
  - Price estimates for both availability and utilisation (based on previous flexibility prices).
  - Peak network load projections across four scenarios (DFES data) and existing BSP network capacity.
  - Estimated utilisation hours and days (DFES data).
  - Baseline reinforcement cost estimates.

- Tool outputs include:
  - Price ceiling based on network reinforcement costs.
  - Optimal deferral timescales based on current prices.

Key Learnings:
- Price ceilings are required until market liquidity improves.
- Data inputs must be continually reviewed and improved to increase validity of results.
- Limitations of the model, which must be improved to include broader socio-economic benefits, and deliverability of widespread reinforcement, may cause flexibility services to be undervalued.



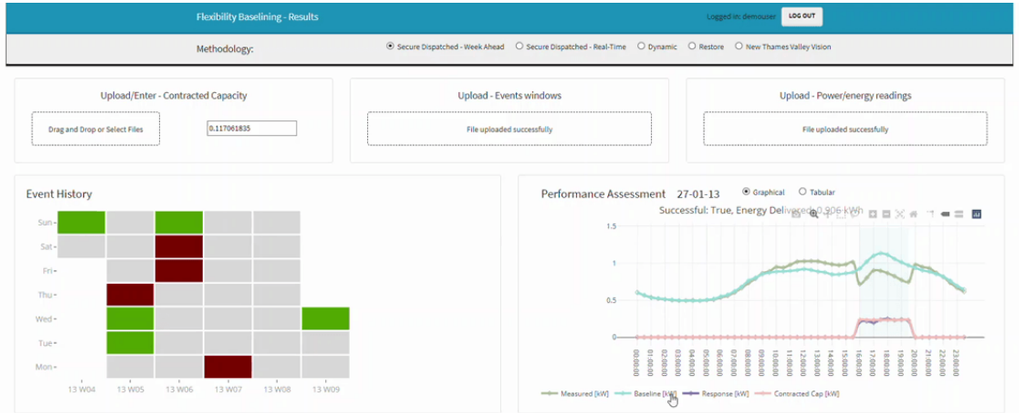


Example CEM tool Outputs.

Flex Market Timeline – Delivery and Settlement (1)

DSO-Procured Services

Project TRANSITION worked with the ENA Open Networks and TNEI to design and deliver a flexibility baseline tool in an industry-leading collaboration. We have together published an online version of the tool on the ENA website, and this is also open for other DNOs to adopt.



Historic baseline methodology:

- Mid-**8**-in-**10 with Same Day Adjustment (SDA)**
- Ranking based on **event period average energy**.
- SDA uses **2 hour** adjustment window prior to event.

Nominated baseline methodology:

- Could be a zero baseline - DNO option to audit as disincentive to manipulate.
- Perceived as being more involved by service provider - may require service provider to have (advanced) forecasting tool.
- Only chosen once in trials.

Key Learning:

- Standardisation and dissemination of baselining methodologies enables easier participation.

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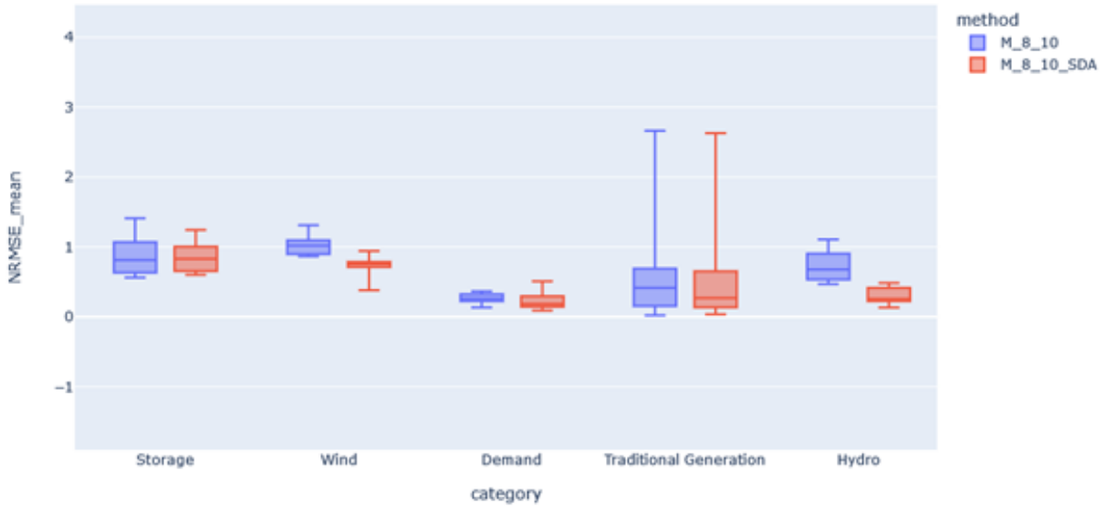
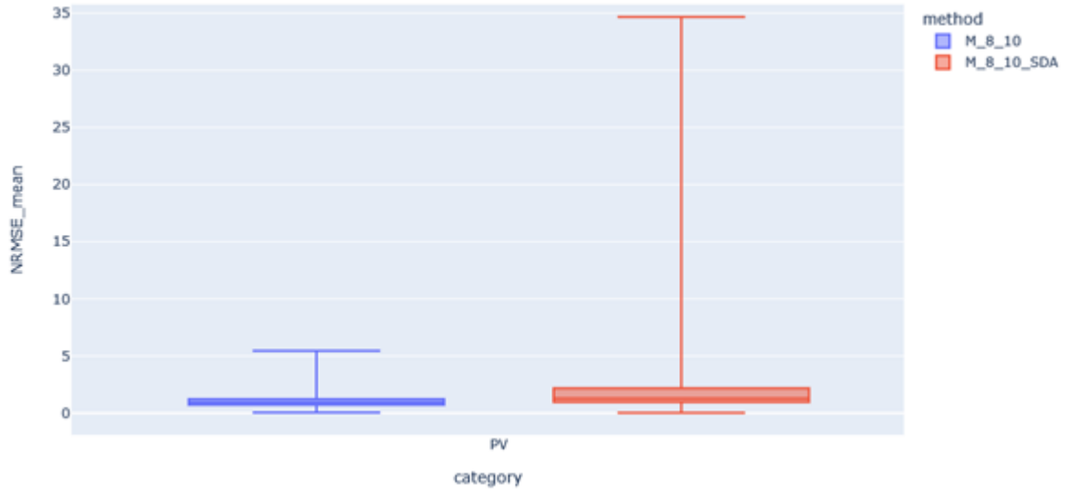
Flex Market Timeline – Delivery and Settlement (2)

DSO-Procured Services

- There are many different factors that may affect the performance of the historic baseline including the asset type, season, time of day and missing data.
- Opportunities for gaming – charging a battery in the two hours (SDA window) prior to an export event.
- Results for PV experienced challenges
  - The regression model is more accurate than the historic methodologies.
  - The regression model is a better fit then the historic methodologies.
- Settlement rule is a piecewise function that reduces payment for under-delivery.
  - Asymmetry may result in unjustified under-payment due to baseline errors.





Key Learnings:

- Different baseline methodologies are required for different asset types.
- The regression baseline may provide a more accurate baseline methodology for solar PV assets but the data requirement is larger.
- Any settlement rule applied going forward should take into consideration the errors in the chosen baselining methodologies.

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Key Learnings Take Away

The procurement of flexibility services is complex and work is still ongoing to ensure DSO ambition in this space can be achieved

Implementing a Framework Agreement will be necessary to scale-up the procurement of flexibility. Work on the FSA is required to make this transition.

A review of the baseline methodologies available, and their necessity in business as usual operations is required.

DSO-Enabled/P2P services are popular but the TCVN process needs to be more efficient in order to enable its transfer to business as usual.

DSO-Procured services need to be priced competitively.

Q&A Session

For more information or to access our extensive learning reports; please visit www.ssen-transition.com

References

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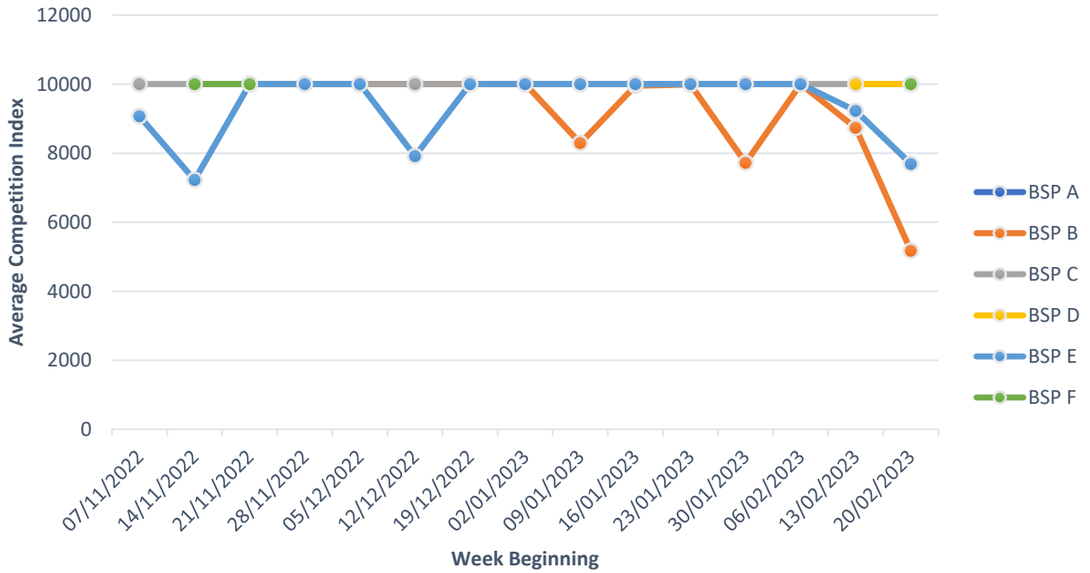
3. ENA Baselining Tool User Guide - https://www.energynetworks.org/industry-hub/resource-library/on22-ws1a-p7-flexibility-baselining-tool-user-guide-(25-mar-2022).pdf
4. Open Networks' Flexibility Baselining Tool – Mathematical Specification - on21-ws1a-p7-appendix-b-mathematical-specification-(13-jan-2022).pdf (energynetworks.org)
5. Baselining Experiences and Recommendation: Learning from TRANSITION and FUSION trials. - Baselining Experiences and Recommendation: Learning from TRANSITION and FUSION trials. | SSEN Transition (ssen-transition.com)
6. Project LEO Baselining Working Group Summary Report - Project LEO Baselining Working Group Summary Report | SSEN Transition (ssen-transition.com)
7. Commercial Findings Report - Commercial Findings Workshop Report | SSEN Transition (ssen-transition.com)
8. Flexibility Services Document Library - Flexibility Services Document Library – SSEN

If you have any questions for the flexibility procurement team within SSEN you can contact us using the following email: flexibilityprocurement@sse.com

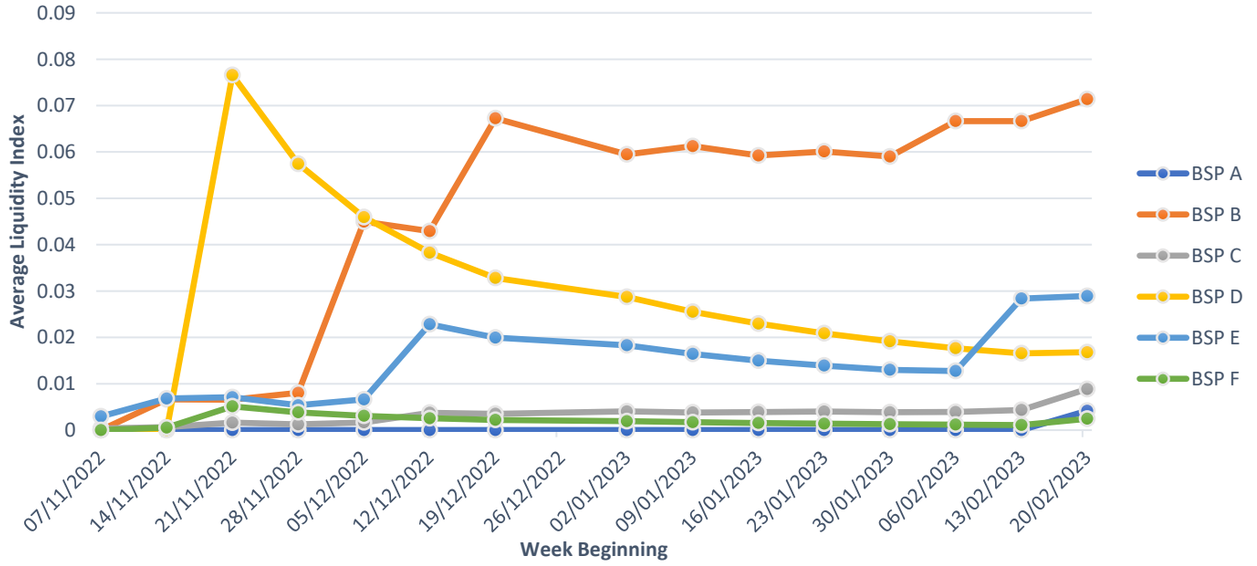
Appendices

Flex Market Steps – Procure (3)

DSO-Procured Market Indices



Competition Index (HHI) during TP3



Liquidity Index during TP3

Key Learnings:

- Liquidity and competition were low throughout trials.
- Aggregators provided the majority of the liquidity towards the end of TP3
  - These will be crucial for flex markets going forward.

Scottish & Southern Electricity Networks

In partnership with Local Energy Oxfordshire