Electricity North West Ltd. & Northern Powergrid

REGIONAL VARIATION IN THE UPTAKE OF FLEXIBILITY SERVICES

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EXECUTIVE SUMMARY

BACKGROUND TO THIS STUDY

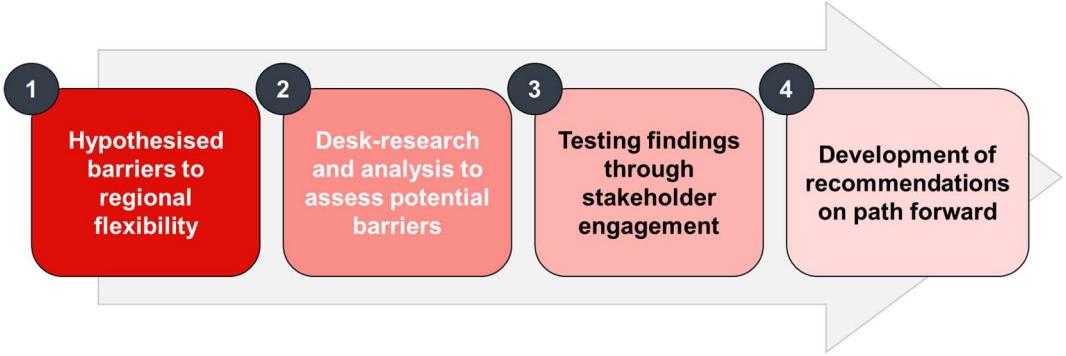
This report has been prepared by WSP, in collaboration with Electricity North West Limited (ENWL) and Northern Powergrid (NPg), to investigate the hypothesis that there are regional differences in the uptake of flexibility services across Great Britain (GB). At a time when new governance arrangements are being proposed to coordinate flexibility markets and regional planning, it is important that these regional differences are first fully understood and addressed – to ensure flexibility is a practical option for all areas of GB.

Since 2018 there has been a lag in the relative uptake of flexibility services across DNO regions – particularly noticeable for the two northern England licensees ENWL and NPg. These differences in uptake appear entrenched despite efforts by both DNOs to develop their flexibility markets, including by: running tenders; relaxing requirements; consulting stakeholders; adopting a common evaluation methodology; absorbing innovation learnings; and sustaining a commitment to Open Networks.

Barriers that are homogenous across GB regions – such as non-standard products, fragmented procurement processes or misalignment of local and ESO markets – are in the process of being addressed by solutions under development. A deeper assessment of whether there are other barriers that impact some regions more than others is timely, while coordinated regional approaches in key areas such as central market facilitation, common digital infrastructure and planning are being developed.

OUR APPROACH

This work, carried out by WSP on behalf of ENWL and NPg, explores the hypothesis that there are region-specific barriers to flexibility services. It does so through desk-research and analysis, complemented by a subsequent engagement programme with key industry stakeholders. The findings of both are brought together to make recommendations on a suitable path forward to address regional barriers to flexibility services.



KEY FINDINGS

This report has investigated a number of hypothesised drivers of regional variations in flexibility services across four key areas – locational, socio-economic, technical and commercial factors – and has found indicative evidence of potential drivers across each of these categories, as summarised in Table 1 below.

Table 1 - Summary of key regional barriers to flexibility uptake

Category	Potential barriers identified
Locational	Location of flexibility requirements (urban vs. rural)
Locational	Levels of distribution connected generation
Socio-economic	Average income
Socio-economic	Low carbon technology uptake
Technical	Electric vehicle charging network
Technical	Trends in electricity demand (including industrial decline)
Technical	Available network headroom
Commercial	Local industries' ability to respond to flexibility needs
Commercial	Likelihood of FSPs to receive dispatch requests
Commercial	Innovation funding in flexibility and first-mover advantage

The analysis finds indicative evidence of these barriers in ENWL and NPg licence areas, reflecting the underlying customers and environments in which they exist and serve. For example:

- This report finds evidence of lower EV uptake in ENWL and NPg regions, which may in part account for lower availability of flexibility services in these regions by reducing the resources available to flexibility aggregators.
- The report identifies significant decline in industrial demand over the last two decades in ENWL and NPg regions, which correlates with available headroom in substations and ultimately reduces the requirements for flexibility service provision.

The weight of evidence assessed across all four areas – locational, socio-economic, technical and commercial factors – suggests a strong regional bias to the barriers affecting the development of flexibility markets.

STAKEHOLDER ENGAGEMENT

Further to this desk research and analysis, stakeholder engagement was conducted to gauge the opinions and experiences of key stakeholders such as service providers, networks, and industry groups. The key findings of these engagements were:

- Stakeholders broadly agreed with the discussed concepts of regional disparities and flexibility uptake and the potential barriers causing these, including several factors identified in the analysis (changing demand, industrial decline, first-mover advantage, and lack of assets in rural areas).
- They perceived there still to be multiple barriers to the uptake of flexibility across GB.
- Interoperability and standardisation across DNO markets are seen as critically important, with different processes and requirements seen to cause unnecessary frictions and loss of time.
- The ability to stack revenues between markets and products is seen as an integral step in developing flexibility markets, particularly those that have been smaller to date.

This stakeholder feedback, coupled with desk-based analytical findings, was critical in shaping the report recommendations, both to address the regional barriers faced by ENWL and NPg, but also wider issues identified with respect to interoperability, standardisation and revenue stacking.

RECOMMENDATIONS

The report concludes by setting out recommendations on a path forward for ENWL and NPg to begin to redress the observed regional imbalance, which in the absence of targeted intervention could become even further entrenched.

A proposal is developed to form a joint network forum, led by ENWL and NPg, with the goal of tackling this regional disparity, while simultaneously testing and developing solutions for future market integration for flexibility services.

This proposal comes at a critical time following the decision by Ofgem to harmonise local flexibility markets under a single Market Facilitator in late 2025 or early 2026, where coordinated action by a network forum could deliver significant learning and benefits.

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1 INTRODUCTION

1.1 CONTEXT

In response to the growing need to decarbonise the energy system and the increasing rate of electrification across sectors, Distribution Network Operators (DNOs) in Great Britain (GB) are facing unprecedented changes in how users consume and produce electricity on their networks.

There is a consensus across the energy sector that flexibility services – where generation or demand are 'flexed' in specific locations by request – are vital to achieve electrification of the sector at least cost to consumers. By altering how much power is generated or consumed, flexibility services enable networks to be designed for lower capacity requirements than would otherwise be required by the increasing uptake of electric solutions in heating and transport, such as electric vehicles (EVs) and heat pumps (HPs).

Ofgem see flexibility as a key strategic priority in their role as regulator. Furthermore, the importance of flexibility is firmly supported by both Electricity North West Limited (ENWL) and Northern Powergrid (NPg). These DNOs both have a 'flexibility first' commitment – an approach that prioritises the use of flexibility services where it is an economic and efficient alternative to traditional network reinforcement.

1.1.1 FLEXIBILITY SERVICE UPTAKE IN ENWL AND NPG

Both ENWL and NPg have seen very limited uptake of flexibility services to date. Key characteristics of their flexibility service uptake to date are summarised in the chart below.

ENWL

- Low uptake of flexibility services, having had limited success fulfilling capacity requirements.
- Predominantly rural requirements for flexibility, being for low total MW capacities and in areas with smaller customer numbers.
- As of the end of 2023, ENWL has issued 13 tenders for 4GW of requirements over 76 locations.

NPg

- Flexibility requirements are predominantly in the rural areas of their licences with low customer numbers.
- NPg has seen little need for flexibility in urban areas.
- Limited historical need for flexibility services, with only 14 primary substations taken to market.
- As of the end of 2023, NPg has procured 1.4MW of 60.4MW tendered over 14 locations.

Both ENWL and NPg are working proactively to improve customer engagement in flexibility services.

- ENWL has issued annual consultations on the provider experience – these have led to: reduced MW participation thresholds; relaxed metering requirements; the offering of both short- and long-term contracts; and dedicated energy efficiency products.

- NPg has also taken steps to improve the procurement experience, moving their tenders to the Piclo Flex platform (doubling the number of companies pre-qualified to tender) and introducing competitions at low voltage (LV) while also performing significant stakeholder engagement.

1.1.2 FLEXIBILITY SERVICES IN A NATIONAL CONTEXT

There are clear regional differences in the uptake of flexibility services between ENWL and NPG (networks situated in the north of England) and other DNO groups with licences in the midlands and the south (i.e. National Grid Electricity Distribution [NGED, formerly WPD], United Kingdom Power Networks [UKPN], Scottish and Southern Electricity Networks [SSEN], and Scottish Power Energy Networks [SPEN]).

Figure 1-1 illustrates the volumes of flexibility services contracted across DNO groups since 2018, constructed with data from the Energy Networks Association (ENA) and individual DNOs' C31E reports. Networks with southern and midland footprints, shown to the right of the figure, have in general reported significantly higher uptakes in flexibility services than ENWL and NPg.

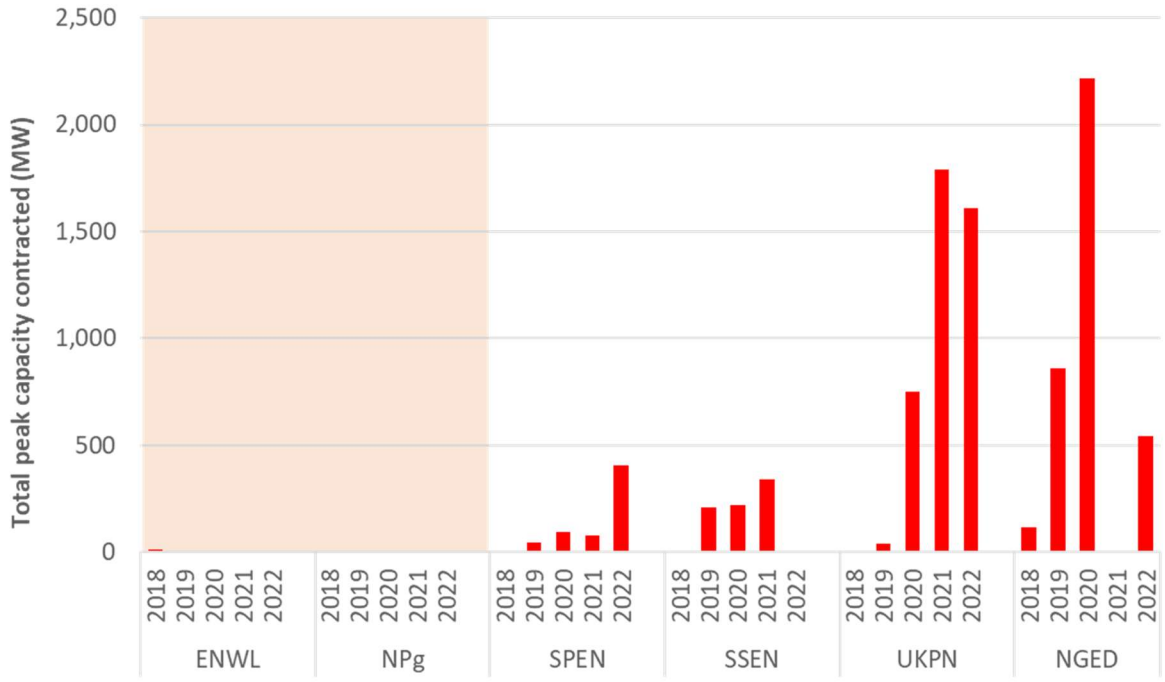
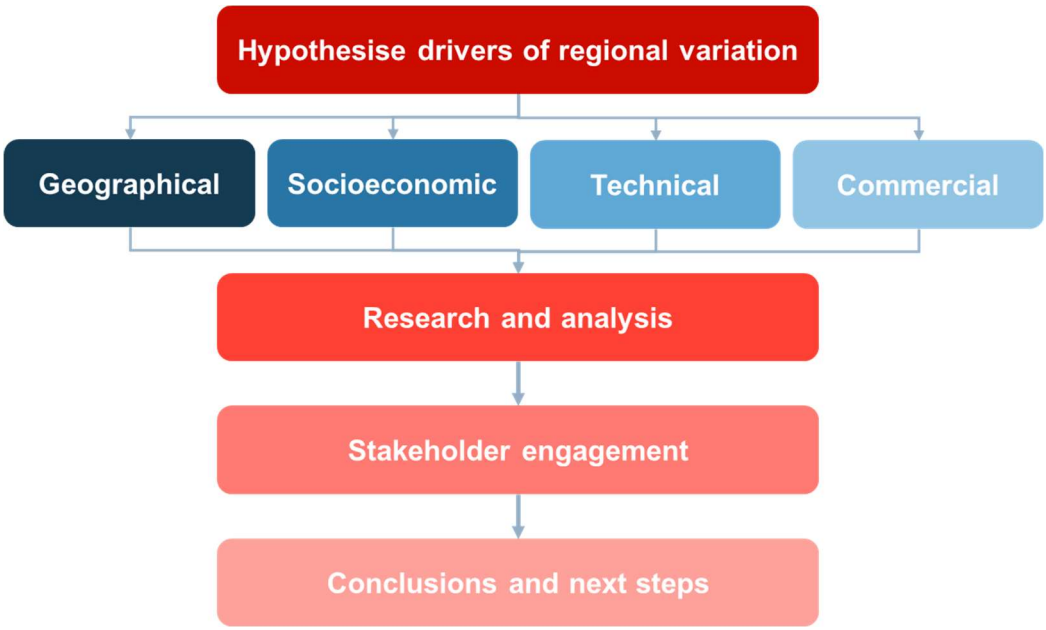


Figure 1-1 – Contracted flexibility services by year for each DNO group.

1.2 OUR APPROACH

With significant regional variation in flexibility services, this report is focused on better understanding what might be driving these differences. To do so, this work has adopted the following approach:



We have structured our assessment of drivers into four key areas: locational; socioeconomic; technical; and commercial. We have investigated several factors within each of these categories, each of which are hypothesised to be a potential contributor to the observed regional variation.

The analysis in this report focuses on identifying basic patterns and correlations (between flexibility services and hypothesised drivers) through the use of publicly available data. More in-depth statistical or econometric analysis has not been undertaken at this stage. With this in mind, findings should be seen as indicative only. In other words, our assessment is focused simply on which drivers look well correlated with regional variation in flexibility and therefore *may* have a causal role in this observed variation.

By the same logic, we do not assess the relative strength of different hypothesised drivers, nor do we assess the extent to which different drivers are correlated and seek to separate out their relative impacts. We hope that this study can act as an important stepping stone for investigating these issues more deeply in the future, supported by more data intensive statistical analysis.

The remainder of this report sets out our approach to analysing different hypothesised drivers of regional flexibility and our findings.

2 LOCATIONAL FACTORS

This section investigates locational factors that may be correlated with differences in flexibility services across DNOs.

Key Findings

- Evidence form ENWL and NPg regions suggests that rural areas struggle to procure flexibility services relative to urban areas.
- However, there is no significant difference in the rural:urban split of ENWL and NPg's licence areas compared to that of some other DNOs that have historically procured more flexibility.
- Embedded capacity registers show significantly less distribution connected generation capacity in the ENWL and NPg regions, which would suggest less need for demand flexibility services to balance growing volumes of variable generation, as well as fewer generation assets available to participate in flexibility markets.

2.1 LOCATION OF FLEXIBILITY REQUIREMENTS

Flexibility requirements are inherently locational, due to the locality of the network constraints to be managed. It was hypothesised that requirements in rural areas may have greater difficulties in obtaining a local provider with both the ability and desire to meet those requirements. Figure 2-1 shows the locations of live competitions on Piclo Flex (an independent flexibility procurement platform currently used by both NPg and ENWL, and other DNOs) at the end of 2023 highlighted in darker blue for ENWL and in darker pink for NPg.

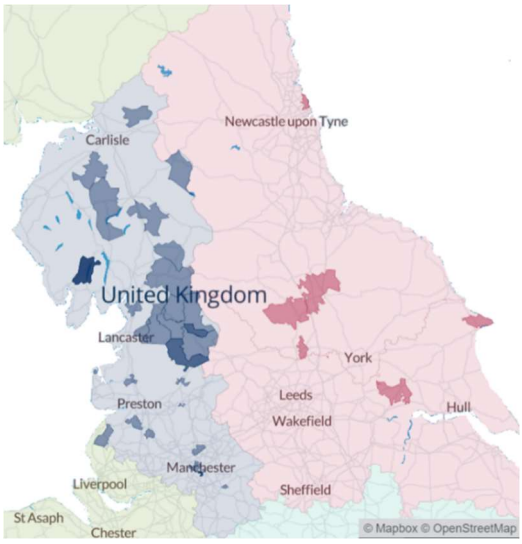


Figure 2-1 – Location of live competitions on Piclo Flex in ENWL and NPG regions (November 2023).[1]

[1] https://picloflex.com/dashboard

Comparing these locations with the map of area classifications in Figure 2-2, it can be seen that almost all of ENWL and NPg's active tenders are in rural areas. One potential hypothesis is that rural areas are struggling to procure flexibility, due to a lack of local providers and/or a lack of interest from any potential providers in the area.

In general, network reinforcement costs will be lower in rural areas, leading to lower ceiling prices in flexibility tenders, and thus reducing interest in participation from any potential Flexibility Service Providers (FSPs). Conversely, DNO markets with needs in urban areas would tend to have more attractive ceiling prices and greater potential for participation.

Overall, evidence on the location of ENWL and NPg's active tenders is consistent with the hypothesis that procurement of flexibility services may be more difficult in rural areas (on both availability and attractiveness grounds).

2.2 URBAN-RURAL SPLIT

Having found evidence to suggest that procuring flexibility is more difficult in rural areas, the natural follow-on question is whether NPg and ENWL serve a high proportion of rural areas relative to other DNOs. To help investigate this, Figure 2-2 shows a map of ONS data of 2011 area classifications across the UK[2], over which rough outlines of ENWL and NPg's licence areas have been indicated.

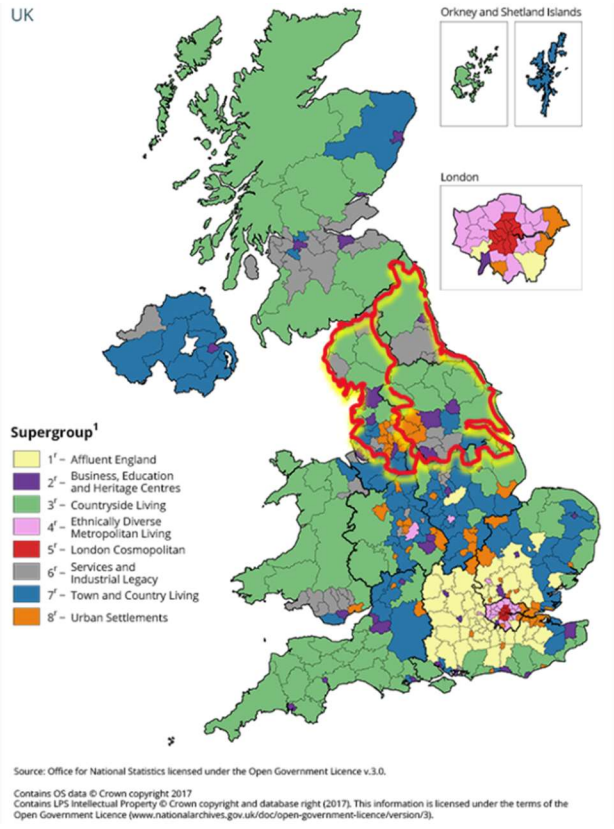


Figure 2-2 – ONS map of 2011 area classifications.

[2] https://www.ons.gov.uk/methodology/geography/geographicalproducts/areaclassifications/2011areaclassifications/maps

It can be observed from Figure 2-2 that:

- Both ENWL and NPg's licence areas have a major urban conurbation (in the south of the region), similar to the licence areas of DNOs in Southern England.
- NPg has a high concentration of 'industrial legacy' areas, as do Scotland and Wales. ENWL has a somewhat lower proportion of these areas.
- The remainder of ENWL and NPg's licence areas are split primarily between 'Town and Country living' and 'Countryside living,' in a manner similar to Scotland and Wales.
- The 'Affluent England' and 'Metropolitan Living' categories are concentrated almost exclusively in and around Greater London.

From a high-level view, it appears that UKPN's regions are significantly more urban and affluent than those of ENWL and NPg. However, the urban-rural split of ENWL and NPg's regions is comparable to that of NGED and the Scottish regions.

Therefore, although it may be more difficult to procure flexibility services in rural areas, the relative urban-rural split of DNO licence areas are not sufficiently different for this alone to act as a key driver of regional variation in flexibility service uptake. As such, it is reasonable to assume that there are further factors driving the regional differences.

2.3 LOCATION OF DISTRIBUTION-CONNECTED GENERATION

Embedded capacity registers (ECRs) can be used to determine the amount of generation capacity connected to each network, as shown in Figure 2-3 (data correct as of February 2024).[3]

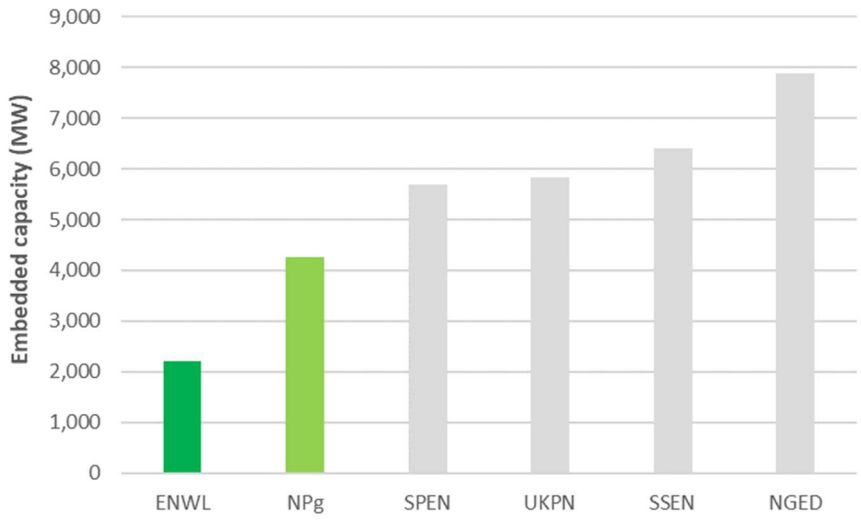


Figure 2-3 – Embedded distribution-connected capacity, by region.

[33] https://www.energynetworks.org/links

It can be clearly observed from these data that ENWL and NPg have significantly less distribution connected generation than the other regions, even compared to NGED which also serves a high proportion of rural areas.

Therefore, although the rural-urban split of ENWL and NPg is similar to those of some other DNOs, the regions differ significantly in terms of installed generation. This more limited distribution-connected capacity may in part explain the lack of rural participation in ENWL and NPg licence areas, identified in Section 2.1.

Furthermore, the lower amount of distribution connected renewables in ENWL and NPg systems may have contributed to less need for demand turn-up services to date than have been seen in other DNO licence areas.

ENWL and NPg regions are characterised by fewer generation assets available to participate in flexibility markets. Moreover, as a significant amount of distribution connected generation is variable generation, such as solar photovoltaic or wind, we would expect more demand-side flexibility to be needed to balance this variable generation in regions with higher volumes of distribution connected generation.

3 SOCIOECONOMIC FACTORS

This section investigates socioeconomic factors – these relate to local population characteristics in each DNO's licence area, which may affect the availability of and/or need for flexibility services.

Key Findings

- ENWL and NPg licence areas cover parts of GB with among the lowest average incomes, suggesting differences in income levels could be a driver of regional variation in flexibility.
- However, the proportion of customers on prepayment meters in a region does not appear to correlate well with regional differences in flexibility uptake.
- EV uptake in regions covered by ENWL and NPg licence areas are three of the four lowest in Great Britain, which may drive observed differences in regional flexibility services.

3.1 AVERAGE INCOME

It is hypothesised that average income in an area will have an impact on the local availability of flexibility services. For example, average income may affect the uptake of low carbon technologies (LCTs), average energy use, and myriad other factors that could affect flexibility procurement.

Figure 3-1 below shows average annual income across GB regions. Regions approximately corresponding to ENWL and NPg's licence areas have been highlighted in green, while the UK average is denoted as a red line.

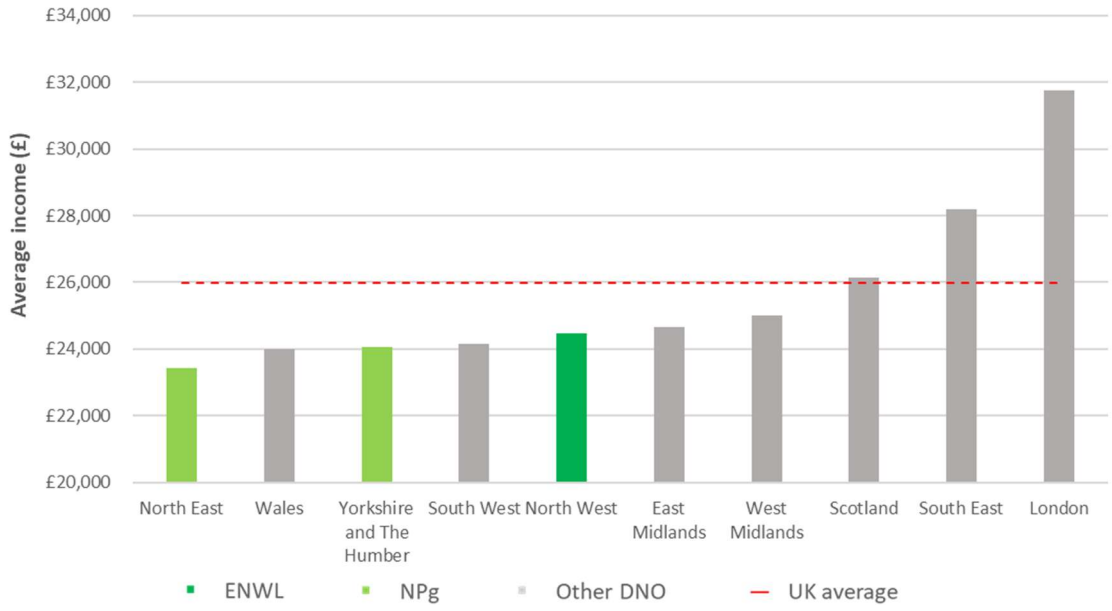


Figure 3-1 – Average annual income by GB region.[4] (ENWL and NPg regions highlighted in green.)

[4] https://www.ons.gov.uk/

It is notable that the three UK regions which closely map to ENWL and NPg's licence areas are in the five lowest income levels across the 10 regions studied, and each fall significantly below the UK average income.

Furthermore, 2021 data from the Department for Energy Security and Net Zero (DESNZ) measuring fuel poverty in England show that the North West, North East, and Yorkshire and the Humber are three of the four highest regions in terms of the proportion of fuel-poor households.[5] Fuel-poor households are far less likely to contribute to flexibility, as they are generally expected to have minimised their demand with little or no elasticity remaining.

The above evidence suggests that lower average income levels (and higher levels of fuel poverty) could be a driver of lower flexibility service uptake in ENWL and NPg licence areas.

3.2 PROPORTION OF PREPAYMENT METERS

Energy consumption patterns can vary significantly between consumers with prepayment meters and those with credit-based meters, and this could in turn have implications for flexibility service needs. In order to investigate this, we have looked at the split of prepayment and credit meters for each GB region. Table 3-1 shows this dataset based on a 2017 breakdown of domestic metering data[6], organised by decreasing share of prepayment meters in total domestic meters. The regions that align with ENWL and NPg's licence areas have their names and percentages highlighted in bold.

Table 3-1 – Domestic prepayment meters by region (as of 2017).

Region	Number of prepayment meters	Total number of meters	Share of prepayment meters (%)
Scotland	460,529	3,021,000	15.2%
Inner London	254,976	1,761,000	14.5%
Wales	199,529	1,548,000	12.9%
Outer London	253,914	2,215,000	11.5%
North West	**388,775**	**3,482,000**	**11.2%**
West Midlands	286,065	2,659,000	10.8%
North East	**125,066**	**1,314,000**	**9.5%**
South West	255,846	2,806,000	9.1%
Yorkshire & the Humber	**228,798**	**2,590,000**	**8.8%**
East Midlands	189,223	2,227,000	8.5%
South East	323,834	4,227,000	7.7%

[5] https://www.gov.uk/government/statistics/sub-regional-fuel-poverty-2023-2021-data/sub-regional-fuel-poverty-in-england-2023-2021-data
[6] Sub-national prepayment electricity meter sales and numbers of customers, 2017, BEIS.

The data show no clear pattern between the share of prepayment meters and the procurement of flexibility services. ENWL and NPg regions cover a relatively average range of prepayment meter percentages. While it may be expected that prepayment customers have consumption patterns that are less amenable to providing flexibility on request, the percentages in each region are relatively low, and do not appear to correlate with flexibility procurement.

3.3 LOCAL LOW CARBON TECHNOLOGY UPTAKE

Following on from the analysis of average income levels, it is logical to hypothesise that uptake of Low Carbon Technologies (LCTs) such as electric vehicles (EVs) and heat pumps (HPs) may vary similarly by DNO licence area.

3.3.1 ELECTRIC VEHICLES

Figure 3-2 shows the number of plug-in EVs (PiVs) per 100,000 people in each region, with regions coinciding with ENWL and NPg licence areas highlighted in green.

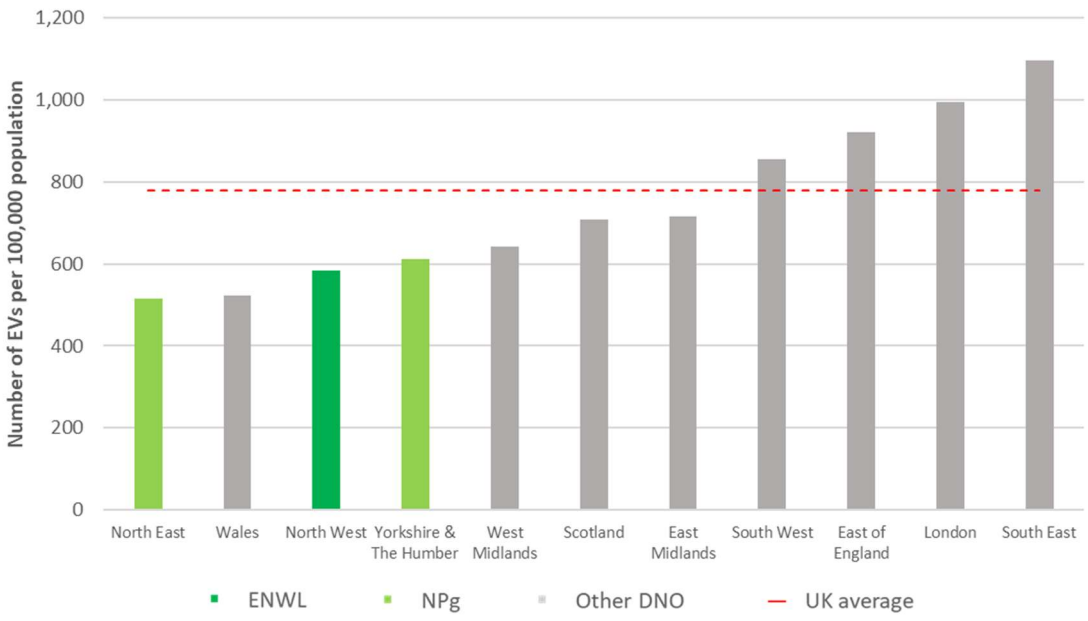


Figure 3-2 – Plug-in electric vehicles per 100,000 population, by GB region.[7]

It can be seen in Figure 3-2 that ENWL and NPg licence areas lag the UK average for PiV uptake on a population-adjusted basis, comprising three of the four lowest uptake areas. Although information on the number of private chargers (e.g. installed in home driveways, garages, etc.) is not publicly available, it is reasonable to assume that the number of private chargers is well correlated with EV uptake.

[7] UK Commons Library

Aggregators such as ev.energy[8] and Ohme[9], who provide flexibility by aggregating demand response from their customer base (including through EV chargers), are known to submit bids to provide flexibility and can be seen bidding on the Piclo Flex platform[10].

Thus, it can be inferred that the regional uptake of EVs, and by extension the availability of private EV chargers to aggregators, may impact the regional availability of flexibility. This was confirmed via stakeholder engagement with aggregators, as described in Section 6.

3.3.2 HEAT PUMPS

Figure 3-2 shows the number of HPs per GB region, adjusted by regional population. HP data includes both domestic and non-domestic HPs as per ESO data.[11] Note that for contemporary relevance, figures are taken from the 2023 HP deployment estimates from the Consumer Transformation scenarios. Population adjustments were performed using 2019 census figures.

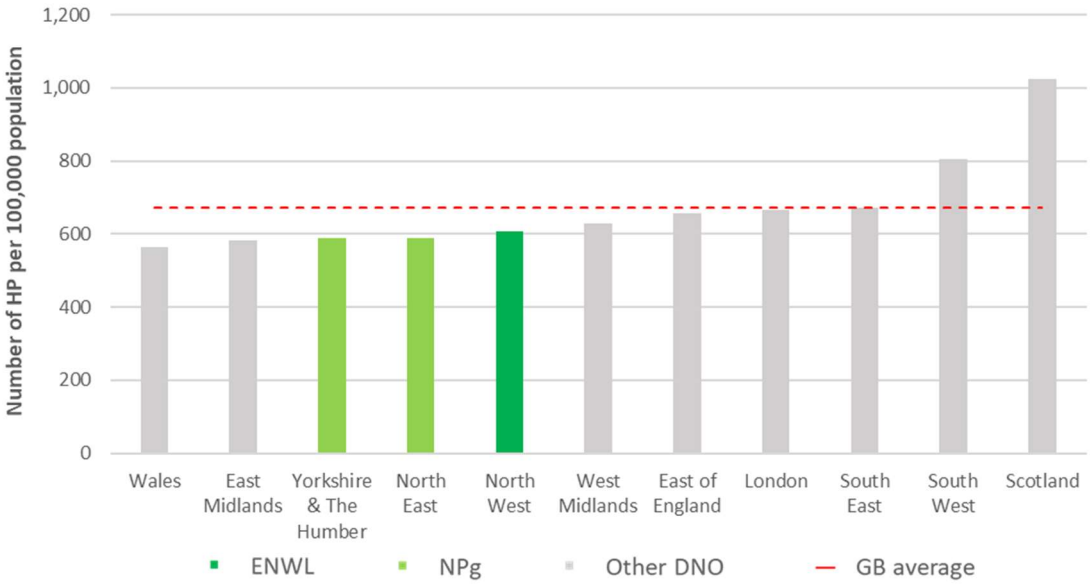


Figure 3-3 – Domestic and non-domestic heat pumps, population adjusted, by GB region.

It can be seen in Figure 3-2 that ENWL and NPg licence areas lag the UK average for HP uptake on a population-adjusted basis, and are among the five slowest GB regions in terms of deployment. As with EV chargers, domestic HP use is an expected contributor to aggregators' flexibility portfolios. As such, a shortfall in HPs in a given region may reduce the availability of resources for aggregators in that area.

There is an expectation that new housing builds will incorporate HPs in the future, including social housing. However, those HPs installed in social housing domiciles are unlikely to participate in

[8] https://www.ev.energy/
[9] https://ohme-ev.com/
[10] https://data.piclo.energy/
[11] https://www.futureenergyscenarios.com/2023-FES/regional-maps.html

flexibility services, as they will tend to be households that have already minimised their heating consumption, and may be subject to commercial barriers within these agreements with housing providers. Figure 3-4 shows the percentage of households in social housing for each region of England, as taken from the government's housing data.[12]

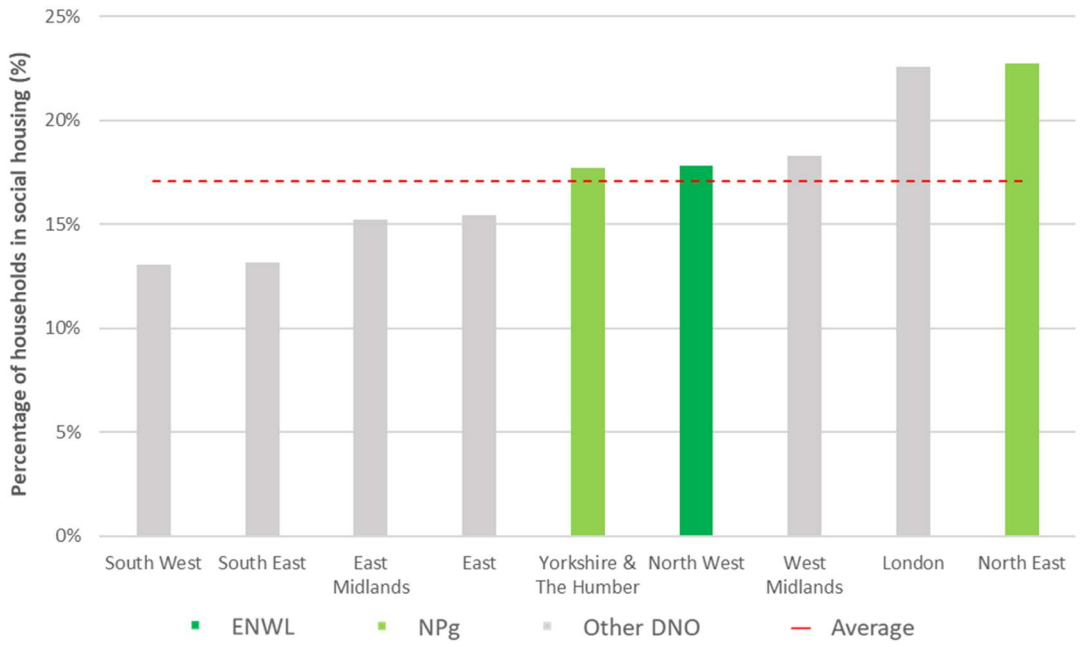


Figure 3-4 – Percentage of households in social housing, by English region.

Significantly, ENWL and NPg's regions all show above average percentages of households in social housing, and as such, even with increasing HP installations in the future, the amount of HPs available to flexibility aggregators may still lag other regions.

Considering the evidence on HP uptake, as well as relative social housing shares, it is reasonable to conclude that lower numbers of HPs will be participating in flexibility services in ENWL and NPg's regions than those of other DNOs.

[12] https://www.ethnicity-facts-figures.service.gov.uk/housing/social-housing/renting-from-a-local-authority-or-housing-association-social-housing/latest/

4 TECHNICAL FACTORS

This section examines technical factors hypothesised to impact regional flexibility procurement. This includes network specifics, such as available headroom, and particulars of network usage, such as historic changes in demand and the public EV chargepoint network.

Key Findings

- Regions corresponding to ENWL and NPg licence areas account for <15% of public EV chargepoints, despite serving ~22% of domestic customers. This links to lower EV penetration in these areas and may contribute to regional variation in flexibility.
- ENWL and NPg licence areas are characterised by high proportions of non-domestic (particularly industrial) customers, who have seen material falls in average consumption over the last two decades, creating more network headroom due to industrial decline.
- The above observation is corroborated by the finding that ENWL and NPg are projected to experience far fewer headroom violations over the next decade than other DNOs, implying a less urgent need for flexibility services in these regions.

4.1 REGIONAL EV CHARGER NETWORK

The network of publicly available EV chargepoints has been growing across the UK in response to the rise in consumer uptake of Evs. However, this growth has not proceeded at a consistent rate in all regions. Figure 4-1 shows the proportion of the current public chargepoint network that is situated in each UK region, according to 2023 data from ZapMap,[13] a UK map of EV chargepoints.

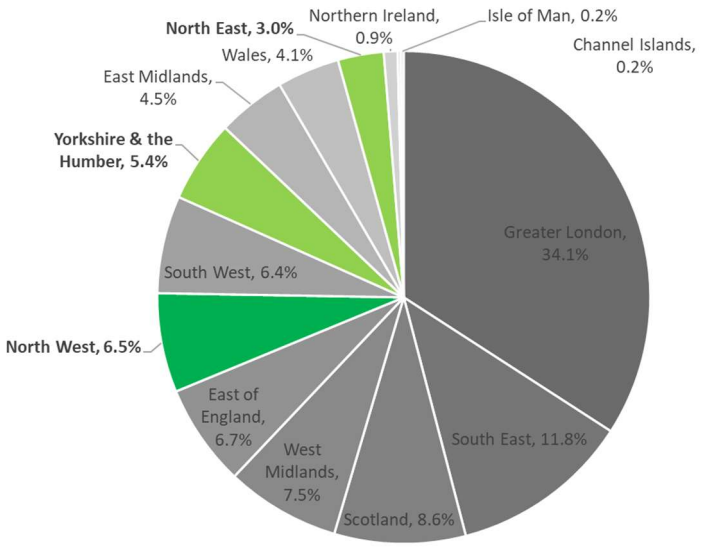


Figure 4-1 – Percentage breakdown of UK public chargepoints by region.

[13] https://www.zap-map.com/

According to these data, the three UK regions corresponding to ENWL and NPg's licence areas account for a relatively small overall share of EV chargepoints across the UK. Collectively, they account for less than 15% of the total public EV chargers in the UK, despite serving roughly 22% of domestic customers.

Private chargers can be available to aggregators if the owner opts in, but the same may not be true of public chargers. However, public chargers can provide flexibility if installed with appropriate Smart Charging Connections (SCCs), such as timed connections. 'Destination charging' (e.g., retail parks, multi-story parking) with statistically predictable occupancy may be particularly suitable for these types of connections.

Certain aggregators include public charge point operators (CPOs) in their client base – an example of this is the company Flexitricity. Flexitricity bid their services in Piclo Flex for provision of active power, but do so only in the UKPN licence area. It may be concluded that CPOs are capable of being utilised by flexibility providers, and as time goes on, the high concentration of CPOs in the south will increase the availability of flexibility in these regions specifically.

Overall, the evidence shows proportionately lower roll-out of public EV charging in ENWL and NPg's licence areas, which may contribute to lower availability of flexibility services in the regions (including through aggregators).

4.2 CHANGES IN ELECTRICITY DEMAND

Changes in local electricity demand will affect the need for flexibility services at a given site. Energy demand changes over time in response to various factors such as population changes, technological changes, and industrial growth or decline.

NON-DOMESTIC DEMAND

It could be hypothesised that industrial decline may have disproportionately affected demand in ENWL and NPg's licence areas. Figure 4-2 shows the percentage of demand in each region that is attributable to non-domestic customers[14], of which industrial demand will represent a significant proportion. ENWL and NPg regions are shown in bold.

[14] Sub-national electricity and gas consumption statistics 2017, BEIS

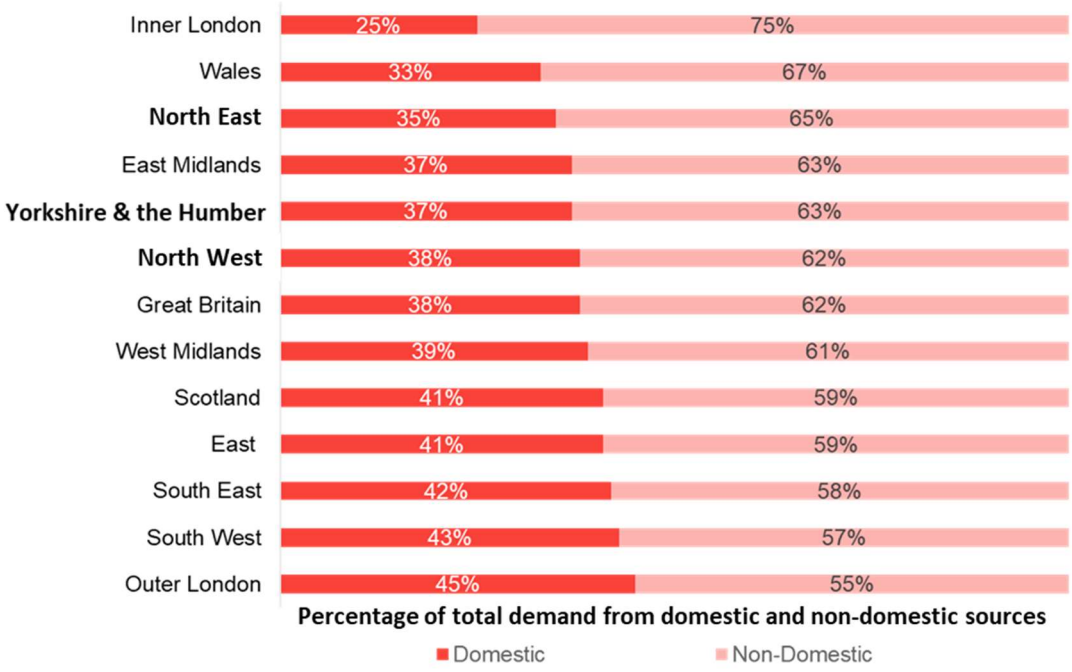


Figure 4-2 – Proportion of demand in each region attributable to non-domestic demand.

In each region, non-domestic demand exceeds domestic demand to a varying degree. The North East, North West, and Yorkshire and the Humber regions each have between 62% and 65% of demand arising from non-domestic sources (which is above the GB average). For these regions, changes in non-domestic demand will have a more significant impact on overall network demand and available headroom.

By considering the average consumption of a non-domestic consumer's meter, the average drop in demand over time can be estimated. Figure 4-3 shows this change in consumption for non-domestic meters since 2005 for each GB region,[15] while Table 4-1 shows the percentage change from each region's peak average non-domestic consumption to its 2021 value, sorted in descending order, as well as the absolute reduction (in kWh) since the peak.

It is clear from Figure 4-3 that each of the regions corresponding to ENWL and NPg have experienced declines from a significantly higher peak than the GB average. Table 4-1 then shows that the **percentage declines in non-domestic demand the North East and North West are also noticeably higher than the average, and these two regions have seen the highest absolute fall in kWh consumption per non-domestic meter**.

[15] Subnational electricity consumption statistics, gov.uk

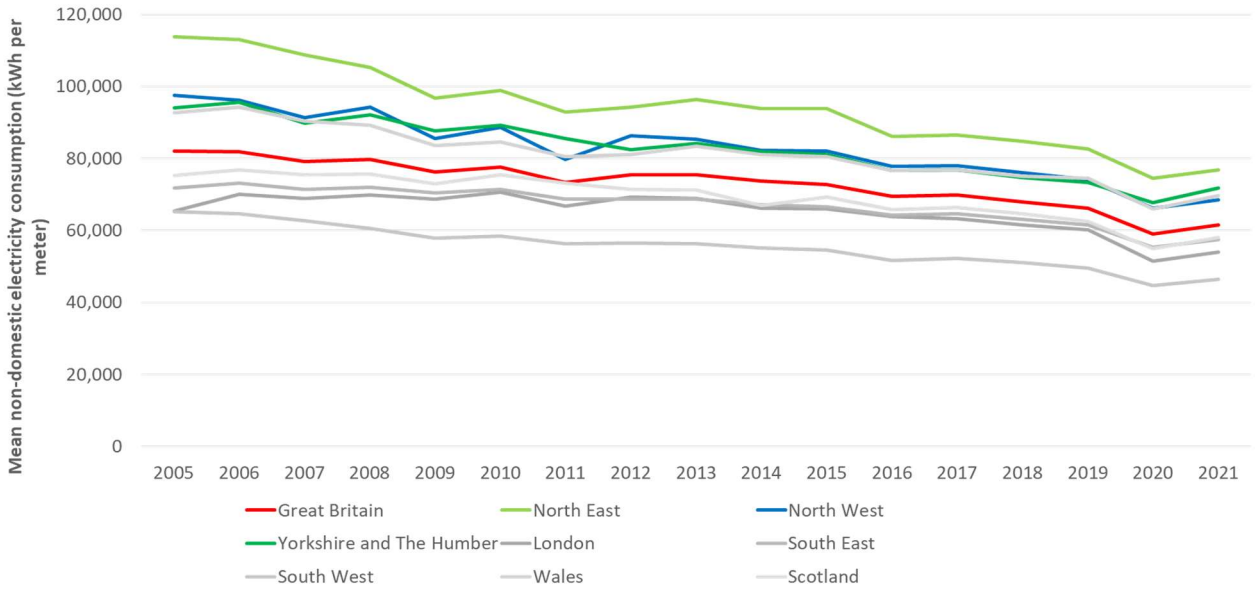


Figure 4-3 – Average per meter consumption of non-domestic meters over time for each GB region.

Table 4-1 – Change in average non-domestic meter consumption for each region.

Region	Absolute reduction from peak to 2021 consumption (kWh/meter)	Percentage reduction from peak to 2021 consumption
North East (NPg)	**36,835**	**32.4%**
West Midlands	28,066	30.9%
North West (ENWL)	**29,107**	**29.8%**
South West	18,844	28.9%
Wales	24,622	26.1%
East Midlands	24,341	25.7%
GB average	20,590	25.1%
Yorkshire and The Humber (NPg)	**23,809**	**24.9%**
Scotland	18,847	24.5%
London	16,653	23.6%
East of England	18,254	23.1%
South-East	15,509	21.2%

DOMESTIC DEMAND

Domestic demand has followed a similar downward trajectory on a per meter basis. Figure 4-4 shows the change in consumption for domestic meters over time for each GB region, while Table 4-2 shows the calculated percentage change between each region's peak average non-domestic consumption and the 2021 value and the absolute kWh reduction.

The evidence shows that the average domestic consumption has decreased in a similar fashion across all regions, while historically the absolute consumption per domestic meter in ENWL and NPg's licence areas have been consistently lower than the GB average.

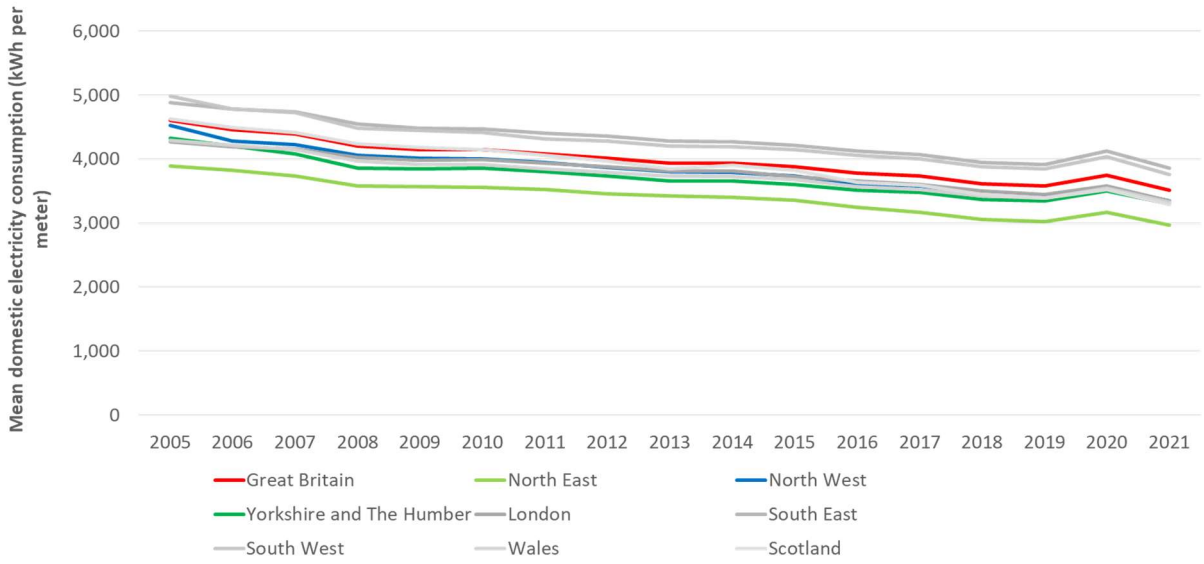


Figure 4-4 – Average per meter consumption of domestic meters over time for each GB region.

Table 4-2 does show however that NPg's regions are roughly equal to the GB average in terms of percentage reduction in domestic consumption per meter since peak. ENWL's service region of the North West has seen per meter domestic consumption drop more than the GB average.

Table 4-2 – Change in average domestic meter consumption for each region.

Region	Absolute reduction from peak to 2021 consumption (kWh/meter)	Percentage reduction from peak to 2021 consumption
Scotland	1,337	28.90%
West Midlands	1,300	26.80%
North West (ENWL)	**1,181**	**26.10%**
South West	1,229	24.70%
GB average	1,093	23.80%
North East (NPg)	**914**	**23.50%**
Yorkshire and The Humber (NPg)	**1,017**	**23.50%**
Wales	970	22.60%
East Midlands	988	21.80%
East	1,081	21.80%
London	926	21.70%
South East	1,023	20.90%

TOTAL DEMAND

Taking domestic and non-domestic consumption collectively, **it can reasonably be concluded that ENWL and NPg's licence areas have seen proportionally greater demand declines than the average across GB.** This is due to relatively large declines in non-domestic demand, coupled with the high percentage of overall demand that non-domestic customers account for in ENWL and NPg's licence areas. As such, it may be that spare headroom now exists at sites that were previously rated for higher demand.

Moreover, due to socioeconomic differences and the higher proportion of fuel poor households as of 2021 (as described in Section 3), ENWL and NPg regions have likely been disproportionately affected by the fuel crisis and rising energy costs, leading to reductions in domestic energy consumption that in turn will have reduced the potential flexible capacity available to aggregators and networks.

4.3 AVAILABLE HEADROOM

The need for flexibility services at a given location depends directly on the amount of network headroom available at that site. If there is a large amount of headroom, flexibility services are much less likely to be required and therefore less likely to be procured. Conversely, a strained site with limited or no headroom may be a prime location for flexibility procurement.

Each DNO publishes a Network Headroom Report (NHR) which projects available headroom at sites across its network. These reports cover each substation on the network at each voltage level.

We have used data from 2021-22 network headroom reports to illustrate the number of projected violations – that is, the number of substations at which headroom is given as a zero or negative value – at 11kV substations for four DNOs from 2024 to 2030. The results are presented in Figure 4-5 for ENWL, NPg, UKPN and SPEN.

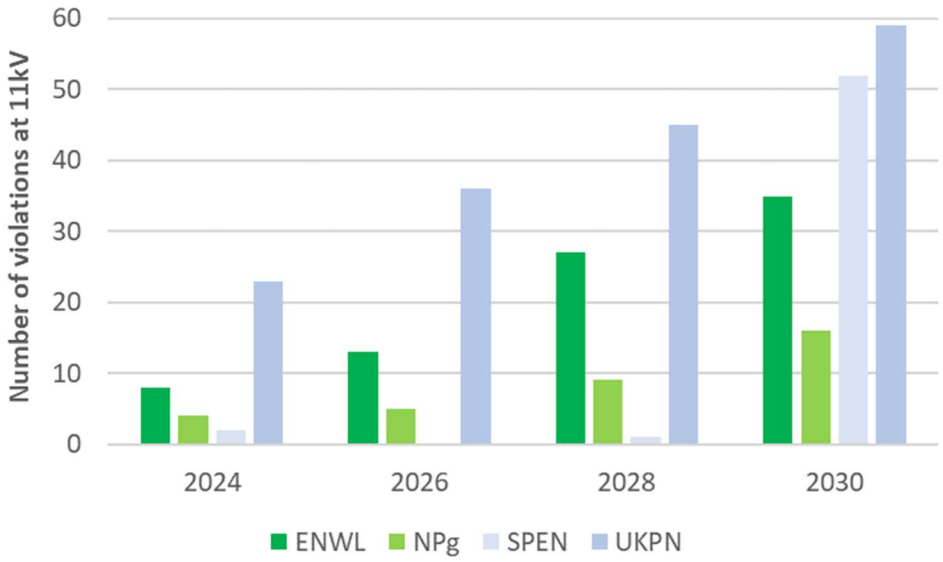


Figure 4-5 – Projected 11kV substation demand headroom violations, by year.

ENWL and NPg both forecast a steady expected rise in headroom violations out to 2030, starting from a relatively low base in 2024. UKPN are projected to experience far more headroom violations at the 11kV level across the time period. SPEN project few violations this decade, but a material step-up by 2030. Note that 6.6kV and 33kV violations are not presented here, as the projected number of violations at these levels are in the single digits for each network and so trends are not significant.

The fewer projected headroom violations in ENWL and NPg's licence areas across the next decade should contribute to lower demand for flexibility services in these areas to date and in the near to medium term (in particular relative to the UKPN licence area). However, in the longer-term (i.e. 2030 and beyond) flexibility services will be increasingly necessary in ENWL and NPg licence areas.

5 COMMERCIAL FACTORS

In this section we examine those factors that may arise from commercial arrangements and the revenues available to FSPs, as well as their perception of different DNO markets.

Key Findings

- ENWL and NPg licence areas are among the GB regions with a higher than average share of manufacturing activities deemed to have more 'inflexible' power requirements, implying less appetite to provide flexibility services.
- Higher historical dispatch of flexibility services in other DNO licence areas may have created a perception of higher future dispatch likelihood in these regions, creating a virtuous circle for flexibility service uptake (relative to ENWL and NPg's licence areas).
- Data on the ESO's Demand Flexibility Service (DFS) suggests that participation in higher value ESO services is also more limited in the ENWL and NPg regions, potentially limiting the impact that measures such as revenue stacking could have on FSP interest in these markets.
- Early flexibility-related innovation projects (in RIIIO-ED1) have been focused in other DNO licence areas (SSEN, SPEN, UKPN, NGED), promoting a perception of these regions as flexibility leaders.

5.1 LOCAL INDUSTRIES

As discussed in Section 4.2, non-domestic demand accounts for a majority of electricity consumption in each UK region. This non-domestic demand can be further broken down into manufacturing (industrial) and services (commercial).

The share of industrial (and commercial) demand varies across regions. We have examined Gross Value Added (GVA)[16] data to understand the relative amount of industrial activity in each region. Figure 5-1 shows the share of GVA attributed to manufacturing categories in each region, as defined in the ONS data.[17]

[16] Gross Value Added (GVA) is a statistic measuring the increase in the value of the economy due to the production of goods and services.
[17] https://www.ons.gov.uk/economy/grossvalueaddedgva

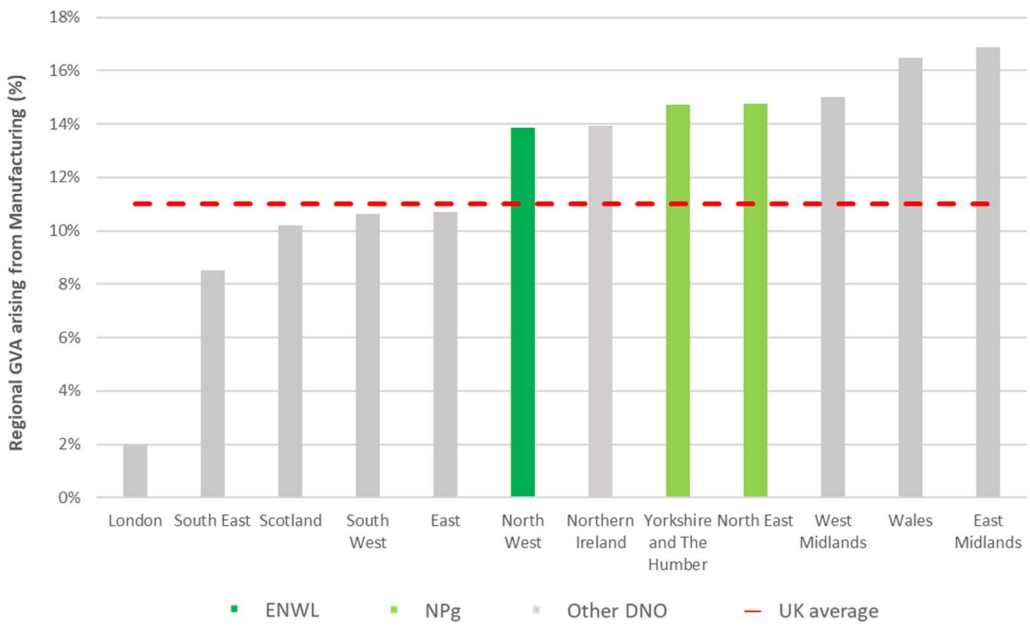


Figure 5-1 – Share of regional GVA attributable to manufacturing by region.

It can be seen that ENWL and NPG's licence areas lie in the middle to upper half of GB regions in terms of the share of their GVA attributable to manufacturing. This is in sharp contrast to London, where the manufacturing share in GVA is only 2% (consistent with its service-dominated economy).

In isolation, the data show no clear correlation between the prevalence of manufacturing in a region and the availability of flexibility services. However, it is hypothesised that some types of manufacturing may be more 'dispatchable' – that is, more willing to reducing their demand when incentivised – than other types of manufacturing, where consistent output may be prioritised over other metrics. We would expect regions with a higher share of manufacturing with more 'dispatchable' demand to see higher levels of engagement in flexibility services.

To explore this hypothesis, we have used ONS data on manufacturing sub-categories to divide manufacturing activities into two subsets – those activities characterised by more 'flexible' power needs and those characterised by 'inflexible' power needs. This is an indicative categorisation based on intuitive judgement of these activities and their respective power needs and output profiles. The division is shown in Table 5-1.

Table 5-1 – Categorisation of manufacturing activities by perceived flexibility in power needs.

Flexible Power Needs	Inflexible Power Needs
Food, beverages, and tobacco	Transport equipment
Textiles, wearing apparel, and leather	Coke, refined petroleum, and chemicals
Wood and paper products and printing	Pharmaceutical products
Rubber, plastic, and non-metallic minerals	Basic and fabricated metal products
Electrical equipment	Computer, electronic, and optical products
Other manufacturing, repair, and installation	Machinery and equipment

Applying this categorisation, we can evaluate the share of manufacturing GVA in each region to activities with more flexible power needs and those with inflexible power needs. The results are shown in Table 5-2.

Table 5-2 – Share of 'inflexible' and 'flexible' manufacturing activities by region.

Region	Share of GVA from manufacturing (%)	Share of which 'flexible' (%)	Share of which 'inflexible' (%)
North East	**14.8%**	**33.0%**	**67.0%**
West Midlands	15.0%	33.6%	66.4%
South East	8.5%	36.8%	63.2%
North West	**13.8%**	**38.5%**	**61.5%**
South West	10.6%	40.8%	59.2%
East of England	10.7%	43.0%	57.0%
United Kingdom	9.7%	44.7%	55.3%
Wales	16.5%	45.0%	55.0%
Yorkshire & The Humber	**14.7%**	**52.6%**	**47.4%**
East Midlands	16.9%	54.2%	45.8%
Scotland	10.2%	57.7%	42.3%
London	2.0%	69.1%	30.9%

We have used the data in Table 5-2 to calculate an indicative share of a region's GVA that comes from manufacturing activities with inflexible power needs. The results are shown in Figure 5-2.

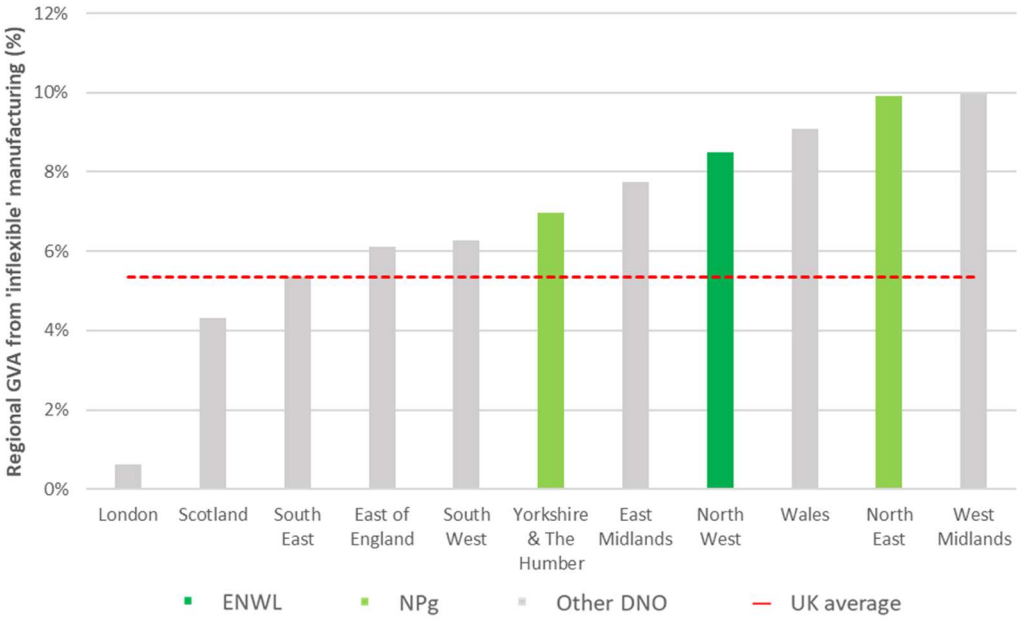


Figure 5-2 - Percentage of regional GVA from inflexible manufacturing sources.

It can be seen from these data that the North West and North East regions show higher than average shares of their GVA originating from manufacturing activities with 'inflexible' power needs. This may limit the supply of flexibility services in these regions.

5.2 DISPATCH LIKELIHOOD

When a flexibility provider is contracted, it is not guaranteed that they will be called on to provide that service, as contracting decisions would depend on requirements forecast in advance of generation or demand levels being precisely known.

The flexibility procurement process makes a distinction in fee types – an 'availability fee' is paid for declarations that a service will be available when accepted in advance, while a 'utilisation fee' is paid for a utilised service following the issuance of a dispatch instruction. Certain services may only have utilisation fees available in their procurement. In these cases, the income a flexibility provider can expect to earn is directly dependent on how often the procuring network issues dispatch orders.

Regional dispatch orders for reporting year 2022/23 were obtained for each DNO from the C31E data tables, the results of which are shown in Figure 5-3.

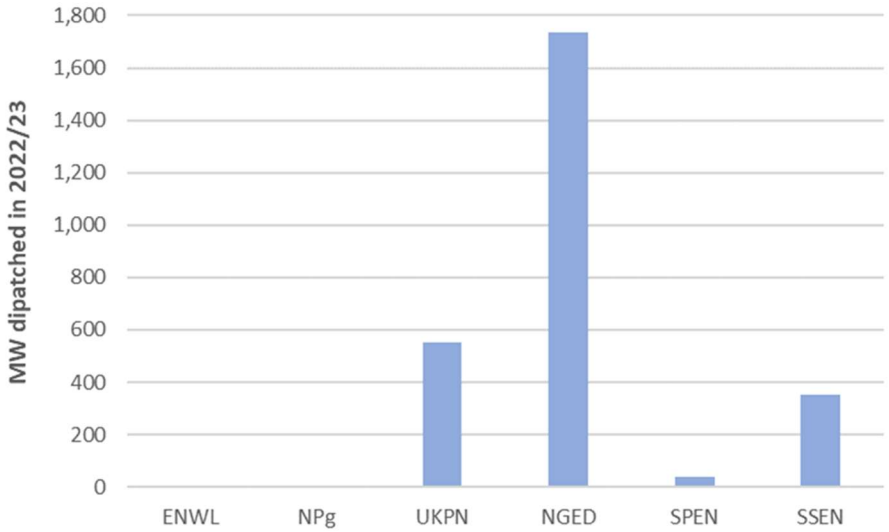


Figure 5-3 – Total flexibility dispatch 2022/23 by DNO.

It is clear from Figure 5-3 that NGED dispatched significantly more flexibility services in the 2022/23 period than any other studied DNO. UKPN and SSEN exhibited lower dispatch volumes, though still dispatched much more frequently than ENWL or NPg.

Markets with higher volumes of flexibility service dispatch in recent years (including NGED, UKPN and SSEN) are likely to be a more attractive market for flexibility providers, as they are likely to offer, and be perceived to offer, a more stable income stream for flexibility services.

5.3 ESO SERVICE OVERLAP

In addition to each DNO's local flexibility market, the ESO operate their own flexibility services that Flexibility Service Providers (FSPs) can choose to participate in. One example of this is the Demand Flexibility Service (DFS), introduced in winter 2022/23, which incentivises consumers to shift their demand away from peak hours in order to earn payment rewards. The scheme saw national interest and uptake, and DFS is again being operated in winter 2023/24.

Figure 5-4 shows the capacity provided to DFS on 28/11/2023 by Octopus Energy specifically for each published region[18] – Octopus Energy were the largest single provider of DFS capacity GB-wide on this date. Note that the regional breakdown used by this dataset differs slightly from those used previously.

[18] https://www.nationalgrideso.com/data-portal/demand-flexibility-service

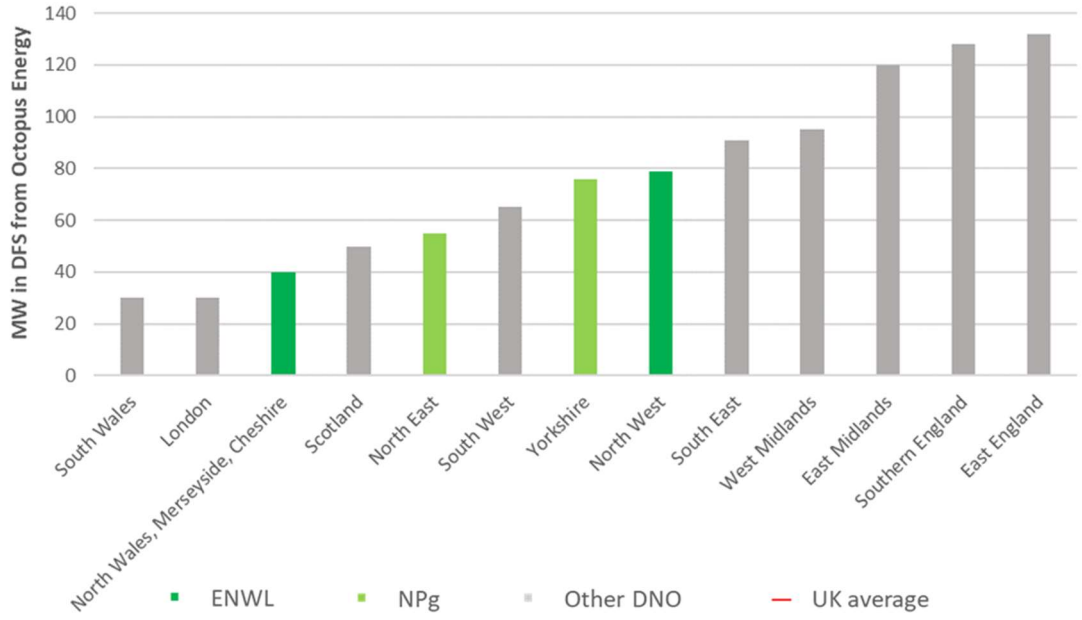


Figure 5-4 – Capacity provided to DFS by Octopus Energy on 28/11/2023.

The analysis shows ENWL and NPg regions to be in the middle and lower end of the range. **This suggests that even ESO products that provide higher revenues may struggle to generate participation in ENWL and NPg regions, implying regional barriers beyond the DNOs' control and suggesting that revenue potential is not the only barrier to flexibility service uptake.**

5.4 EARLY INNOVATION PROJECTS

Over the course of RIIO-ED1 and RIIO-ED2, there have been a variety of sources of innovation funding available for DNOs to apply for to address emerging issues or to address existing problems in novel ways. Since 2018, many of these projects have been funded to develop flexibility products, services, or markets. However, it was hypothesised by stakeholders that these projects were generally not led by ENWL and NPg, potentially due to their minimal need for flexibility services in these early years. Table 5-3 lists examples of these flexibility-related innovation projects.

Table 5-3 – Examples of innovation projects targeting FSP market participation.

Project name	Lead DNO	Start year	Funding
Project Leo	SSEN	2019	£15m
Transition	SSEN	2018	£14.5m
Fusion	SPEN	2018	£5.3m
Electric Nation	NGED	2020	£2.6m
TransPower	UKPN	2018	£2.1m
Shift	UKPN	2019	£1.3m

Note that this table is not an exhaustive list of those innovation projects that may have touched on flexibility, as many are too broad to allow for simple categorisation. That caveat aside, Table 5-3 suggests that networks with more urgent capacity needs moved early, developing their flexibility markets via innovation projects, often with significant input from innovation funding mechanisms (e.g. Project Leo [£15m], Transition [£14.5m], Fusion [£5.3m]) that had a direct impact on FSP stimulation.

Innovation projects targeting FSP market participation have provided other DNOs an early mover advantage, enabling routes to market for FSPs and promoting a perception of these regions as flexibility leaders.

6 STAKEHOLDER ENGAGEMENT

Following a thorough review and analysis of available data on potential drivers of regional flexibility variations, it was instructive to engage with relevant stakeholders in the flexibility market space in order to test these findings.

Key Findings

- Stakeholders agreed that barriers exist, either between regions or DNOs, and sighted several factors analysed in this report (changing demand, industrial decline, first-mover advantage, and lack of assets in rural areas).
- There are still perceived to be multiple barriers to the uptake of flexibility across GB.
- Interoperability and standardisation across DNO markets are seen as critically important, with different processes and requirements seen to cause unnecessary frictions and loss of time.
- The ability to stack revenues between markets and products is seen as an integral step in developing flexibility markets, particularly those that have been smaller to date.

6.1 STAKEHOLDER ENGAGEMENT APPROACH

A wide range of stakeholders were identified, covering a variety of categories, namely FSPs, platform providers, industry bodies, networks, and government. Of those contacted, interviews were arranged with 11 stakeholders, spanning each category. A list of the interviews held is presented below.

Table 6-1 - Stakeholder categorisation

Stakeholder	Category
ev.energy	FSP
Oaktree Power	FSP
CUB Ltd.	FSP
Octopus Energy	FSP
Piclo Flex	Platform provider
ElectraLink	Platform provider
Electron	Platform provider
Energy Network Association (ENA)	Industry body
Association for Decentralised Energy (ADE)	Industry body
National Grid Energy Distribution (NGED)	Network
Department for Energy Security and Net Zero (DESNZ)	Government

Participants were given the background details on the project (though not the detailed findings) and asked if they consented to having their views attributed to them. Discussions were framed around a list of conversation-prompting questions – representative examples are listed below.

Example Stakeholder Engagement Questions

1. Do you perceive any regional differences in the uptake of flexibility services across the UK? Please explain.
2. Are you selective with where you recommend flexibility services? If so, why?
3. What are your views on the current barriers to flexibility service provision?
4. Do you agree with our assessment of barriers that a DNO can influence? Do you believe there are any further barriers that a DNO can (or cannot) influence that have not been identified?
5. Do you believe revenue stacking of DSO services and ESO services will enable greater participation across the whole UK?
6. Following from question 5 – do you believe the marketplace is currently able to facilitate this; if not, what else do you think is required?
7. A Market Facilitator will be created in late 2025/early 2026 to coordinate DSO/ESO flexibility markets. What can be done now to better coordinate local flexibility markets?
8. Do you believe there are areas that would not benefit from standardisation? If so, what are these and why do you think they would not benefit from standardisation?
9. Do you believe that ESO services such as DFS have an impact on DSO flexibility services uptake, and if so, why?
10. Do you believe that the Regional Energy Strategic Planners who will be responsible for regional strategic planning activities could positively influence flexibility service procurement? And if so, how?

From the answers to these questions and the wide-ranging conversations with interview participants, several key themes emerged.

6.2 STAKEHOLDER FEEDBACK

It was agreed that disparities exist, either between regions or DNOs

Initial interview discussions focused on the existence of regional differences in flexibility uptake, prompted by the project hypothesis and the first question. Interviewees were also shown a draft version of Figure 1-1 during the discussion as context.

In general, interviewees agreed that they had either experienced, observed, or heard of regional disparities in flexibility uptake.

- Multiple interviewees attributed this at least partially to what they saw as varying needs between regions, be that due to rising demand or industrial decline (as investigated in Section 4.2).

- Several interviewees attributed the difference to a 'first-mover advantage' for UKPN and others, noting that early innovation projects developed their markets and relationships with suppliers (as evidenced in Section 5.4).

> *"There are some leaders in DNO flexibility services - those who tender for the most, and who have more advanced systems than others."* **Sarah Honan (ADE)**
>
> *"NPG have historic headroom because of the nature of the network which had a lot of industries, now they're that are now defunct. So those industrial connections which are no longer used have left adequate capacity in the network."* **Avi Aithal (ENA)**
>
> *"I think they [Southern DNOs] are more active potentially because they did more breakthrough projects a fair few years ago now. And in my view that established a route to market for them. And I think they've probably gone through a couple of pinch points and pain points along the way, but they did that a few years ago, so they've now established perhaps more awareness in their patch with their key players."* **Rebecca Hassall-Lees (ElectraLink)**

- Several interviewees, particularly the FSPs and aggregators, noted that from their perspective the differences across markets were primarily due to their lack of assets in the areas with requirements, aligning with previous findings suggesting that tenders in rural areas are less likely to be contracted (as described in Section 2.1).

> *"ENWL put out tenders, but they are very much for their more northern, less populated regions … I would bid into ENWL and NPG if I could, but we just don't have the assets."* **Michael Kenefick (ev.energy)**

All stakeholders still perceive multiple barriers to the uptake of flexibility across GB

In response to the third question, all interviewees believed that barriers currently exist that are affecting the uptake or procurement of flexibility services, regional or otherwise. Stakeholders were initially asked for their own impressions of barriers. Subsequently, they were shown a list of barriers identified through this work and a review of prior consultations and asked for their opinions.

Generally, similar themes were identified by all stakeholders when discussing potential barriers, including standardisation of processes, market coordination and stacking, consistent baselining of assets, tender requirements, etc. However, some unique concerns were raised, including:

- FSP bandwidth: when all DNOs launch their tenders around the same time, it can lead to smaller FSPs being unable to assess opportunities in all markets in time.
- Control system sophistication: some asset types may not have sophisticated enough control systems to respond to dispatch orders within the required time margins.
- Smart meter rollout: the varying progress of the smart meter rollout across GB affects who is able to join up with aggregators.

Interoperability and standardisation are key concerns across all stakeholder categories

While discussions with stakeholders were freeform to an extent, questions 3 through 6 prompted discussions of the barriers to flexibility uptake. In most discussions, interoperability and standardisation between different DNO markets were raised as critically important. FSPs in particular were clear that the different processes and requirements between DNO markets causes unnecessary frictions and loss of time.

> "Whenever a DNO launches a tender, we basically have to start over." **Jason Avramadis (Oaktree Power)**
>
> "There's definitely more to do to remove barriers for flexibility providers – standardising information and processes to reduce the amount of times providers have to submit information to market operators, and where appropriate standardising the requirements themselves." **Hannah Clapham (DESNZ)**

The ability to stack revenues between markets and products is seen as an integral step in developing flexibility markets

Revenue stacking, i.e. the ability for an FSP to combine or 'stack' revenues from multiple products or markets with a single asset or aggregate, is currently not enabled between flexibility markets, and is the subject of a detailed review of primacy rules being undertaken by the ENA. Revenue stacking has the potential to bolster interest in smaller markets, as it allows FSPs to participate in those markets to augment their revenues without losing out on larger or more stable flexibility income streams.

Stakeholders agreed that enabling revenue stacking is critical for further development of flexibility markets in GB, and that it could help to 'bootstrap' those regional markets that are currently lagging.

> *"Ultimately if you make it easier for [FSPs] to stack revenue streams, you reduce the opportunity cost of participating in ours… it's a no brainer, it's absolutely essential. I think we're very clear that if revenue stacking is not allowed, providers will prioritise the other services because of the relative value cases… DFS is a prime example. With current pricing they'll pick DFS over the DSO market, so how you enable stacking is really important."* **Matt Watson (NGED)**
>
> *"Some people [FSPs] might be nervous at the moment about [revenue stacking] even if they've got the capacity, about signing up to provide services to two different entities. If you enable that stacking, then it removes a barrier."* **Anthony Bivens (Electralink)**

Ultimately, stakeholders agreed that action to develop flexibility markets in those regions that are currently lagging would be very welcome.

7 OPPORTUNITIES AND NEXT STEPS

Desk research and analysis, coupled with stakeholder engagement, has provided strong evidence of regional disparities in flexibility markets across GB. Our analysis has identified a number of factors that may be driving regional disparities that are outside of DNO control.

To prevent further divergence of market opportunities and ensure flexibility remains an option available to all GB networks, targeted action is needed to begin to address these regional challenges.

In accordance with stakeholder feedback, there is considerable scope for action on central market facilitation between the time of this work and the likely first actions of the Market Facilitator (MF) in early 2026. In fact, there is now a unique opportunity to establish an efficient pathway to implement central market facilitation, regional planning, and even impact the wider RIIO-ED3 process in a way that addresses the entrenched regional disparity in the uptake of flexibility, in particular:

- Reducing the lead time for full scale central market facilitation and regional planning by starting small, avoiding competition for scarce expertise, and learning lessons and scaling up.
- Designing and calibrating approaches in market facilitation, regional planning and network regulation that account for regional variations in flexibility and equalise regional markets for all consumers.
- Galvanising coordinated ‘bottom-up’ thinking from DNOs in collaboration with Ofgem, FSO and MF to prepare and lay the groundwork to accelerate the assimilation of the MF and RESPs.

7.1 IMPLEMENTATION TRIALS

The emerging recommendation from this study is to deliver on the above objectives through an ENWL- and NPg-led network forum targeted specifically at addressing barriers to flexibility uptake and redressing the imbalances between regional markets. A scoping note outlining the form and remit of these trials was previously shared with Ofgem, and is included in the Appendix to this report.

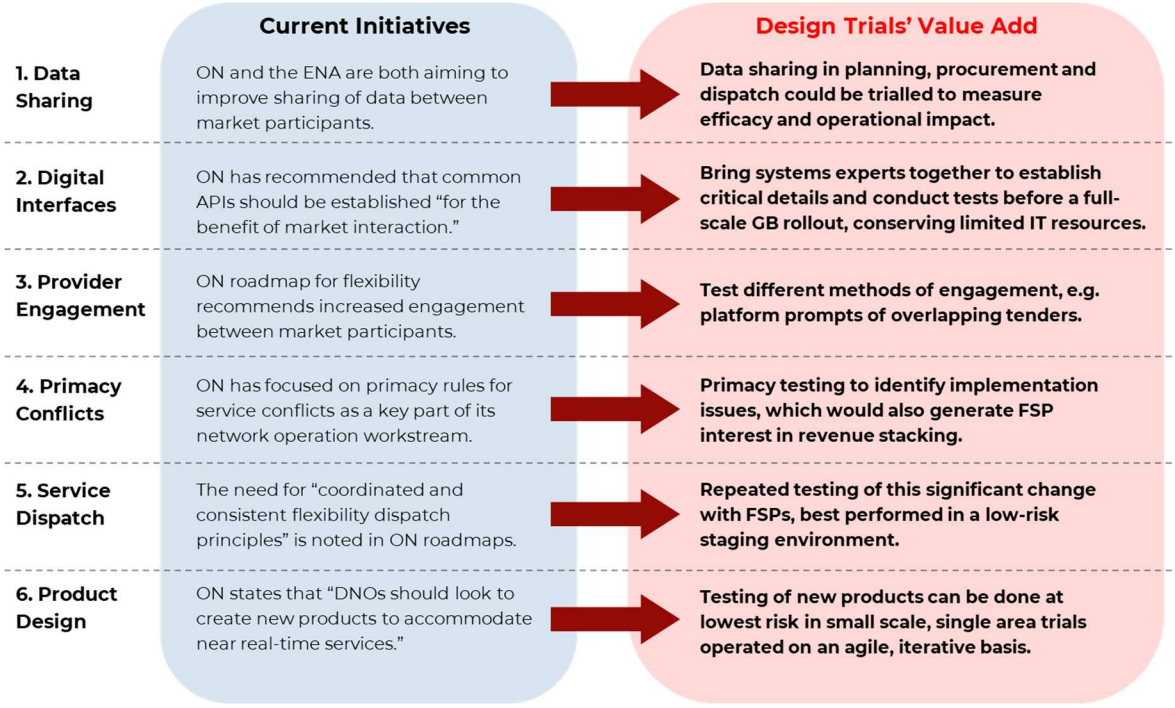
ENWL and NPg can work with this forum to lead and deliver a concerted, small scale implementation trial of central market facilitation; i.e. utilise these smaller, lower risk markets for time limited trials for the implementation of central market facilitation measures. The key benefits of this would be:

- Generating interest and opportunity awareness for markets that are lagging in participation.
- Creating more ‘brand awareness’ for ENWL and NPg’s markets amongst FSPs.
- Highlighting MF implementation issues in a contained, low-risk environment.
- Reducing the risk of duplicative work at the market facilitation blueprint phase, avoiding wasted resources or stranded investments.
- Reducing frictions and inefficiencies at the first implementation of the MF in 2025/26.
- Informing aspects of regional planning and market facilitation that require regional approaches.

7.1.1 SCOPE OF REGIONAL TRIALS

Harmonisation of flexibility markets under the MF will require integration of bespoke systems from multiple organisations. Without sufficient prior testing this carries significant risk of inefficiency, process frictions, cyber security issues, and stretching limited IT resources. However, the current suite of activity in innovation by the ESO and by DNOs through Open Networks (ON) is focused on theoretical designs – there are as yet no specific plans for testing.

As such, critical gaps remain where an agile, DNO-led project collaborating with the MF candidate can deliver significant value in 'learning by doing' through trials (as demonstrated in the graphic below).



A small-scale trial to simulate key aspects of the MF would be especially well-suited to delivery in ENWL and NPg's regions for a number of reasons, in particular:

7.1.2 FORM OF IMPLEMENTATION TRIALS

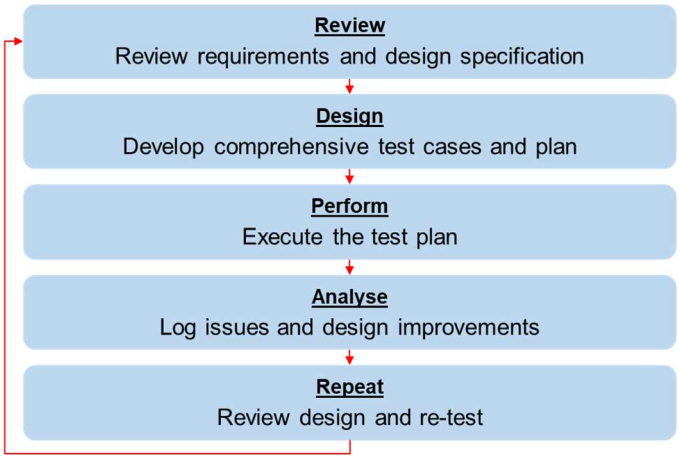
Given the complex nature of centralised market facilitation, an agile and iterative approach will be required to ensure fast response to emerging issues. An iterative trial enables innovations to be delivered with speed and productivity, developed through rapidly repeated cycles of building, field testing and learning. These cycles can be classified by the relative depth of the changes they test as 'Shallow,' 'Intermediate,' and 'Deep.'

The goals of the implementation trials would be to:

- Test the principles of Central Market Facilitation in action in a low risk environment.
- Avoid inefficiencies in the development and rollout of the chosen archetype for MF.
- Focus FSP interest on currently underdeveloped markets.

The phased nature of the trials delivers this by iteratively expanding scope in a geographically focused market, allowing coordination and primacy to be tested at a small scale with learnings immediately adopted into the next iteration. Furthermore, from the intermediate stage, the increased coordination will allow the testing of primacy rules and enable FSPs to access revenue stacking opportunities, focusing interest on these markets as sources of both increased revenue and valuable learning opportunities for FSPs.

The various stages of the trial (i.e. shallow, intermediate, and deep) can be used to test a 'menu' of implementation measures that are beyond the scope of current industry initiatives. The exact measures tested in each stage should be defined in consultation with DNOs, MF delivery body candidates and Ofgem at the beginning of each trial period, allowing for fast response to industry developments and input from relevant stakeholder groups (in particular, platform providers and FSPs). Each stage would proceed according to the widely used systems testing format illustrated below:



The final output of these implementation trials would be a minimum viable product for central market facilitation that has identified and resolved implementation challenges, leading to fewer frictions in the adoption of the MF by all network companies.

7.2 STAKEHOLDER SUPPORT

In those stakeholder engagement sessions where such trials were discussed, stakeholders were broadly supportive of this process. Specific feedback included:

"The best way forward for primacy rules is to trial them as they are developed, so that we can iterate, refine and 'learn by doing', rather than waiting for the perfect end state." **Nick Huntbatch (Head of Product, Electron)**

"Given systematic constraint issues, pilot schemes in the north is an interesting idea. However, it quickly opens the door to issues that need proactive engagement such as establishing the correct price signals for different types of flexibility service provider in demand turn up services." **Sarah Honan (ADE)**

"Central Market Facilitation sounds great, but the reason the UK has got where it is, is that the fragmented approach has allowed companies to innovate – if you centralise, you are also centralising all your problems, and how individual companies and DNOs all feed into that platform remains a question." **Michael Kenefick (ev.energy)**

"I think that the best way [to standardise] is … make sure that all the markets work as well as possible at the local level and then we try to standardise, and once everything is standardised, you can then give the central management to someone. I would be sceptical to just hand over centralised management at this very moment simply because there is so much inconsistency between the DNOs' approaches" **Jason Avramidis (Oaktree Power)**

"On incentivising DNOs to integrate with the MF... absolutely – I've been impressed so far with their participation with the ENA and the collaboration there. But what's next? This kind of preparation has to be a part of that, and whoever ends up being the MF will have a much easier time when they go live if this has happened, otherwise it could take years for that party to have an influence" **Louis Fairfax (CUB UK Ltd)**

Ultimately, the outputs of these regional trials would be shared with the goal of elevating regional flexibility markets to the leading standard, as well as including consideration of regional factors in the calibration and design of RIIO-ED3 regulatory reports and metrics, informing the implementation of enduring solutions, and forming a body of evidence from across all licence areas as a 'one-stop shop' for information and inputs to Regional Energy Strategic Planners (RESPs) and the MF.

8 CONCLUSIONS

There is clear evidence of regional differences in flexibility uptake across GB.

At a time when new governance arrangements are being proposed to coordinate flexibility markets and regional planning, these regional differences must first be fully understood and addressed to ensure that flexibility is a practical option for all areas of GB.

Since 2018 there has been a lag in the uptake of flexibility services between DNO regions – particularly noticeable for the two northern England licensees ENWL and NPg. These differences in uptake appear to be entrenched despite efforts by both DNOs to develop their regional flexibility markets, including running tenders, relaxing entry requirements, consulting stakeholders, adopting a common evaluation methodology, absorbing innovation learnings, and sustaining a commitment to the Open Networks project.

Differences arise from regionally variant barriers to flexibility uptake and availability

Barriers that are homogenous across all regions – such as non-standard products, fragmented procurement processes or misalignment of local and ESO markets – are being addressed by solutions that will shortly be adopted. A deeper understanding barriers that impact some regions more than others is timely while coordinated regional approaches in key areas such as market facilitation, common digital infrastructure, and regional planning are being developed. Regional differences can be addressed through these governance and policy developments in order to break the lag and equalise the performance of flexibility markets for consumers across GB.

This work has explored the hypothesis that there are barriers with a regional bias, identifying locational, socio-economic, technical, and commercial factors driving these barriers. A summary of the findings is shown in Table 8-1 below.

Table 8-1 - Summary of potential barriers to flexibility uptake identified in this work.

Category	Potential barriers identified
Locational	Location of flexibility requirements (urban vs. rural)
Locational	Levels of distribution connected generation
Socio-economic	Average income
Socio-economic	Low carbon technology uptake
Technical	Electric vehicle charging network
Technical	Trends in electricity demand (including industrial decline)
Technical	Available network headroom
Commercial	Local industries' ability to respond to flexibility needs
Commercial	Likelihood of FSPs to receive dispatch requests
Commercial	Innovation funding in flexibility and first-mover advantage

As is clear from Table 8-1, this report has found evidence of a large number of factors that may be driving regional variation in flexibility services. Moreover, the balance of evidence suggests that ENWL and NPg service areas have certain characteristics (in relation to these factors) that may limit the uptake and availability of flexibility services.

Considered action should be taken to make flexibility viable for all customers

These identified regional barriers, reflective of the unique customers and environments that each DNO serves, could severely limit the potential flexibility market size and response in ENWL and NPg's regions. Without considered intervention, this regional disparity is likely to become further entrenched.

This report has concluded by presenting a potential way forward to begin to address this observed regional disparity. It has proposed that ENWL and NPg form and lead a DNO forum whose aim is to elevate all flexibility markets to the level of the market leaders. As a first step to delivering that goal, it is also proposed that ENWL and NPg volunteer to run small scale, regional trials of central market facilitation, investigating and tackling implementation issues and practicalities such as primacy rules while also stimulating interest in currently underserved markets.

It is recognised that many of the barriers explored in this report will require long-term action to address. A regional focus will be needed in key action areas such as central market facilitation and strategic planning. As such, the findings of this DNO forum can be used to inform the development of the Market Facilitator role and the local actions of RESPs, and potentially provide input to the development of regionally nuanced incentive metrics for flexibility services for the RIIO-ED3 price control period.

APPENDIX: REGIONAL TRIALS SCOPING NOTE

Regional Variation in Flexibility – Scoping of Design Implementation Trials

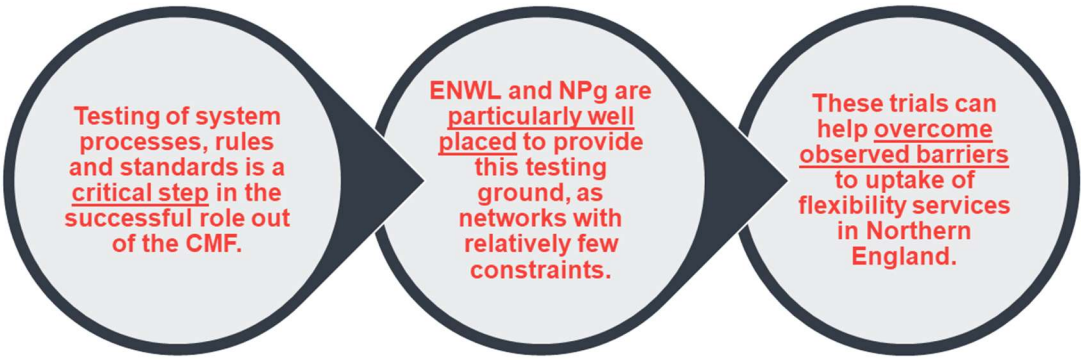
Executive Summary

The goal of nationwide flexibility markets is to enable fair access and participation of flexibility service providers (FSPs) and so facilitate whole system benefits through greater optimisation. However, recent work by WSP with Electricity North West Limited (ENWL) and Northern Powergrid (NPg), previously presented to Ofgem, has shown that markets in northern England experience significant barriers to the uptake of flexibility services.

While uptake in northern England has lagged, the market for flexibility services has developed rapidly driving the need for a Central Market Facilitator (CMF). A key role of the CMF will be to determine processes, rules, and standards to enable fair access to flexibility services markets that coordinate the needs of distribution and transmission networks.

However, thinking to date on the CMF's coordinated flexibility services solutions has been limited to theoretical designs and blueprints, without specific plans for testing these designs in action and thus 'learning by doing'.

In this context, ENWL and NPg are proposing to lead a collaborative network forum to take timely action on design implementation trials for central market facilitation of flexibility services.



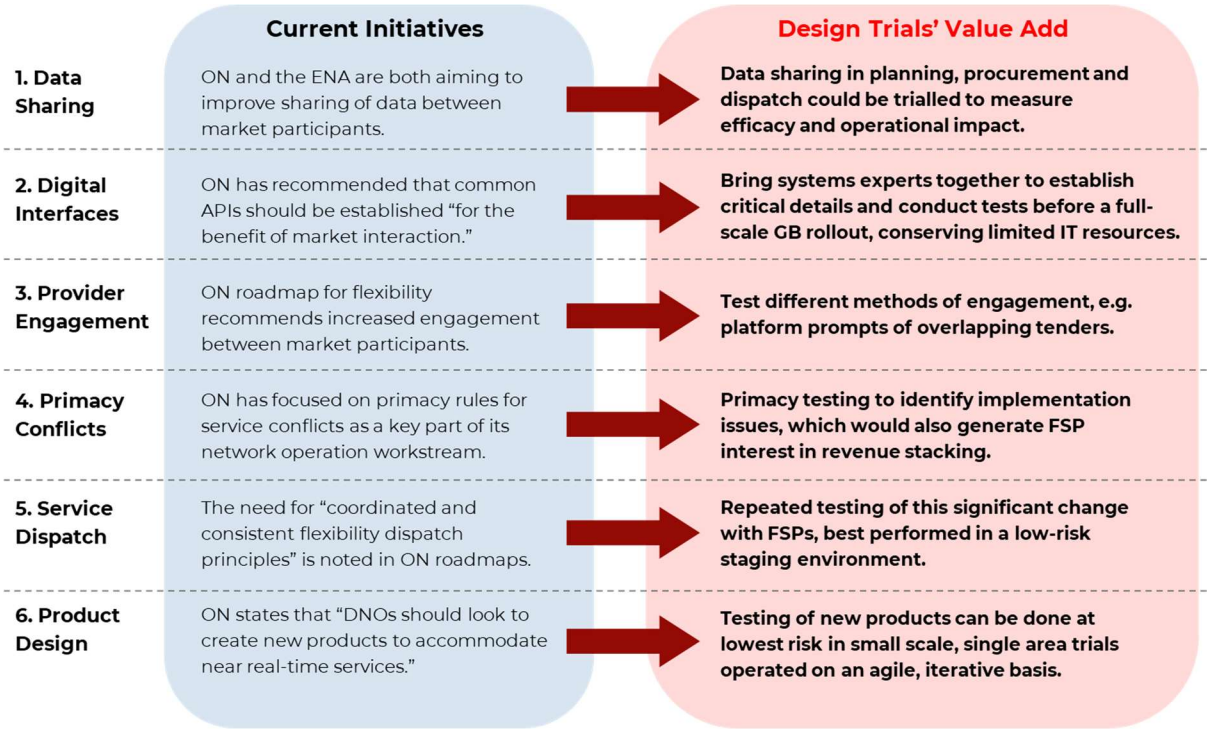
In this short scoping note, we set out high level answers to the following questions and welcome the opportunity to explore these in more depth with Ofgem.

Q1. How would the design implementation trials add value?

Harmonisation of flexibility markets under the CMF will require integration of bespoke systems from multiple organisations. Without sufficient prior testing this carries significant risk of inefficiency, process frictions, cyber security issues, and stretching limited IT resources.

However, the current suite of activity in innovation by the ESO and by DNOs through Open Networks (ON) is focused on theoretical designs – there are as yet no specific plans for testing.

Critical gaps remain where an agile, DNO-led project collaborating with the CMF candidate can deliver significant value in 'learning by doing' through trials.



Q2. How would the design implementation trials be carried out?

With the CMF expected go live in late 2025 or early 2026,[19] there is a small but crucial time window for 'learning by doing' via an agile work programme, where:

- The collaborative network forum would invite representation from the ESO, market facilitator delivery body, Ofgem, and DESNZ.
- The design implementation trials would comprise repeated cycles of building, field testing, and iterating, with learnings from each stage adopted into the next.
- Each stage would be used to test a 'menu' of implementation measures, defined in consultation with network companies, the CMF delivery body candidates and Ofgem.
- The scope of testing would be gradually expanded with each iteration, increasing underlying architectural complexity and end use cases.

[19] Future of local energy institutions and governance, Ofgem, November 2023

Q3. Why are ENWL and NPg especially well placed to deliver these trials?

A small-scale trial to simulate key aspects of the CMF would be especially well-suited to delivery in ENWL and NPg's regions for a number of reasons, in particular:

Creating a regional testbed for these learnings will draw FSP interest to these currently underserved markets, offering value to providers through access to learning and feedback, as well as additional earning opportunities via revenue stacking.

As such, these design implementation trials can deliver the parallel benefit of addressing current regional variation in the uptake of flexibility services identified by the WSP study.

Q4. How can success for these trials be measured?

The final output of these implementation trials would be a minimum viable product for central market facilitation that has identified and resolved implementation challenges, leading to fewer frictions in the adoption of the CMF by all network companies.

Critical Success Factors:

Delivery of trials
- Delivery of multiple, timeboxed trials of central market facilitation measures.

Identification of issues
- Identification of issues arising from the implementation of the measures being tested.

Issue resolution
- Resolution of issues identified during the trials, iterated and tested across subsequent trial stages.

Increased FSP participation
- Increased interest and participation of FSPs in ENWL and NPg regions in response to these trials.

Improved market development
- Increased standardisation and market knowledge for dissemination via the network forum and CMF candidate.

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