

What if... we rewarded low carbon pioneers for their network-friendly behaviour in the home?





Sustain-H

Invitation to participate
June 2020



CONTENTS

- Executive summary
- Context
- Details
- Appendix

EXECUTIVE SUMMARY

We invite you to participate in the Sustain-H service.



Sustain-H is a scheduled demand reduction service

The service requires a pre-agreed change in import (kW) over a defined period of time.



...worth up to £5-75/household/year

The service is readily stackable with other revenues. Payments come directly from WPD's core business rather than innovation funding, signaling a pathway to commercialisation.



...procured by WPD in targeted locations

The service is procured in Constraint Management Zones (CMZs) within the Midlands, South West and Wales where there are existing constraints.



...from market intermediaries with domestic portfolios

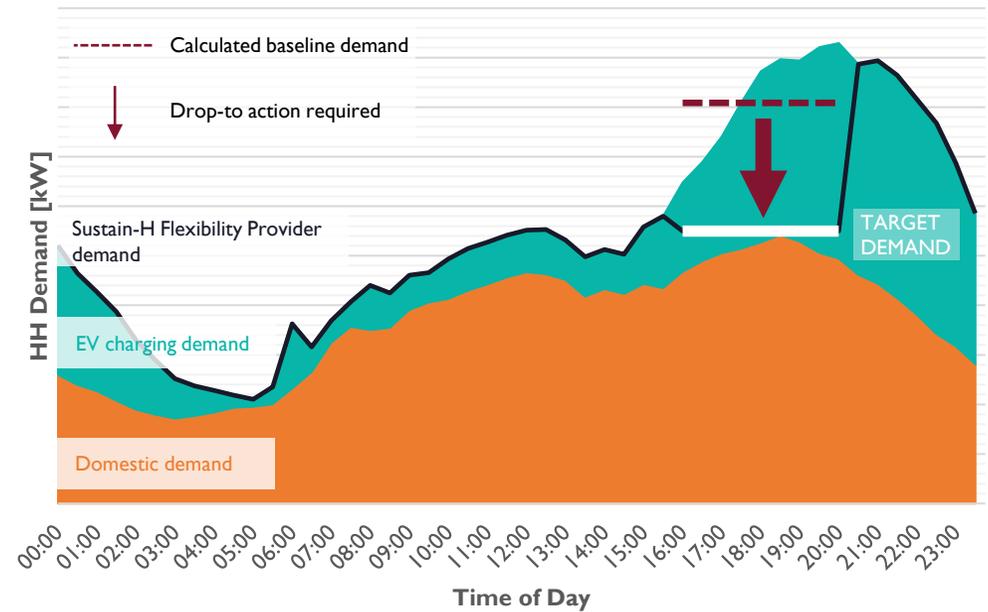
The service is open to energy suppliers and/or asset aggregators. Eligible households are those with an EV, heat pump and/or battery.



...starting November 2020.

We are seeking your feedback to finalise the service design. Sustain-H will commence in November and run for 9 months. We will then look to transition to business-as-usual.

Drop-to service requirement
Example: domestic + EV demand profile

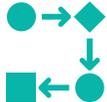


Sustain-H forms part of Future Flex. Future Flex is an innovation programme pioneering second generation DSO services for domestic scale assets. It is delivered by Western Power Distribution, Everoze and SGC, with National Grid ESO as observer. It is funded by the Network Innovation Allowance.

NEXT STEPS

Contact us to arrange call and then receive detailed design pack.
felicity.jones@everoze.com
benjamin.lock@everoze.com

THE SUSTAIN-H SERVICE IS PART OF FUTURE FLEX

FUTURE FLEX		
CONTEXT	WORKSTREAM	GOAL
<p>Future Flex is an innovation programme pioneering second generation DSO services for domestic scale assets.</p> <p>It is delivered by Western Power Distribution, Everoze and SGC, with National Grid ESO as observer. Future Flex is funded by the Network Innovation Allowance.</p> <p>We aim to identify and address unconscious biases in DSO service design, unlocking domestic participation.</p> <p>Following industry feedback in Q1 2020, we are pursuing 3 workstreams:</p> <ol style="list-style-type: none"> 1. DSO-Ready Homes 2. Sustain-H – the focus of this slidepack 3. Pro Low Carbon. 	<p>1. DSO-READY HOMES What if ... we make homes DSO-ready to suit the home, rather than to suit the DSO?</p> <p>2. SUSTAIN-H What if ... we trial a DSO service framed for domestic flex & efficiency – rather than asking domestic solutions to fit current requirements?</p> <p>3. PRO LOW CARBON What if ... we investigate the carbon impact of DSO services, rather than being blind to carbon intensity?</p>	<p> Homes activated to provide DSO services</p> <p> DSO procurement requirements appropriate to domestic portfolios</p> <p> Clarity on carbon impact of DSO services</p>

THIS SLIDEPACK FOCUSES ON SUSTAIN-H

We call the service **Sustain-H**, as it is the **Sustain** service, adapted for **Homes**.

Sustain is the Scheduled Constraint Management service being rolled out across all DSOs, following standardization work by the Energy Networks Association. We sought to build on existing terminology that is agreed across-GB, rather than start again from scratch.

The objectives of Sustain-H are to:

- Remove barriers to domestic flexibility in providing DSO services
- Probe the data options, methods and benefits of taking a portfolio view
- Transition the trial into business-as-usual procurement.

We continue to solicit feedback on the service design; as such, the features presented on the following slides may be subject to changes.

THE SERVICE HAS 3 DESIGN PRINCIPLES

IN PLAIN LANGUAGE

IN DETAIL

ILLUSTRATION

RATIONALE

1. Sustain-H aims to be simple.

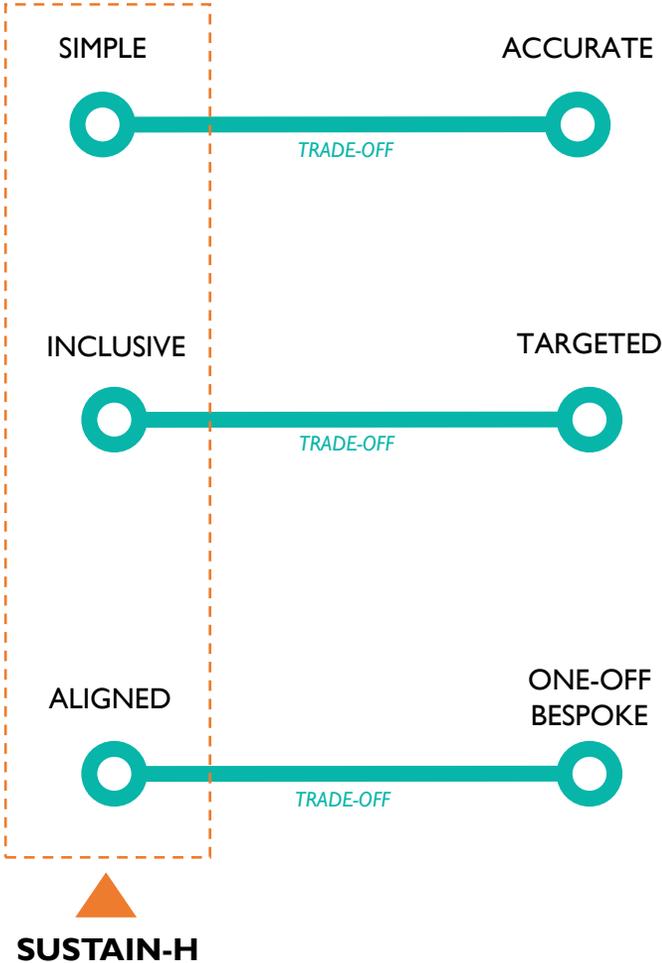
Rather than reflect the precise network need of WPD (which varies substantially by location & time), we aim to radically standardise and simplify requirements.

2. Sustain-H aims to be inclusive of participant type and technology

Rather than limiting the service to licensed suppliers only, we seek to include asset aggregators too.
Rather than targeting a single technology, we aim to attract participation from households with flexibility and/or energy efficiency solutions. For the trial only, we are focusing on EVs, heatpumps and battery storage technologies.

3. Sustain-H aims to be aligned with other services

Rather than develop a new service with new terminology, we choose to align with the Open Networks activity led by the Energy Networks Association.
Rather than work in an innovation bubble, we aspire to collaborate closely with Flexible Power team to ensure integration and alignment with WPD’s existing commercial service suite.



We target simplicity to ensure that service requirements are commensurate with value (£). Your feedback at our workshops repeatedly emphasised the challenge of low service value. As the value is limited by network benefit, we have sought to strip out complexity to reduce the cost of participation.

We target inclusivity to embrace the diversity of solutions being developed. The workshops were attended not just by suppliers, but tech aggregators too. Your feedback emphasised the need to be inclusive of energy efficiency. By focusing on specific technologies for the trial, we target the higher impact demand technologies for the trial.

We target alignment to enable a clear pathway to commercialisation and to aid revenue stacking. One-to-one discussions signalled trial-fatigue: you want a long-term route to market, not a one-off trial. You also want greater alignment across services.

THERE ARE 5 MINIMUM ELIGIBILITY REQUIREMENTS

HOUSEHOLD

FLEXIBILITY PROVIDER

IN PLAIN LANGUAGE

1. Have EV, heat pump and/or battery

2. Located in WPD Constraint Managed Zones

3. Able to influence domestic consumption

4. Able to share usage data

5. Strategic positioning for future revenues

IN DETAIL

Households must minimally have an electric vehicle, heat pump and/or battery (already existing or installed by Nov 2020). Having additional smart appliances or energy efficiency solutions may make it easier to meet the *Target Demand*, but are not necessary.

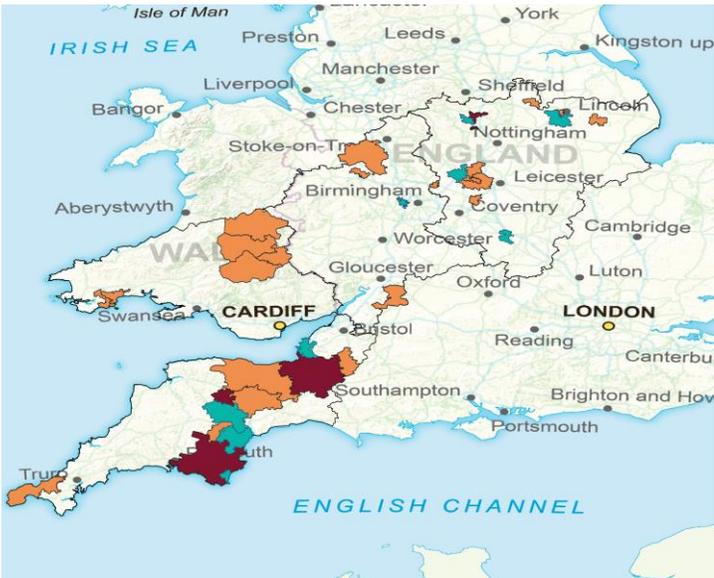
Households must be located within a Constraint Management Zone (CMZ) – see map to the right. The portfolio of households can be spread across multiple CMZs during the trial.

Flexibility Providers must be able to influence consumption at household or asset level. Consumption can either be influenced directly (e.g. control algorithm) or indirectly (e.g. time-of-use price signal).

Flexibility Providers must share consumption data from household meters or asset meters. There is some flexibility on data format and resolution.

WPD seeks participation from *Flexibility Providers* who are not just eager to pursue a trial but have the intent of long-term service provision when the service transitions to business-as-usual.

ILLUSTRATION



Eligible Constraint Management Zones are shown in the shaded regions in the map: orange for both summer & winter seasons, red for summer-only and teal for winter only. The wider Flexible Power CMZ map is available online [here](#).

RATIONALE

We seek to be inclusive of technologies to maximise participation.

Services are procured in areas of network need, as this is a location-specific constraint service. Eligible CMZs are consolidated into summer and winter operational groups. This simplification is made for the trial only and may not be carried through to any future roll out.

We aim to be inclusive of different methods that market participants may employ to maximise participation, rather than prescribe how the service is packaged to consumers.

We aim to show flexibility on data provision and learn from industry what data can be provided efficiently and accurately.

WPD's ultimate objective is for fully commercial procurement of services. The intent is to roll Sustain-H into business-as-usual assuming trial results are positive.

SUSTAIN-H IS A SCHEDULED 'DROP-TO' SERVICE

IN PLAIN LANGUAGE

Sustain-H is a **scheduled service**

Sustain-H is a **drop-to service**

Sustain-H is **measured and assessed at a portfolio level**

IN DETAIL

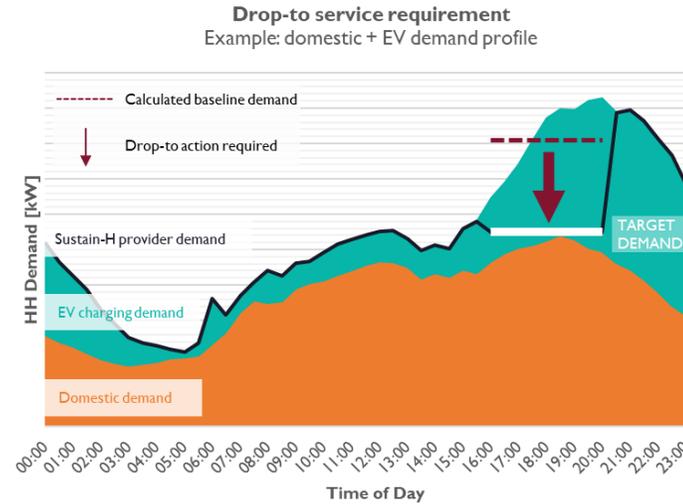
Flexibility Providers deliver a pre-agreed change in import or export (kW) over a defined period of time. Sustain-H is a pre-fault service, with delivery scheduled months in advance.

Flexibility Providers reduce demand to a level at or below a pre-agreed *Target Demand* and hold this for a 4-hour window. The *Flexibility Provider* defines a *Target Demand* that is suitable for their portfolio, contracting for a *Target Demand* of X kW, delivered by a portfolio of Y households. Valuation is based on the reduction against a pre-established *Baseline Demand*.

The *Flexibility Provider* manages the delivery risk of meeting the *Target Demand* that it defines.

Demand is measured and assessed on an aggregate portfolio basis. The *Target Demand* is fixed for the entire season.

ILLUSTRATION



WPD will provide a suggested *Target Demand* level for the domestic portfolio, but the *Flexibility Provider* can increase/decrease this depending on portfolio capability and for purposes of delivery risk management.

RATIONALE

We have prioritised simplicity to be inclusive of a broader range of actors, and also to ensure service complexity is commensurate with service value.

We have sought to develop a service that is inclusive and simple. The drop-to approach is inclusive of energy efficiency & smart appliance solutions, and removes much of the complexity and consequent cost of service provision that is a feature of 'drop-by' services.

One of our objectives is to probe a portfolio approach, interrogating its benefits and data implications. Given the small contribution of an individual household, we are eager to take a portfolio view, and also better understand its statistical characteristics.

THE SERVICE IS CONTRACTED FOR FIXED PERIODS

IN PLAIN LANGUAGE

The service is contracted **seasonally**

Volume and time periods are **fixed in advance**

There are **2 pre-defined service windows, per weekday**

IN DETAIL

For the first year, the winter season will run from Nov-Feb and the summer season will run from Mar-Jul.

Flexibility Providers can choose to participate in one or both seasons.

The service is required on weekdays only. Its requirements remain the same across each weekday when the service is required to be delivered.

For some Constraint Management Zones, the service will not be required for each month of the season. This is communicated in advance of the season.

Flexibility Providers can provide the service for the defined 4-hr period in the morning, and/or the defined 4-hr period in the evening. The period is the same across summer and winter seasons.

However, not all CMZs require all delivery periods.

ILLUSTRATION

<p>FLEXIBILITY PROVIDER OPTIONS WEEKDAYS ONLY</p>	 <p>DAYTIME 8AM-NOON</p>	 <p>EVENING 4-8PM</p>
 <p>WINTER NOV-FEB*</p>	<p>DELIVERY PERIOD 1</p>	<p>DELIVERY PERIOD 2</p>
 <p>SUMMER MAR-JUL</p>	<p>DELIVERY PERIOD 3</p>	<p>DELIVERY PERIOD 4</p>

The *Flexibility Provider* can choose which delivery periods to target.

RATIONALE

The seasons have been defined to fit the trial timeframes; however, if rolled out as hoped in future, the seasons are expected to be reviewed and redefined.

Substantial simplifications have been made to minimise barriers to entry: for instance standardising the requirement across weekdays. Also, fixing volumes and periods in advance allows *Flexibility Providers* to plan for delivery well in advance. For the trial only, service will be contracted for all months in the trial, but for any future roll-out this will only be for the months needed in that CMZ.

Substantial simplifications have been made to minimise barriers to entry: namely standardising the delivery periods.

THE BASELINE IS DERIVED FROM NETWORK MODELS

IN PLAIN LANGUAGE

The **baseline** is derived from network models

The **baseline** is fixed at time of qualification

The **baseline** is tied to the portfolio

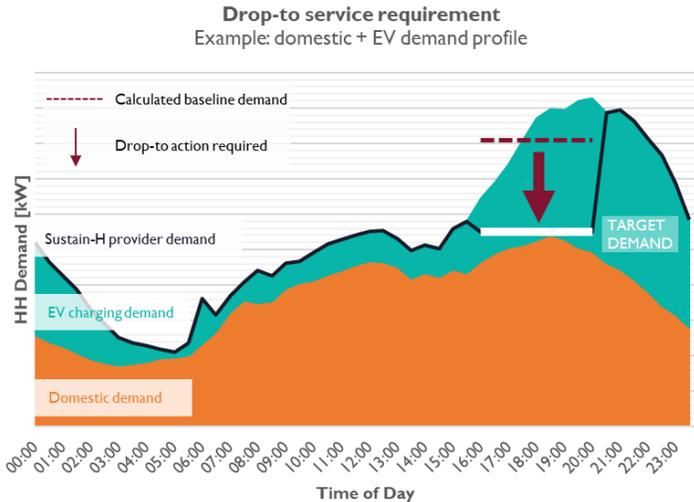
IN DETAIL

Baselining is used to measure portfolio performance and calculate payments. The baseline is tied to the diversified demand profiles used by WPD for Extra High Voltage (EHV) network modelling and planning.

The baseline of a *Flexibility Provider's* domestic portfolio is fixed at the time of qualification for each season. The *Baseline Demand* remains the same over the full duration of the season.

The established *Baseline Demand* is tied to i) the number of households, and ii) the technology make-up of the portfolio. Any change either of these points will mean a new portfolio baseline is needed.

Remuneration is informed by *Contracted Flexible Capacity*, where: *Contracted Flexible Capacity = Baseline Demand - Target Demand*.



AN EXAMPLE FOR CALCULATING BASELINE DEMAND

For a domestic portfolio of 100 homes with 60 homes equipped with EV chargers and 70 homes equipped with heatpumps.

$$\text{Baseline Demand} = 100 \times \text{domestic demand} + 60 \times \text{EV charger demand} + 70 \times \text{heatpump demand}$$

Using the domestic, EV charger and heatpump demand for the evening 4-8pm delivery period for the winter season.

$$\text{Baseline Demand} = 100 \times 1.0 \text{ kW} + 60 \times 0.5 \text{ kW} + 70 \times 5.6 \text{ kW}$$

$$\text{Baseline Demand} = 525 \text{ kW}$$

THE RATIONALE

Linking the baseline to network models provides a clear link between the service provided and the network benefits.

The baseline is fixed at qualification for simplicity. However, there is an opportunity to update it at the start of each season, reflecting any material changes in portfolio makeup.

The baseline is an important metric and is specific to each portfolio. The baseline has a direct impact on remuneration. During the trial, the need for *Flexibility Providers* to change their portfolio make-up (no sooner than monthly) shall be reviewed as a learning outcome.

HOUSEHOLDS CAN EARN UP TO £5-75/YEAR

IN PLAIN LANGUAGE

The service is paid monthly on a **fixed tariff**

Assessment is on an **aggregated basis**

Payment **multipliers** are used in calculating the monthly payment

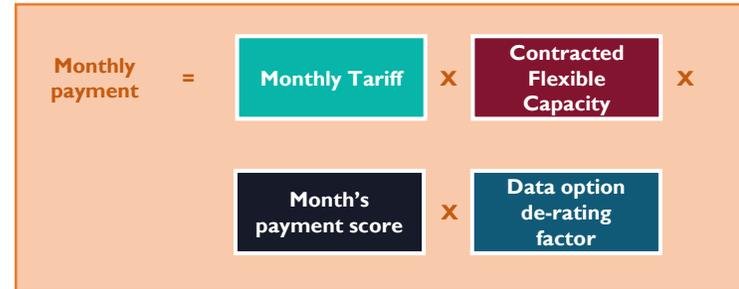
IN DETAIL

Flexibility Providers are paid based on a fixed monthly tariff of **£1.8 per kW demand reduction per month** for one delivery period in a season.

Flexibility Providers provide a single dataset showing the meter data aggregated for the whole portfolio for the full month. WPD will also request individual meter data from all households for one or two months during the trial.

Service delivery is assessed on a day-by-day basis, based on the highest HH metered demand over the delivery period, and a payment score (between 0-1) is calculated. A payment de-rating factor linked to the data option used by the Flexibility Provider is also used in the payment calculations. de-rating factor is set at 1 at the start of the trial and will be considered further during the course of the trial.

ILLUSTRATION



AN EXAMPLE FOR CALCULATING MONTHLY PAYMENTS

For the example considered in the previous slide: a domestic portfolio of 100 homes with 60 homes equipped with EV chargers and 70 homes equipped with heatpumps.

Baseline Demand = 525 kW

Assuming Flexibility Provider offers a Target Demand of 450 kW

Contracted Flexible Capacity = Baseline Demand – Target Demand

Contracted Flexible Capacity = 525 kW – 450 kW

Contracted Flexible Capacity = 75 kW

Monthly payment = £1.8/kW/month x 75 kW x 1 (month's payment score) x 1 (no derating)

Monthly payment = £135 or approx. £1.4 per household

RATIONALE

Service valuation is linked to existing payments made under Flexible Power. The tariff will be reviewed and revisited following the trial if/when transitioning into business as usual procurement.

Keeping admin low. We seek to offer Flexibility Providers a data option that is suited to domestic portfolios. No data pre-processing is required.

The data/metering options used for the trial carry uncertainties in actual real-time delivery for WPD procuring this service. To capture the effect of this uncertainty on the value of the flexibility service to WPD, a derating factor is used in the payment calculations.

YOUR JOURNEY WILL STEP TOWARDS LAUNCH IN NOV

IN PLAIN LANGUAGE	HELP PERFECT THE DESIGN	CONFIRM ELIGIBILITY	QUALIFY	SET RESPONSE PARAMETERS	CONTRACT	TRIAL	BUSINESS AS USUAL
IN DETAIL	The market intermediary is at the centre of this service. We are seeking your feedback to help perfect the final design of the Sustain-H service.	To access the trial, you and your domestic portfolio must meet the eligibility criteria, including location, technology and data requirements.	The formal qualification process involves confirmation of qualifying assets and establishing the baseline demand for the portfolio. It is a vital precursor to contracting.	Choose how and when your portfolio will deliver Sustain-H. Providers have the power to define their response through a choice of availability windows and target demand level.	Formalise your participation by executing the Sustain-H trial contract, which defines the key terms of your participation. The contract will run from November 2020 to July 2021.	Deliver the service, helping support the local grid network and receiving payments in return. Delivery assessments and payments will be carried out monthly for the trial's duration.	We aspire to transition Sustain-H from its trial stage to a standard DSO service within the Flexible Power product suite, where you will have the opportunity for continued participation.

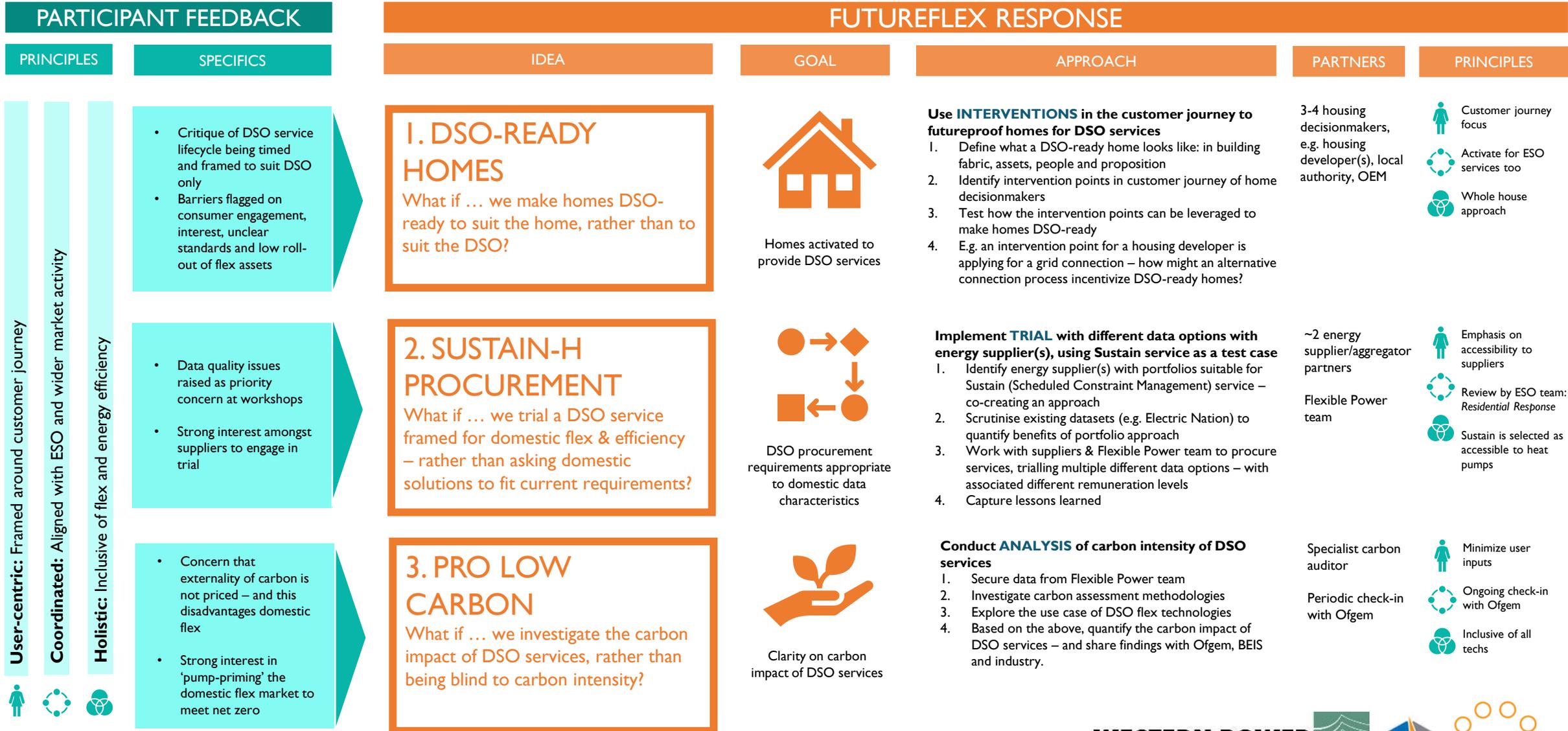


TIMEFRAME	June	July	August/Sept	September	October	Nov-Aug	Q4 2021

APPENDIX

- THE WIDER FUTUREFLEX PROJECT
- DISCLAIMER

FUTURE FLEX: ENABLING HOMES TO SUPPORT THE DSO – UNLOCKING GRID CITIZENSHIP



FutureFlex: Trial Engagement Pack

Client	Western Power Distribution
Document number	WESTERN002-ST-S-03
Revision	B
Issue Date	17 June 2020
Status	Final
Prepared by	Nithin Rajavelu, Felicity Jones
Checked by	Benjamin Lock
Approved by	Nithin Rajavelu

This document has been prepared and is issued by Everoze Partners Limited to the named Client in accordance with the contract dated 9/12/2019 and subsequent Variation dated 21/05/2020. This governs how and by whom this report should be read and used. The associated NIA code is WPD_NIA_047.

