



# Demand Flexibility

18 August 2022, Virtual Webinar, 11am -1pm

# Agenda

- Context and overview
- High-level service design
- High-level process design
- Timings and next steps
- Q&A

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**#Flexibility**



# The context

- As a prudent system operator, we are taking steps to ensure we are well prepared to maintain safe and secure operation of the electricity system
- These steps include actions to build our resilience and mitigate the potential impact to electricity customers in Great Britain
- Given the risks and uncertainties of possible shortfalls in Europe's gas supply this winter, the ESO will be supporting greater participation of demand side response from energy consumers with a new winter service
- This would see consumers voluntarily reducing their demand at peak times by using less energy and / or using energy at different times of the day

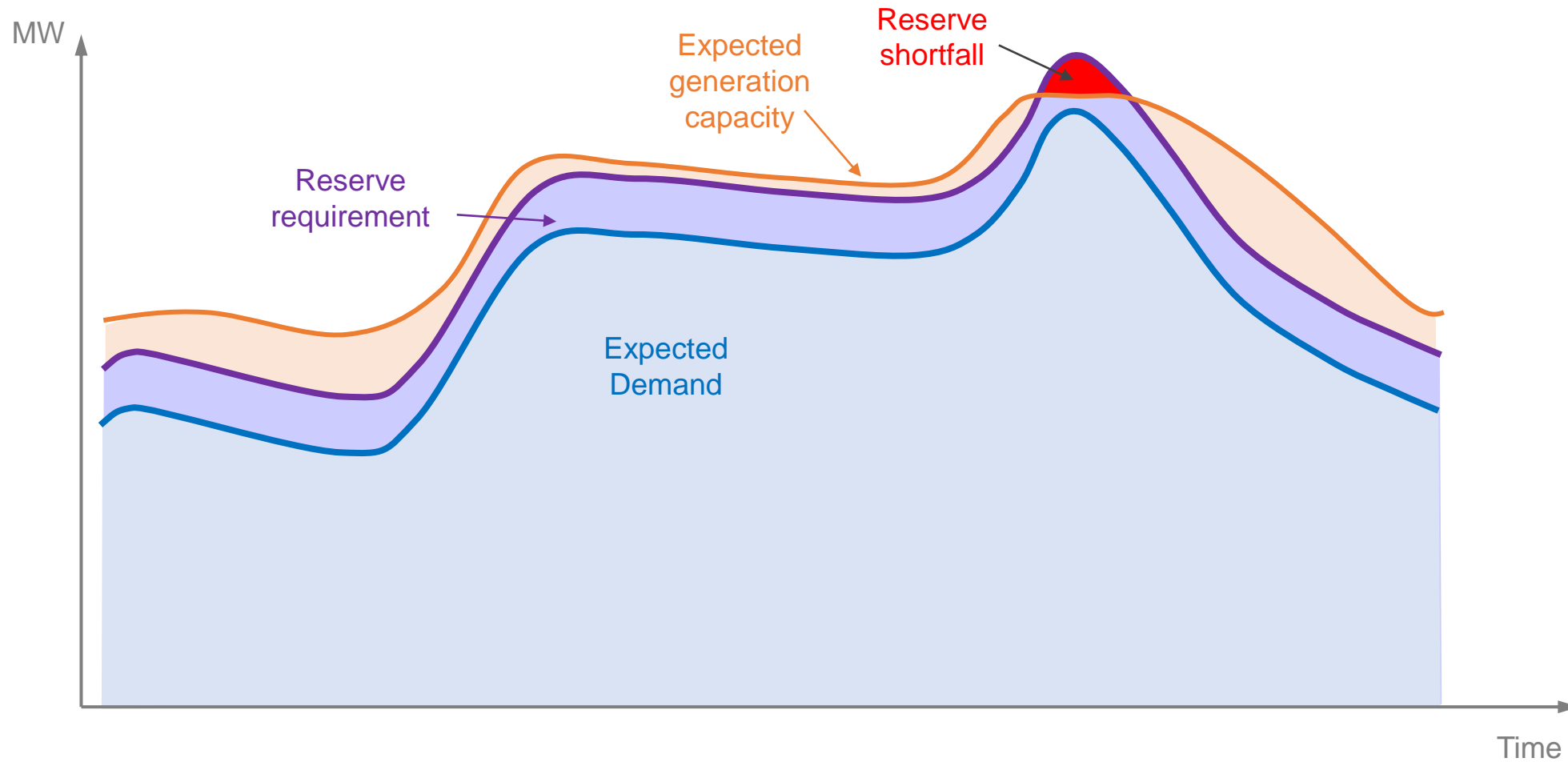
# Why it's important

- Consumers are looking to engage in the energy market when incentives are offered as demonstrated by the recent [Octopus Energy turn down trials](#).
- Longer term, wholesale and retail markets will unleash the potential of demand side flexibility with the introduction of half-hourly (HH) settlement in 2025
- Meanwhile, there's an opportunity to **accelerate the transition to a smart, flexible energy system** this winter through a nationwide demonstration of a demand reduction service

Providers participating in demand side flexibility services can:

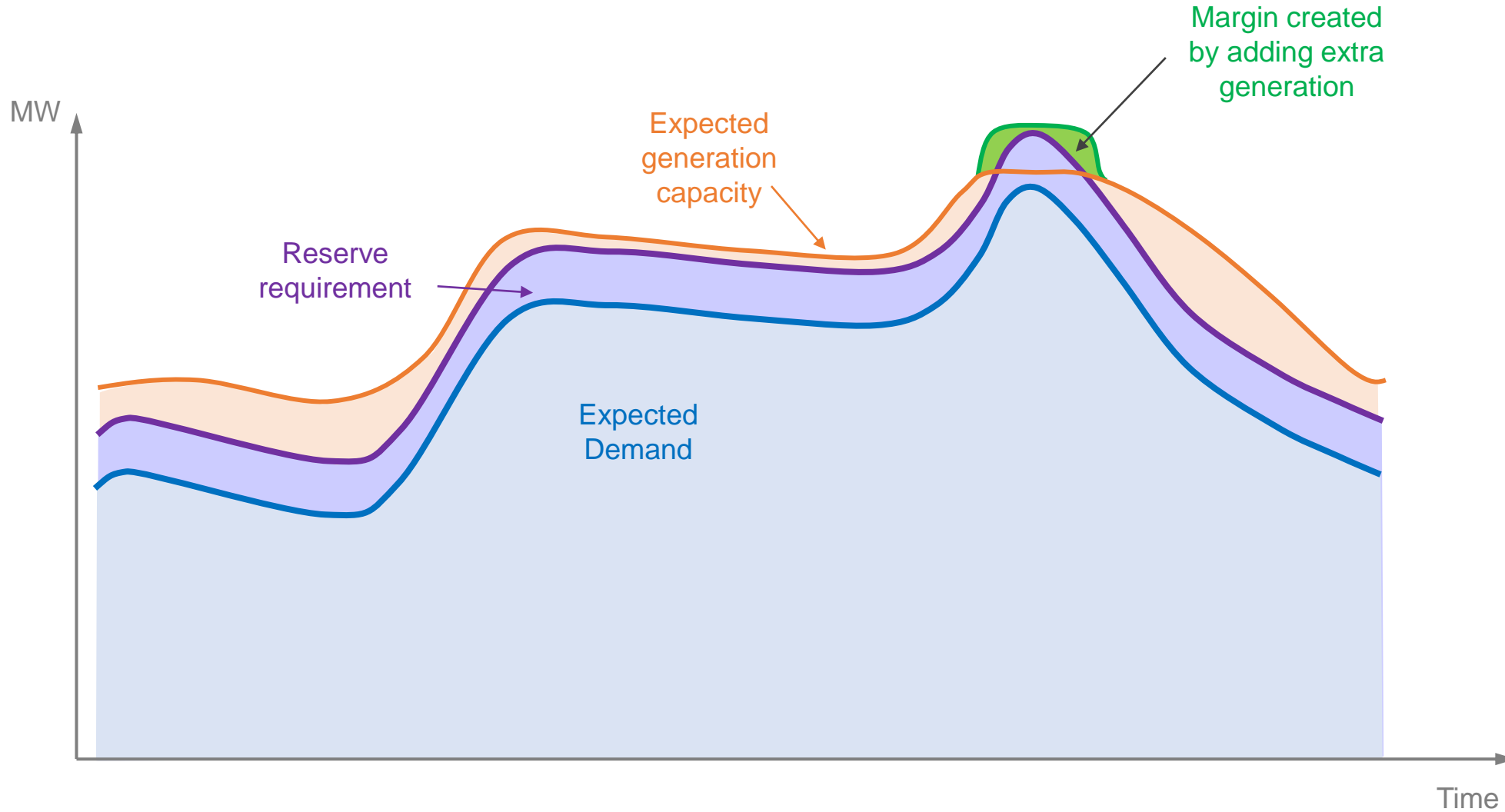
- ✓ Reduce the cost of their own bills
- ✓ Reduce overall costs of managing the energy system
- ✓ Reduce carbon emissions
- ✓ Speed up the transition to a smart, flexible energy system

# Example of managing system margins



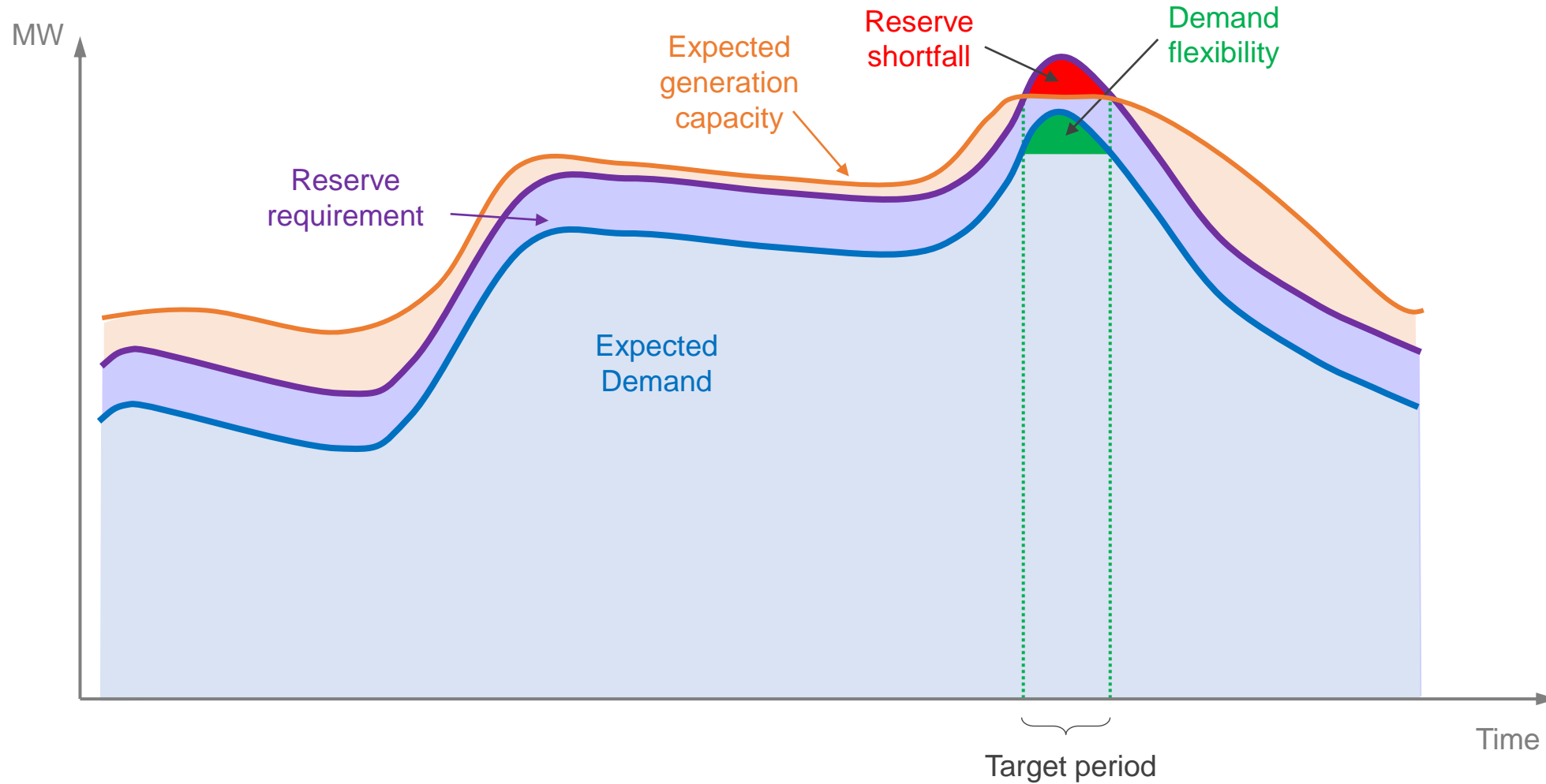
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# Example of managing system margins



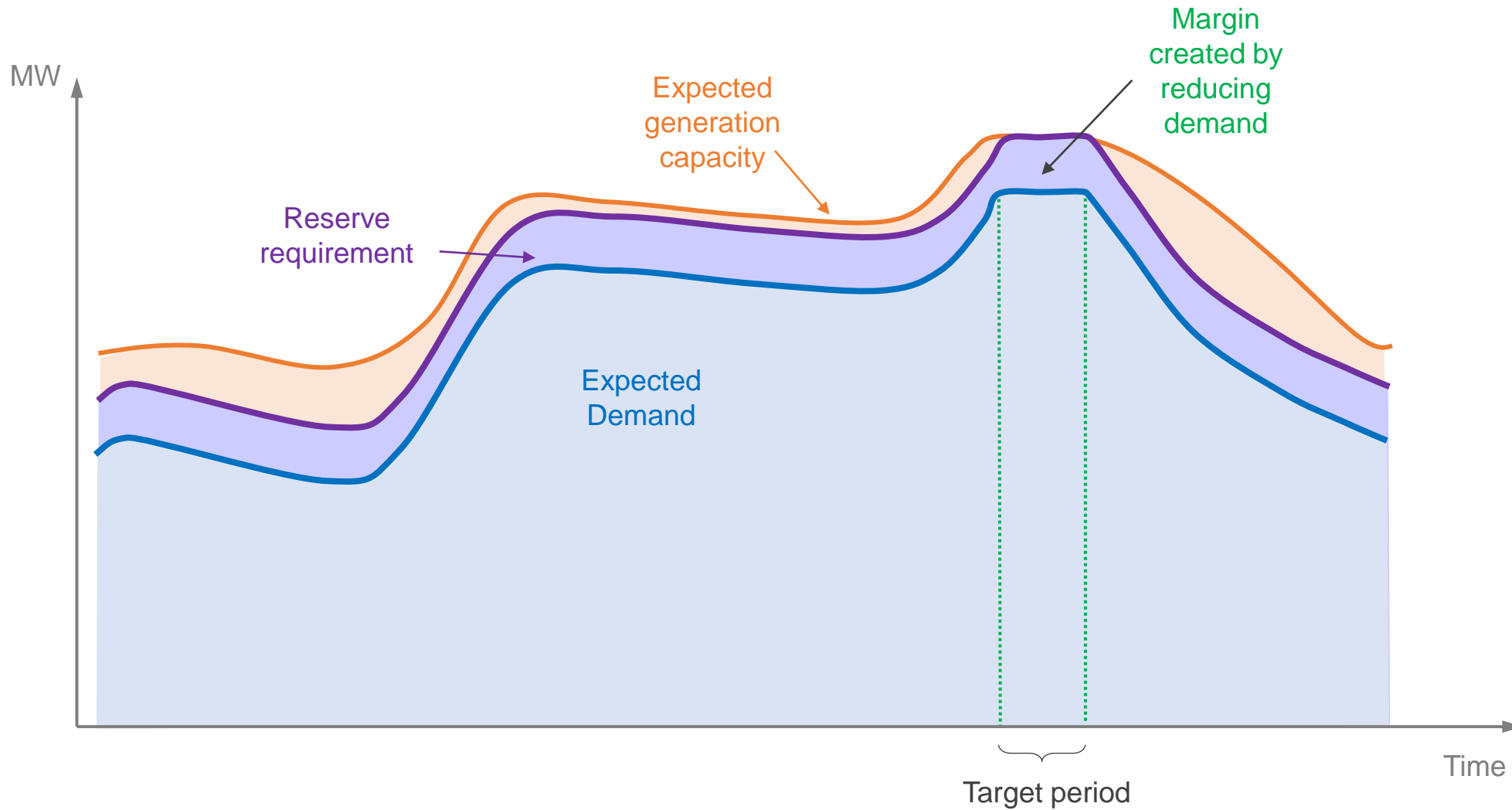
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# Example of managing system margins



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# Example of managing system margins



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# Further context

- When national demand is at its highest, during **peak winter days**, we would expect all available generation to be available and running, potentially with interconnectors imports and some demand-side response through price sensitivity and triad-avoidance.
- With this profile, there may be a requirement for **additional flexibility** to balance generation and demand, as well as to **achieve sufficient upwards reserve**.
- Our [early winter outlook](#) sets out our **base case view** that margins are expected to be **within the Reliability Standard** under normal market conditions.
- Our operational modelling shows that **there may be some tight periods** that we expect to be able to manage using our standard operational tools.
- The demand flexibility service is one of the **enhanced actions** we are creating as an **additional tool in our toolkit for this winter**.
- As an enhanced action, it will act as a **last resort service** to allow the ESO to **access the flexibility** that is **not currently accessible through existing services and market incentives**, in the event that insufficient upwards flexibility is forecast at the day ahead stage.

# When would the service be required?

- Our requirement for demand flexibility is most likely during the **high demand periods of the day**, on days where net interconnector exports are anticipated and with low renewable output.
- These high demand periods are typically during the **evening period between 16:00 - 21:00**, but could also be over the morning peak.
- These higher demand periods are more likely to occur on the **weekdays**. Where there is a requirement, we anticipate that it will be for **3 hours** during peak demand periods.
- We will assess and dispatch the service when a requirement is identified at **day ahead**.
- If there is a requirement, the MWh volume requirement for demand flexibility will vary day-to-day dependent on the demand and the generation profile.
- We will share further analysis on service requirements prior to the service going live.
- We will also **guarantee a minimum of 8 dispatch instructions** of the service for units that are ready to participate from November - see slides on **Testing**



High-level service

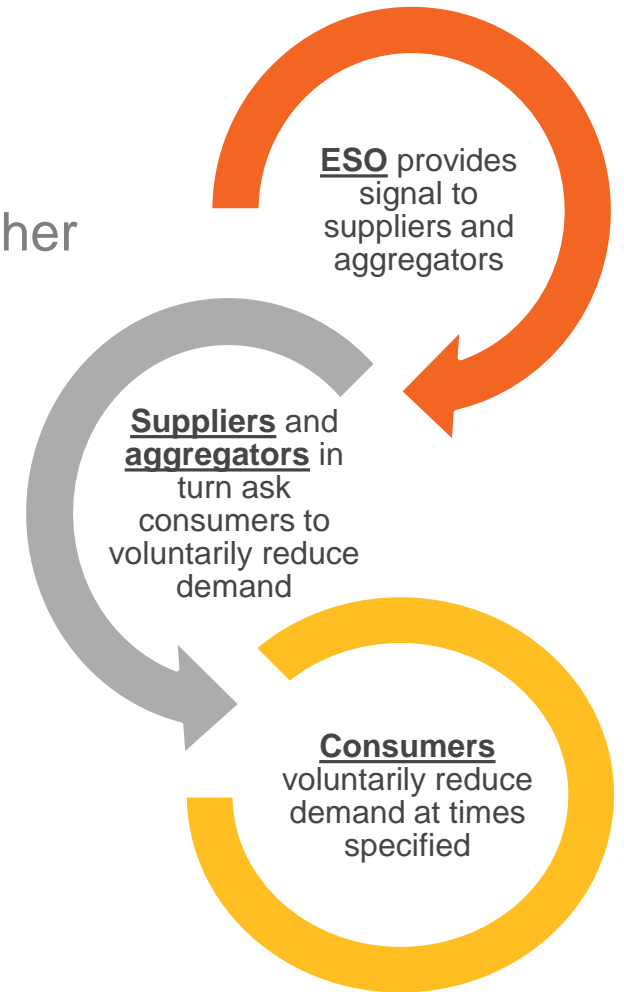
# Service eligibility

## Service open to

- As many participants as possible. This includes:
  - ✓ parties/assets which we cannot currently access through BM or other ancillary services

## Exclusions

- Assets with a Capacity Market (CM) contract
- Service will not be open to DNOs as they already procure similar arrangements with large/commercial suppliers & aggregators
- Stacking/splitting other services are not permitted



# Service parameters

## Participation

- Assets require half-hourly metering
- Demand reduction must be for a minimum of 30 minutes

## Providers

- Providers need to be able to respond to an email instruction for day-ahead delivery
- Bids size per unit (multiple units per provider is allowed)
  - minimum 1 MW / unit
  - maximum 100 MW / unit
- Providers must provide relevant HH metering and baselining data to demonstrate delivery of demand reduction

## Payment structure

Pay as Bid

£/MWh utilisation rate

Payment based on delivered volume

# How will the payment mechanism work?

- Demand Flexibility will be set up as a new Ancillary Service
- We are buying and nominating the utilisation straight away. No further dispatch instruction from NGENSO is necessary
- Payment will be based on actual delivery (no penalty for over or under delivery)



## HH settled volume

- We will apply *Applicable Balancing Services Volume Data* (ABSVD) to HH-settled volume

## Non HH-settled volume

- We will not apply ABSVD to non-HH settled volume, due to the complexity of the data and the smaller proportional impact on load-profiled demand

### Example:

- Provider forecasts they can deliver 100MW demand reduction
- ESO instruct them to target 100MW demand reduction
- Provider actually delivers 90MW demand reduction
- Utilisation payment only for the 90MW that was delivered

# Other service parameters

## Ramp Rates

- No restrictions. ESO will shape the requirement to manage the overall step-changes in demand to be manageable.

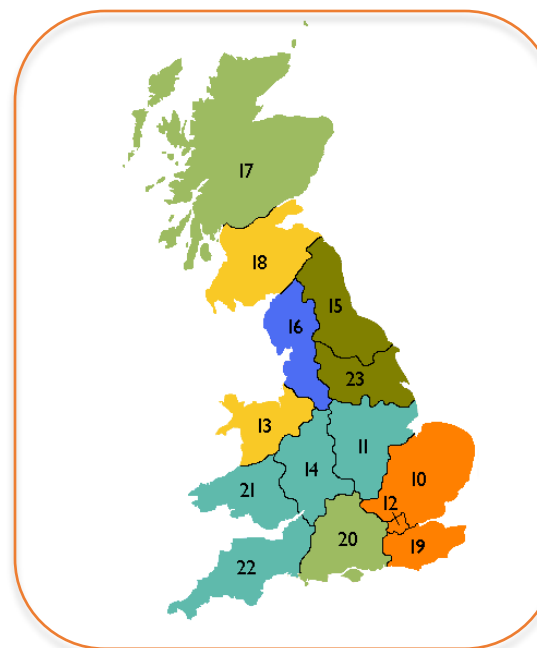
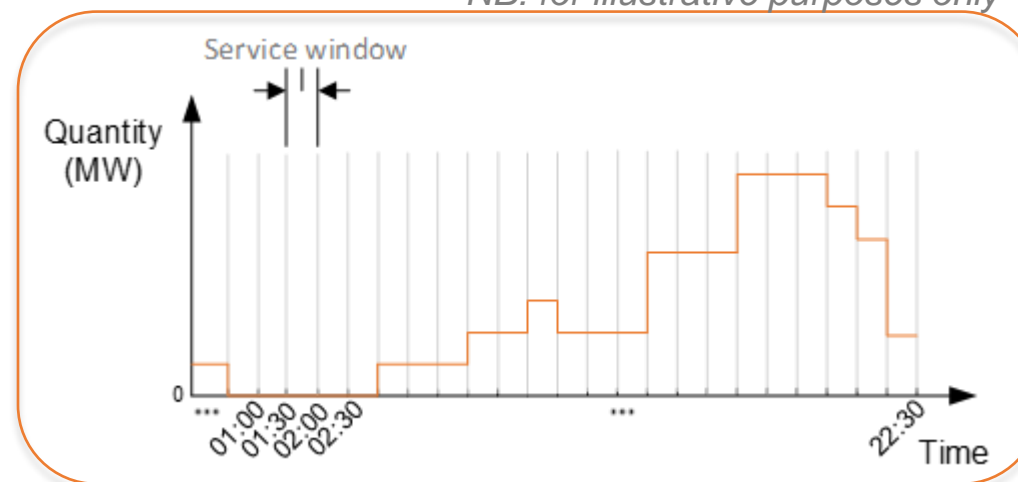
## Service Windows

- 48 half-hour windows per day (SP)
- Allows finer granularity of requirement and shaping procurement (to manage effective ramp rates)

## Aggregation

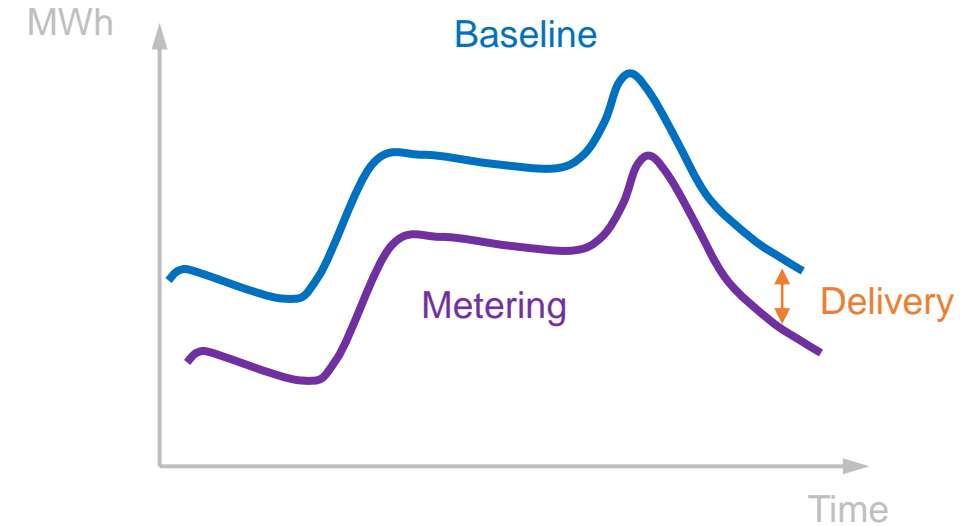
- This will be limited to **GSP group**
- Single national requirement

*NB: for illustrative purposes only*



# Baseline

- Baselineing is required to calculate the actual demand reduction delivered at a unit level
- We propose to use the methodology set out in [BSC P376 'Utilising a Baselineing Methodology to set Physical Notifications'](#) with an in-day adjustment
- This methodology has been previously approved by Ofgem in another context

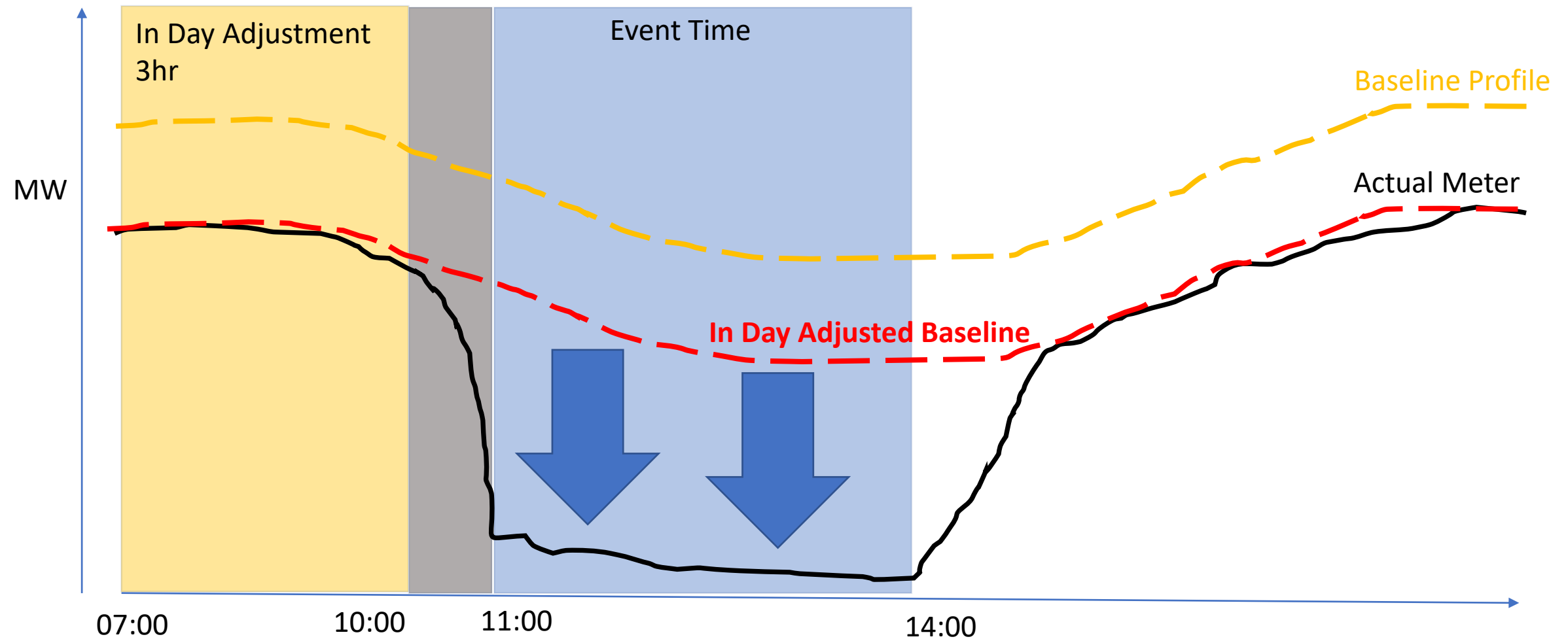




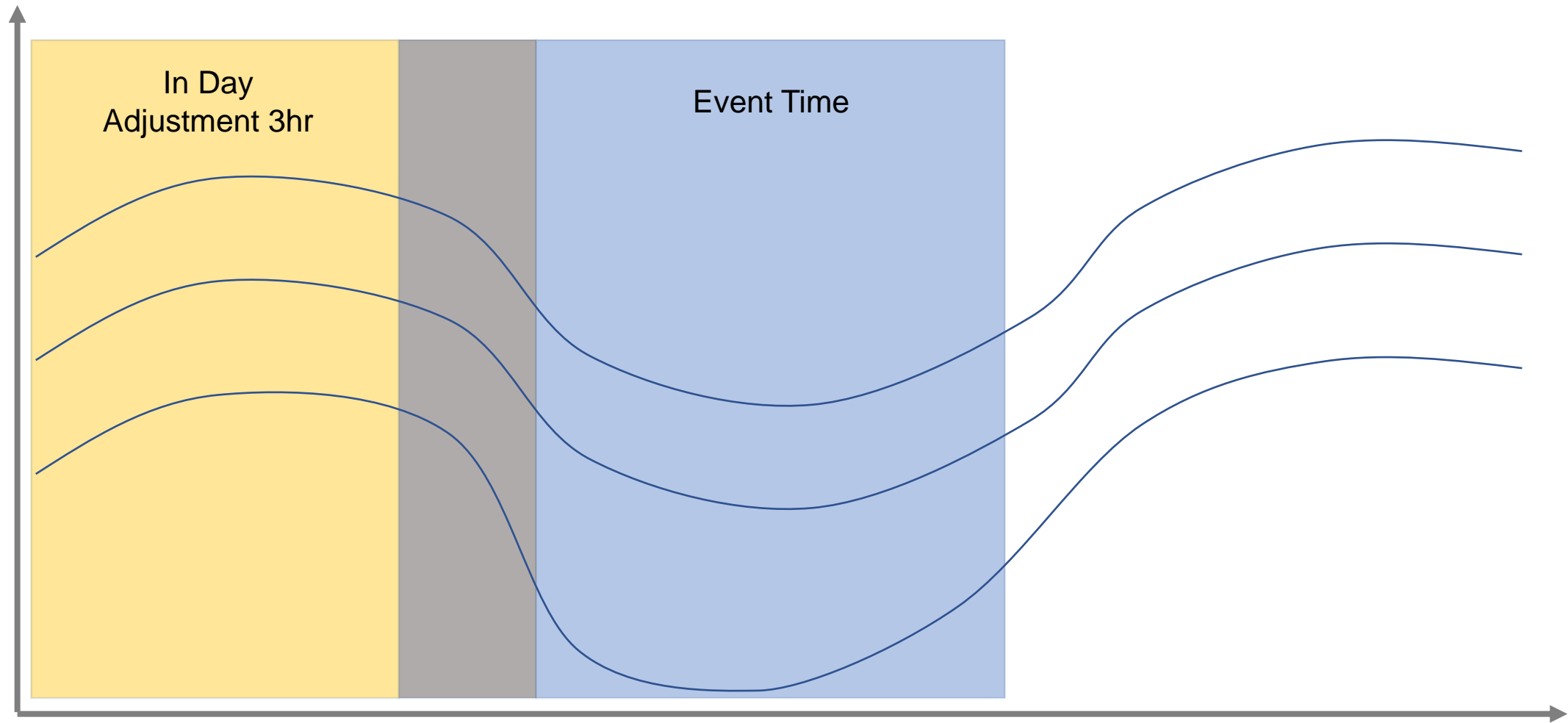
# Baseline Example

- To create a Baseline Profile, at unit level, the last 60 days of actual metered data is used
- The 60 days is split into three groups: Working Day ( Monday to Friday) / Non Working Day (Sat,Sun & Bank Holiday) / Event Day ( any day the unit took part in the service and delivered a Demand Reduction)
- If the service is requested for tomorrow which is a working day then:
- The baseline methodology will select the last 10 working days (out of the last 60 days) and average the data, weighted equally, to generate a Settlement Period by Settlement Period profile curve.
- This is the baseline profile curve that will be used to compare actual meter output during the time of service delivery
- To correct for all day specific effects such as weather conditions the baseline profile will be in day adjusted by using actual Metered Data over the three hour period up until one hour before the relevant Settlement Period where the unit is delivering the service. This will be compared to the calculated baseline values and an additive adjustment applied to ensure that the profile created by the baseline best matches real data for the run up to the Settlement Period.
- Now the unit has an in day adjusted baseline profile and actual metered data for the day the service is delivered.
- The difference between the two, for the settlement periods the unit is delivering the service, is the volume of demand reduction delivered. Settlements will pay as bid for this volume delivered.

# Baseline Example



# Baseline Example



# Settlement

## Baseline

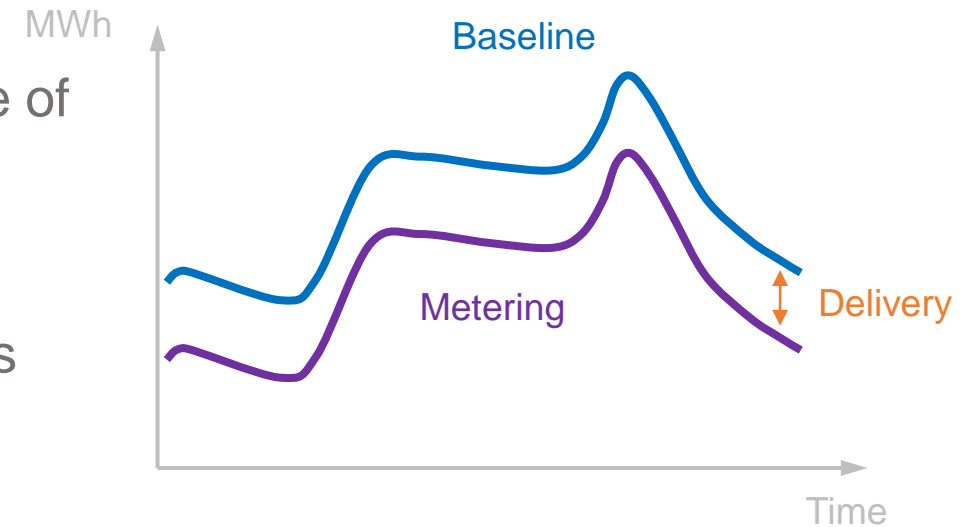
- Providers must provide the ESO the total half-hour baseline of their participating consumers

## Metering

- Providers must provide the ESO the total half-hour readings for the outturn demand of their participating consumers  
*NB: this requires half-hourly metering for participating consumers*

## Settlement

- Providers must give the ESO their total half-hour calculation for the estimated delivery of their service by their participating consumers
  - No specific penalty for under or over-delivery versus the accepted bid
  - Payment will only be for the quantity delivered
  - This will be monitored for consistency and errors
  - Service providers may be removed to allow others to deliver within acceptable parameters
- This will be settled in-line with our usual timescales and processes



# Assessment process and principles

## Process

- ESO receives submissions (quantities and prices) from providers for each service window
- Submissions are ranked in price order and accepted in merit order
- The quantity we ultimately accept may be different from our initial requirement, either more or less, as we respond to potential changes in system conditions
- Acceptance will be final and binding

## Pay as Bid

- Allows providers to tailor their incentives based on their end consumers and overall strategy (i.e. paid own submitted price)
- NB: this is an update from our initial thinking laid out in the C16 consultation*

## Submission size per unit

(multiple units per provider)

- Min 1MW
- Max 100MW

Provider A			Provider B		
Unit	MW	£/MWh	Unit	MW	£/MWh
A1	100	3	B1	75	4
A2	50	5	B2	100	12
A3	80	10			
A4	100	20			

ESO		
Unit	MW	£/MWh
	100	3
	75	4
	50	5
	80	10
	100	12
	100	20

Accepted submissions: Units 1-4 (MW: 100, 75, 50, 80; £/MWh: 3, 4, 5, 10)

Rejected submissions: Units 5-6 (MW: 100, 100; £/MWh: 12, 20)

\*Numbers are purely illustrative for purposes of sharing an example and not indicative

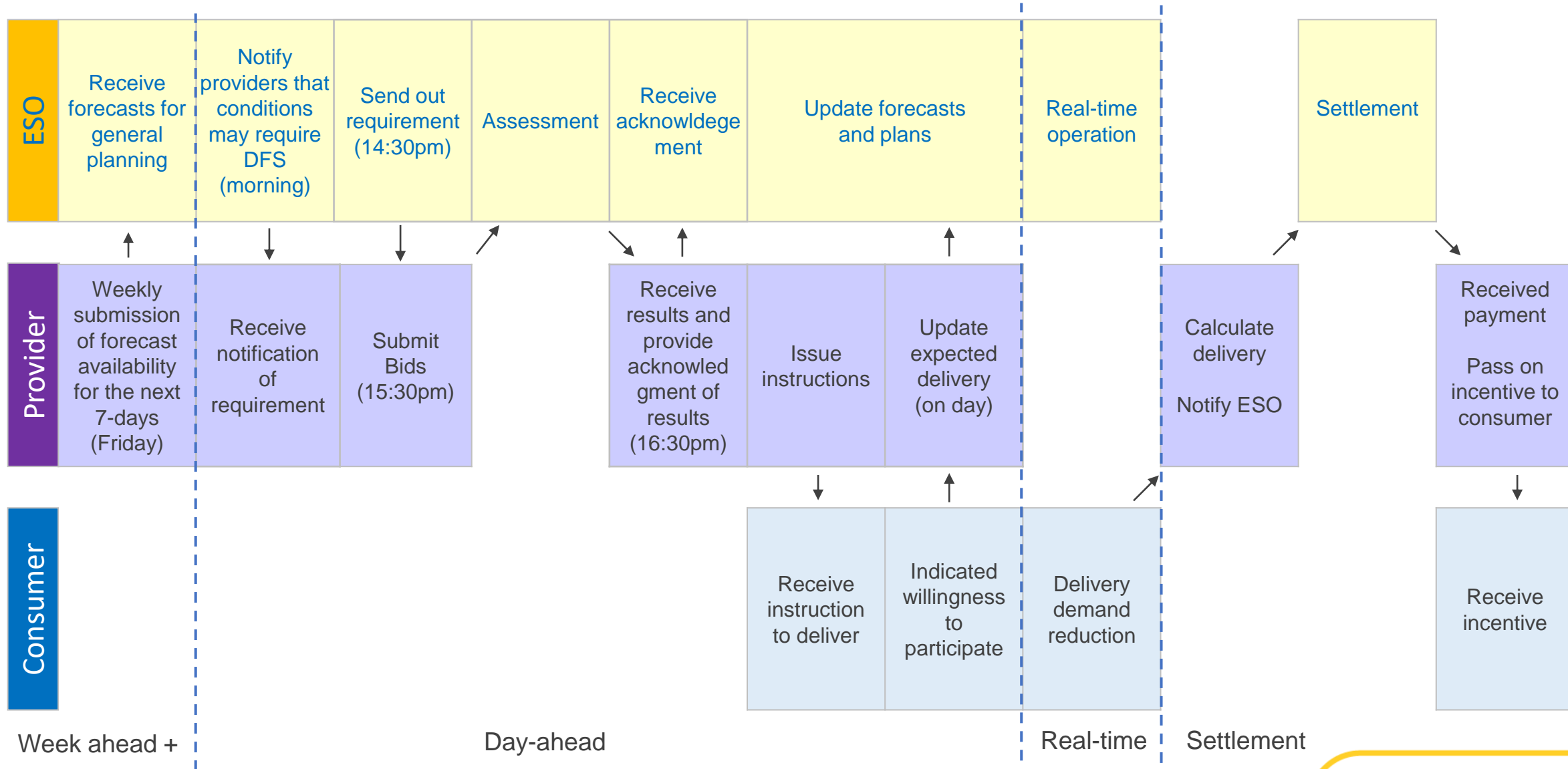
# Summary of service parameters

Service Topic	Parameter
Delivery Via	Load reduction / demand shifting
Service Duration	A min of 30 min demand reduction
Process	ESO will run and issue instructions at the day ahead stage. Calendar day ahead.
Metering	Participating assets must have HH metering which is accessible to tendering party.
Qualifying parties	Parties can be either HH or non HH settled. Cannot mix HH or non HH assets in units.
Unit Restrictions	1MW min – 100MW max
Aggregation	Units can aggregate but no wider than GSP group
Registration / contract terms	ESO anticipates using our Single Markets platform to register participants, units and adhere to the contract terms
Tender	Pay as bid. £/MWh utilisation rate
Tender submissions	Email submissions via an offline spreadsheet
Tender results	Results will be emailed to participants which also form their instruction to deliver
Payment	Payment based on delivered volume only
Settlement	Parties will determine their delivered volume based on the industry agreed P376 baselining methodology.
Settlement	Parties will need to send aggregated data to ESO within 7 days via email.
Settlement	ABSVD will be applied to HH settled units only.



High-level process

# Proposed high-level process





# Tests

- To build confidence in this service and to encourage early participation we will test the end-to-end process via a number of dispatch tests.
- A minimum of **8 dispatch instructions** for units that are ready to participate from November is guaranteed.
- We will run **four initial tests** for each provider
- The requirement will be for one hour
- These will take place in the **first full month** you are signed up for

*e.g. If you sign up by 31<sup>st</sup> Oct, your first tests will be in November*

*If you sign up by 30<sup>st</sup> Nov, your first tests will be in December*

- We will also run **one test per month** for each subsequent month you remain in the service, and that the service is active for

*e.g. If you sign up by 31<sup>st</sup> Oct, your first tests will be in November (4) and then you will have one test per month in Dec, Jan, Feb, Mar (total 8)*

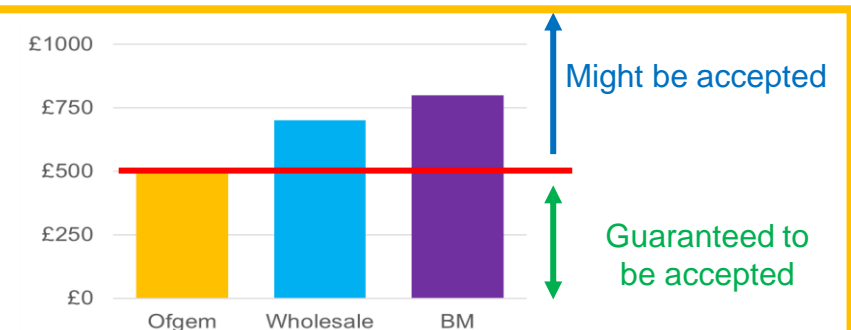
# Tests – Guaranteed Acceptance Price

- We need to balance between incentivising participation and managing the overall cost and impact of tests on the wider market
- Tests will have a “Guaranteed Acceptance Price” to provide revenue certainty for providers
  - if you bid *at or below* this price, you are guaranteed to have your bid accepted at the price you submit
  - higher priced bids may be accepted, but are not guaranteed to be accepted
  - We will publish this price with the test requirement before you submit bids
- The “Guaranteed Acceptance Price” for tests will be set no lower than the minimum of:
  - the Ofgem price capped rate for a unit of electricity for Domestic consumers
  - the day ahead wholesale price for the test period
  - the marginal BM offer price we expect to take in the test period

For example, if:

- the unit cap was £530/MWh (53p/kWh)
- the DA price was £700/MWh, and
- the margin BM price was £800/MWh

the guaranteed acceptance price would be £530/MWh



The “guaranteed acceptance price” **only applies to tests of the service**; it is not applicable when we use the service in a non-test scenario



Timings and next steps

# Key dates



New provider and new volume can enter the market throughout the winter

# Questions and answers

# Thank you

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Any further comments or questions please email  
[box.ESOConsumer@nationalgrideso.com](mailto:box.ESOConsumer@nationalgrideso.com)