Baringa

Baselining Experiences and Recommendations

Learning from TRANSITION and FUSION trials

Webinar, 10.00 – 11.45, 25th April 2023

transition
Moving to a smart future

FUSION

With support from:

Local Energy Oxfordshire

Certified B Corporation

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Agenda

Time	Activity	Duration
10:00 – 10:05	Introduction	5 mins
10:05 – 10:35	Results from trials - FUSION	30 mins
10:35 – 11:05	Results from trials - TRANSITION	30 mins
11:05 – 11:15	Q & A	10 mins
11:15 – 11:20	Baselining experience survey	5 mins
11:20 – 11:35	Recommendations	15 mins
11:35 – 11:40	Feedback on recommendations	5 mins
11:40	Close	-

Please use MS Teams chat function for questions

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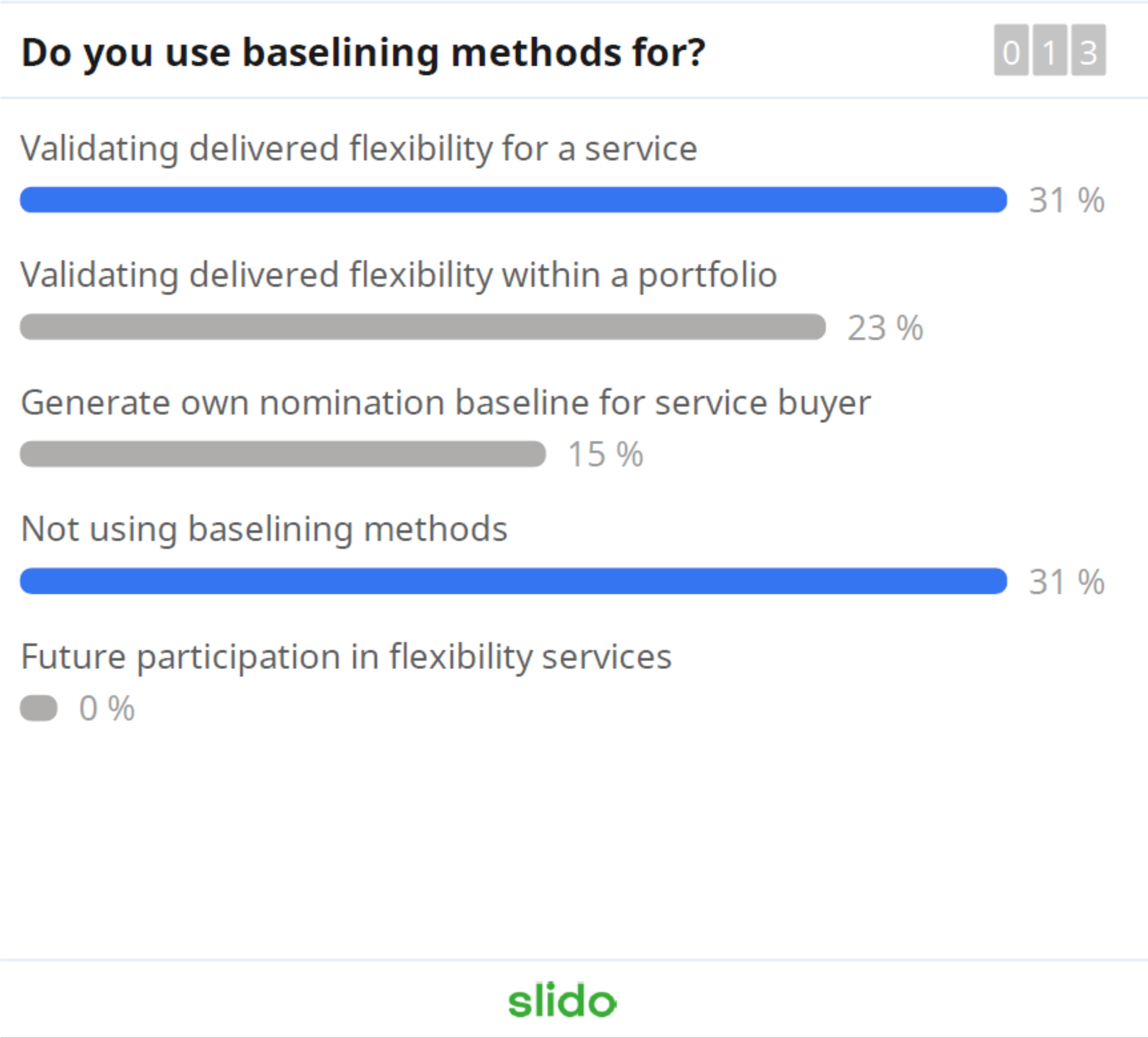
Welcome



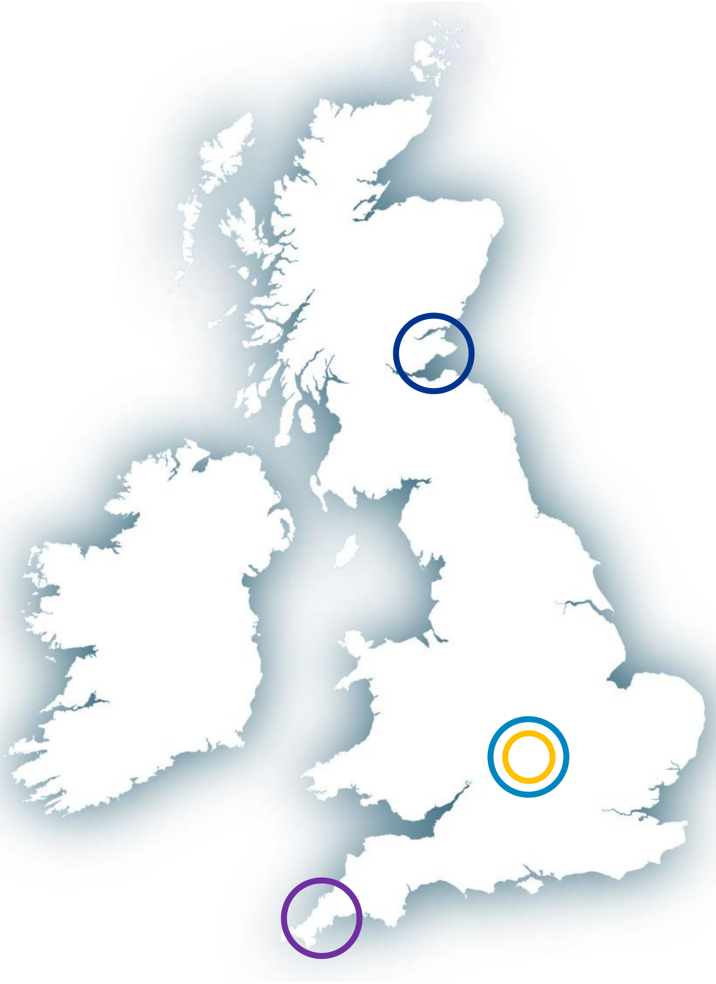
T.E.F. Overview

FUSION

- 5-year project
- Physical trials in East Fife
- Based on USEF market models, drawing on ON learning
- Trialling commoditised local demand-side flexibility

WESTERN POWER DISTRIBUTION EFFS

- 3-year project
- Learning will feed into the Cornwall Local Energy Market
- Based on ON market models, drawing on USEF learning
- Forecasting and data communication focused



transition

- 5-year project
- Physical trials in Oxfordshire Based on ON market models, drawing on USEF learning
- Trialling of local energy flexibility and the facilitation of peer-to-peer trading

Project LEO

Local Energy Oxfordshire

- 3-year Innovate UK project
- Physical trials in Oxfordshire
- Deliver a transformative integrated smart local energy system
- Maximise the prosperity from local energy systems and demonstrate new value creation opportunities.

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WHEN TRUST MATTERS

Baselining Learnings from FUSION

FUSION Trial Summary

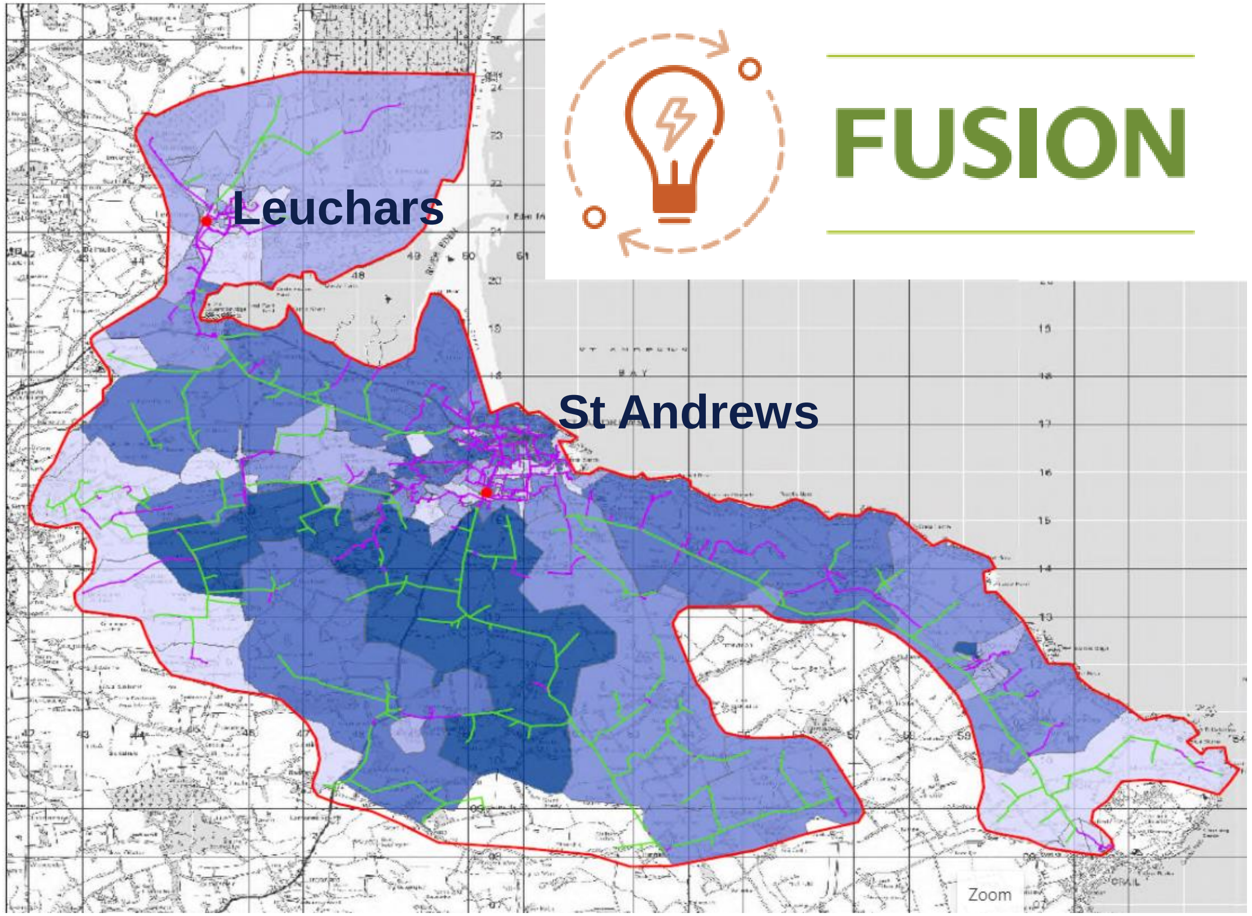
Jack Thomas & Aurora Sáez Armenteros
Jack.Thomas@dnv.com
Aurora.Saez@dnv.com

25 April 2023

1. FUSION trial overview

Overview of FUSION

- Project FUSION is funded under Ofgem's 2017 Network Innovation Competition (**NIC**),
- Led by SP Energy Networks in partnership with DNV, Origami Energy, Imperial College London (academic partner), SAC Consulting, The University of St. Andrews, and Fife Council
- FUSION implemented and operated a local flexibility market based on the **USEF framework**, which:
  - aims to facilitate effective coordination across all the different actors involved in the electricity market
  - provides a common standardised roles model and flexibility market design
  - describes communication requirements and interactions between market roles



Project Timeline

Trial Design and Preparation
2020-2021

Phase 1 Trial Begins
September 2021

End of Phase 1 Trial
March 2022

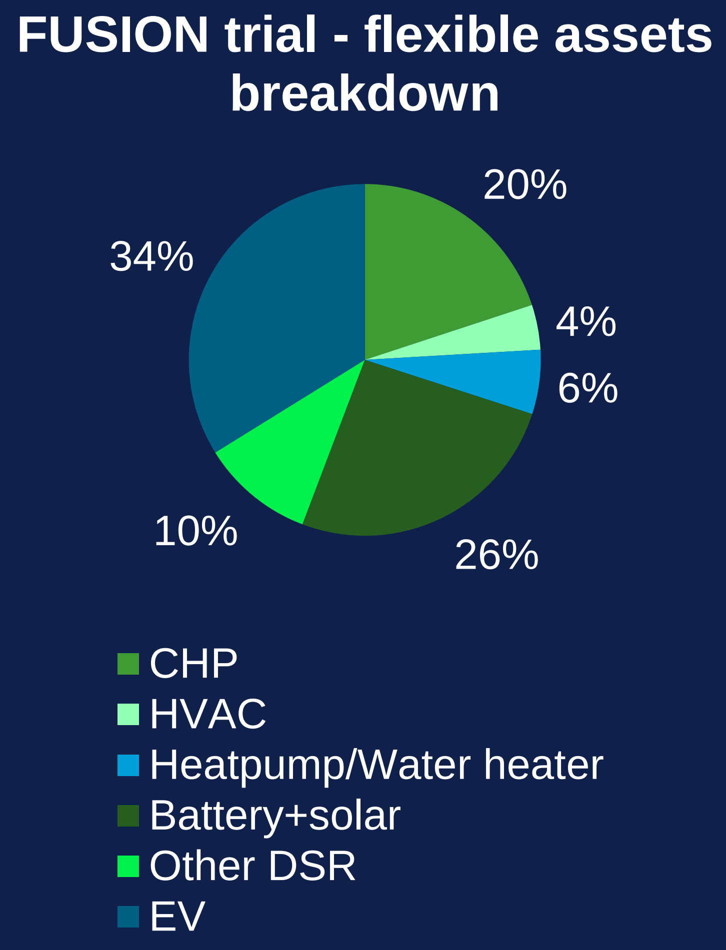
Phase 2 Trial Begins
April 2022

End of Phase 2 Trial
March 2023

Full Project Completion
November 2023

FUSION Trial Summary

- 2 congestion points at primary substations (St. Andrews and Leuchars) and 3 11kV feeders.
- 2 aggregators competed day-ahead by offering their flexibility to respond DSO requests
- Contracted capacity in total 1230 kW
- 80% of assets participating in the FUSION trial are from the residential sector
- During the trial period up to March 2023 the DSO sent **440 flex orders**, i.e., the DSO dispatched 55 MWh based on (simulated) day-ahead and real time needs.



Composition of Aggregator Portfolios

- The two portfolio types participating in the trial were:

Portfolio type	Congestion points	Composition
Portfolio 1	Leuchars Primary, St Andrews Primary St Andrews 11kV-18612, St Andrews 11kV-18614, St Andrews 11kV-18616	Heat pump/ water heater
		Battery + solar
		Other DSR
		EV
Portfolio 2	Leuchars Primary, St Andrews Primary	CHP
		HVAC

2. Baselining Objectives

Baselining in the Trial

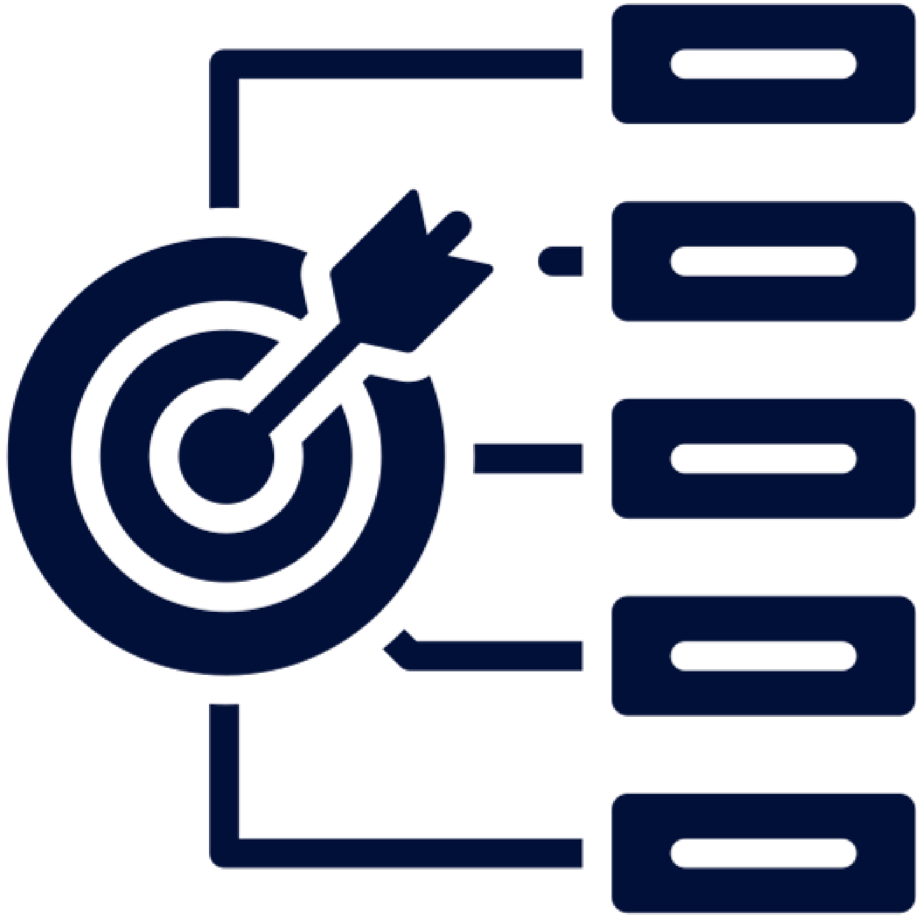
- The FUSION trial is using a **nomination baseline** (referred to within the trial as D-programmes or D-prognosis) as prescribed by the USEF framework
- Nomination baselines are the forecast of the generation or demand profile of the asset or portfolio if no flexibility activation would take place.
- Choice of method to do the forecast is left at the **discretion of the Flexibility Service Provider (FSP)**
- Forecast determined by FSP and sent to DSO at 11am on the day **before** delivery
- DNO can then use this profile to calculate the deviation of the metered data from the planned profile.
- Example of a nomination baseline is the **physical notifications** which are used in the Balancing Mechanism

Example of nomination baseline compared to actual consumption for a non-event day in the FUSION trial

FUSION objectives on baselining

We used data from the trial to explore the following objectives:

- Assess the performance of the **nomination baseline** used in the trial:
  - Quantitatively using different metrics
  - Qualitatively based on feedback from aggregators
- Compare the results with **other baseline methodologies** including historical and meter-before meter-after
- Understand the impact of baseline accuracy on the **reliability and cost** of flexibility procurement



Baseline Performance Assessment

The following metrics were used to assess the performance of the baselines:

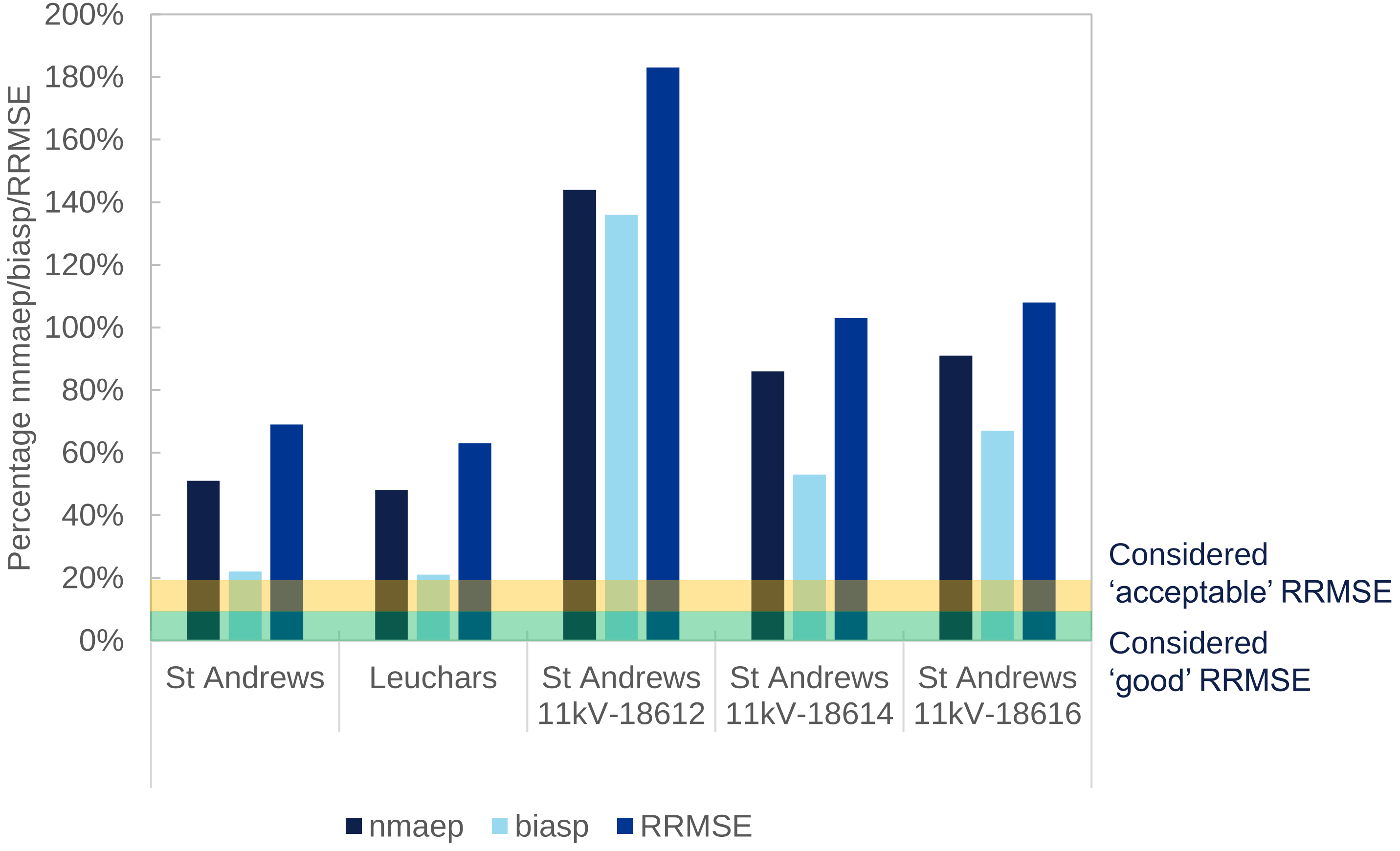
- **Quantitative**
  - *Variance:* normalised mean absolute error and relative root mean square error
  - *Bias:* normalized mean bias
- **Qualitative**
  - *Simplicity:* reflects the level of effort and the complexity of implementing and operating/using the baseline methodology. Simplicity refers to whether it is practical and the effort required is proportionate to the outcome.
  - *Inclusivity* the degree to which the baseline is suitable to use for (almost) all technologies. This criterion was analysed qualitatively based on the input from aggregators, and the diversity of assets contracted in the FUSION trial.
- **Other Aspects**
  - *Integrity* (potential for gaming behaviour) and *stackability* are left out of the analysis.

3. Nomination baseline

Insights from Aggregator Interviews

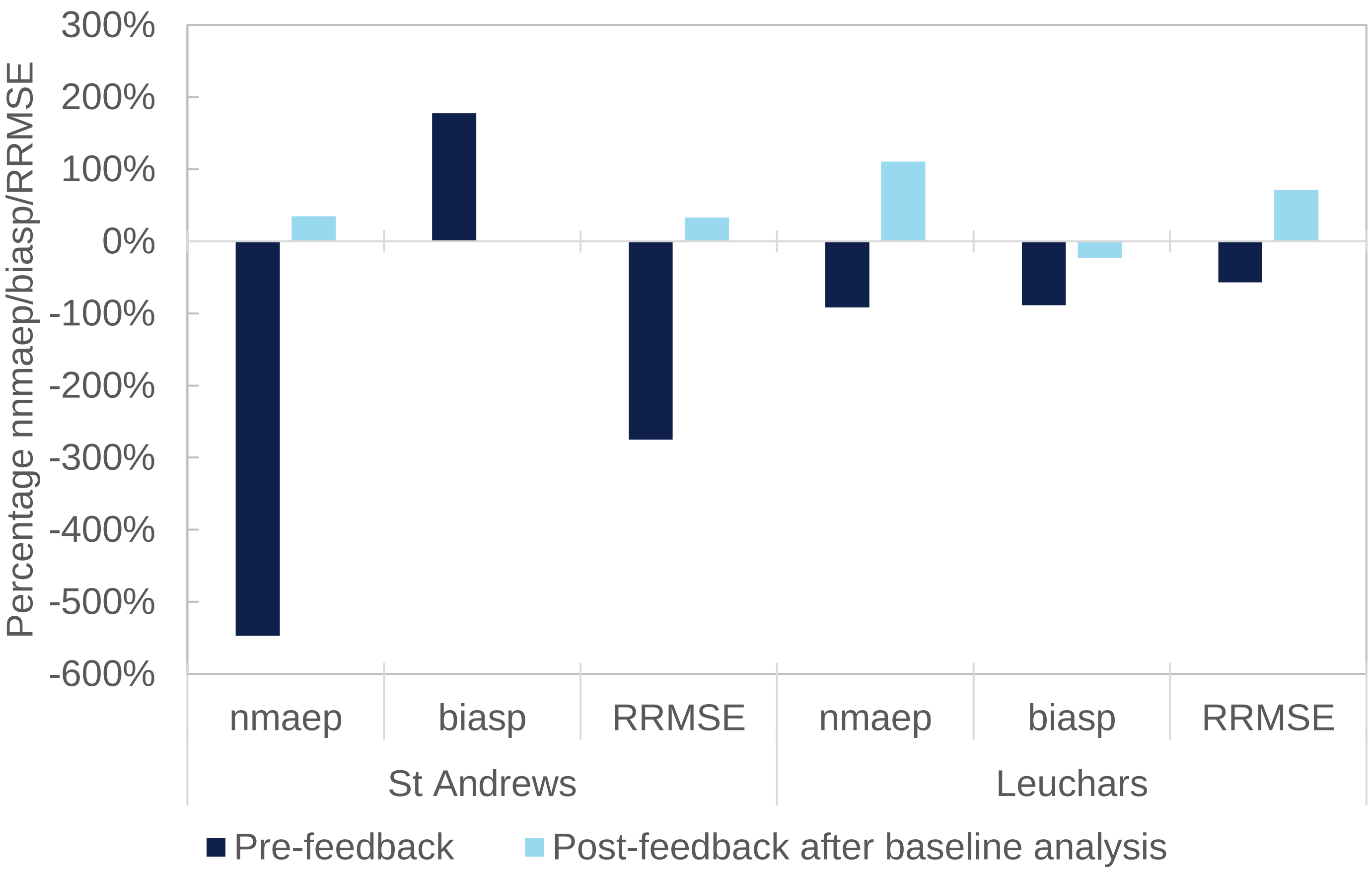
- Aggregators indicated that they are positive about the use of nomination baselines due to the **ease of implementing** for a **diverse range of assets**
- Aggregators recognise they need to improve the baseline quality
- Portfolio 1 was compensating for their baseline accuracy by overdelivering
- Portfolio 1’s forecasting method consists of forecasts per technology supported by machine learning
- Portfolio 2 initially used the baseline method from the New England model and then tested manually inputting the demand or generation before reverting back to the New England model
- Both aggregators **implemented improvements to their baseline methodology during the trial, as permitted with a nomination baseline**

Trial Baseline Accuracy Results for Nomination Baseline for Portfolio 1



- May and June 2022 were selected for a detailed assessment of baseline accuracy due to availability of non-event meter data
- Accuracy is generally considered below what is acceptable for a baseline
- Accuracy at substations better than for 11kV feeders where the overall loads were larger
- Significant difference in the performance between both aggregators

Portfolio 2’s Baseline Accuracy



- Portfolio 2 encountered issues with its baseline, particularly in the first half of Phase 2 of the trial
- Baseline consistently failed to predict the on/off state of the CHPs, which led to significant errors in the baseline
- **Baseline accuracy improved after communicating analysis on performance** back to aggregator, which led to changes to their methodology
- Lower baseline accuracy will have impacted Portfolios 2’s settlement calculations
- We have separated out the results from Phase 2 before and after these changes to demonstrate the improvement

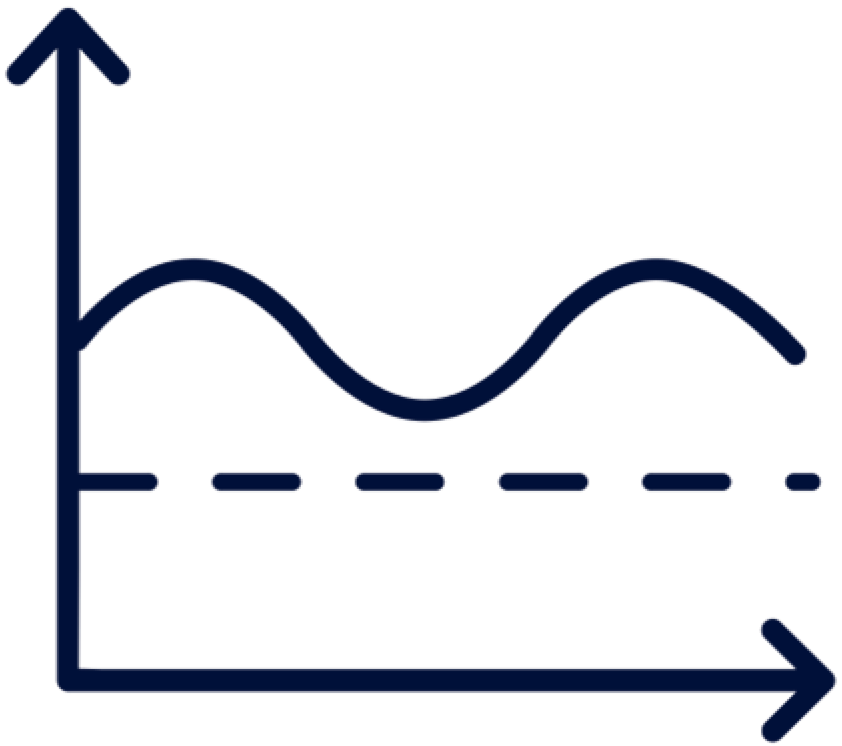
4. Comparison of Nomination with other Baseline Methodologies

Baseline Methodologies Considered

The different baseline methodologies explored as a comparison to the trial's nomination baseline were:

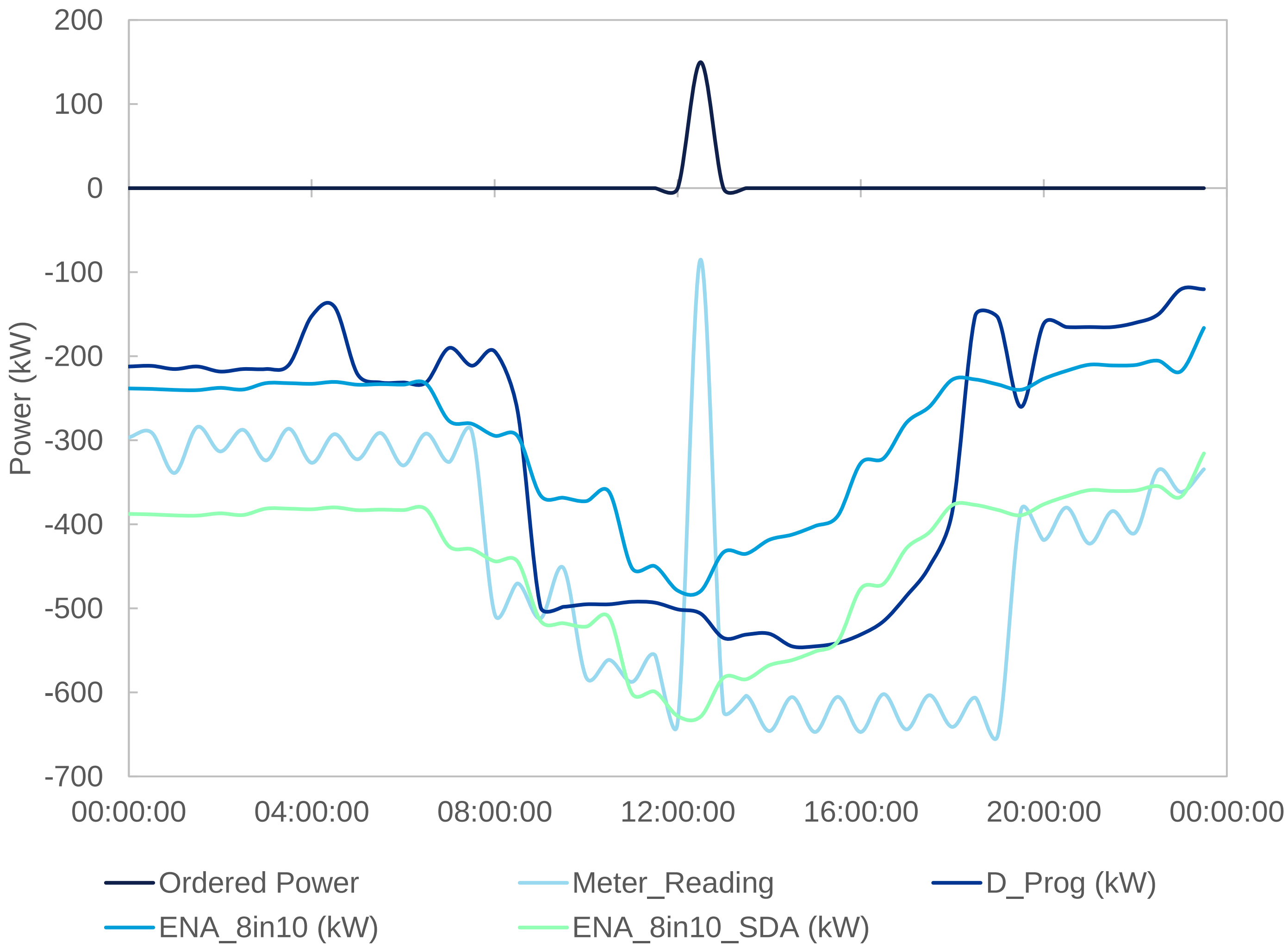
- **Historical baseline** - using historical data to calculate the baseline, usually based on recent data prior to the utilisation day. The ENA's online baselining tool[1] was used to generate a new historical baseline using meter data that picked the middle of the last 8 in 10 days

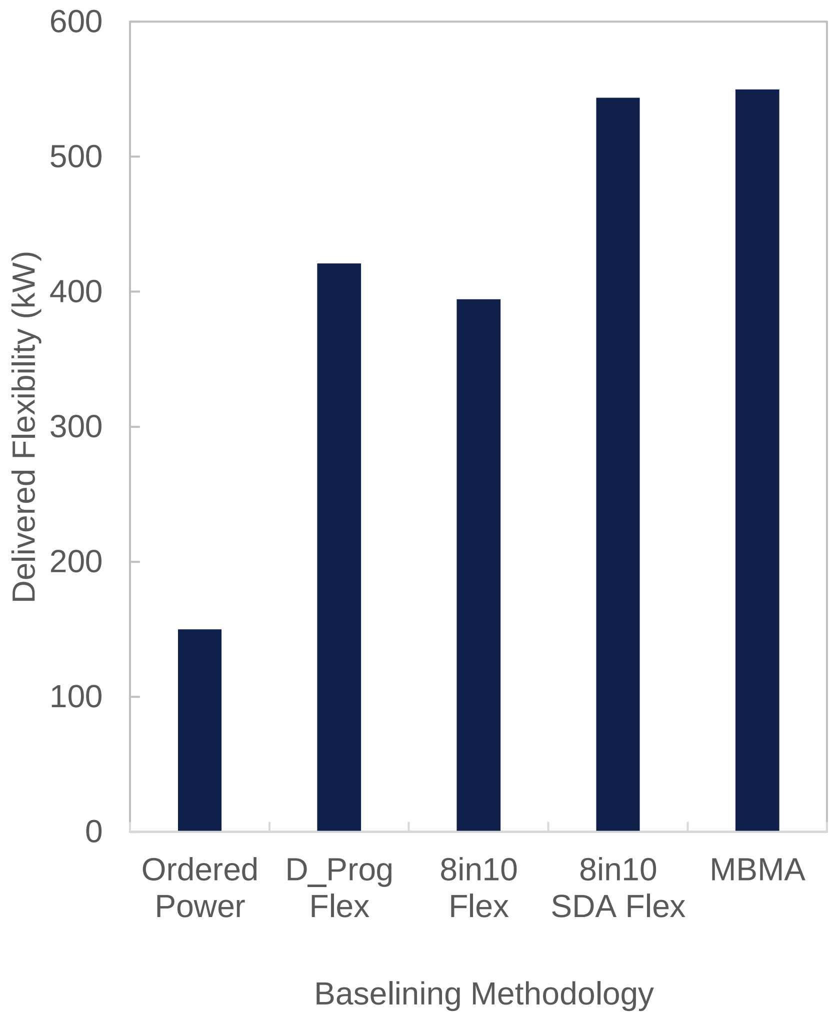
- **Meter-before meter-after (MBMA)** – a flat baseline that takes a value at the same level as the pre-activation meter reading against which to measure the delivered flexibility. This was generated in excel using aggregator meter data



[1]ENA - Flexibility Baselining Tool

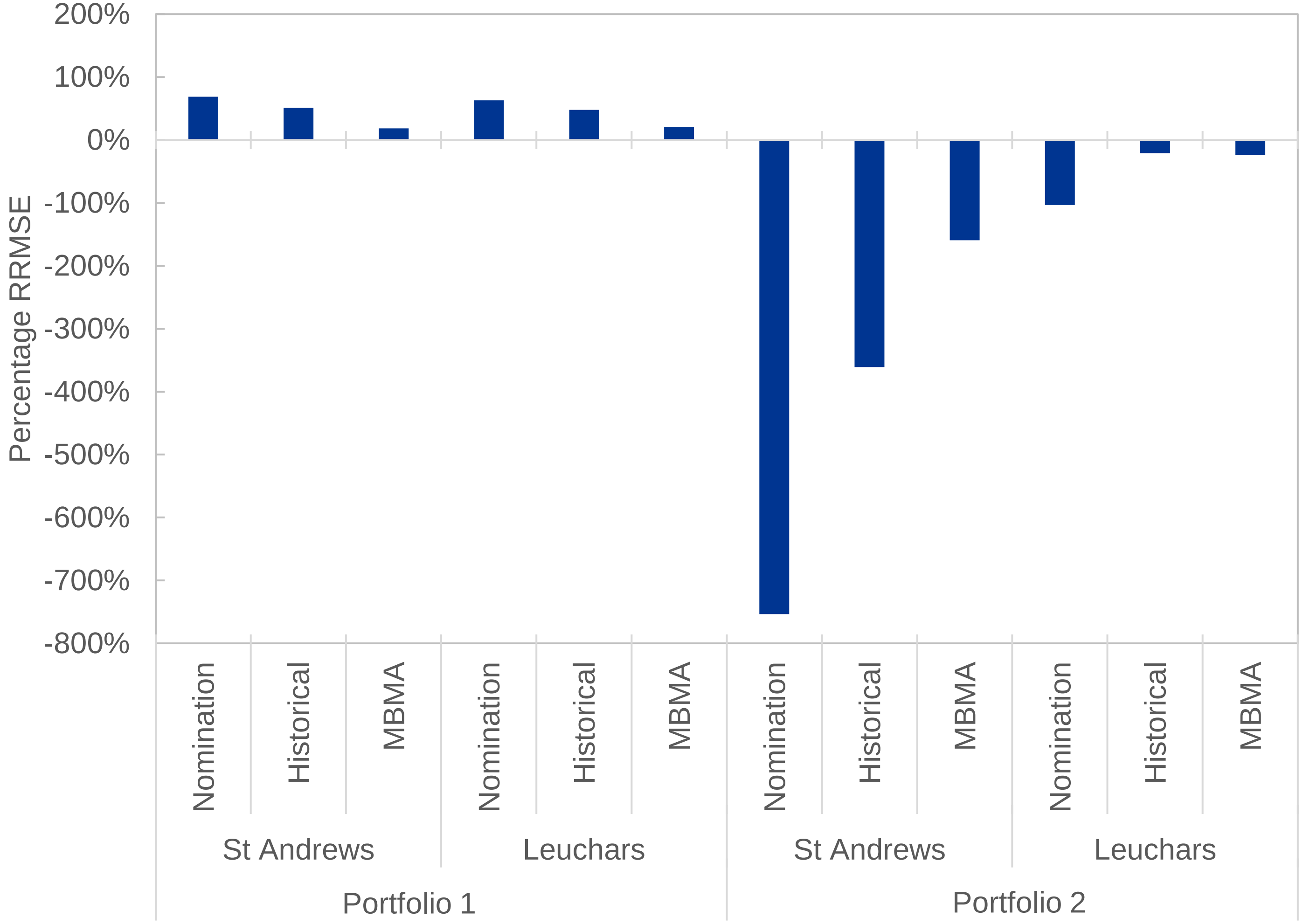
Comparison of Baseline Methodologies





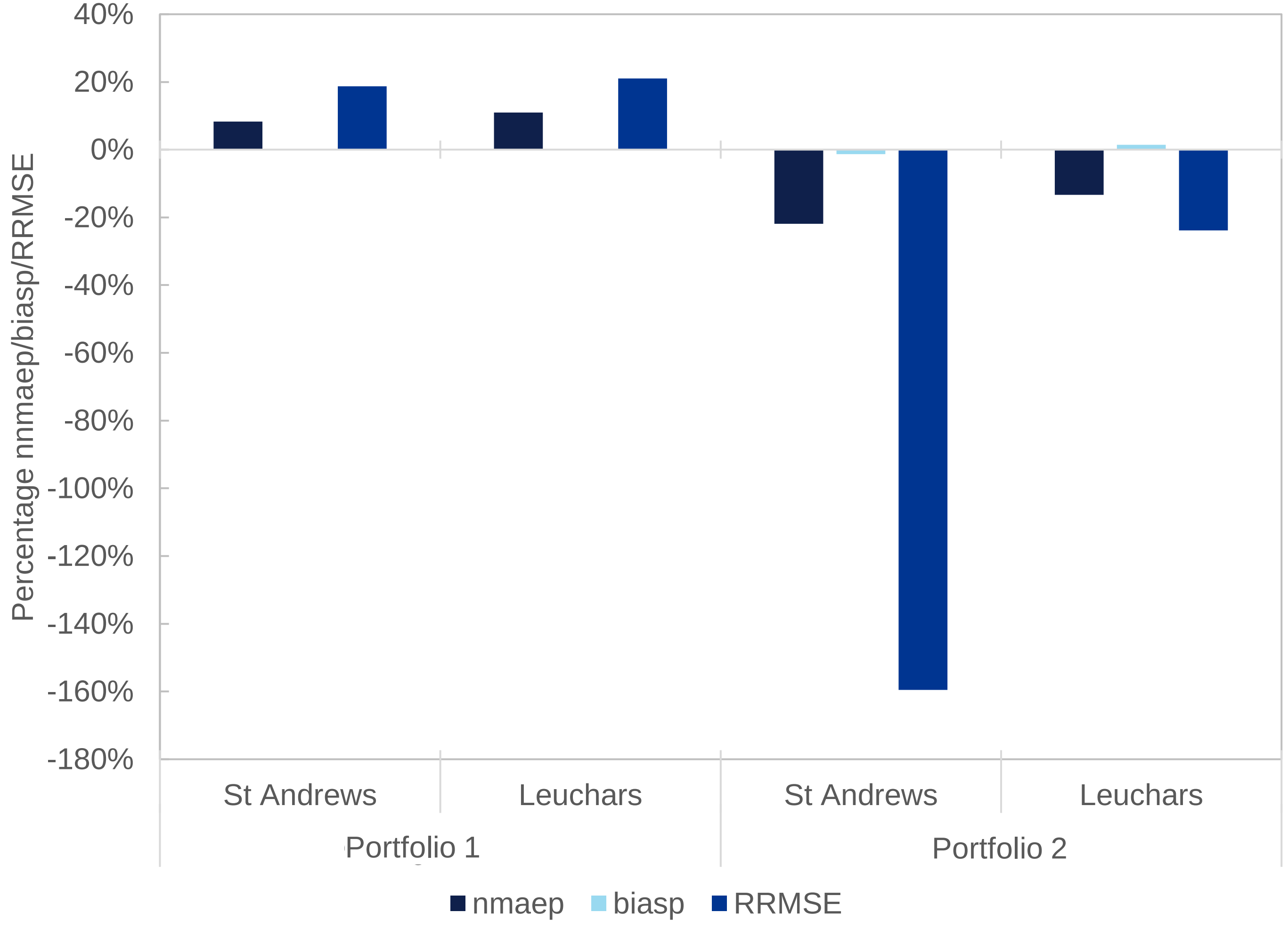
Notes
+ve is generation and –ve is demand

Comparison of RRMSE for Nomination, Historical and MBMA Baselines



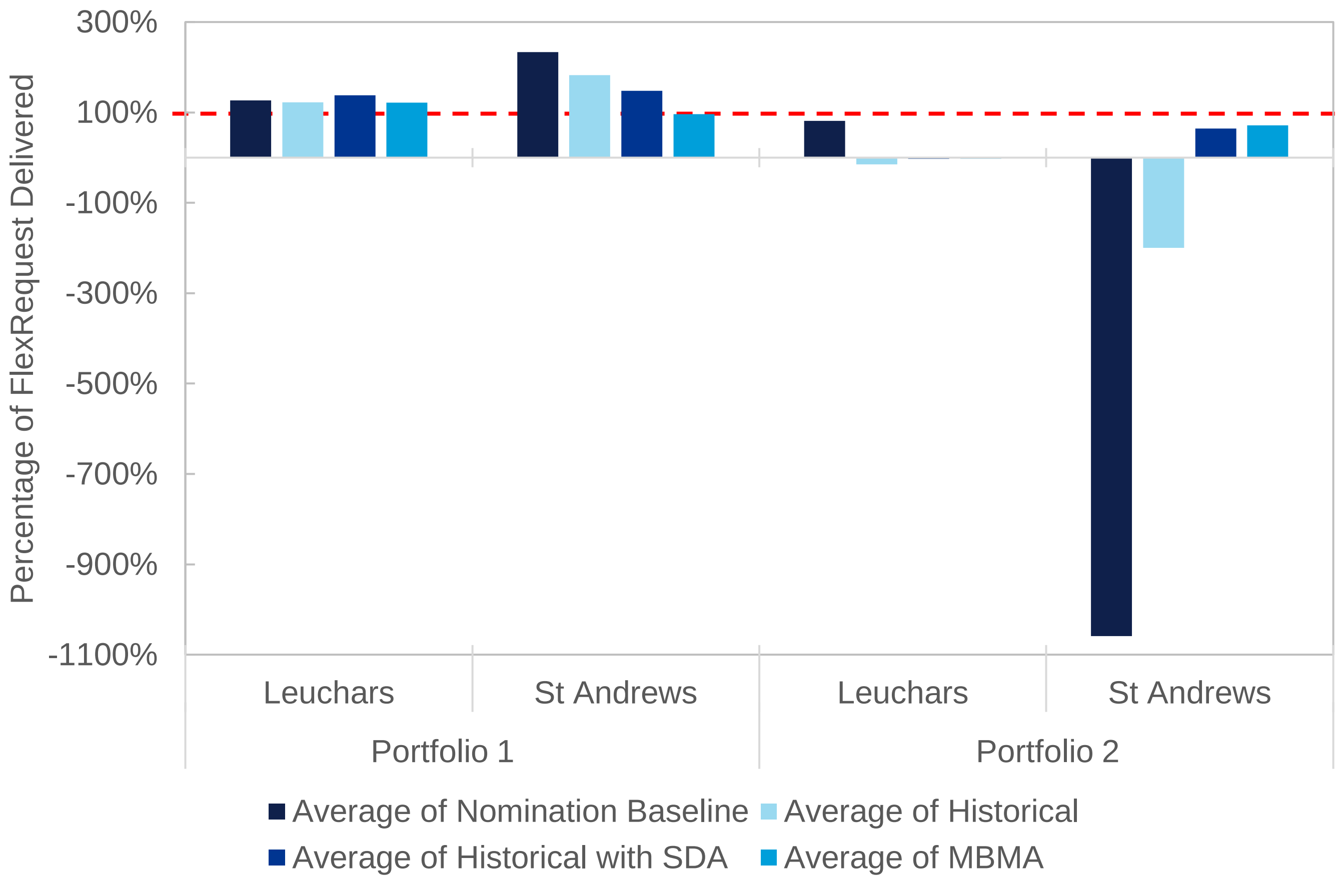
- MBMA and historical baselines performed better in terms of RRMSE compared with the aggregators' nomination baseline
- A historical baseline was still not able to achieve an accuracy considered acceptable for baselining and MBMA scored on the borderline of what is considered acceptable

MBMA performed the best of the three baseline methods using the trial data



- MBMA baseline achieved an RRMSE of between 19% and -160%
- nmaep ranged between 11% and -21%
- MBMA baseline bias approximated to zero
- MBMA, therefore, achieved the closest results to what is considered an “acceptable” baseline
- FUSION has **not assessed the gaming risk** related to the different baselines

Comparison of Delivered Flexibility Calculated Using Different Methodologies



- We calculated the delivered flexibility using the different baselining methodologies at two of the primary substations
- Graph shows the **percentage difference** between the requested and delivered flexibility
- Results show the high level of agreement between methods for Portfolio 1 at Leuchars
- Significant variation in the nomination baseline results across the different sites

5. Impact of Baseline Accuracy on Reliability and DSO Costs

Impact of Baseline Accuracy on Reliability

- Calculated the reliability after taking into account the baseline accuracy of the aggregator
- Probabilities show that there is much less certainty that the required flexibility was delivered due to the baseline accuracy
- **Caused by large standard deviation in the baseline error** making it more difficult to be confident in the volume of flexibility that was delivered

Aggregator name	Congestion point	Reliability of Aggregators Delivering Greater than FlexOrder Power After Accounting for Baseline Accuracy
Portfolio 2	Leuchars Primary	77%
	St Andrews Primary	59%
Portfolio 1	Leuchars primary	53%
	St Andrew Primary	51%
	St Andrews 11kV-18612	60%
	St Andrews 11kV-18614	53%
	St Andrews 11kV-18616	50%

Assessment of Different DSO Cost Drivers

- Calculated the additional flexibility required for the DSO to procure enough flexibility after accounting for the baseline accuracy
- Split the delivery risk evenly between the aggregator and DSO
- Significant additional flexibility required at all congestion points show that the **baseline accuracy had a large impact on the FUSION trial**

Aggregator name	Congestion point	Additional Flexibility Required due to Baseline Accuracy
Portfolio 2	Leuchars Primary	55%
	St Andrews Primary	17%
Portfolio 1	Leuchars primary	24%
	St Andrew Primary	26%
	St Andrews 11kV-18612	72%
	St Andrews 11kV-18614	43%
	St Andrews 11kV-18616	46%

6. Conclusion & Key Learnings

Conclusion & Key Learnings

- Nomination and historical baselines were not able to achieve an accuracy that is considered “acceptable” for baselining, however an **MBMA baseline** achieved on the borderline of “acceptable”
- Nomination baseline quality results are **highly dependent on the aggregators** that are participating in the trial
- Adequate baseline accuracy is essential for ensuring **reliability** of delivery of DNO flexibility services. Not achieving this accuracy would either (depending on how the risks are distributed) be detrimental to the DSO or aggregator depending on how it is implemented
- FUSION recommends to incorporate **on-going monitoring** of the baseline accuracy in a standardised way across DNOs

Baseline Learnings from TRANSITION

Emily Smith, Scot Wheeler and Atzin Madrid

emily.smth@sse.com

transition

Moving to a smart future

April 2023

TRANSITION

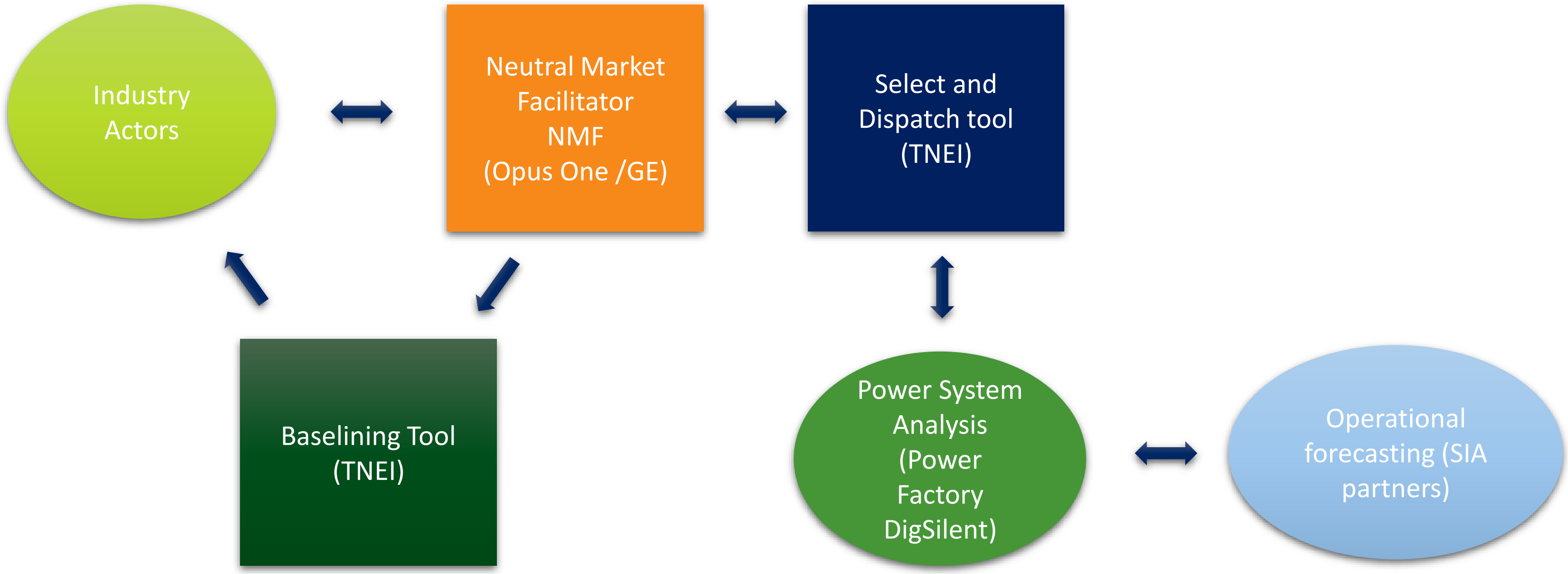
"LEO Local Energy Oxfordshire and transition Moving to a smart future bring together local community aspirations with energy industry drivers"

The projects provide a £40m programme which is further leveraged by £46m public sector investment.

- Customer Expectations
- National Policy
- Statutory Duties
- Regulation
- SSEN Business Model

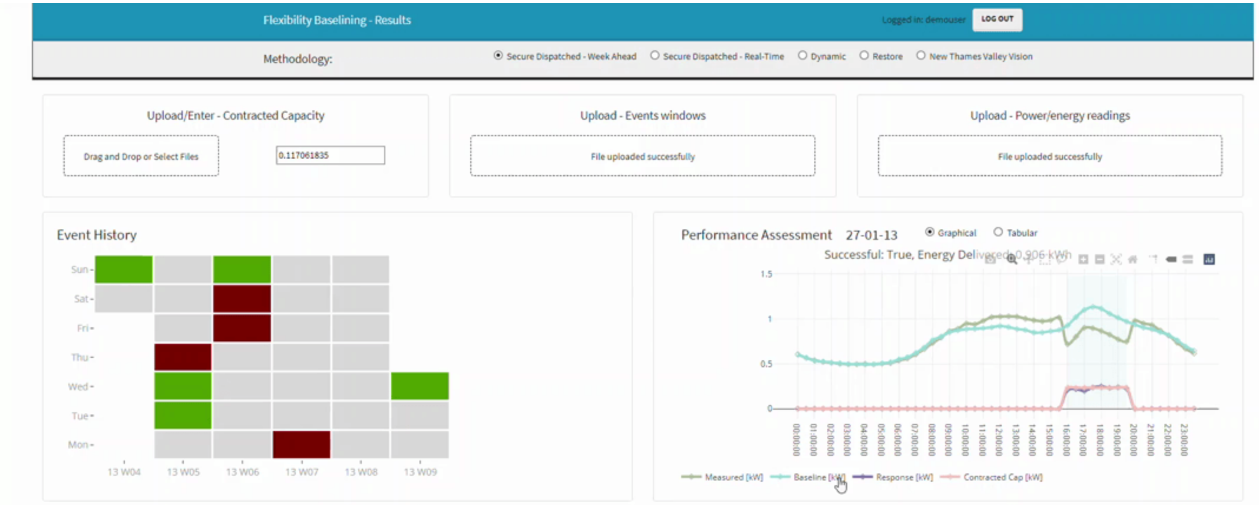
Understand customer drivers, risks and business cases.	Inform new business approaches which aid the funding of renewable generation and low carbon technologies.	Maximise the commercial opportunities for customers through the service market, peer to peer trading, etc.	
Demonstrate a commercially viable local energy market that is replicable.	Inform the interaction between traditional and emerging energy actors.	Deliver a model for future local energy system cross vector planning.	
Demonstrate methodologies for new and changed SSEN business functions required for DSO.	Demonstrate readiness for RIIO-ED2 negotiation, enabling SSEN to influence new regulatory mechanisms.	Inform economic case for a DSO and develop a business model for RIIO-ED2 and beyond.	Develop the role of a DSO acting as a neutral market facilitator.

System Design for DSO Flexibility Market



ENA Baseline Tool

- Online tool: https://ena-baselining.herokuapp.com/baselining_app/
- User Guide: https://www.energynetworks.org/industry-hub/resource-library/on22-ws1a-p7-flexibility-baselining-tool-user-guide-(25-mar-2022).pdf
- Mathematical Specification: https://www.energynetworks.org/assets/images/Resource%20library/ON21-WS1A-P7%20%20Appendix%20B%20Mathematical%20Specification%20(21%20Feb%202022).pdf
- ENA Webinar: https://www.youtube.com/watch?v=MKPzST8fzOY
- TNEI Insights Session – access to the recording can be requested here: https://tneigroup.com/tnei-insights



Day in the Life of a Flex Market

TRANSITION Trials Overview

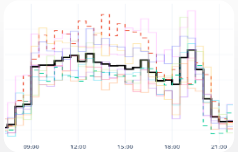
Service names	*Action required*	*Notice given*	*Trial periods testing in*		
			TP1	*TP2*	*TP3*
Sustain Peak Management	Demand down Generation up	12hrs	Y	Y	Y
Sustain Export Peak Management	Demand up Generation down	12hrs	N	Y	N
Secure DSO Constraint Management (pre fault)	Demand down Generation up	4hrs	N	Y	Y
Dynamic DSO Constraint Management (post fault)	Demand down Generation up	30mins	N	Y	Y
Peer to Peer — Trading MIC/MEC	One generator uses below MEC and one above / One consumer using above MIC and one below.	As agreed	Y	Y	Y

	TP1	**TP2**	**TP3**
Trials			
Total Number of Auctions (P2N)	35	110	255
Total Number of Auctions (P2P)	5	21	17
Total Number of Responses (P2N)	41	103	184
Total Number of Contracts (P2N)	35	92	181
Total kW Requested (P2N)	748	7454	46979
Total kW Contracted (P2N)	379	1553	1174
Participants			
Total Number of Active Participants (P2N)	2	6	5
Total Number of Active Participants (P2P)	2	2	3
Total Number of Active Assets (P2N)	4	22	35
Total Number of Active Assets (P2P)	2	2	4
Delivery			
Total Number of kW Requested (P2N)	611	2926	769
Total Number of kW Delivered (P2N)	560	1119	324

Please note the delivered quantity is not capped at the requested quantity.

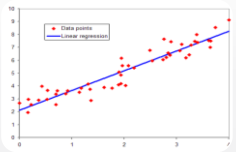
Baseline Methods

- To verify delivery, flexibility is measured relative to a ***baseline*** – the counterfactual power use had there not been an instruction to deliver.

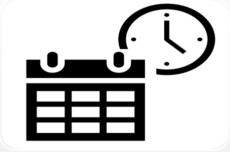


Historic Average

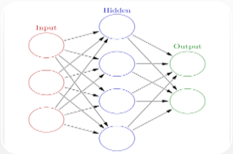
Control groups



Regression



Schedules



Machine learning

Interpolation

TRANSITION Baseline Options

General **mid-X-in-Y** historic method

- Uses data from the “middle” of the last X of Y days.
- Days are ranked based on a metric e.g. peak or average energy.
- Optional Same Day Adjustment (SDA) adjusts baseline using an event day reference point.

TRANSITION Trials

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

Historic Baseline	**Nominated Baseline**
Uses historical data to create the baseline	Uses a forecast to create the baseline
Baseline data must be uploaded at the beginning (1st – 10th) of each month during the Flexibility Contract	Baseline data must be uploaded by 17:00hrs for each day during the service period
Baselining is conducted by SSEN who also do any adjustment for variable factors e.g. weather	Baselining conducted by Service Providers. No adjustment made.
Historic meter readings must be sent	No historic meter readings required - baseline forecast provided instead

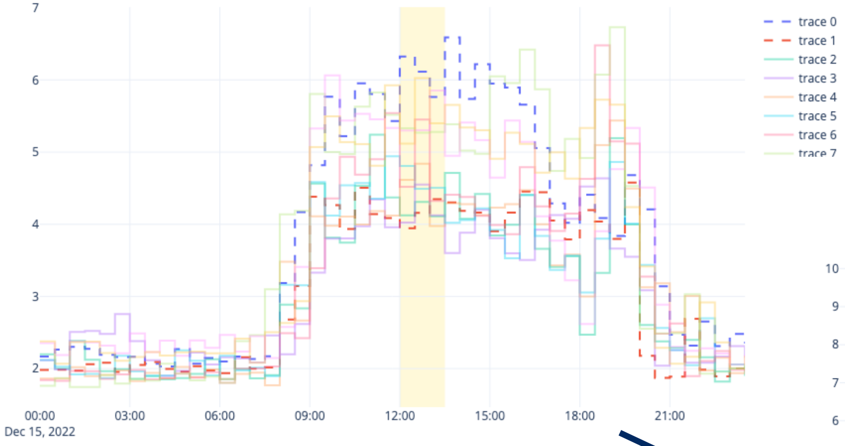
Nomination Baseline

- Provided by the service provider
- Submitted ahead of (and irrespective of) instruction.
- DNO option to audit as disincentive to manipulate.
- Could be a zero baseline.
- May require service provider to have (advanced) forecasting tool.

TRANSITION Trials

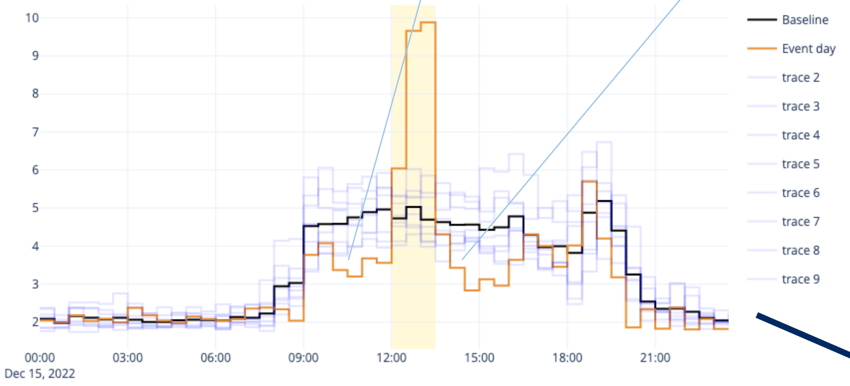
- Only chosen once in trials.
- Perceived as being more involved by service provider.

Historic Baseline with SDA – example



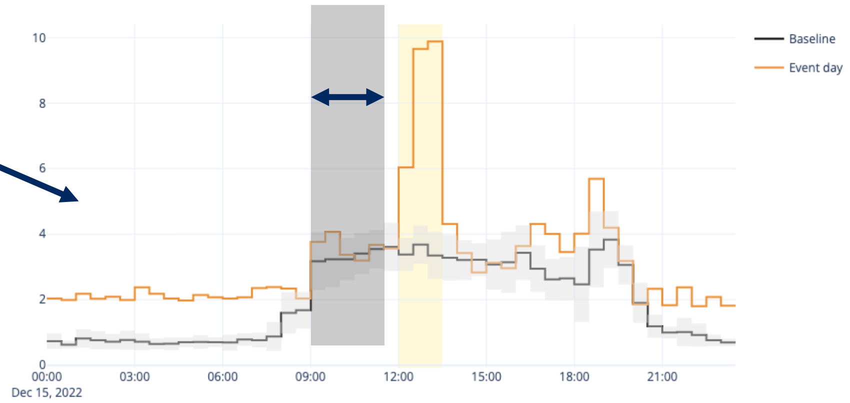
1. Determine historic days

Mid 8-in-10 based on event period average energy



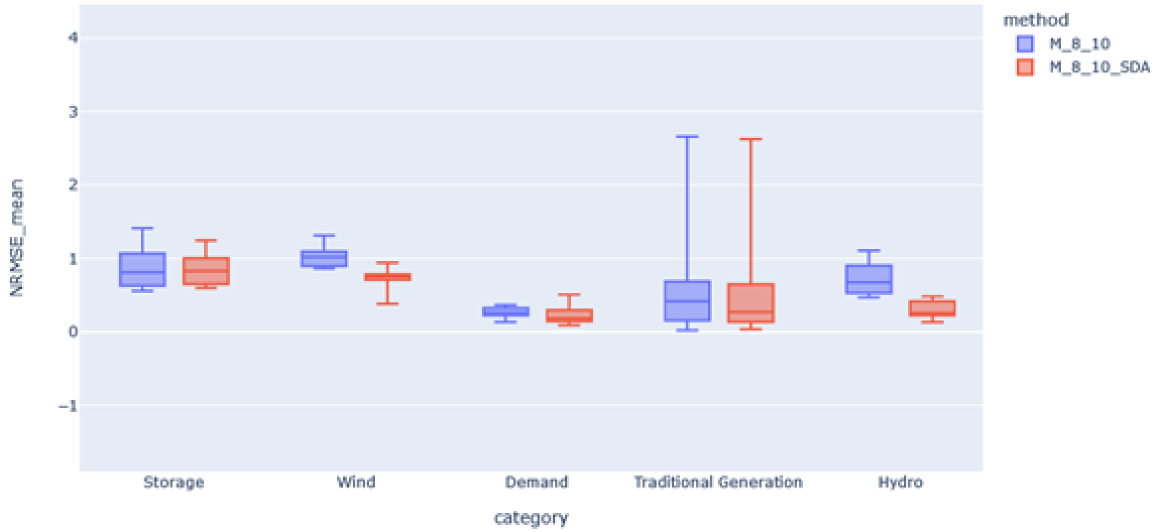
2. Take the average for each time period

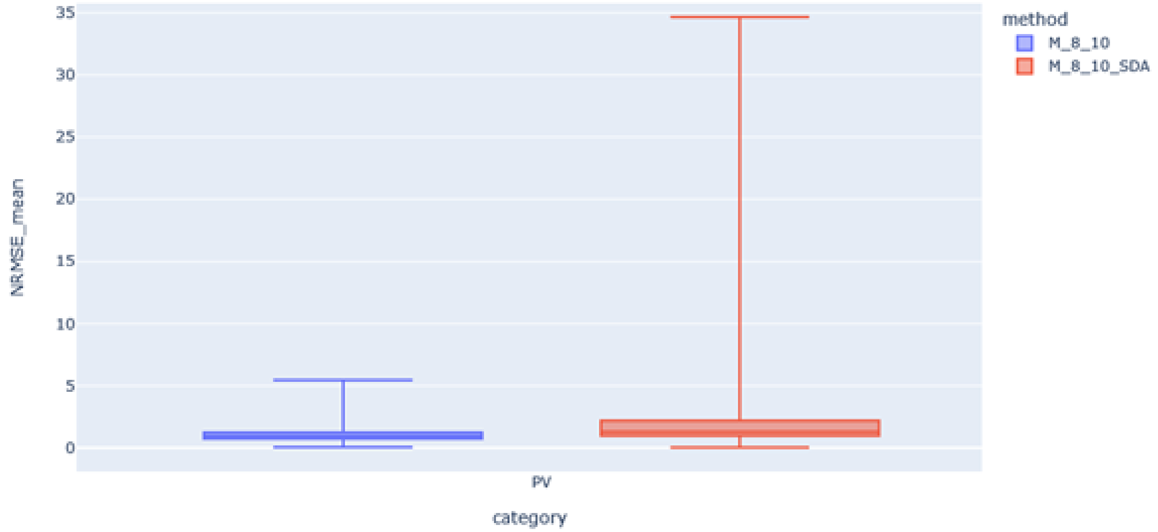
3. Apply Same Day Adjustment based on previous 2 hours



Performance of Methods for each Asset Type

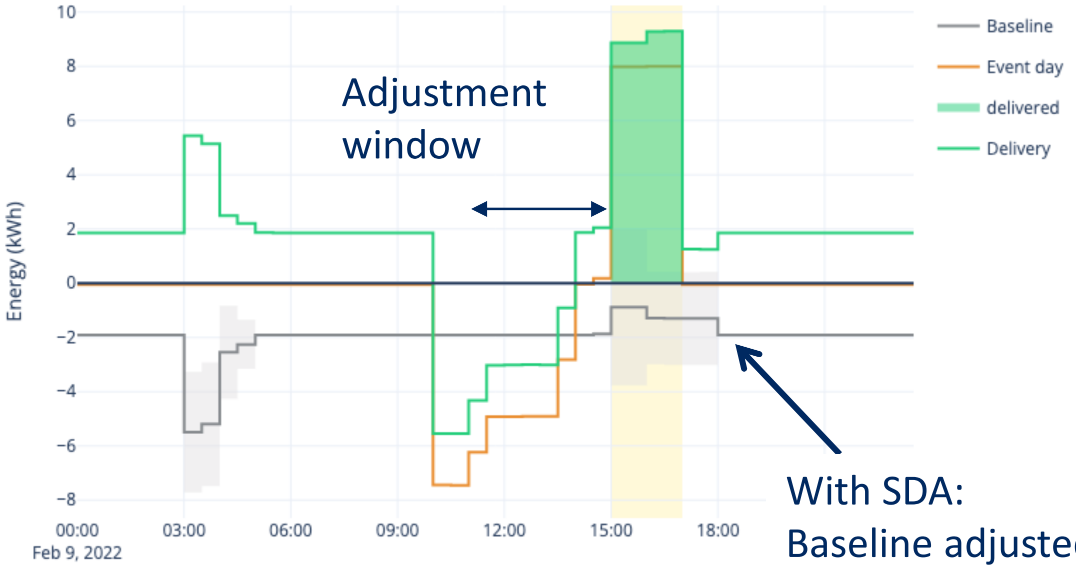
- Graphs show the spread of errors (error = baseline estimate – metered data), per asset type.
- The historic methods seem to perform best for demand and hydro.
- Results for PV are poor.
  - Magnitude of errors varies with season
  - Smaller outputs generally in Winter and Autumn, larger error in the baseline in comparison to Spring and Summer



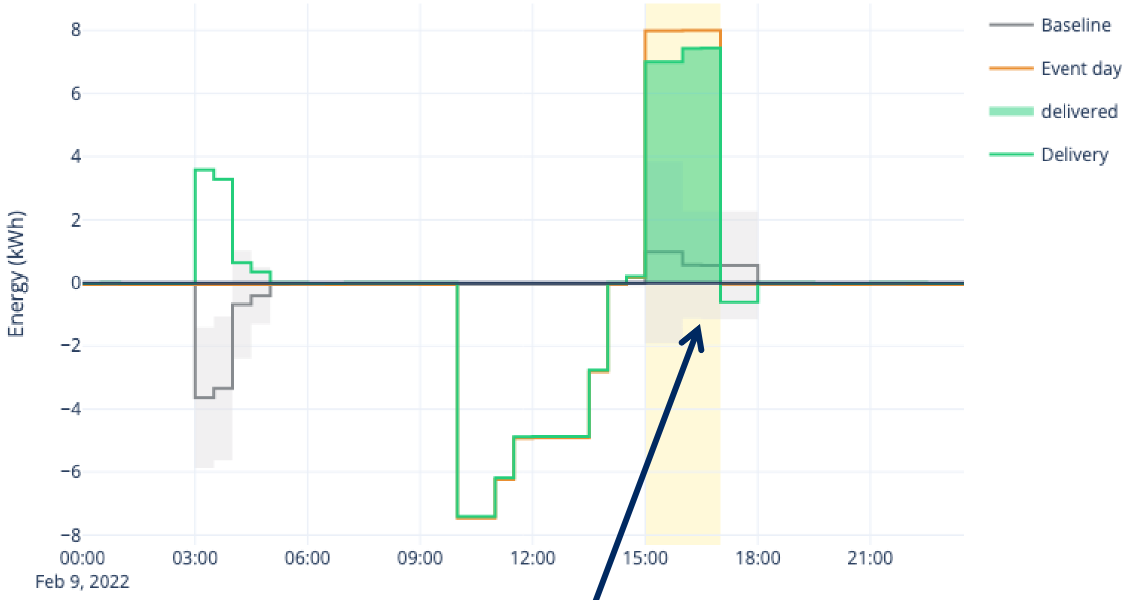


SDA issues – Evidence from Trials

- Apparent 43% over-delivery
- Only paid 100% due to settlement rule cap – however, could be used to manipulate market
- If opposite service: 43% under delivery = 83% reduction in payment

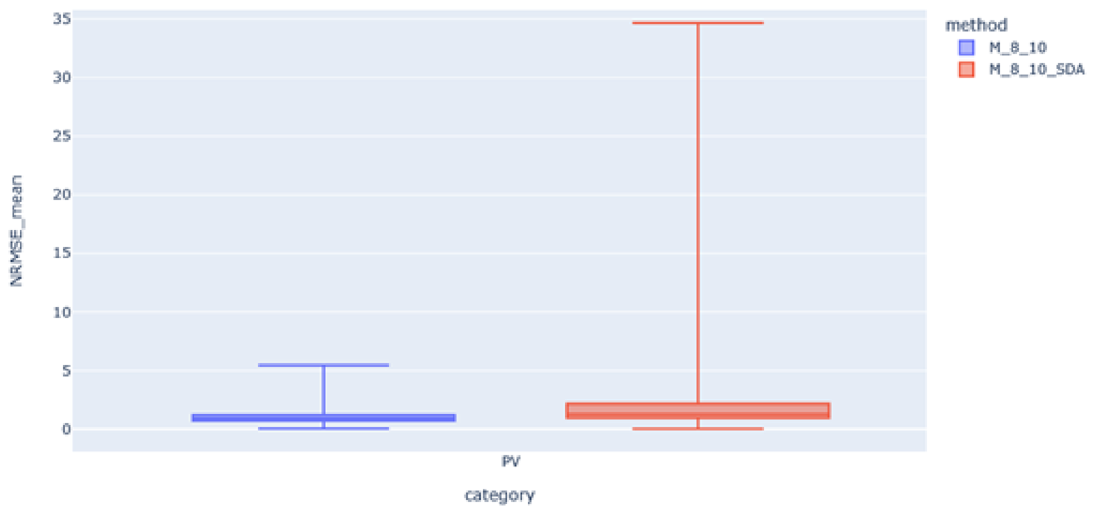


With SDA:
Baseline adjusted down by ~4kW



Without SDA:
Baseline not adjusted

Regression Methodology



○ Results for historic methods applied to PV are poor.

○ Generalised Additive model: smooth (linear and) nonlinear relationships

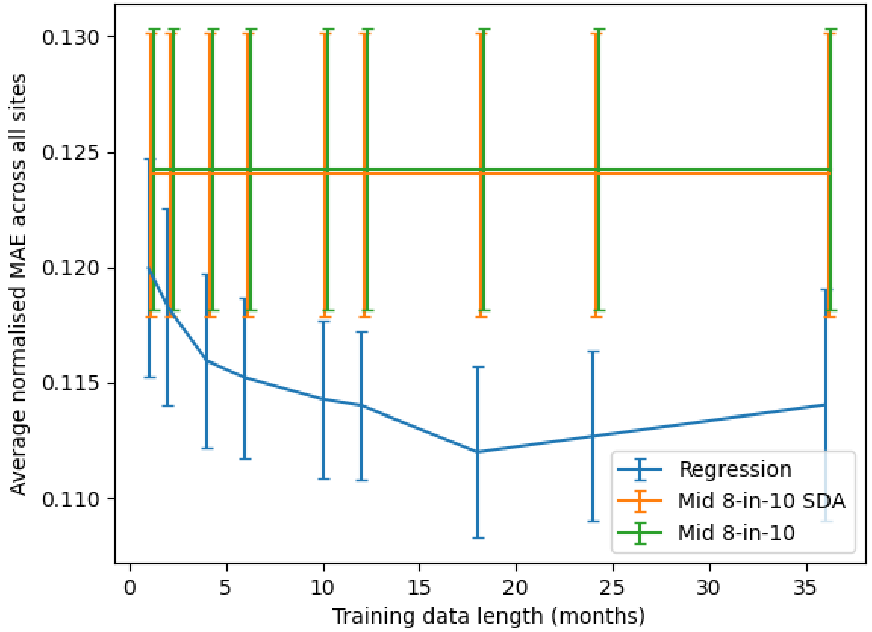
Weather features:
- Clear sky radiation
- Clear sky index
- Temperature

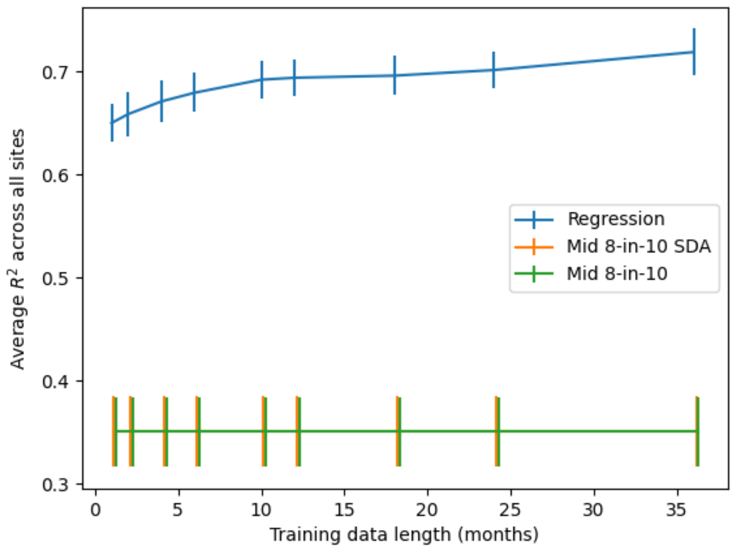
Other features:
- Daylight minutes
- Time of year
- Lagged power
- Mean power per radiation group

○ Weighted by inverse of power density (gives higher powers more weight)

Regression Methodology

- MAE is lower for the regression methodology compared with both historic baseline methodologies for PV assets.
- R^2 value is also higher for the regression model.
- If the optimum training length is selected for each site, the regression baseline gives an average of:
  - 10% reduction in MAE.
  - 105% increase in R^2 value.
- The range of improvements:
  - 1.1% deterioration to 25% improvement of MAE.
  - 39% to 129% improvement in the R^2 value.





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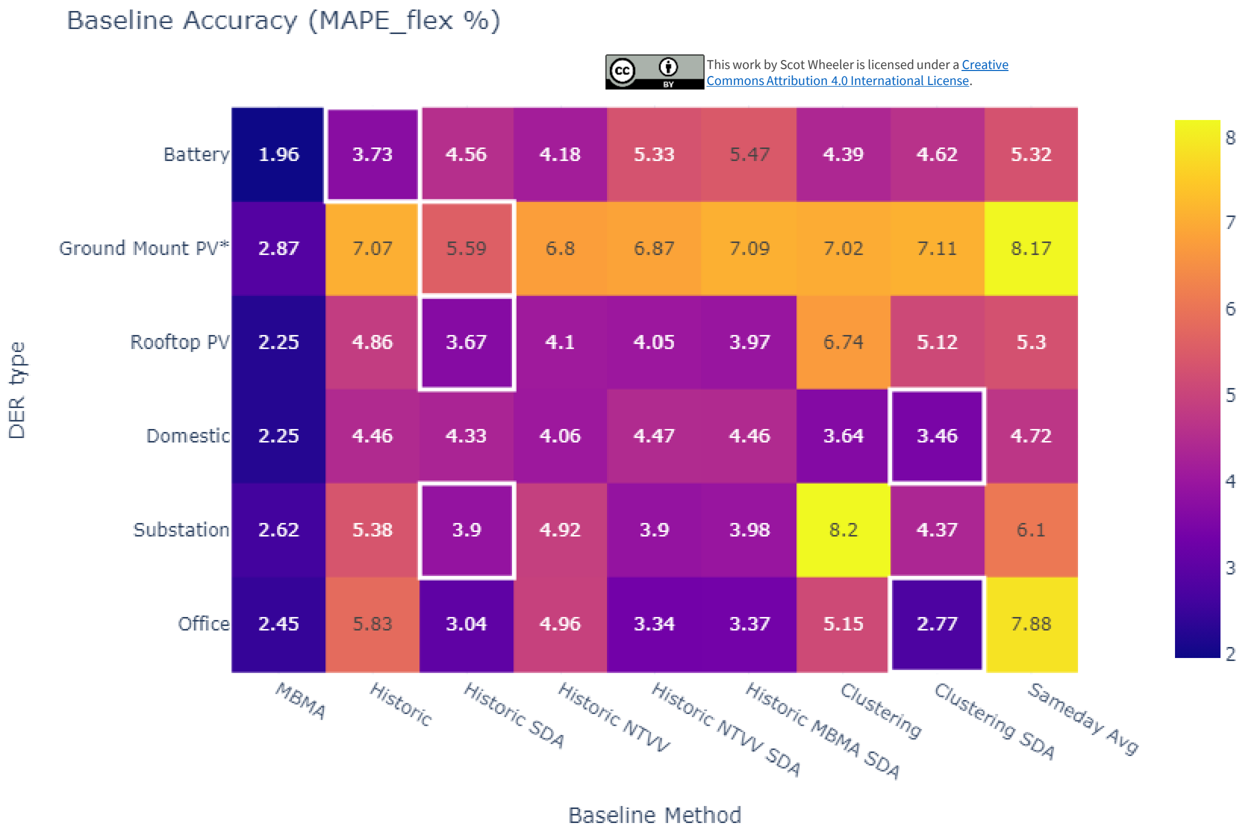
Method – Asset Accuracy Scan

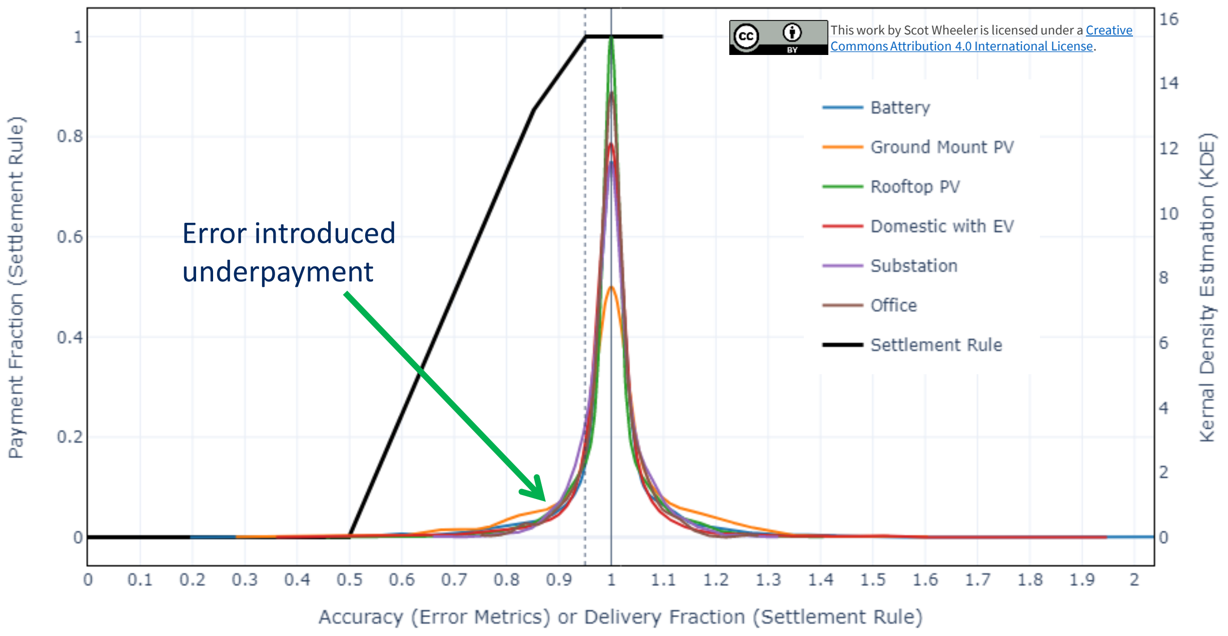
Accuracy of various baseline methods analysed for multiple DERs based on trial data.

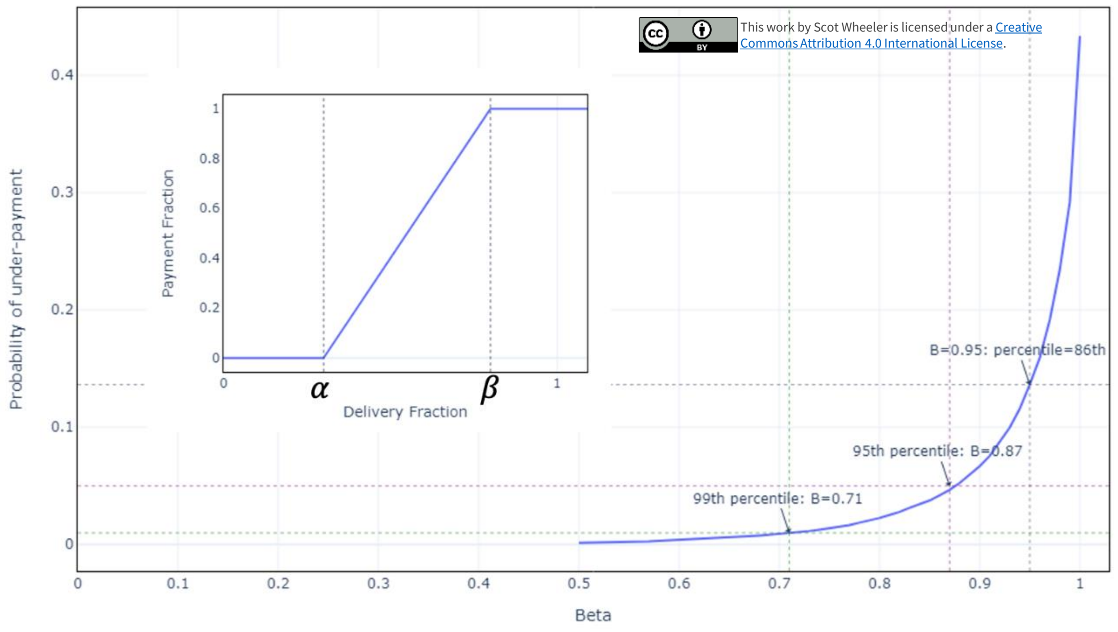
- Meter Before Meter After (MBMA) interpolation the most accurate – but most prone to manipulation.
- Inclusion of SDA generally improves accuracy.
- Should accuracy analysis be used to provide tailored baseline for each DER, DER type or service?



Integration with the Settlement Rule

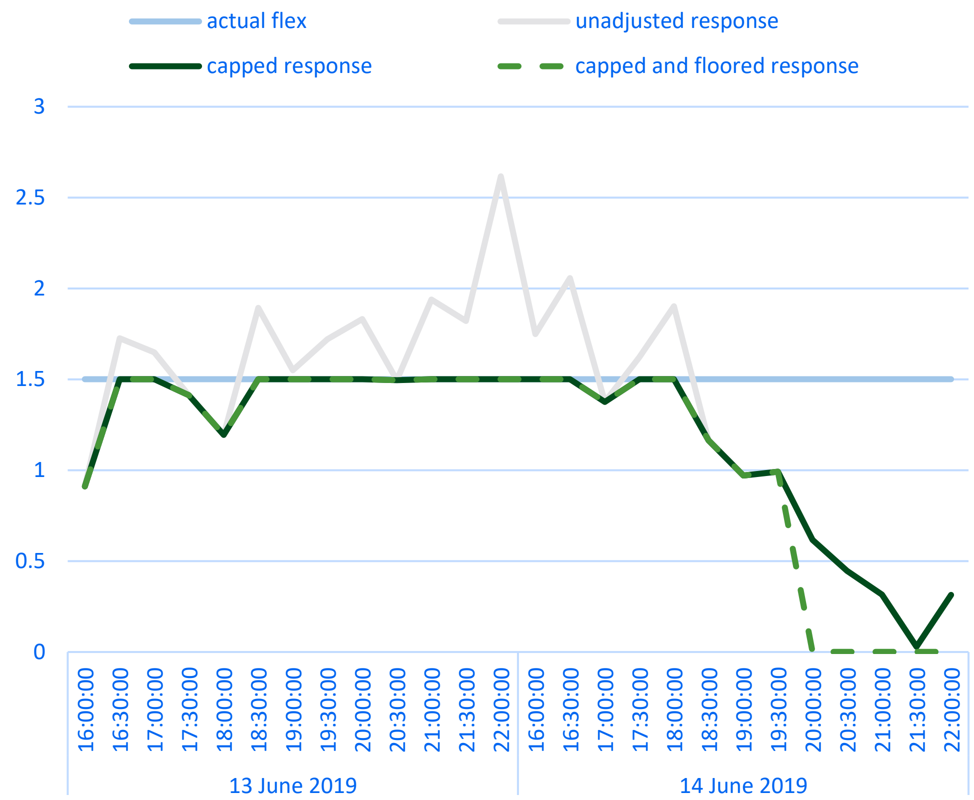
- Settlement rule is a piecewise function that reduces payment for under-delivery.
- Asymmetry may result in unjustified under-payment due to baseline errors.
- Settlement rule can be tailored based on method performance to avoid under-payments.





Cap and Floor Settlement

- TNEI carried out some flexibility (1.5kW) simulation tests on a large non domestic customer (not providing flex)
- With the cap, responses above 1.5kW are just fixed at 1.5kW.
- With the "floor" anything less than 0.75kW is just taken as 0kW.
- These both reduce the calculated response volume and thus remuneration.
- In this simulation, reductions up to 30% were observed.



Summary

Data is a requirement for baselining services

Different methods have different primary and secondary considerations

Uncertainty & error is unavoidable with relative baseline services

Its how we use the data available to us in order to minimise this

…without significant cost, effort or complication

End-to-end service delivery (bid - delivery - settlement) depends on the baseline

A biased baseline coupled with a unsymmetric settlement rule may drive 'non-optimal' bidding behaviour

Not trivial how to balance accuracy with market requirements

how to balance accuracy with simplicity, inclusivity, security and compatibility in a market with such a varied asset portfolio equiwatt

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Baselining learnings & insights from a participant's perspective

From Project LEO & TRANSITION

By: Atzin Madrid & Graham Oakes
Email: atzin@equiwatt.com

18 April 2023

Overview of learnings

- Non eligible days to be excluded (holidays, previous SSEN events, weekends, etc) did not consider ESO / national events (DFS) or other events the provider and users took part in besides TRANSITION events.
- The methodology for historic baseline was not fully clear (for participants) and whilst the mathematical specification was available, it had various ambiguities as the step by step calculation was not available and code was not published.
- The alternative to historic baseline inaccuracies and complexities was the nominated approach, however this is very time consuming to be done daily/weekly manually, specially having multiple portfolios with multiple assets each. Automating calculations and integrating them into our processes/data systems would have taken development time (which at the time was constrained) without the certainty of this methodology being the one used for other BAU services (ESO & DSO).
- Lack of standardisation of methodologies amongst flex services and buyers makes it very complex for providers/aggregators to automate processes and embed them in their data systems.

No baselining method is perfect

Each method can give poor results under some circumstances. E.g.

- The most suitable methodology varies **depending on the type of asset** and at domestic level if it is at whole household or by load disaggregation - asset metering. Each type of asset has a profile , habits and routines play a factor into this. Current in-day-adj. approaches mainly consider collective conditions (like weather) and it could be misleading (e.g. charging an EV at home).

- The "Mid 8 of 10" approach not the best to accurately measure and incentivise domestic demand side response. This often results in lower responses than the user actually provided and thus lower payments/rewards passed down to them. This can ultimately cause households to lose interest.

All baselining methods are complex; clarity and transparency are key

- With large portfolios of small assets, the order in which you aggregate, mid-8-from-10, applying adjustments can affect the result. Most baselining algorithms haven't thought this through in detail — **they were defined for smaller portfolios of larger assets**, where the issues aren't so severe. **These could be resolved by publishing reference code for the algorithms.**

- When you consider these details, the algorithms can get quite complex. The specifications provided don't fully address this — they contain ambiguities and unclarities

All baselining methods can be gamed

Only real time response & no notice events could prevent this (requires asset metering)

In-day adjustment can promote **perverse incentives** / gaming the system. E.g.

- Running added load during the baseline period.
- On the other hand, this is exactly what would be expected with a heat pump to preheat the home before turning off for a turn down event → not gaming, but it inflates the response.
- Other behaviours, like charging an EV, would probably be gaming.

How do you separate these behaviours? Is there fair way to do this?

What is the alternative?

- Baselines with far more data embedded, use of machine learning to predict behaviour and then measuring the deviation. More complex but more appropriate to the individual user and harder to game.
- Based on profiles / fixed baselines (e.g. NMEC)
- Avoid baselines altogether? E.g. allocate each home a load allowance depending on the overall congestion on the network constraint points, and then reward them for going beneath this allowance.

Supporting notes

Examples of ambiguity in methodology & specification:

- *"The algorithm has two different approaches for ranking the demand on each day to select which are the "middle" days to be included, and which are the lowest and highest to be excluded, as this was not specified in the recommendation to the ENA"* — Which approach / choice was SSEN's/ TRANSITION?
- Other uncertainties, such as differences in responses outcome using different approaches. E.g.: a. (HHb1 + HHb2) - (HHr1+HHr2) or b. HHb1- HHr1 and independently HHb2 - HHr.

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Q&A

Please use the MS Teams chat function to post your question

Survey

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Baselining experiences

What method are you using the most? (1/2)

005

- Historical X of Y — 0 %
- Historical X of Y with same day adjustment — 60 %
- Regression — 20 %
- Clustering of days — 0 %
- Clustering of sites — 0 %
- Before / after meter reading — 0 %
- Nomination — 20 %
- Zero baseline — 0 %
- other — 0 %

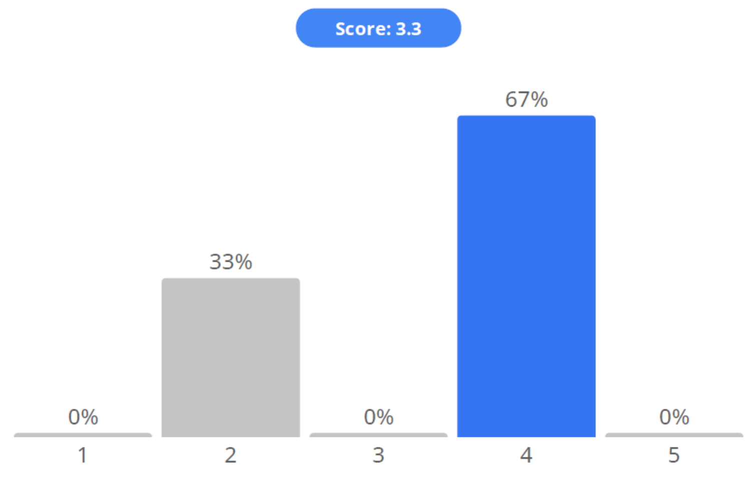
In your view, what are the key blockers/barriers to effective and fair validation and settlement of flexibility services?

002

- Accuracy of baseline result, and whether shall DNO use baseline as part of the validation
- Complexity and cost

In your experience, are you satisfied with the processes for validation and settlement of flexibility services that you have participated in?

003



slido

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Baselining experiences

For what types of flexibility do you use baselining (EVs, V2G, Battery energy storage, domestic demand response, commercial demand response, portfolio of domestic customers, portfolio of commercial customers, industrial demand response, PV, wind, hydro...]

006

HVAC

EV

domestic demand response

VG2

DSO procured servcies

Recommendations

from learning and experiences in trials

Timur Yunusov

Timur.Yunusov@baringa.com

Recommendation # 1

Collaboration for better, fairer and more efficient flexibility market

Managing the risk of non-delivery with over-procurement and strict settlement mechanisms with narrow full payment band introduces inefficiencies and reduces market liquidity as flexibility providers aim to over-deliver to reduce risks of under-delivery as evaluated by baselining methods.

Recommendation:
DSO marketplace operators and flexibility providers need to work together to understand the risks associated with service validation and settlement, and balance risks between the flexibility buyer and flexibility seller

Examples of implementation

- Transparency on baselining methodology applied by marketplace.
- Transparency and auditability of validation and settlement processes carried out by market place.
- Transparency on nomination baselines from flexibility providers including visibility of what constitutes a portfolio and what contributed to baseline.
- Common validation tool for performance assessment of methods and self-evaluation of baseline methods
- Centralised repository for provide Transparency on participation and delivery of services to determine eligible days for calculation of baseline.

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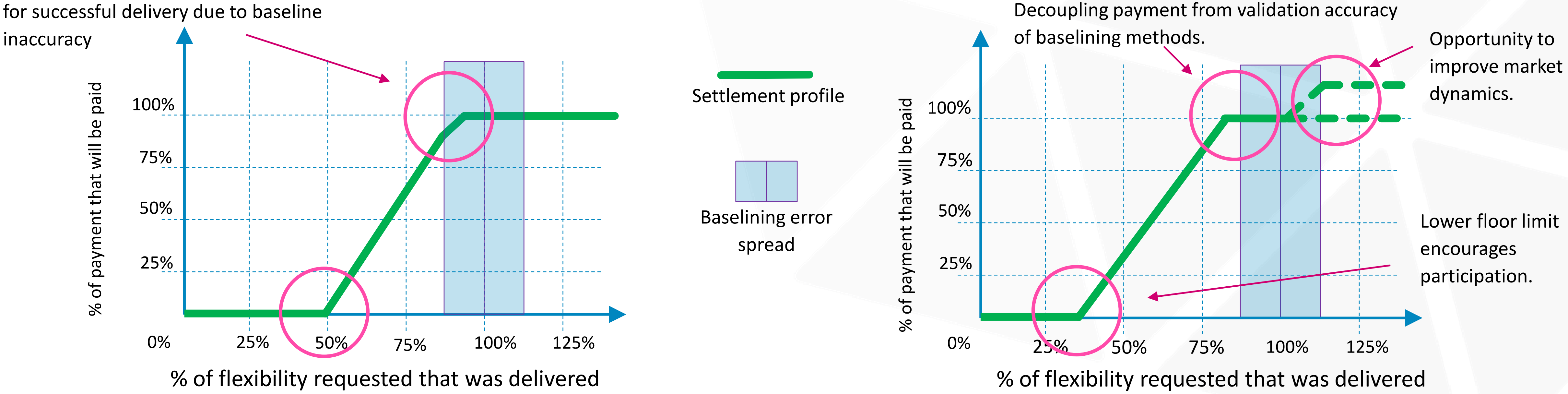
Recommendation # 2

Settlement structure reflective of the accuracy of the baselining methods

Baselining methodologies not tailored to specific types of flexibility are likely to exhibit bias (consistent error in evaluation of delivered flexibility) or broad error spread which leads to flexibility providers being underpaid if the settlement profile have narrow cap and floor limits.



Recommendation:

Settlement structure should have cap and floor limits reflective of the accuracy of baselining methods to give a fairer reward to the flexibility providers and ensuring balance between discouraging under-delivery and motivating participation

Recommendation # 3

Standardised approach to baselining

Flexibility providers that deliver services across multiple flexibility buyers may be subjected to different baselining and settlement mechanisms, and interfaces for submission of metering data for validation, which inherently increases the cost of participation in flexibility markets. Equally, flexibility providers within one flexibility marketplace could use a range of methods for nomination baselines, potentially distorting the playing field and gaining advantage over smaller flexibility providers that have to resort to generic baselining methods offered by the service buyer.

ENA Baselining tool
https://ena-baselining.herokuapp.com/baselining_app/

Recommendation:
Develop industry-wide guide outlining standards for application of baselining methods, settlement mechanisms and data interfaces

Examples of scope for guides and standards

- Standard for selecting baselining methods to based on suitability for the types of flexibility resources and flexibility portfolios
- Guide for pairing baselining methods and compatible settlement calculation profiles to improve market liquidity and fairness of value
- Standards for data formats and data interfaces to reduce risk of incompatibility errors and enable interoperability
- Guide for incorporating stacked services in baselining approaches (e.g. eligibility days, split of coincident delivery)
- Best practice guide to minimise gaming opportunities e.g. through settlement and legal mechanisms

Recommendation # 4

Consider alternative services that do not require baselining

For non-traditional flexibility providers and non-aggregated flexibility at the grid edge it may not be financially viable to participate in delivery of flexibility services through explicit procurement which requires additional processes for validation and settlement. This is increases the complexity of service delivery, introduces barriers to entry and discourages wider participation in flexibility services

Recommendation:

Consider alternative baselining-free services to be made available to flexibility providers, where baselining is not feasible of ineffective

Examples of alternative approaches

- Capacity-based services where flexibility providers bid for reduced import capacity
- Critical-peak price signals reflecting network congestion
- Direct load control e.g. homogenous loads with assumed delivery derived from state and load factors or a scheme similar to Active Network Management
- Capacity time-of-day and season profiling with attractive pricing

Feedback

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Feedback on recommendations

What recommendations do you agree with?

0 0 7

1.Collaboration for better, fairer and more efficient baselining

14 %

2. Settlement structure reflective of the accuracy of the baselining methods

29 %

3. Standardised approach to baselining

14 %

4. Consider alternative services that do not require baselining

43 %

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Please rank the the recommendation from least important to most important?

0 0 8

1. Consider alternative services that do not require baselining

2.63

2. Collaboration for better, fairer and more efficient flexibility market

2.50

2. Standardised approach to baselining

2.50

4. Settlement structure reflective of the accuracy of the baselining methods

2.38

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Feedback on recommendations

What would you add to the recommendations? 004

- Time resolution may need to be better than 30 minutes, to avoid large steps on settlement period boundaries.
- Perhaps explore the 'capacity' market that Emily referred to and evaluate how that could fit within the mix
- It is useful to know the smart ChargePoint regulations mandate the inclusion of secondary metering. Similar may apply to heat pumps in the near future.
- Consider rewarding over delivery, within reason!
- Important to consider more refined asset-tailored baselining

Thank you!

Project TRANSITION

- https://ssen-transition.com/

Project FUSION

- https://www.spenergynetworks.co.uk/pages/fusion.aspx

Project Local Energy Oxfordshire (LEO)

- https://project-leo.co.uk/

