

Open Networks Project

Baseline Methodologies

December 2020 | Version 1

WS1A P7

DOCUMENT CONTROL

Authorities

| Version | Issue Date | Authorisation | Comments |
|---------|------------|-----------------|--------------|
| 0.1 | 14/12/2020 | Helen Sawdon | |
| 1.0 | 20/12/2020 | Courtney Madden | New template |

TABLE OF CONTENTS

| | | |
|-----|---|----|
| 1 | Glossary | 5 |
| 2 | Introduction | 6 |
| 3 | Scope of the Product | 7 |
| 3.1 | Objective | 7 |
| 3.2 | Background | 7 |
| 3.3 | Product deliverables | 7 |
| | Sub-deliverable a | 7 |
| | Final Deliverables | 7 |
| | Sub-deliverable b | 8 |
| | Final Deliverable | 8 |
| | Sub-deliverable c | 8 |
| | Final Deliverables | 8 |
| | Exclusions | 9 |
| | Assumptions | 9 |
| | Constraints | 9 |
| 4 | Product timeline | 10 |
| 5 | Product Outputs | 11 |
| 5.1 | Identify DNO Baseline Principles | 11 |
| | 5.1.1 DNO Baseline Principles | 11 |
| | 5.1.2 Alignment with ENA Six steps to flexibility | 12 |
| 5.2 | Consultant Appointment | 13 |
| 5.3 | Stakeholder engagement | 14 |
| 5.4 | Market Assessment | 15 |

| | | |
|-------|--|----|
| 5.4.1 | DNO Product Assessment..... | 15 |
| 5.4.2 | Assessment of GB and International Practices | 16 |
| 5.4.3 | Comparison of GB and International Practices | 17 |
| 5.4.4 | Alignment with the ESO..... | 18 |
| 5.5 | Baseline assessment and scoring | 18 |
| 5.5.1 | Assessment Criteria..... | 18 |
| 5.5.2 | Scoring Framework..... | 20 |
| 5.5.3 | Scoring Outcomes..... | 21 |
| 5.5.4 | Analysis of baselines per product..... | 21 |
| | Category A – Sustain & Secure Scheduled | 21 |
| 6 | Recommendations..... | 23 |
| 6.1 | Methodology recommendations..... | 23 |
| 6.2 | Further notable recommendations from DNV GL | 26 |
| 7 | Next steps | 27 |
| 7.1 | Considerations for Implementation | 27 |
| 7.2 | 2021 ON WS1A P7 Scope | 27 |

1 Glossary

| Term | Definition |
|-------------|--------------------------------|
| BLM | Baseline Methodology |
| DNO | Distribution Network Operator |
| DSO | Distribution System Operator |
| NGO | Non-governmental Organisations |
| ESO | Electricity System Operator |
| FSP | Flexible Services provider |
| ENA | Energy Networks Association |
| ONP | Open Networks Project |
| SDA | Same Day Adjustments |
| DER | Distributed Energy Resources |

2 Introduction

The Open Networks Project is a major energy industry initiative, run by the Energy Networks Association that will transform the way our energy networks work, underpinning the delivery of the smart grid. This project brings together 9 of UK and Ireland's electricity grid operators, respected academics, NGOs, Government departments and the energy regulator Ofgem. The 2020 Project Initiation Document outlines what the Open Networks Project will deliver in 2020, how it will be delivered and when. Workstream 1A is focused on Flexibility Services in the developing Flexibility Market and has 3 key objectives:

1. Develop and deliver good practice and convergence of directly contracted DSO services to customers across DNOs to deliver a consistent experience for customers
2. Facilitate markets outside the direct procurement of service by DSOs to allow third parties to develop effective and liquid market platforms for customers to realise value for flexibility, and
3. Support the wider use of DSO services by removing barriers and encouraging the consideration of flexibility solutions.

The following extract summarises the aims for **Product 7 in Workstream 1A, Baseline Methodologies**, for which this document is a key deliverable;

2020 PID Extract – WS1A P7 Baseline Methodologies;

To date each DNO has developed their capability in flexibility supporting differing methodologies to establish baselines.

It is agreed that any possible alignment in this area will benefit both providers and the DNO, therefore assessment of existing practices should be undertaken.

Outcomes:

- Collate details of current industry baselining practice
- Assess advantages and applicability to DSO Flexibility operations
- Recommend practicable methodologies/s
- Recommend any further actions that could be taken to achieve consistency

Benefits:

- Comprehensive assessment avoids duplication
- View to align methodology supports stakeholder concerns
- Stakeholder opportunity to provide input at an early stage
- Aligned methodology would considerably increase provider confidence in distribution level flexibility.

3 Scope of the Product

3.1 Objective

Undertake assessment of current work in the industry that relates to the development of a baselining methodology for measuring delivery of services through third party DER and recommend further actions DNOs could take to achieve a consistent approach.

3.2 Background

This work was identified during gap analysis carried out in the 2019 ON WS1A programme under Product 3 – Dispatch & Settlement. To date each DNOs has developed their capability in flexibility supporting differing methodologies to establish baselines. While DNOs experience operating flexibility is still in its infancy it is unpractical to establish good practice. However, it is agreed that any possible alignment in this area will benefit both providers and the DNO, therefore assessment of existing practices should be undertaken.

3.3 Product deliverables

Sub-deliverable a

Establish success criteria and detailed scope.

1. Agree common success criteria & baseline principles. It is anticipated the baseline principles will consider and weight criteria which will include the following;
 - Accuracy tolerance,
 - Implementation complexity,
 - DNO replicability,
 - Provider stack-ability,
 - DNO verifiability,
 - DNO/Provider benefits.
 - Any others as identified.
2. Produce relevant questions for ENA Flexibility Stakeholder Consultation to be undertaken in July 2020.
3. Define scope for consultancy support & procure consultants.

Final Deliverables

2. Finalise product Scope document.
3. Consultant scope document.
4. Draft baseline principles.
5. ENA Flexibility Stakeholder Consultation questions.

Sub-deliverable b

Information gathering & assessment – Consultant led.

1. Research existing UK ESO & DSO baselining practices along with any EU ENA member system operators identified as relevant by ENA.
 - It is anticipated the consultants research will consider but not be limited to the following statements;
 - The baseline methodology should be common across the defined Distribution Flexible Services product types.
 - A suite of methodologies may need to be developed to support differing DER types e.g. storage, turn-down, generation etc...
 - A baseline determined using historical demand data will support provider stack-ability opposed to a real-time baseline.
 - Any others as identified.
2. Assess responses to ENA Flexibility Stakeholder Consultation
3. Engage further with any existing industry expertise that is identified.
4. Weight/score existing baseline practices in line with agreed baseline principles.

Final Deliverable

1. Draft findings & Recommendations report.

Sub-deliverable c

Recommendations & implementation.

1. Assess and agree recommendations from Findings Report.
2. Present findings to WS/SG group and agree if common approach can/should be adopted.
3. Final findings & Recommendations report.
4. Gap analysis and impact assessment of implementation (IT systems, resource etc.).
5. Produce timeline for adoption of common approach.

Final Deliverables

1. Final findings & Recommendations (Product) report.
2. Implementation timeline, if applicable, and next steps.

Exclusions

- Interface protocol standardisation.
- Payment mechanics for settlement and under-delivery.

Assumptions

- Freely shared methodologies from all parties, including the ESO.

Constraints

- Not all DNOs will have established methodologies yet.

4 Product timeline

| Month | P7 Product Team | Appointed Consultants |
|---------------|---|---|
| June 2020 | <ul style="list-style-type: none"> Finalise Product scope document Produce questions for public consultation. Define scope for consultant support. | |
| July | <ul style="list-style-type: none"> Agree baselining principles. Appoint consultant support. | |
| August | <ul style="list-style-type: none"> Support consultants with research activities. | <ul style="list-style-type: none"> Research existing baselining practices. Review public consultation responses. Engage with wider industry expertise. Produce findings and recommendations report. |
| September | | |
| October | | |
| November | <ul style="list-style-type: none"> Assess and agree recommendations | |
| December 2020 | <ul style="list-style-type: none"> Final product report summarising activities, recommendations and proposed next steps. | <ul style="list-style-type: none"> Final report on findings, recommendations. |

5 Product Outputs

5.1 Identify DNO Baseline Principles

Before we research and assess any potential baseline methodologies, it is important that we identify what characteristics must be met by the methodology in order to meet the needs of both the DNO and the flexibility provider.

To facilitate this the product team will identify 'Core Baselining Principles' that it views as critical characteristics that any proposed baseline should meet.

By identifying these principles, it allows us to score the applicability of any existing methodologies for the UK distribution market, ensuring a fair and measured approach to assessment. In addition, the product team will identify any 'Score-able sub-factors' that should also be included for assessment.

5.1.1 DNO Baseline Principles

The product team collated a long list of potential principles that could be used for the qualitative assessment of existing baseline methodologies. These were then grouped if appropriate and consolidated to inform the core principles.

Four core principles were agreed, these cover the key aspects any baseline methodologies under consideration should be assessed against and be expected to meet.

UK DNO Core Principles;

| | | |
|---|----------------------|---|
| 1 | SIMPLICITY | The solution is practical and the effort required is proportionate to the outcome. |
| 2 | ACCURACY | The baseline methodology provides a good representation of the counterfactual behaviour of the provider |
| 3 | INTEGRITY | Restricts ability for the DER provider to distort or game the market. |
| 4 | REPLICABILITY | Can be replicated for forecasting and verification by all relevant parties. |

The product team then considered what other factors from the long list should be included for the scoring and assessment of potential methodologies.

Some methodologies may meet some but not all of these sub-factors or only meet them in part.

Score-able Sub-factors;

| | |
|---------------------|--|
| Inclusive | Is not bias to a particular type of response |
| Design fit | Meets the needs of the DNO product design specifics. |
| Stackability | Allows participation in other markets |

Non Score-able Service Specific Sub-factors;

The following factors were identified as service specific, meaning the design and operation of the product by the DNO will influence what is acceptable. Therefore, these factors cannot be scored and will not be included in our assessment.

| | |
|------------------------------|---|
| Data quality | Individual Data Quality issues both known and un-known should not undermine baseline selection. |
| Metering arrangements | Variations in metering arrangements are not interdependent with the baseline methodology. |
| Data granulation | Data granulation does not impact applicability of Baseline methodology |
| Systems | Variations in data handling systems are not interdependent with the baseline methodology. |

5.1.2 Alignment with ENA Six steps to flexibility

Finally, we considered how the principles and sub-factors developed align with the ENAs six steps to flexibility;

1. **Champion a level playing field** – baseline(s) should not bias for/against a particular solution(s)/technologies.
2. **Ensure visibility and accessibility** – the provider should be able to calculate their baseline ahead of an event (with real-time data or forecast) in order to establish their flexible capacity (from procurement through to operation).
3. **Conduct procurement in an open and transparent manner** – baseline methodology is published upfront.
4. **Provide clarity on the dispatch of services** – the dispatch history that is published needn't include baseline calculations, but should include the instructed delta.

5. **Provide regular, consistent and transparent reporting** – be transparent in the baseline methodology and calculations on ongoing basis.
6. **Work together towards whole energy systems outcomes** – best practice baselines are adopted across DNOs/ESOs, the baseline where possible could contribute to ability for service stacking.

5.2 Consultant Appointment

The appointment of the chosen consultant was facilitated by the ENA who conducted a formal tender.

- An Invitation to Tender (ITT) was issued by the on 17th July
- 4 responses were received by the ITT deadline on 3rd August
- ITTs were assessed by the product team and the preferred option was interviewed on 11th Aug.
- DNV GL Limited were appointed and notified on 13th August

DNV GL Limited were appointed based on their experience working on related project and the robustness of their proposed approach, which is detailed below;



5.3 Stakeholder engagement

In July 2020 The ENA their 2020 Flexibility Consultation 2020. Following its closure in September 2020, the P7 product team and DNV GL undertook analysis of the consultation responses to identify their impact on P7.

DNV GL then engaged directly with four identified relevant stakeholders to ensure full understanding of their responses, as well as to ensure that the project captures and benefits from stakeholders’ expertise in full.

In addition DNV GL facilitated a workshop with the Association of Decentralised Energy (ADE) members.

The outcomes of this engagement is summarised below and further detailed in DNV GLs recommendations report¹.

| Stakeholders said... |
|--|
| Give consideration to all methodology types. |
| Currently a lack of simple and clear baselines. |
| Consider challenges driven by metering configurations |
| Current processes do not support revenue stacking |
| Simplicity and Inclusivity are key priorities |
| Alignment should be considered across the industry/ESO |
| Future-proofing of methodologies where possible |
| Consultation should be undertaken with a wide range of stakeholders both before and after recommendations are finalised. |
| Be open and transparent thoroughout |
| Consider susceptibility to gaming and accessibility |

Further findings

The bilateral engagement with stakeholders demonstrated that very few best practices/precedents are available for GB DSO products, particularly where long utilisations and instruction notifications are concerned.

With respect to nomination baselines, Some stakeholders were strongly in favour of nomination methodologies on the basis that nomination baselines can be more inclusive for certain assets especially when there is lack of historical data or for variable loads. Other stakeholders highlighted that nomination baselines are technology-dependent, working well for scheduled generators and controlled industrial processes but not for most other asset types.

¹ Link to recommendations report to be added once final

5.4 Market Assessment

5.4.1 DNO Product Assessment

A key task for DNV GL was to understand and agree the ENA DNO product parameters, as their final recommendations must to the ENA DSO products². Product parameters have a large impact on the choice of the right baseline methodologies, which is a theme that stakeholders highlighted in the ENA ONP 2020 Flexibility Consultation. The parameters with the largest impact on baseline assessment are:

| |
|--|
| Metering configuration |
| Type of remuneration |
| Utilisation instruction notification period |
| Utilisation period |
| Frequency of use of the flexibility product |
| User and technology segment |
| Pool or asset level activation |
| Controller of the assets (i.e. DSO or the FSP) |

To perform this assessment, the products were grouped under 4 baseline product categories mainly based on the utilisation instruction notification period. The utilisation period and the frequency of use were also considered. Where there was not alignment in these parameters, notification period took precedence.

As such, the Secure Dispatched product was split to 2 baseline product categories on the basis of different utilisation notification periods (i.e. week ahead and real time) and Sustain and Secure Scheduled were grouped.

² Link to ENA product descriptions

The table below summarises the ENA DSO products, their parameters and their baseline product categories.

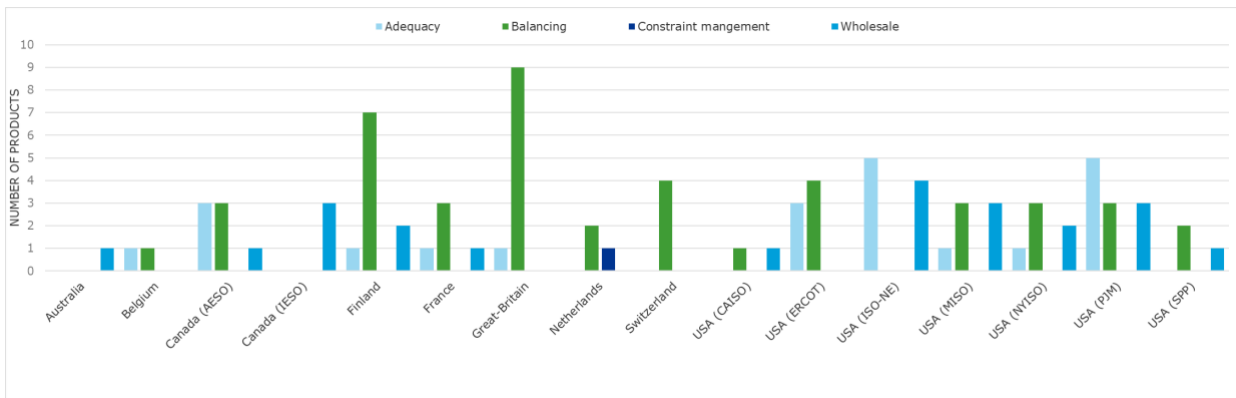
| Category | Product | Metering Resolution | Type of remuneration | Earliest utilisation instruction notification | Latest utilisation instruction notification | Typical utilisation period | Frequency of use |
|----------|-------------------|--|--|---|---|---|--|
| A | Sustain | HH metering | Utilisation and Availability | Scheduled in advance Years ahead | 3 months ahead | Not defined, typically 3 to 24 hours | High: 5 deployments per week |
| A | Secure Scheduled | metering requirements vary across DNOs | | Contract stage | 3 months ahead | not defined, typically 3 hours or more | Medium: 2 deployments per week |
| B | Secure Dispatched | | | 10 days ahead | 3 days ahead | | |
| C | Secure Dispatched | | | 30 minutes | Real Time | | |
| D | Dynamic | | | 15 minutes | Real time | Not defined, Typically several hours (it could take up to days) | Rarely, in case of faults |
| D | Restore | | Utilisation (it can also be availability only, it depends on DNOs) | 15 minutes | Real Time | Not defined, Several hours to days, minimum 3 hours | Rarely, in case of complete loss of supply |

5.4.2 Assessment of GB and International Practices

To compare GB and international practices against ENA DSO products, DNV GL undertook a review their product parameters and identify similarities with ENA DSO products.

They compiled a data base containing 90 different products from 9 countries: GB, France, Switzerland, Finland, Netherlands, Belgium, USA, Canada and Australia. Since DSO constraint management is quite a novel service, the vast majority of the services that were included in their analysis were balancing, adequacy or wholesale services.

Error! Reference source not found. summarises the type of products per country (and state) that were reviewed and shows that DNV GLs list included only 1 DSO Constraint Management product



Following further market assessment, the following observations were produced and these have partially informed the recommendations:

- Meter before-Meter after (MBMA) is the most common baseline and mainly used in balancing services. MBMA is a common baseline for short and fast reacting balancing services and the most common baseline for the shortest utilisation instruction (i.e. less than 15 minutes).
- Historical baselines are the second most common baselines. They are met across all products and are the most popular baselines across products with longer utilisation periods such as wholesale and adequacy products which typically use historical baselines.
- Regression-based, calculated and control group baselines are less common; these baselines are usually preferred when the common baselines are not suitable. Notably, regression baselines are used for longer utilisation periods, as they can increase accuracy using external variants.
- Nomination baselines are more common in balancing products, with short notification periods, Nomination have also been used for relatively longer utilisation periods. It worth noticing, that nomination is used in the only DSO constraint management product which is included in our list.
- Finally, a key observation is that a large number of products (~ 40) provide a choice of baselines to the FSPs. This is mainly driven by the fact that some of the common baselines (historical and MBMA) are not always suitable for certain assets/customers or technologies, particularly as new assets enter the flexibility markets.

5.4.3 Comparison of GB and International Practices

To compare the DSO services into the international products, DNV GL looked into two product parameters: utilisation instruction notification and maximum/typical utilisation period.

Below is a summary of their findings, more detail is available in the DNV GL recommendations report.³

³ Link to DNV GL recommendations report to be added once final

Sustain and Secure Scheduled have very long utilisation instruction periods which do not exist elsewhere in the GB and international practices. Existing best practices for these products could not be identified.

Real time products (i.e. Dynamic, Restore and, Secure Dispatched – real time), show similarities with balancing products and adequacy product on the notification instruction timing. However, the utilisation period of DSO products is notably longer than seen in international practices.

In conclusion, no ENA DNO products suitably compare against GB and international practices. Nevertheless, examples have been taken into account for the recommendations.

5.4.4 Alignment with the ESO

Alignment with ESO products, albeit not expressed in the key principles, nor explicitly in the assessment criteria for baseline methodologies, was a key element of DNV GLs analysis and recommendations. This is highlighted through the following elements:

- **Examining of best practices:** Many ESO (viz. TSO / ISO) products have been analysed, including their associated baseline methodologies, such as STOR, Dynamic Containment, FFR services and GB's Capacity Market. Products with similar characteristics compared to the different DNO products are considered "best practices" and provide important input to our baseline assessment and selection.
- **Baseline methodology assessment:** In analysing the costs and benefits for the FSP, we have taken into account potential synergies when baseline methodologies are aligned with those that are currently applied for any of the ESO products. The main example is the nomination baseline methodology type that resembles the physical notification used in the balancing mechanism and in the Dynamic Containment.
- **Process considerations:** the assessment also describes the information exchange associated with the baseline calculation. For example, using the sub-meter that is currently used for ESO services, for DNO services, creates synergy for both the DNO and FSP.

However, due to substantial differences between ESO and DNO products, there are also limitations in the synergy that can be achieved. For example, although the Sustain product may strongly resemble the national capacity market, the long notification time will necessarily lead to a different baseline design. Also, the potential for long utilisation periods render the baseline methodologies used in several ESO products unsuitable for DNO products.

5.5 Baseline assessment and scoring

5.5.1 Assessment Criteria

Based on the baseline principles, the assessment criteria against which the baseline methodologies have been assessed was developed. Further to that, DNV GL and the P7 product team agreed appropriate prioritisation of the assessment criteria. These are detailed in the table below;

| Principles | Criteria and weighting factor | Description | Priority |
|----------------------|----------------------------------|--|-----------|
| Simplicity | DNO implementation costs (13%) | Are the costs for implementing and operating the administrative processes proportionate for the DNO? | High |
| Simplicity | FSP implementation costs (17.4%) | Are the costs for implementing and operating the administrative processes proportionate for the FSP? | Very High |
| Replicability | Replicability (8.7%) | Is the baseline reproducible by the DNO, FSP, and third-party validator for settlement (verification) purposes? | Medium |
| Design fit | Robustness to data (4.35%) | Are there high requirements on data to calculate the baseline? Do data quality issues undermine the baseline quality? | Low |
| Accuracy | Variance (8.7%) | Does the Baseline Methodology provide an accurate estimate of the flexibility load impact at a level expected by DNO and FSPs, or does it show a relatively high variance? | Medium |
| Accuracy | Bias (8.7%) | Does the Baseline Methodology provide an unbiased estimate of the flexibility load impact at a level expected, or does it show a relatively high bias? | Medium |
| Integrity | Integrity (8.7%) | Does the Baseline Methodology avoid or minimize the risk of gaming and strategic behaviour? | Medium |
| Inclusivity | Technology agnostic (17.4%) | Is the Baseline Methodology technology agnostic and not biased to a particular type of solution, technology and provider? | Very High |
| Design fit | Design fit – parameters (4.35%) | Can specific parameters of the service design be met? | Low |

| | | | |
|---------------------|---------------------|--|--------|
| Stackability | Stackability (8.7%) | Does the Balancing Methodology allow the FSP to combine the delivery (Availability and/or Utilisation) of DNO products with other markets? | Medium |
|---------------------|---------------------|--|--------|

5.5.2 Scoring Framework

The potential baselines were scored against the assessment criteria based on the framework shown in the table below;

| Criteria | 5 - Excellent | 4- Good | 3 - Average | 2 - Fair | 1 - Poor |
|--------------------------|--|---|--|---|--|
| DNO implementation costs | Simple, straightforward calculation, e.g. MBMA | Relatively simple calculation | Slightly complex calculations | Rather complex calculations | Highly complex calculations, e.g. regression |
| FSP implementation costs | as above | as above | as above | as above | as above |
| Replicability | Easy to be replicated by different parties. | Relatively easy to replicate by other parties. Same data should be used. | It can be replicated by different parties, dependent on data | Difficult to be replicated by different parties, due to complex processes or lack of information. | Very difficult to be replicated by different parties due to complex calculations, use of certain data or intelligence. |
| Robustness to data | No dependency on data | Availability of data is not an issue | Availability of data can be an issue, dependency is low | Availability of data can be an issue, dependency is average | Availability of data can be an issue, dependency is strong |
| Variance | Small variance for all technologies | Small variance for most technologies, medium variance for some profiles (e.g. volatile load). | Small, medium and high variances depending on technology | Some small and medium variances, mostly high variance for different technologies. | High variance for most technologies |
| Bias | No bias throughout the service window | Small bias in certain parts of the service window | Small or no bias on average, yet higher bias at specific moments of the day / service window | Some bias on average, yet higher bias most moments of the day / service window | Strong bias throughout the service window |
| Integrity | No gaming options foreseeable | Some gaming options, with sufficient mitigations options | Likely gaming options with good mitigation / some gaming options with little mitigation | Likely / obvious gaming options with some mitigation | Obvious gaming options with little/no mitigation |
| Technology agnostic | Fully technology agnostic | Technology agnostic with few exceptions | Favouring specific technologies, not excluding others | Favouring specific technologies, excluding some others | Favouring specific technologies, excluding others |
| Design fit - parameters | Excellent fit to product design | Good fit to product design | Average fit to product design | Fair fit to product design | Poor fit to product design |

| Criteria | 5 - Excellent | 4- Good | 3 - Average | 2 - Fair | 1 - Poor |
|---------------|---|---|--|--|--------------------------------------|
| Additionality | Stacking on Capacity Market (CM) and Wholesale (WS) always possible | Stacking on CM and WS in most situations possible | Stacking on CM and WS sometimes possible | Stacking on CM and WS in exceptional situations possible | Stacking on CM and WS never possible |

5.5.3 Scoring Outcomes

The each baseline methodology within the baseline groups listed in the table below were then subject to scoring;

| Methodology group |
|---|
| Nomination |
| Historical baseline (a.k.a. rolling baselines) |
| Historical baseline (a.k.a. rolling baselines) with Same Day Adjustments |
| Regression-based |

Notably, this list excludes calculated baselines and the control-group baselines, as these baselines are only applicable to a small set of technology types. For example, a calculated baseline which uses weather and wind data could be applicable for wind generation; a control-group baseline would be suitable for EVs chargers. These methodologies, however, cannot be applied wider. At this stage we have considered methodologies that are generally applicable to facilitate inclusivity, simplicity and replicability.

5.5.4 Analysis of baselines per product

Scoring was applied to each product category and the outcomes of this analysis is summarised below. More detail of the scoring and analysis is available in DNV GLs Recommendation Report⁴.

Category A – Sustain & Secure Scheduled

Analysis and discussion with DNOs concluded that the Sustain product is not yet sufficiently crystallized to standardize the verification methodology, nor the associated baseline methodology. None of the DNOs has used the Sustain product yet, although most of them have tendered for 2020 or following years. Similarly, only one

⁴ Link

DNO has procured Secure Scheduled, although they haven't dispatched the service yet. As such, it's recommend that more experience is gained by DNOs before moving to standardisation.

- For future standardisation efforts DNV GL suggest considering the following approach:
 - For dispatchable generation assets - recommend setting the baseline to 0. The asset is required to provide capacity when needed, regardless of how it would have otherwise dispatched. To remunerate the activation, we recommend the flexibility DER assets would be compensated for the *hours of delivery x capacity*.
 - For non-dispatchable generation - recommend the same approach using de-rating factors. We recommend that the de-rating factors are the same as these which are used in the Capacity Market to achieve further alignment and consistency with the ESO.
 - For load assets - recommend using a historical baseline which uses data from the previous year. To increase consistency the same historical baseline methodology as recommended for secure dispatched (week ahead) can be applied.

Category B – Secure Dispatched (week ahead)

At this stage, DNV GLs recommendation is to shortlist Nomination and Historical baselines (without SDA).

In the future and as DNOs get more experience in operating flexibility services, DNOs could re-assess the suitability of these baselines and particularly their accuracy. If all baselines are not sufficiently accurate, then DNOs may decide to move to day-ahead utilisation instruction or real-time, or to consider regression-type baseline methodologies.

Category C – Secure Dispatched (real-time)

DNV GLs recommendation is to shortlist Nomination and Historical baselines (with SDA).

Category D – Dynamic & Restore

DNV GLs recommendation is to shortlist Nomination and Historical baselines (with SDA).

6 Recommendations

6.1 Methodology recommendations

It is acknowledged that GB DNO flexibility markets are still at their infancy. Although all DNOs have now procured flexibility, they still need to gain more experience in procuring and operating flexibility. There is still progress to be made for further alignment and standardisation of DNO product parameters.

The recommendations take into account the current status of GB DSO flexibility markets and the current priorities of DNOs and FSPs, as per the consultation responses and the bilateral stakeholder engagements. Simplicity and inclusivity of flexibility markets are key priorities at this stage, so that wider market participation in DSO services is facilitated. We also acknowledge that stakeholders as well as Ofgem and BEIS ask for consistency across DNO products, ESO products and the wider industry.

On this basis, the recommendations focus on three types of baselining methodologies that are relatively simple, are known in GB markets, and which are currently in use by DNOs and/or in ESO balancing services and/or in the Balancing Mechanism. To facilitate technology-agnostic solutions and allow FSPs to choose a baseline based on their needs and types of asset, we recommend an agile baselining methodology solution:

- Use a historical baseline methodology for all products as the default option:
 - Only for Secure Dispatched – real time, Dynamic and Restore we recommend performing a same-day-adjustment, to increase the accuracy.
 - In case of historical baselines, we recommend that DNOs calculate and share the baseline prior to the utilisation period to facilitate the FSPs and increase transparency and visibility of their processes.
 - Allow for all technologies to use a nomination-type baseline, when the historical baseline is not sufficiently accurate (e.g. for future technologies such as EV charging and future customer segments such as residential):
 - The use of nomination baselines can be particularly suitable for generation assets, or connections with dominant generation, in all products. In addition, ESO products move also to nomination baselines (e.g. Dynamic Containment) so that there is alignment with the Balancing Mechanism. As such, the use of nomination baselines aligns with the consistency considerations across the GB industry.
 - FSPs choosing this option need to submit nominations regularly, prior to the utilisation instruction notification.

These generic recommendations do not apply to the Sustain and Secure Scheduled products, as explained.

This table summarises DNV GLs final recommendations for the ENA DNO flexibility products.

| Product | Recommendation | Reasoning |
|--------------------------------|--|--|
| Sustain | <p><u>Recommend testing technology-specific validation mechanisms.</u></p> <p>More experience needs to be gained by all DNOs before moving to the standardisation of the validation process (including baselines, if applicable).</p> | <p>Long utilisation instruction notification periods and long utilisation periods allow limited options for this product. A drop-to mechanism could be also suitable if no utilisation payment was included.</p> |
| Secure Scheduled | <p><u>Recommend testing technology-specific validation mechanisms.</u></p> <p>More experience needs to be gained by all DNOs before moving to the standardisation of the validation process (including baselines, if applicable).</p> | <p>Long utilisation instruction notification periods and long utilisation periods allow limited options for this product.</p> |
| Secure Dispatched (week-ahead) | <p><u>Historical baseline without SDA</u></p> <p>Mid 8 of 10 for weekdays, mid 2 of 4 for weekends.</p> <p><u>Nomination to be used</u></p> <ul style="list-style-type: none"> • dispatchable generation • connections with dominant dispatchable generation • if accuracy levels of historical baselines are (too) low | <p>Historical and nomination baselines are more suitable for longer utilisation periods and for long instruction notifications, where MBMA and WBA cannot be applied.</p> <p>Historical and nomination baselines are simpler compared to regression.</p> <p>Nomination is recommended for predictable and non-variable assets, esp. when sub-metering is available. Nomination can also be a solution for new assets, when there is lack of historic data.</p> <p>In addition, nomination can be an option in case of frequent activations, where the use of recent historic data can be challenging.</p> <p>All baselines score relatively low against the parameters of this product. In the future and as DNOs get more experience in operating</p> |

| | | |
|-------------------------------|---|--|
| | | flexibility services, DNOs could re-assess the suitability of these baselines and particularly their accuracy. If all baselines are not sufficiently accurate, then DNOs may decide to move to day-ahead utilisation instruction, or may consider regression-type baselines. |
| Secure Dispatched (real time) | <p><u>Historical baseline with SDA</u></p> <p>Mid 8 of 10 for weekdays, mid 2 of 4 for weekends.</p> <p>Additive SDA using the last two hours of unaffected load prior to notification.</p> <p><u>Nomination to be used</u></p> <ul style="list-style-type: none"> • dispatchable generation • connections with dominant dispatchable generation • if accuracy levels of historical baselines are (too) low | <p>Historical baselines with SDAs increase the accuracy compared to historical baselines without SDA. Both historical with SDAs and nomination baselines are simpler than regressions.</p> <p>Historical with SDAs and nomination are future-proofed solutions in case of short utilisation periods in the future, as they can still be used and provide similar results to MBMA and WBAs without the need to update the processes.</p> <p>Nomination is the most inclusive baseline for real time notification as it allows all assets to provide the most updated forecast. Historical with SDAs are also better suitable for technologies with limited historical data or with variable load (e.g. EVs, RES).</p> |
| Dynamic and Restore | <p><u>Historical baseline with SDA</u></p> <p>Mid 8 of 10 for weekdays, mid 2 of 4 for weekends.</p> <p>Additive SDA using the last two hours of unaffected load prior to notification (or prior to outage).</p> <p><u>Nomination to be used</u></p> <ul style="list-style-type: none"> • dispatchable generation • connections with dominant dispatchable generation • if accuracy levels of historical baselines are (too) low | <p>As this is a real-time post fault product with low frequency of activations, all baselines scored higher compared to the other products, driven by accuracy and integrity scoring criteria.</p> <p>We recommend historical baselines with SDA and nomination as they are both inclusive of different technologies, and to remain consistent with the Secure Dispatch product.</p> <p>Longer utilization frequencies can have a negative impact on the accuracy, in this case the FSP can decide to apply a nomination baseline, esp. when operating dispatchable generation.</p> |

6.2 Further notable recommendations from DNV GL

1. further study is needed determining the extent to which stackability should be facilitated, how the validation and settlement should be organised, and finding the right balance between stackability and simplicity.
2. For the Sustain and Secure Scheduled products, we recommend to further gain experience and standardise these products. Also, the other products and their use may evolve over time. This may also impact the performance of certain baseline methodologies. We therefore recommend to
3. Finetune the baseline methodology against the product design, if the latter evolves over time. Also, product design may take the impact of certain parameters on the baseline effectiveness into account, based on the principles highlighted in this document (e.g. move the notification closer to real-time).
4. Recommend augmenting this study by calculating the variance and bias for the proposed historical baselines for a large, representative set of assets.
5. recommended that DNOs facilitate the FSPs by calculating and publishing all relevant baselines after the notification has been submitted, (well) in advance of the utilisation period.

7 Next steps

7.1 Considerations for Implementation

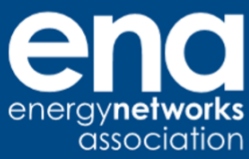
This product will continue under the ENA Open Networks 2021 Programme. Further consideration will be taken during 2021 as to the practicality of implementing the recommended baselines and further consultation will be undertaken with stakeholders.

DNOs will need to consider available system capability as well as their current operational processes when assessing the suitability and practical implementation of these recommendations.

While these recommendations will greatly inform our thinking, it is recognised that further implementation assessment over 2021 may evolve the final methodologies that DNOs go on to adopt.

7.2 2021 ON WS1A P7 Scope

| | |
|--|--|
| Stakeholder Feedback | Consult with DNOs and relevant stakeholders to share baseline recommendation and gather feedback. |
| Refine and finalise baseline(s) | Evolve, refine and finalise the recommended baselines. Agree DNO implementation strategy and develop an appropriate governance strategy. |
| Quantitative Analysis | Commission a tool to undertake analysis to ensure results meet baseline objectives. Develop tool to allow ongoing verification of baselines by DNOs, FSPs and Platforms |
| Disseminate and implement | Publication and marketing of product outputs; <ul style="list-style-type: none"> • Final report. • Implementation strategy/timeline. • Governance strategy. • Baseline verification tool and supporting documentation. |




Energy Networks Association

4 More London Riverside

London SE1 2AU

t. +44 (0)20 7706 5100

w. energynetworks.org

 [@EnergyNetworks](https://twitter.com/EnergyNetworks)

© ENA 2020

Energy Networks Association Limited is a company registered in England & Wales No. 04832301
Registered office: 4 More London Riverside, London, SE1 2AU