FASS Programme

Day-Ahead System Services Auction (DASSA) Top-Up Mechanism - Recommendations Paper

August 2025

EirGrid SONI

Executive Summary

In September 2024, the SEM Committee (SEMC) published its decision[1] with respect to the recommended design for the Day-Ahead System Services Auction (DASSA) that was submitted by the Transmission System Operators (TSOs) to the SEMC in July 2024[2]. This decision did not approve a key component of the TSOs' recommendations – the Final Assignment Mechanism (FAM).

The TSOs' view, consistent with the view expressed in our DASSA Design Recommendations Paper, remains that a DASSA top-up mechanism is required to bridge any gap between the outcomes of the daily auction, real time system requirements and the actual service volume availability of DASSA Order Holders in real time. The TSOs consider that it is essential to incentivise service providers to make themselves available to provide services where they have availability in real time beyond those volumes awarded via the DASSA. This would ensure that reserve volume requirements would continue to be met during operational timeframes (real time), a key consideration for the TSOs in terms of system security.

In its decision, the SEMC noted the TSOs' concerns about the inherent risks in operating a constrained system with high levels of renewable penetration and associated high levels of redispatch (which is further discussed in Section 4 of this consultation paper). As a result, the SEMC indicated that the Regulatory Authorities (RAs) were happy to work with the TSOs to develop alternative approaches to address the SEMC's concerns, which would need to comply with the following:

- A top-up auction should allow for the updating of bids up to gate closure of the latest market.
- Units should not be rewarded as a consequence of how they have been positioned post redispatch.
- Units should not be incentivised to withhold volumes from the initial DASSA auction.
- Ex post volume requirements should be set by real time volume requirements for each service rather than ex-ante forecasts.

Following the SEMC decision, the TSOs and RAs agreed to conduct a Joint Options Assessment of eight weeks duration, which was critical to ensure that the TSOs' IT systems requirements/design workstream would not be delayed. The outcome of the assessment was that the RAs and TSOs agreed a minded to position on a suitable DASSA top-up mechanism option.

On 25 March 2025, the TSOs consulted on the proposed mechanism, namely the Residual Availability Determination (RAD)[3]. Stakeholders were invited to provide feedback on our proposals. The consultation period closed on 2 May 2025. The TSOs received 16 responses to the consultation.

In this recommendations paper, the TSOs recap the proposals and questions set out in the consultation paper, summarise the feedback received from industry stakeholders, address the comments made by respondents and outline the final recommendations for the RAD design.

This paper also summarises the independent 'needs analysis' for a DASSA top-up mechanism that was carried out by AFRY[4].

The key recommendations made in this paper are:

- The RAD mechanism as proposed in the consultation, with some small amendments, to serve as an incentive for service providers to make any residual availability – net of other market commitments, including the DASSA – available in real-time.
- The RAD gate-closure (for ex-ante bids) to align with the DASSA, with both submission windows closing at 15:30 D-1.
- RAD bids may not be updated post RAD gate-closure.

[1] SEM-24-066: Section 5.1 (semcommittee.com)
[2] DASSA Design Recommendations Paper (EirGrid); DASSA Design Recommendations Paper (SONI)
[3] DASSA Top-Up Consultation Paper (EirGrid); DASSA Top-Up Consultation Paper (SONI)
[4] AFRY Needs Analysis Report (EirGrid); AFRY Needs Analysis Report (SONI)

- RAD bids to have no commitment obligation attached.
- The RAD to procure the same system services as will be auctioned in the DASSA, including upward and downward reserve, and also reflecting any requirements for dynamic service provision and other service qualities to be defined.
- The RAD to satisfy the same locational constraints as the DASSA i.e. jurisdictional minimum volume requirements.
- The ex-post execution of the RAD auction to be based on:
    - Identified real time volume requirement, and
    - Supply curve derived from submitted RAD bids and service providers' availability to provide system services in real-time.
- The RAD volume requirement per service to be made up of:
    - System service needs in real time (capped at DASSA service volume requirement)

      MINUS

      DASSA service volume requirement (as procured in the DASSA)

      PLUS

      System service volumes that were cleared in the DASSA but unavailable due to self-lapsed DASSA Orders, TSO-lapsed DASSA Orders and service providers who were unavailable in real time.
- The ex-post RAD auction to award service providers in merit at the RAD clearing price, which is to be pay-as-clear.
- The RAD clearing price to be capped at the value of the DASSA clearing price for the relevant Trading Period.
- A RAD default price, the value of which would be determined by the RAs, to apply to service providers that did not submit ex-ante bids into the RAD but nonetheless made themselves available in real time.
- The TSOs reiterate our recommendation, previously described in our DASSA Design Recommendations Paper[5], that service providers be obligated to declare their availability to provide a service to the TSOs if they are technically capable of doing so, irrespective of whether they hold a DASSA Order for the service volume; this requirement would be set out in the System Services Code.

[5] Section 6.7 (EirGrid); Section 6.7 (SONI)

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Glossary of Terms

Table 1: Glossary of Terms

Acronym	Meaning
SEMC	SEM Committee
TSO	Transmission System Operator (EirGrid for Ireland and SONI for Northern Ireland)
DASSA	Day-Ahead System Services Auction
FAM	Final Assignment Mechanism
RA	Regulatory Authority
RAD	Residual Availability Determination
DS3	Delivering a Secure, Sustainable Electricity System
SSFA	System Services Future Arrangements
HLD	High Level Design
FASS	Future Arrangements for System Services
LPF	Layered Procurement Framework
PIR	Phased Implementation Roadmap
DAM	Day Ahead Market
FPN	Final Physical Notification
LSI	Largest Single Infeed
LSO	Largest Single Outfeed
D-1	Day Ahead
BM	Balancing Market
LTS	Long Term Scheduler
EMS	Energy Management System
POR	Primary Operating Reserve
NI	Northern Ireland
NCC	National Control Centre
BESS	Battery Energy Storage System
SO	System Operator
VFM	Volume Forecasting Methodology
SEM	Single Electricity Market

Relevant SEMC Decisions

SEM-20-044	System Services Future Arrangements Scoping Paper
SEM-21-021	System Services Future Arrangements Decision Paper 1
SEM-22-012	System Services Future Arrangements High-Level Design Decision
SEM-23-103	System Service Future Arrangement Phase III: Detailed Design & Implementation Decision Paper
SEM-24-066	Future Arrangements for System Services DASSA Market Design Decision Paper
SEM-25-011	Future Arrangements for System Services DASSA Volume Forecasting Methodology Decision Paper

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1 Introduction

1.1 Background

EirGrid plc is the licenced electricity Transmission System Operator (TSO) in Ireland, and SONI Ltd is the licensed TSO in Northern Ireland. It is our job to manage the electricity supply and the flow of power from generators to consumers. Electricity is generated from gas, oil and renewable sources (such as wind, solar and hydro power) at sites across the island. The high voltage transmission network then transports electricity to high demand centres, such as cities, towns and industrial sites.

We have a responsibility to facilitate connections to the power system, including increased levels of renewable sources, while continuing to ensure that the system operates securely and efficiently. The respective TSO licences include a requirement for the relevant TSO to contract for the provision of system services.

Currently, under the DS3 System Services (Volume Uncapped) Regulated Arrangements, the procurement of system services is based on technical qualification and availability-based tariffs. In enabling a transition to a low carbon energy system and ensuring efficient procurement of relevant services, while ensuring compliance with EU requirements, there is a need to move to a more competitive procurement process.

1.2 System Services Future Arrangements

The System Services Future Arrangements (SSFA) programme was officially launched by the SEM Committee (SEMC) in July 2020 with the publication of a Scoping Paper (SEM-20-044)[6] for public consultation.

As set out in the SEMC's SSFA Decision Paper 1 (SEM-21-021)[7], the objective of the programme is:

> "*to deliver a competitive framework for the procurement of system services, that ensures secure operation of the electricity system with higher levels of non-synchronous generation.*"

In April 2022, the SEMC published the SSFA High-Level Design (HLD) Decision (SEM-22-012)[8]. The HLD set out a framework for the competitive procurement of system services, consisting of the following:

1. **Daily Auction Framework** for the procurement of some of the system services through a daily spot market
2. **Layered Procurement Framework (LPF)** comprising contracts with a term of more than a day and up to 12 months.
3. The existing **Fixed Contract Framework** to continue to be used to remove barriers to entry for new technologies with the use of more long-term contracts and ensure sufficient volumes of system services, as required.

In December 2023, the SEMC published its SSFA Phase III: Detailed Design & Implementation Decision Paper (SEM-23-103)[9], in which it decided that the commercial arrangements as described in the HLD should be progressed by the TSOs.

In September 2024, the SEMC published its Future Arrangements for System Services DASSA Market Design Decision Paper (SEM-24-066)[10] with respect to the TSOs' recommended design for the Day-Ahead System

[6] SEM-20-044 System Services Future Arrangements Scoping Paper.pdf (semcommittee.com)
[7] SEM-21-021 System Services Future Arrangements Decision Paper 1.pdf (semcommittee.com)
[8] SEM-22-012 System Services Future Arrangements High-Level Design Decision Paper (semcommittee.com)
[9] SEM-23-103 System Service Future Arrangement Phase III: Detailed Design & Implementation Decision Paper (semcommitte.com)
[10] SEM-24-066 Future Arrangements for System Services DASSA Market Design Decision Paper (semcommittee.com)

Services Auction (DASSA)[11] that was submitted to the SEMC in July 2024. This decision did not approve a key component of the TSOs' recommendations – the Final Assignment Mechanism (FAM).

As a result of the SEMC decision and the view of the TSOs that a DASSA top-up mechanism to incentivise availability of system services in real time is essential to the FASS arrangements, the TSOs and Regulatory Authorities (RAs) agreed to conduct a Joint Options Assessment to identify a solution which would address the SEMC concerns while ensuring that appropriate incentives were in place to meet the real time system services needs of the TSOs.

The outcome of the Joint Options Assessment is that the RAs and TSOs proposed a mechanism called the Residual Availability Determination (RAD) for consultation.

Figure 2 below shows the timeline of key papers and decisions in the development of the RAD.

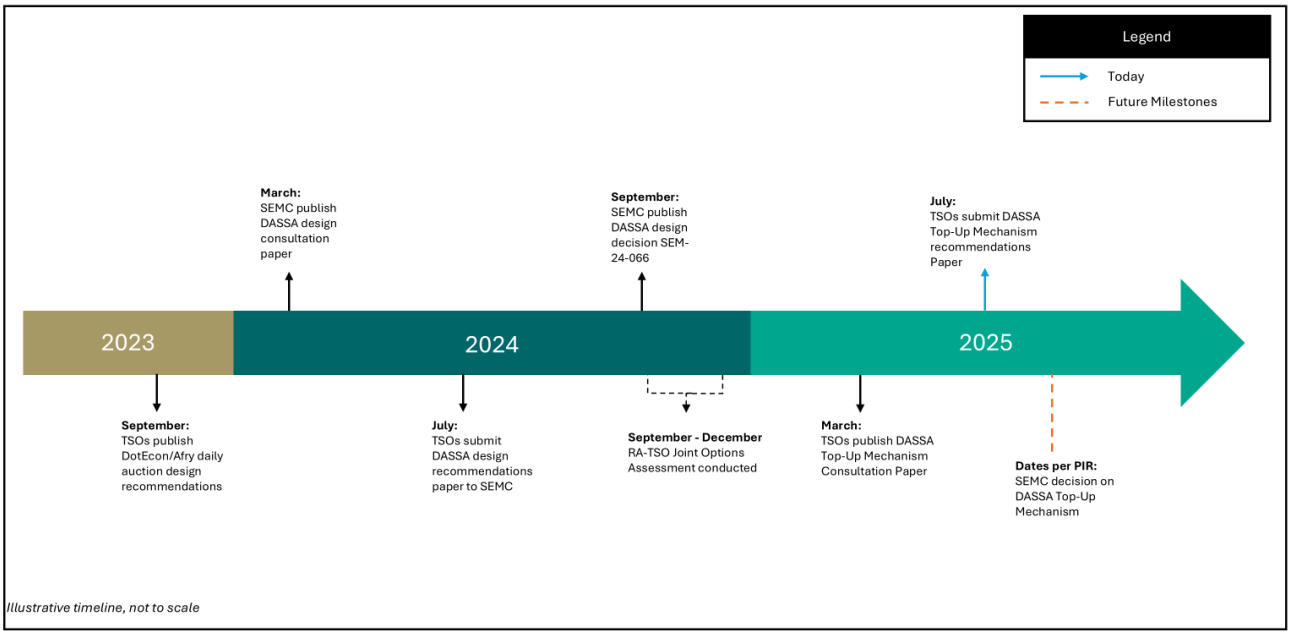

Figure 2. DASSA Design Timeline

1.3 Purpose of this Paper

This paper sets out the TSOs' recommendations for the design of the RAD mechanism, which aims to bridge any gap between the outcomes of the DASSA, real-time system requirements and the actual service volume availability of DASSA Order Holders in real-time.

In the sections below, the TSOs recap the proposals and questions set out in the DASSA Top-Up Mechanism Consultation Paper[12], summarise the feedback received from industry stakeholders, address the comments made by respondents and outline the TSOs' final recommendations for the RAD design.

The design recommendations presented in this paper are subject to approval by the SEM Committee and are intended to align with the broader objectives of the System Services Future Arrangements initiative.

[11] DASSA Design Recommendations Paper (EirGrid); DASSA Design Recommendations Paper (SONI)
[12] DASSA Top-Up Consultation Paper (EirGrid);DASSA Top-Up Consultation Paper (SONI)

1.4 Phased Implementation Roadmap

The TSOs acknowledge the necessity of providing clear timelines to industry to facilitate their own programme deliveries. In this regard, the FASS Programme workstreams and projected timelines are detailed in the Phased Implementation Roadmap (PIR), which is revised biannually to reflect changes to programme scope or schedule.

As per the TSOs' Phased Implementation Roadmap V3.0[13], and as agreed with the Regulatory Authorities, the TSOs are required to consult on and submit a recommendation paper to the SEMC on the DASSA Top-Up Mechanism.

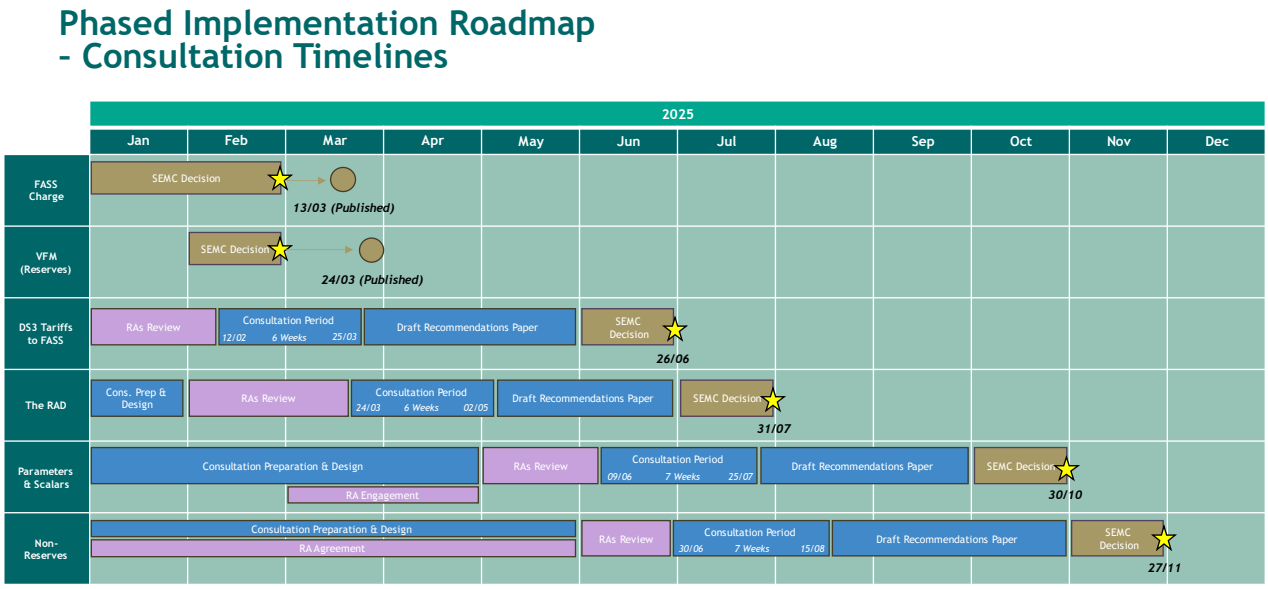

Figure 3. Phased Implementation Roadmap – Detailed schedule of Programme Consultation

[13] Phased Implementation Roadmap (EirGrid); Phased Implementation Roadmap (SONI)

1.5 Structure of Paper

This paper sets out the TSOs' recommendations for the design of the DASSA Top-Up Mechanism. Where applicable, the paper refers to related workstreams, the schedule of which is summarised in the PIR.

Chapter 2 provides an overview of previous SEMC decisions regarding a DASSA top-up mechanism. Chapter 3 details the TSOs view, outlining the necessity of a top-up mechanism to operate the system securely. Chapters 4 to 6 address the comments received to the consultation questions and outline the TSOs' considerations and final recommendations on these topics.

1.6 Next Steps

The TSOs will be submitting this recommendations paper to the SEM Committee for consideration at its August 2025 meeting.

As per the PIR, the TSOs expect that the SEM Committee will publish its decision on the DASSA design shortly thereafter.

The TSOs will consider the SEM Committee's decision regarding the design and delivery of the DASSA by May 2027.

2 SEMC Decision on DASSA Top-Up Mechanism

The SEM Committee's High Level Design Decision (SEM-22-012)[14] provides for a DASSA top-up mechanism (ex-post), to address additional procurement requirements beyond those identified for the DASSA:

"The SEM Committee has decided to proceed on the basis of a daily ex-ante market auction to take place at some point after the closure of the DAM. This will then be followed by an ex-post physical top-up auction, based on the TSOs physical dispatch of the system, to take place if there are insufficient System Service volumes procured through the ex-ante market auction."

In late July 2024, the TSOs submitted a DASSA Design Recommendations Paper to the Regulatory Authorities which contained an ex-post top-up component named the Final Assignment Mechanism (FAM)[15].

In the corresponding SEMC Decision Paper[16] in September 2024, the SEMC decided that the TSOs' proposals with the respect to the FAM were not approved:

- SEMC Decision: "The SEM Committee does not approve the introduction of the FAM. The TSOs may propose alternatives to the FAM for delivery either alongside the scheduled market go-live date or post go-live".

The SEMC had several concerns with the FAM, as set out below:

- "The SEM Committee considers the daily auction framework for procurement of system services does not robustly incentivise availability as intended by the TSOs. There is a need to ensure only units that position themselves ex-ante for service provision are rewarded through System Services markets. Moreover, given there will be no understanding of the FAM volume requirement ahead of time, there will be no certainty of achieving a FAM position for bidders. This is therefore unlikely to have any influence on how units enter the intra-day energy markets and does not provide any robust incentive to position a unit for ex-ante reserve availability. The SEM Committee considers that it would simply act as a compensation mechanism for units based on what their position ended up being at Gate Closure, as opposed to a mechanism which incentivises units to position their portfolio of assets across energy and system services provision.
- The inability to update bids in the FAM means that the true value of closer to real time service provision is not reflected in the FAM, as the DASSA bids are essentially outdated due to updated market positions.
- The introduction of a fully automated secondary market and the removal of compensation payment protections for providers mitigates the need for a top-up auction as the market mechanisms should now encourage outcomes which ensure providers are physically able to provide.
- The SEM Committee understands that units who are repositioned in real time will remain categorised as DASSA winners, but their volumes will be released into the FAM for further procurement. This does not align with the HLD that the total volume procured must not exceed the total volume requirement.
- Measures such as the zero volume bid and volume capped bidding recommendations encourage reduced liquidity in both the DASSA and the secondary market. The SEM Committee considers that a secondary market which is fully automated and allows trading up to 60 minutes before a trading period adequately allows all technologies to participate, and the FAM risks reducing incentives for participation, reducing secondary market liquidity and reducing the likelihood of all technologies being able to establish an ex-ante market position.

[14] SEM-22-012: Section 4.3 (semcommittee.com)
[15] Section 6 (EirGrid);Section 6 (SONI)
[16] SEM-24-066: Section 5.1 (semcommittee.com)

- The FAM volume is intended to meet any deficit in the DASSA volume, however it would be more appropriate for it to make up any deficit in the real-time volume requirement once the available DASSA winning volumes have been accounted for. The third worked example in the HLD (SEM-22-012, page 95) illustrates this."

Consequent to the SEMC decision and the consistent view of the TSOs that a DASSA top-up mechanism to incentivise system services availability in real-time is essential to the FASS arrangements, the TSOs and RAs agreed to conduct a Joint Options Assessment to identify an option which would address the SEMC concerns, while ensuring that appropriate incentives were in place to meet the system services needs of the TSOs.

3 Requirement for DASSA Top-Up Mechanism

The TSOs consider that it is essential for reasons of system security to incentivise service providers to make themselves available to provide services in real-time beyond those volumes awarded via the DASSA.

There may be several reasons for a difference between the outcomes of the DASSA and the availability of DASSA Order Holders in real-time, including:

- Holders of a DASSA Order may not meet their commitment obligation (i.e. a submitted FPN may not be compatible with the DASSA Order) and may be lapsed by the TSOs.
- Holders of a DASSA Order may self-lapse their Order.
- Holders of a Confirmed DASSA Order may declare themselves unavailable to provide a service.
- Holders of a DASSA Order may be moved away from a compatible position by the TSOs for system security reasons.

In the absence of an ex-post reconciliation mechanism, the TSOs are concerned that there may be insufficient reserves available in real time, posing a risk to system security. Without an incentive for service providers who were not successful in the DASSA or secondary trading to offer their full technical capabilities in real-time, these service providers may either remain unavailable or only offer minimal levels of services as required by the Grid Codes.

In its decision[17], the SEMC indicated that it considered the ex-ante framework of the DASSA, secondary trading and the ability to reposition units in the Balancing Market for non-energy actions, to be a sufficient mechanism to address real time reserve requirements on the system. However, the SEMC stated that it was open to an additional mechanism and other options if the TSOs could demonstrate that there could be a system services volume deficit in real-time. Following this, the TSOs, in collaboration with the RAs, began defining the scope of works for the evaluation and development of an alternative DASSA top-up mechanism, resulting in the establishment of two work packages.

The scope of the first work package (WP1) was the delivery of an independent assessment analysing the risk of the DASSA, together with a fully automated secondary trading platform, not providing sufficient incentives to address real-time operational reserve requirements following TSO/service provider actions. This 'Needs Analysis' is discussed in further detail in Section 3.1 below, outlining the results of and TSO commentary on the independent assessment. The second work package (WP2), known as the Joint Options Assessment (JOA) conducted by the TSOs and RAs, is described in Section 6 of the DASSA top-up Mechanism consultation paper[18]; industry feedback on this process is addressed in Section 5 below.

3.1 Needs Analysis

3.1.1 Scope of Work

As noted above, the TSOs agreed the scope of work for an independent 'Needs Analysis' for a DASSA top-up mechanism with the RAs: to assess whether there is a risk of increasingly scarce (and potentially too expensive) reserve in operational timeframes without an appropriate top-up mechanism. This risk was to be assessed assuming the presence of a fully automated secondary trading platform, accounting for the incentives in the Balancing Market, but also the impact of non-energy actions on the resulting dispatch. The scope of work required modelling how the DASSA (day ahead and secondary trading) would function within the existing energy market (ex-ante and balancing), concentrating on analysing the risk of a potential

[17] SEM-24-066: Section 5.1 (semcommittee.com)
[18] Section 6 (EirGrid);Section 6 (SONI)

shortfall in real time operational reserve requirements, accounting for the impact of non-energy actions in the Balancing Market and the incentive to remain available for potential Balancing Market payments.

The TSOs agreed the defined scope of this work in October 2024 and commissioned AFRY to carry it out.

The AFRY report can be found on the EirGrid and SONI websites[19].

3.1.2 Modelling Overview

AFRY's approach to this analysis was to model an 'unconstrained' DASSA and DAM and to compare this to modelled 'constrained' dispatch runs for the years 2027 and 2030. This modelling highlights how reserve provision may change from the day-ahead stage closer to real time. AFRY also considered variations on the effectiveness of compensation payments and secondary trading of DASSA Orders.

AFRY's analysis is described in detail in Sections 2 and 3 of their paper.

3.1.3 Needs Analysis Conclusions

The results of the modelling exercise varied depending on the underlying assumption as to the liquidity of the secondary trading market and effectiveness of the commitment obligation mechanism.

Assuming a compensation payment that always encourages trading in the secondary market (rather than lapsing or submitting an incompatible FPN) and a very liquid secondary trading market, we could expect on average 1% of additional reserve required. This reflects only plant outages post gate closure. AFRY and the TSOs consider that these assumptions test the boundaries of what is realistically possible.

On the other extreme, with weak commitment obligations, the TSOs may have to replace up to, on average, 30% of reserve volumes procured in the DASSA but not available in real time.

Assuming a cost-reflective compensation payment mechanism (i.e. closer to what is currently proposed by the TSOs and the RAs), the resulting 'gap' is somewhere in between the two extremes: an average hourly change between reserve volumes from the market and what is then available in real-time ranging from 3% for FFR to 10% for RR. However, for 10% of periods of the year (i.e. more than two hours per day on average) the real-time reserve 'deficit' is expected to be more than 100MW for each reserve product.

The previous AFRY analysis did not assume that the absence of an explicit payment may have an impact on the willingness, but also the capability of different providers to provide reserve outside the DASSA. AFRY then also tested this – is there a risk that the TSOs may not have sufficient reserve assuming service providers without a DASSA Order offered the minimum Grid Code? The analysis results suggested the TSOs would not be able to ensure system security by relying solely on service providers offering the minimum Grid Code requirements, i.e. relying on Grid Code requirements alone would not be sufficient to ensure adequate reserve. This relates to all reserves other than FFR, which is not specified in the Grid Codes and therefore does not even have a minimum Grid Code requirement. We therefore believe that even if a top-up mechanism is used infrequently and/or for small volumes, it still would act as a necessary incentive to promote full technical service capability.

In summary, the TSOs consider that AFRY's analysis supports the implementation of a DASSA top-up mechanism to incentivise service providers to maintain their full technical capability and continue to ensure system security. The analysis suggests that without sufficient incentives:

- There will be a real-time reserve 'deficit' of more than 100 MW for each reserve product for 10% of periods (i.e. more than two hours per day on average) of the modelled year 2027.
- While the TSOs will endeavour to manage such deficits in the BM, there will be no explicit compensation for reserve. There will therefore be a risk, in the absence of an incentive, that service providers will not make themselves available above the mandated Grid Code requirement of 5% of capacity.

[19] AFRY Needs Analysis Report (EirGrid); AFRY Needs Analysis Report (SONI)

- The minimum reserve service provision as mandated by the Grid Code will not be sufficient for system security.

4 Consultation Overview

4.1 Consultation Summary

The DASSA Top-up Mechanism consultation[20] was launched on 25 March 2025 and closed on 02 May 2025. A virtual industry workshop was held on 16 April 2025 to support the consultation process.

In total, 16 written responses to the consultation were received. The 15 non-confidential responses were as follows:

- Bord Gáis Energy
- Bord Na Mona
- Captured Carbon Ltd
- Demand Response Association of Ireland (DRAI)
- Electricity Association of Ireland (EAI)
- Energia
- EP UK Investments
- ESB Generation
- Federation of Energy Response Aggregators (FERA)
- Hanwha Energy Corporation Limited
- iPower
- Moyle Interconnector Ltd
- RWE Renewables Ltd
- SSE
- Wind Energy Ireland (WEI), Energy Storage Ireland (ESI) & RenewableNI (RNI)

4.2 Consultation Responses Summary

The consultation paper set out the TSOs' proposals for the design of the RAD and invited feedback from interested stakeholders on the four questions posed.

The responses received to the consultation are quite detailed and the TSOs appreciate the time and effort industry participants committed to reviewing the proposals and providing very helpful feedback. We have assessed the responses and have provided further information in this paper where possible to aid clarification on some issues. In addition to the questions asked in the consultation paper, many respondents provided feedback on wider aspects of the DASSA and FASS arrangements. These are valuable to capture, and in the below sections we outline the views received and aim to address them where possible.

In general, respondents acknowledged the importance of a DASSA top-up mechanism in supporting the continued procurement of sufficient system services, such that system security is maintained. However, while there was support in principle, several themes emerged in the responses. Further detail and clarity were sought on several facets of the RAD, including the TSOs' justification for the RAD, lack of industry involvement in the development of the proposal and operational considerations. Of note, there was broad disagreement with the proposal for a RAD price cap, with respondents expressing concern that it may distort market signals and disincentivise participation. Additionally, the proposed RAD Gate Closure timing was viewed by a number of respondents as misaligned with existing operations and potentially restrictive for some technologies. There was also a perception that volumes required in the RAD would be minimal thus

[20] DASSA Top-Up Consultation Paper (EirGrid); DASSA Top-Up Consultation Paper (SONI)

removing opportunities from assets with varying availability, and some concern that there is an undervaluation of system services with the current proposals.

These themes, among others, will be discussed further in the subsequent sections of this paper.

5 Joint RA-TSO Options Assessment Process

5.1 Review of Comments on the Joint Options Assessment

Section 6 of the consultation paper[21] described the processes and outcomes of the Joint Options Assessment conducted by the TSOs and the RAs.

Question #1: Do you have any comments on the Joint Options Assessment conducted by the RAs and TSOs?

5.1.1 Question 1 – Summary of Consultation responses

15 of the 16 consultation respondents expressed their views on the Joint Options Assessment process.

Most respondents expressed concern that the consultation did not provide sufficient detail on the nine options presented to determine a preferred option. A few respondents outlined that the benefits and challenges presented for each option lacked justification and were not appropriately compared to other options. Some respondents requested that the TSOs should consult further with industry on these options.

Some respondents outlined their view that the Joint Options Assessment should not have been conducted without industry representation, highlighting that earlier engagement with industry would have offered an opportunity to raise concerns and suggest solutions.

Two respondents considered that the conservative volume forecasting approach as outlined in the DASSA Volume Forecasting Methodology paper[22] will increase the likelihood of over procurement in the DASSA, thereby reducing volumes available to service providers and thus negating the need for a DASSA top-up mechanism. One respondent stated the options presented should be re-assessed considering the information relating to volume procurement in the Volume Forecast Methodology paper was released after the Joint Options Assessment was conducted.

One respondent stated that the Joint Options Assessment was reasonable for the determination of the proposed top-up mechanism.

5.1.2 Question 1 - TSOs' Commentary

5.1.2.1 Detail on Options Assessed

The TSOs acknowledge the feedback received on the nine options presented within the consultation paper, noting the need for more clarity and transparency. In sections 6.3 and 6.4 of the consultation paper[23], the TSOs endeavoured to provide sufficient detail of each option to illustrate to industry how the outcome of the Joint Options Assessment was arrived at, including whether the options met the TSOs' requirements and considerations on the complexities of any implementation. In Appendix 1 below, following requests for further information regarding the options, the TSOs have included the "Day in the Life" examples prepared for each option during the assessment process.

5.1.2.2 Industry Involvement in Joint Options Assessment Process

As noted in previous sections, the SEMC in its SEM-24-066 decision paper[24] decided that the TSOs' recommendations with the respect to the FAM were not approved due to several concerns it had with the mechanism. However, the SEMC considered the TSOs' view that a top-up mechanism was essential to

[21] Section 6 (EirGrid); Section 6 (SONI)
[22] Section 4.2 (EirGrid); Section 4.2 (SONI)
[23] Sections 6.3 & 6.4 (EirGrid); Sections 6.3 & 6.4 (SONI)
[24] SEM-24-066: Section 5.1 (semcommittee.com)

maintaining the secure operation of the power system and indicated that the RAs were willing to work with the TSOs to identify a proposal that would address SEMC and TSO concerns.

Considering the additional overhead that developing a new DASSA top-up mechanism would require, the TSOs sought to develop a proposal with the RAs that would address the SEMC's concerns and could be shared with industry as soon as possible, believing the Joint Options Assessment to be the fastest way to deliver a viable alternative mechanism without impacting FASS programme timelines.

The TSOs appreciate the wide array of technologies and service providers that participate in consultations on the DASSA design and the time it takes to respond to consultations. The TSOs conducted the assessment process to evaluate and present a preferred proposal to industry that addressed the concerns outlined by the SEMC and considered the practicality of implementation in the overall DASSA design. By conducting the assessment in this manner, the TSOs' objective was to present evaluated options for consultation without further delaying the delivery of the FASS programme.

Section 6 of the consultation paper[25] outlines the processes involved during the Joint Options Assessment work package, highlighting the assessment criteria, determination of options and results of the assessments conducted.

The TSOs endeavoured to keep stakeholders informed of the assessment process, presenting the outcomes of the Joint Options Assessment to the SSFA Project Panel in December 2024, to industry at the Future Power Markets industry workshop in January 2025, and finally, following publication of the consultation paper, at the consultation information session held in April 2025. The information presented has remained largely unchanged across these three sessions and the TSOs addressed all questions received during these presentations.

5.1.2.3 Conservative Volume Forecasting Methodology

The TSOs' Volume Forecast Methodology Recommendations paper[26] describes the inputs for determining the reserve service volumes to be procured daily, which include largest single infeed (LSI) / outfeed (LSO) values, consequential losses, and allowances for unexpected service provider availability. Unexpected availability covers circumstances following execution of the DASSA where reserve providers may become unexpectedly unavailable or limited by local constraints. The TSOs, as prudent system operators, do not consider the overall approach to constitute 'over procurement' as the volumes must be determined in advance of the outputs of the wholesale D-1 and intraday markets, without clarity on interconnector flows.

The TSOs consider that the methodology may evolve over time to include improvements based on real-life operational experience, evolving ex-ante market dynamics and improved forecasting tools. Specifically, the allowance for unexpected unavailability will be reviewed based on the success of any top-up mechanism.

[25] Section 6 (EirGrid); Section 6 (SONI)
[26] Section 4.2 (EirGrid); Section 4.2 (SONI)

6 Residual Availability Determination Mechanism

Section 7.1 of the consultation paper[27] set out an overview of the proposed RAD. The RAD addresses any real-time shortfalls in available volumes of system services that were procured through the DASSA.

6.1 RAD Ex-Ante Design

Section 7.2 of the consultation paper outlines the TSOs' proposal for an ex-ante gate closure and bidding format for the RAD.

6.1.1 Question 2 - Consultation Proposal Summary

TSO Proposal: Bid/offer submission for the RAD will be permitted up to a RAD Gate Closure, which is proposed to be 14:30 day-ahead. Bids may not be updated after RAD Gate Closure.

Question #2: Do you have any comments on the proposed timings for the submission of bids for the RAD?

6.1.2 Question 2 – Summary of Consultation responses

All 16 respondents set out their views on the proposed RAD Gate Closure.

Most respondents disagreed with the TSOs' proposals for the RAD Gate Closure, stating that service providers should be permitted to submit updated bids closer to real-time in line with SEM-24-066[28]. Many respondents recommended that the RAD should be aligned with the Balancing Market (BM) Gate Closure, stating that this would enable more accurate bidding of volumes and offer real-time value to assets providing services.

Four respondents raised concerns that the timeframe proposed is too far ahead of real-time, creating uncertainty and risk for service providers with unpredictable availability when bidding into the RAD.

One respondent requested clarification on the RAD gate opening, highlighting that service providers might struggle to optimise asset positions should the RAD bidding window be too short.

Several respondents highlighted issues surrounding bidding into the RAD without knowing DASSA outcomes. One respondent noted that the separation of bidding for both auctions would add unnecessary complexity considering the information available to providers at the RAD Gate Closure will remain unchanged by the DASSA Gate Closure. Other concerns raised highlighted risks associated with bidding unknown volumes for an unknown price and the potential risk exposure.

Many respondents expressed views that the TSOs' concerns surrounding market power are unjustified and remain hypothetical until supporting evidence of market power is presented. Some respondents stated that the RAs should be responsible for monitoring and rectifying market power issues rather than measures being incorporated into the DASSA design by the TSOs.

[27] Section 7 (EirGrid); Section 7 (SONI)
[28] SEM-24-066: Section 5.2 (semcommittee.com)

6.1.3 Question 2 – TSOs' Commentary

6.1.3.1 RAD Gate Closure

The TSOs acknowledge respondents' feedback regarding the timing of the RAD Gate Closure and the desire to allow participants to update bids closer to real-time.

The TSOs' proposed RAD Gate Closure of 14:30 was intended to separate the bidding processes for the RAD and the DASSA considering the different bidding strategies for service providers. Further to the industry feedback received, the TSOs consider that the alignment of bidding windows for the DASSA and the RAD is reasonable: it will increase operational efficiency for service providers when compared to the original proposal, while maintaining the rule that service providers will not be aware of DASSA outcomes when bidding into the RAD.

In our consultation paper, the TSOs did not propose a RAD gate opening time, i.e. the earliest time that RAD bids may be submitted for a given Auction Timeframe. The DASSA gate opening is subject to the outcome of the Parameters and Scalars consultation, where the TSOs invite feedback on our proposal to allow DASSA bids from 11:45 D-1. The TSOs will revisit the question of the RAD gate opening time following the SEMC decision on the RAD and having noted industry commentary on the DASSA gate opening.

In its DASSA Design Decision paper[29], the SEMC states *"the DASSA will be the primary procurement mechanism"* and that *"units should not be incentivised to withhold volumes from the initial DASSA auction"*. By clearing the RAD ex-post, service providers will not know whether they will be in receipt of a RAD payment before bidding into the DASSA, removing incentives to withhold capacity when bidding into the DASSA and maintaining the DASSA as the primary procurement mechanism for System Services. The TSOs' proposed price cap in the RAD is also aimed at incentivising participation in the DASSA; see the TSOs' commentary on this proposal in Section 6.2.3.1 below.

The TSOs address respondents' feedback on the updating of bids in Section 6.1.3.3 below.

6.1.3.2 Participant Risk Exposure

The TSOs welcome respondents' feedback regarding the risk exposure for service providers participating in the RAD. The TSOs wish to reiterate that the proposed RAD is an ex-post mechanism that evaluates real time system needs and service provider availability to remunerate residual availability net of other market commitments (assuming in merit). As detailed within the consultation paper[30], there will be no commitment obligation attached to RAD bids.

The TSOs consider that the absence of commitment obligations will allow service providers to bid a range of volume up to the qualified capacity of a participating unit, with the knowledge that any deficit in bid volumes submitted, when compared to real-time availability, will not be subject to financial loss on the part of the service provider.

The TSOs acknowledge that there are production costs associated with maintaining residual availability in real-time and that service providers will reflect these costs when bidding into the RAD. However, the TSOs consider that, since all other market opportunities will have been exhausted, the opportunity cost for service providers to participate in the RAD will be low, with little or no risk attached.

6.1.3.3 Compliance with SEM-24-066

The TSOs acknowledge respondents' comments regarding the RAD's alignment with the SEMC's considerations in its decision not to approve the FAM. An extensive review of the SEMC's commentary was conducted as part of the Joint Options Assessment: the TSOs consider that the RAD design as proposed complies with the key considerations raised in SEM-24-066[31], as follows.

SEMC Decision: *"A top-up auction should allow for the updating of bids up to Gate Closure of the latest market, in this context this is currently the secondary market one hour before the trading period"*

[29] SEM-24-066: Sections 2.1 & 5.2 (semcommittee.com)
[30] Section 7.1 (EirGrid); Section 7.1 (SONI)
[31] SEM-24-066: Section 5.2 (semcommittee.com)

TSO Commentary: In Section 6.1.3.4 below, the TSOs detail the rationale for introducing a RAD Gate Closure to prevent opportunities for market power in the RAD.

In a market where bids can be updated closer to real-time, post DASSA execution, a credible risk exists where service providers may strategically lapse DASSA orders to obtain a more advantageous position in the RAD. By utilising information published following the DASSA clearing and results of the Long-Term Scheduler (LTS), service providers could infer the position of competitors and strategically alter bids to gain an advantage.

Additionally, the RAD, as proposed by the TSO, will assess whether any additional volumes are required to meet system needs. Where a volume deficit has been identified, the RAD will execute based on the real-time availability of service providers and the merit order of submitted price-quantity curves. By determining the real-time availability of service providers, the TSOs' ensure that the positions of service providers are accurate and reflect real-time capability to provide additional reserve to aid system security.

SEMC Decision: *"Units should not be incentivised to withhold volumes from the initial DASSA auction i.e. there should be no mechanism for partial volume bids"*

TSO Commentary: In the DASSA Design recommendations paper[32], the TSOs proposed that portions of volumes bid into the DASSA would be considered for the FAM, utilising volume capped and zero-volume bids. In SEM-24-066, the SEMC decided "there should be no mechanism for partial volume bids" that may result in withholding volumes that would be otherwise procured through the DASSA. To address this, the TSOs have separated the bidding processes for the DASSA and the RAD, requiring service providers to submit volumes explicitly for both auctions. Considering this, and with the RAD being an ex-post mechanism, service providers will not be incentivised to withhold volumes during the DASSA the bidding process, maintaining the DASSA as the primary procurement mechanism.

SEMC Decision: *"Ex-post volume requirements should not be set by reference to ex-ante forecasts, rather it should only be used if there is a deficit against the ex-post real time volume requirement for each service."*

TSO Commentary: The proposed RAD mechanism has been designed to assess system needs in real-time, which will determine any additional service volume requirements beyond what was procured in the DASSA. The inputs to this assessment will be:

- Real-time system constraints, which will be based on data from the TSOs' Energy Management System (EMS).
- The total volume procured in the DASSA.
- The total volume of lapsed DASSA Orders.
- The real-time availability of confirmed DASSA Order holders.

The outcome of the RAD assessment could be positive or negative. If the real-time system needs are satisfied by the procured DASSA volume net of lapsed and unavailable orders, then the RAD will not execute. Conversely, if a volume deficit has been identified, RAD orders will be awarded to service providers based on the real-time availability and merit order of submitted price-quantity curves. This fundamental design component ensures the total volume procured through the DASSA and the RAD will not exceed the volume required to maintain system security and aligns with the SEMC's decision.

6.1.3.4 Market Power

The current proposal outlined by the TSOs where the RAD Gate Closure precedes the DASSA, mitigates against service providers with asymmetric knowledge of the market: specifically, those from larger portfolios with knowledge of DASSA outcomes and the Long-Term Schedule (LTS) may be able to infer the position of other service providers and could utilise that information when bidding into the RAD.

Additionally, the TSOs' proposal that RAD bids may not be updated closer to real-time mitigates the risk of service providers strategically lapsing DASSA Orders to obtain a more advantageous position in the RAD. By utilising information following publication of the DASSA outcome and results of the Long-Term Scheduler

[32] Section 6.3 (EirGrid); Section 6.3 (SONI)

(LTS), service providers could infer the position of competitors and strategically alter bids to gain an advantage.

The TSOs note respondents' requests for empirical evidence of market power. As responsible system and market operators, the TSOs consider that it is reasonable to address the risk of market power in the development of the new DASSA arrangements rather than wait for issue to materialise when the auction goes live.

The TSOs are of the view that a full evaluation of the potential for the exertion of market power in the DASSA arrangements (including the RAD) should be undertaken by the Regulatory Authorities. The TSOs are willing to support the RAs in carrying out this assessment.

6.1.4 Recommendation – RAD Gate Closure

The TSOs recommend that the RAD Gate Closure is extended to align with the DASSA, with both submission windows closing at 15:30 D-1. Additionally, the TSOs recommend that RAD bids cannot be updated post gate closure.

6.2 RAD Ex-Post Design

6.2.1 Question 3 - Consultation Proposal Summary

TSO Proposal: Clearing (including submitted RAD offers, unit availability based on real-time data and determination of both price and residual volume requirements) of the RAD mechanism will be an ex-post process prior to FASS settlement.

Question #3: Do you have any comments with respect to the clearing proposals for the RAD mechanism?

6.2.2 Question 3 – Summary of Consultation Responses

Respondents outlined a range of views regarding the clearing arrangements for the RAD mechanism. Multiple respondents disagreed with the proposed price cap, particularly the link between the RAD clearing price and the DASSA clearing price, arguing that it limits the RAD's ability to reflect real-time system conditions and may disincentivise participation from some service providers. For example, one respondent stated that *"[We] do not agree with a price cap in a top-up mechanism being used to force cheaper prices than the scarcity value of the services"*, while another added that *"There is no justification for implementing a price cap that is set off the DASSA clearing price"*.

Several respondents requested further detail on how the RAD clearing process would operate in practice. One respondent noted, *"Key elements - such as how real time volume requirements will be derived, how bids will be evaluated against constraints, and how fallback provisions will work in case of volume insufficiency - are not defined in sufficient detail"*.

One respondent questioned the rationale for using a pay-as-clear approach for a top-up mechanism, i.e., *"As this is a top up auction then why is this not Pay-as-Bid which could reduce the cost to the consumer? We accept that the main DASSA auction being Pay-as-Clear would reflect the cost associated with the required system services, however the RAD may require more expensive providers that didn't clear in the DASSA. If the prices submitted to the RAD are lower than the DASSA then it is understandable to use Pay-as-Clear."*

6.2.3 Question 3 – TSOs' Commentary

The TSOs welcome respondents' feedback regarding the proposed clearing arrangements for the RAD mechanism. This section provides further clarification on the rationale for the application of a price cap that is aligned with the DASSA clearing price, the functionality of the ex-post clearing design and the usage of a pay-as-clear approach.

6.2.3.1 Price Cap Rationale

In SEM-24-066[33], the SEMC decided *"Price caps will be allowed for in the design of the DASSA, the TSOs are requested to consult on the methodology and conditions to apply to the use of price caps."*

The TSOs consider that the proposed RAD price cap, set at the DASSA clearing price, is necessary to incentivise participation in the DASSA and mitigate the risk of strategic lapsing of DASSA orders.

As noted in Section 6.1.3.1 above, SEM-24-066 states that *"the DASSA will be the primary procurement mechanism"* and that *"units should not be incentivised to withhold volumes from the initial DASSA auction"*. Implementing a price cap in the RAD equal to the value of the DASSA clearing price will disincentivise service providers from not participating in the DASSA in the expectation of earning greater income in the RAD.

Strategic lapsing of DASSA Orders could occur if a service provider considers that the RAD will be more lucrative than the DASSA, allowing for the cost of any Compensation Payment payable to the TSOs for the lapsed Order. The proposed price cap for the RAD mitigates against this potential behaviour.

The TSOs address respondents' feedback on the value of system services in Section 6.3.2.1 below.

6.2.3.2 RAD Clearing Process

As described in the consultation paper[34], the RAD is designed to execute ex-post, when a real-time volume deficit is identified (through an assessment of system needs) for a specific combination of service, zone (jurisdiction) and quality category, e.g., Dynamic POR in NI. This ensures the auction will run only when necessary and will reflect actual system conditions.

In terms of constraints, the RAD will procure services on an individual basis, accounting for the same jurisdictional and quality category constraints as the DASSA. In addition, the RAD will utilise EMS data (ex-post), as used in the control centres, to determine a unit's real-time availability: this data may incorporate some additional constraints that are not known at the DASSA clearing stage.

As outlined in the Parameters and Scalars Consultation Paper[35], the TSOs propose that, in the event of a suspension of the DASSA, all available reserve volumes in real-time will be settled through ex-post arrangements. In such cases, if the RAD mechanism is operational, service providers will receive a price as cleared in the RAD. However, if both the DASSA and RAD are unavailable, the TSOs propose that all available reserve volumes be settled at predefined tariffs based on the long-run marginal cost of a BESS dedicated solely to reserve provision.

The TSOs have provided an additional worked example, illustrating the RAD clearing process in Appendix 2 below.

6.2.3.3 Pay-as-Clear Rationale

The TSOs consider pay-as-clear to be an appropriate clearing rule for the RAD given than it is expected that the bids into the RAD will be lower than the DASSA. In theory, pay-as-bid may seem to provide cost savings compared to pay-as-clear. The TSOs consider that if the RAD was cleared pay-as-bid, service providers would be incentivised to bid according to an estimated clearing price, rather than bidding according to their costs of providing reserves. Any inaccuracies in estimating a clearing price would result in inefficient selection of service providers and a higher cost to consumers.

See Section 6.1.3.2 above for the TSOs' commentary on the risk for participants in bidding into the RAD.

[33] SEM-24-066: Section 2.6 (semcommittee.com)
[34] Section 7.1 (EirGrid); Section 7.1 (SONI)
[35] Section 12.1 (EirGrid); Section 12.1 (SONI)

6.2.4 Recommendation – RAD Clearing Proposals

The TSOs recommend that the RAD clearing proposals are implemented as proposed within the consultation paper[36], where:

- Clearing of the RAD mechanism will be an ex-post process prior to FASS settlement.
- The RAD will determine any real-time system service requirements beyond the available DASSA volumes procured (the RAD will not result in the TSOs procuring service volume greater than the day ahead service volume requirement).
- A RAD clearing price, which will be pay-as-clear, will be determined per system service product / zone / quality category, as per the DASSA.
- The RAD clearing price will be capped at the value of the DASSA clearing price for the relevant Trading Period.

6.3 Additional Comments on the RAD Mechanism

Question #4: Do you have any additional comments with respect to proposed RAD?

6.3.1 Question 4 – Summary of Consultation Responses

Respondents provided a range of additional observations on the RAD mechanism. Particularly, several respondents expressed concern regarding a perceived undervaluation of system services and a drive towards cost minimisation. One response noted, *"The value of system services and security of supply to Consumers, the SOs and the RAs should be reflected in appropriate levels of remuneration to providers. This is not the case in our view."*

Some respondents queried whether the RAD would receive approval from the SEMC, arguing that there are key similarities between the proposed design and previously rejected FAM. One respondent commented that *"The RAD is very similar to the Final Assignment Mechanism (FAM) that was previously proposed, and rejected by the SEMC."* Another noted, *"The inability to update bids closer to real time was a primary reason for SEMC rejecting the FAM."*

Respondents also considered that the volumes to be procured from the RAD would be minimal, thereby removing opportunities from assets with varying availability or those without cleared DASSA orders. For example, one response noted, *"It is still the most likely case that cleared DASSA volumes will exceed real-time requirements most of the time. In addition, the Secondary Trading mechanism will provide a further signal to deliver real-time requirements and as a result, RAD volume requirements will often be minimal or even zero."* Another added *"We are very concerned that such assets (wind/solar), under the mechanisms proposed, will not have an equal chance of their services being availed of and remunerated."*

Other respondents commented on the increasing complexity of the overall FASS design and requested clarity on how the different component elements fit together, e.g., *"It is not clear how the Fixed Term Contracts, LPF and DASSA will interact with each other."* Another highlighted cost implications, noting *"…we have concerns with the FASS direction of travel and increasing complexity involved with the DASSA and the top-up mechanism. The level of complexity that now appears in the RAD, DASSA and secondary trading platforms and subsequent potential IT costs to the market participant and TSOs, appear to be growing."*

Respondents also noted the challenge of assessing the RAD proposals in isolation, given the perceived dependencies on other consultations. For example, *"A primary concern is that at the time of this response, several related consultations are either running in parallel or have not yet been published including those covering key settlement parameters, performance scalars, and the Bidding Code of Practice. This makes it extremely difficult to provide a fully informed response."*

[36] Section 7.4 (EirGrid); Section 7.4 (SONI)

Some respondents raised concerns about the treatment of units that will provide system services during frequency events but will not be compensated through the DASSA or the RAD. Respondents requested greater clarity how such providers would be remunerated. One respondent provided an example of a service provider not recuperating any monies in the DASSA, RAD or the BM despite being available to provide reserves. The respondent requested clarification on how this service provider would be compensated if it were to deliver reserves in response to a frequency event.

Respondents queried the energy market principle of being "made whole" and its applicability to the DASSA, with one noting, *"We do not believe that it is appropriate that the principle of being made whole where a participant is being exposed to TSO actions, which is enshrined in the energy balancing market, should not equally apply in the DASSA."* Another added "*The energy market works on the principle that, where moved by a TSO action, participants would be made whole based on the difference between the imbalance and their bid price."*

6.3.2 Question 4 – TSOs' Commentary

6.3.2.1 Perceived Value of System Services

As noted in Section 6.2.3.1 above, in SEM-24-066 the SEMC directed the TSOs to consult on the methodology and conditions to apply to the use of price caps. The SEMC will decide upon the value and application of any price caps.

In the TSOs' Parameters and Scalars consultation paper[37], the TSOs set out proposals for the value of a DASSA Bid Price Cap and a DASSA Scarcity Price.

In developing the proposed Bid Price Cap with our external partner AFRY, the TSOs have endeavoured to ensure consumer protection, by managing the cost to consumers and minimising any potential impact from the exercise of market power, while also maintaining market efficiency by allowing bids to reflect actual operating and opportunity costs to the greatest extent possible.

In addition, the value of our proposed Scarcity Price recognised the link between energy and reserve markets and aims to ensure service providers receive comparable returns across both markets in times of scarcity. The Scarcity Price will apply to the DASSA clearing price per service where volume insufficiency thresholds are exceeded. The RAD clearing price, as recommended in Section 6.2.4 above, will be capped at the DASSA clearing price per service. Any increases in the DASSA clearing price in times of scarcity will be reflected in the clearing price cap per service applied in the RAD.

6.3.2.2 SEMC Approval of RAD

As described in detail in the DASSA Top-Up Mechanism consultation paper[38], the TSOs and RAs collaborated closely in developing the proposed RAD. Section 5.1.2 of this paper addresses respondents' comments on the Joint Options Assessment process, while Section 6.1.3.3 describes how the proposed RAD addresses the SEMC considerations on a DASSA top-up mechanism set out in SEM-24-066.

The TSOs cannot comment on whether the SEMC will formally approve the RAD as recommended. We can only state that the primary goal of the Joint Options Assessment process was to develop a DASSA top-up mechanism proposal that would meet the TSOs' requirements for operational security while addressing the SEMC's requirements.

To reiterate, the RAD fundamentally differs from the FAM in that RAD bids are separate from the DASSA, allowing for service providers to reflect their respective costs appropriately. In addition, the TSOs proposed measures, in the form of the RAD bidding Gate Closure time and RAD price cap, to ensure that the DASSA would remain the primary procurement mechanism for system services and that service providers would not be incentivised to withhold capacity from the daily auction.

6.3.2.3 *Volumes Procured in the RAD*

The RAD as proposed by the TSOs is an ex-post mechanism, required only when a real-time service volume deficit has been identified. In Section 3.1 above, the TSOs summarise the 'needs analysis' for a DASSA top-

[37] Sections 4.2 & 4.4 (EirGrid); Sections 4.2 & 4.4 (SONI)
[38] Section 6 (EirGrid); Section 6 (SONI)

up mechanism, conducted by AFRY, which analysed the risk of volume deficits in real-time. This analysis showed that there will be a real-time reserve 'deficit' of more than 100 MW for each reserve product for 10% of periods of the year (i.e. more than three hours per day on average).

The TSOs consider that the RAD will play a role in supporting service providers who face challenges in participating in the DASSA due to uncertainty as to their availability day-ahead. DASSA Order holders are subject to commitment obligations. The RAD, by contrast, allows service providers to offer availability without a commitment obligation. This design provides a route for variable renewables to participate in the DASSA arrangements. Additionally, we expect that the RAD requirement would become more predictable as the arrangements mature, increasing the opportunity for participation from intermittent renewables.

6.3.2.4 Complexity of Overall FASS Design

The TSOs acknowledge respondents' observations regarding the complexity of the overall FASS design. However, the scope of the FASS Programme as set out in the SEM Committee's high-level design is broad. Regarding how the arrangements fit together, for the 'Day One' implementation, the TSOs will procure all reserve services via the DASSA arrangements, i.e. the DASSA and the RAD. The TSOs consider that the complexity of the implementation is a function of the competitive procurement requirements as outlined in European legislation[39] and detailed in the FASS High-level Design, and the need for arrangements that sufficiently *"ensures secure operation of the electricity system with higher levels of non-synchronous generation"*.

To mitigate implementation risk, however, the TSOs have progressed a comprehensive business readiness workstream. As outlined in the High-Level Readiness Scope Document[40], our readiness methodology is a structured framework used to assess, plan and ensure a successful transition for the TSOs and industry from DS3 to the FASS programme. This comprehensive framework helps to identify potential risks, gaps and areas of focus. The structured framework serves as a foundation for developing metrics to track and evaluate activities across impacted stakeholder groups. For operational readiness, our approach will prioritise stakeholder engagement, assess readiness using data-driven insights and trial the new interface and auction process to identify and address inconsistencies. Ultimately, the TSOs' readiness effort will support service providers to adopt and integrate changes driven by the introduction of the FASS programme, and ensure that service providers are fully aligned, prepared and ready for a successful implementation. Further detail on the delivery and schedule of readiness activities is included in the TSOs' Phased Implementation Roadmap V3.0[41].

Regarding the financial burden of the FASS arrangements, the TSOs recognise service providers may need to invest in new IT systems and capabilities to participate effectively in the arrangements. However, the TSOs consider that the timely progression of readiness activities as described above will provide participants with sufficient notice to plan, resource and implement the required updates such that they will be prepared to engage with the core mechanisms of the FASS arrangements from go-live.

6.3.2.5 Assessment of the RAD Proposals by Industry

The TSOs note stakeholder concerns regarding the challenge of assessing the RAD proposals in isolation, particularly in the context of the ongoing Parameters and Scalars consultation[42], which aims to finalise the design of the DASSA.

Due to the tight timelines required for delivery of the DASSA, it has been necessary to run workstreams in parallel, which has resulted in aspects of the auction design being developed simultaneously. In addition, the SEMC decision[43] not to approve the FAM meant that a further unplanned workstream to develop an alternative DASSA top-up mechanism was added to the programme schedule. The TSOs appreciate the overhead for industry in being asked to provide feedback on concurrent and consecutive consultations.

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[39] EGBL (2017/2195); Electricity Regulation (2019/943)
[40] High-Level Readiness Scope (EirGrid); High-Level Readiness Scope (SONI)
[41] Phased Implementation Roadmap (EirGrid); Phased Implementation Roadmap (SONI)
[42] DASSA Parameters & Scalars Consultation Paper (EirGrid); DASSA Parameters & Scalars Consultation Paper (SONI)
[43] SEM-24-066 Future Arrangements for System Services DASSA Market Design Decision Paper (semcommittee.com)

The TSOs consider that the RAD as proposed can largely be evaluated independently, particularly as it follows on from a mechanism that was previously consulted upon – the FAM. The TSOs have also taken account of industry feedback through other channels – such as industry workshops - in developing this recommendations paper.

6.3.2.6 Treatment of units that provide system services during frequency events but are not compensated through the DASSA or the RAD

The TSOs acknowledge respondents' feedback regarding the treatment of units that provide system services during frequency events but are not compensated through the DASSA or the RAD.

The Grid Codes[44] already specify minimum frequency response requirements for units connected to the transmission system. In addition, in our DASSA Design Recommendations Paper, the TSOs recommended that service providers be obligated to declare their availability to provide a service to the TSOs if they are technically capable of doing so, irrespective of whether they hold a DASSA Order for the service volume[45]; this requirement would be set out in the System Services Code. The TSOs reiterate this recommendation.

The design of the RAD is intended to provide financial incentives to service providers for making any residual system service capability, net of other market commitments, available to the TSOs. We acknowledge that RAD payments will only be made to those service providers whose bids are in merit in the event of a real-time volume deficit.

In the Parameters and Scalars consultation paper[46], the TSOs noted that a default price would be considered for the RAD to allow for service providers that did not bid into the RAD to potentially be paid for making themselves available in real time. Having considered the feedback to this RAD consultation, the TSOs recommend that a RAD default price be implemented. The default price would be a predetermined price, with its primary consideration being that it does not undermine incentives for service providers to participate in the DASSA and the RAD. The value of the default price would be for consideration by the RAs.

6.3.2.7 Energy Market Principle of Being "made whole"

The TSOs appreciate feedback received regarding the absence of make-whole payments in the DASSA and the RAD considering their similarities to the Balancing Market. Respondents discussed exposure to risk due to TSO actions and inefficiencies in procurement. The TSOs have previously discussed participation risks in section 6.1.3.2 and would reiterate there is minimal risk associated with participating in the RAD.

The DASSA, as the primary procurement mechanism for system services, includes a commitment obligation for service providers to remain available and deliver according to their DASSA orders. In section 8.6 of the Parameters & Scalars consultation paper the TSOs discuss exemptions to commitment obligations where providers lapsed by the TSO, for reasons pertaining to system security, would not be subject to a compensation payment. Make-whole payments will still be calculated where applicable (as defined in the Trading and Settlement Code[47]) for TSO actions in the Balancing Market.

6.3.3 Recommendation – Availability Obligation and RAD Default Pricing

The TSOs reiterate our recommendation that service providers be obligated to declare their availability to provide a service to the TSOs if they are technically capable of doing so, irrespective of whether they hold a DASSA Order for the service volume; this requirement would be set out in the System Services Code.

The TSOs recommend that the RAD default price will apply to service providers who do not submit a bid into the day ahead auction but have maintained residual availability in real time.

The value of the RAD default price will be established by the Regulatory Authorities in conjunction with the TSOs.

[44] Section CC.7.3.1.1 (EirGrid); Section CC8.8.7 (SONI)
[45] Section 6.7 (EirGrid); Section 6.7 (SONI)
[46] Section 11.2 (EirGrid); Section 11.2 (SONI)
[47] Section F.11.4 (SEMO)

7 Summary and Next steps

This paper sets out the TSOs' recommendations to the SEM Committee for the RAD to be utilised as an ex-post reconciliation mechanism, remunerating service providers who made themselves available where System volume requirements were not fully met by DASSA Order Holders. The SEM Committee will review the proposed recommendations and will issue a decision in August on these recommendations.

The TSOs will continue to engage with industry on our forthcoming auction design proposals, Grid Code alignment workstreams, System Service code development and subsequent consultations.

Appendix

Appendix 1 – Joint Options Assessment – Day-in-the-life Examples

Sections 6.3 and 6.4 of the RAD consultation paper detail the process undertaken to determine viable options for industry consultation. Further commentary on the Joint Options assessment is provided in section 5.1.2 above. Following requests from respondents, the TSOs have provided "Day in the life" examples for the options presented during the Joint Options Assessment. Each option has an annotated Day in the life flow, describing the process at a high level with respect to the complexity of IT implementation. Additionally, the benefits and challenges of each option have been included below the corresponding process example.

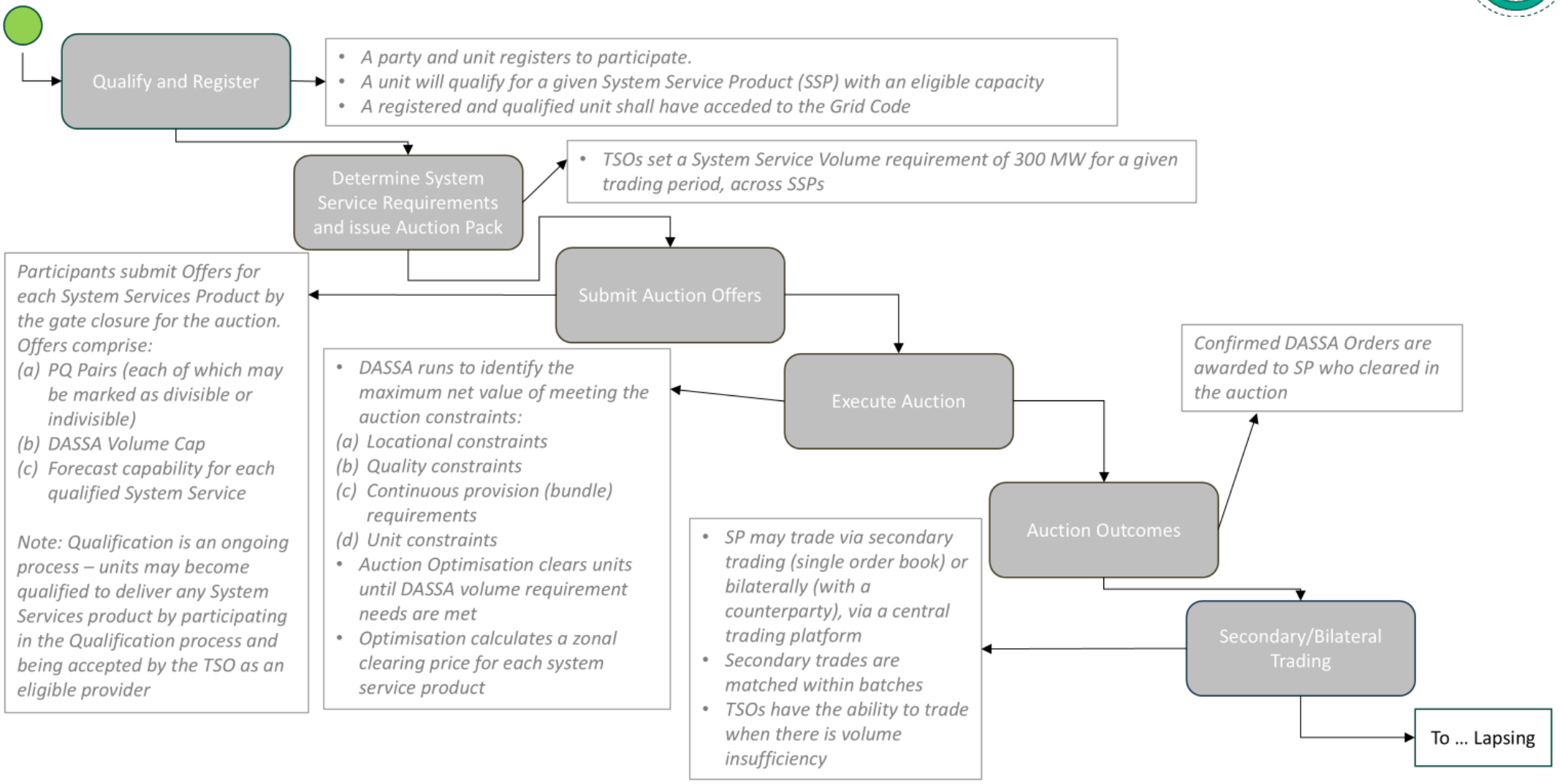
Prerequisites

- Grey annotations illustrate no changes are required to the DASSA baseline IT requirements.
- Green annotations illustrate that implementing this option will change the DASSA baseline IT requirements, such changes risk delays to FASS programme timelines.

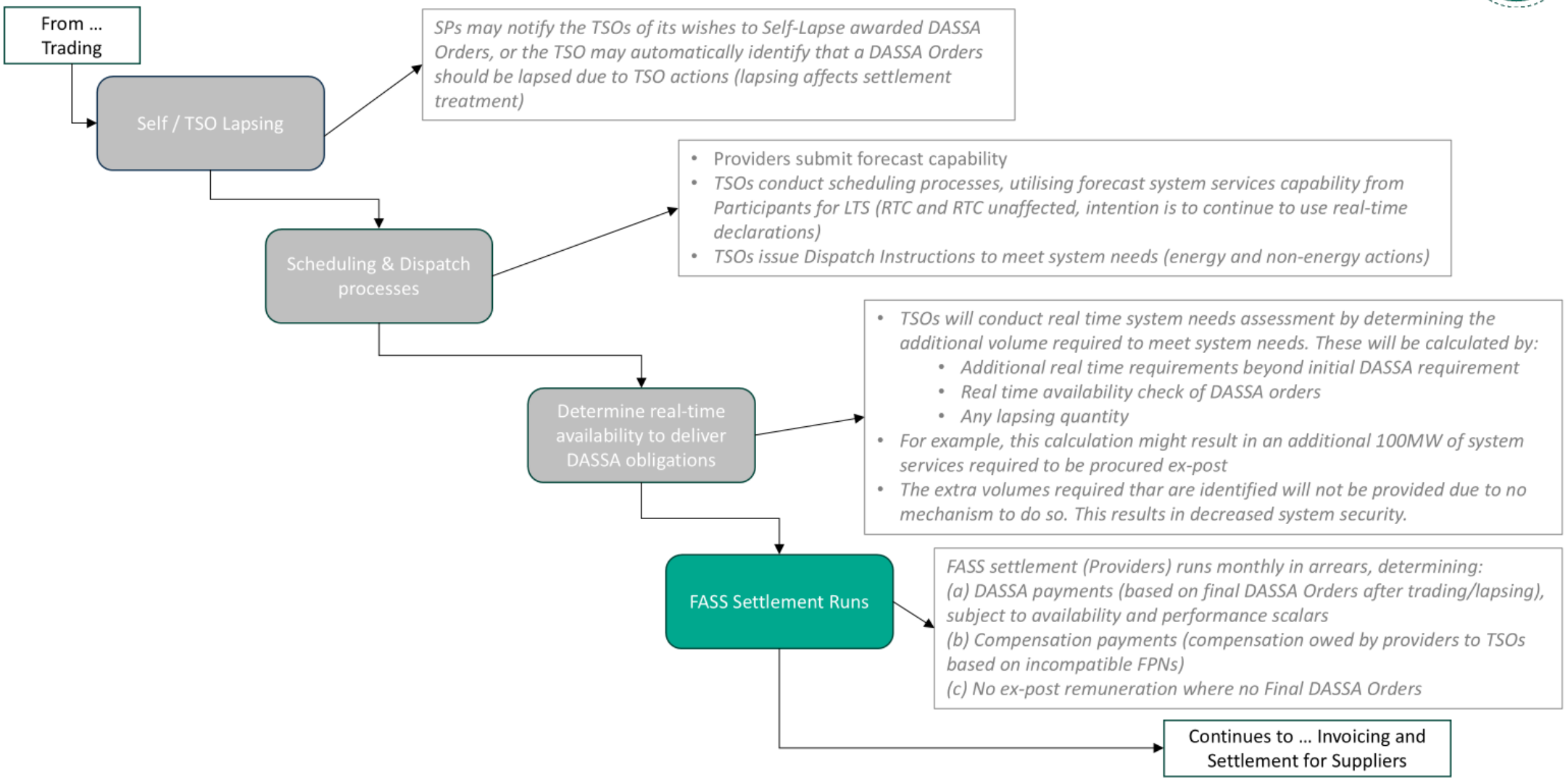
Option 1: "No additional procurement mechanism (1 of 2)"

1

DAY IN THE LIFE



Option 1: "No additional procurement mechanism (2 of 2)"



Option 1: “No additional procurement mechanism”

1

FEATURES – BENEFITS -- CHALLENGES

Key Features

- DASSA is the only means of procuring system services
- DASSA is the only incentive to participate in DASSA & Secondary Trading
- No additional top up mechanism
- Relies on TSO secondary trading when there is volume insufficiency

Benefits:

- Simpler IT solution, eliminating the need for a new top-up mechanism.
- Encourages stronger participation and commitment from providers during the DASSA auction, as no other mechanism exists.
- Reduces TSO operational overhead and administrative burden associated with running a separate top up.
- Unlikely to have impact on PIR or IT delivery timelines.

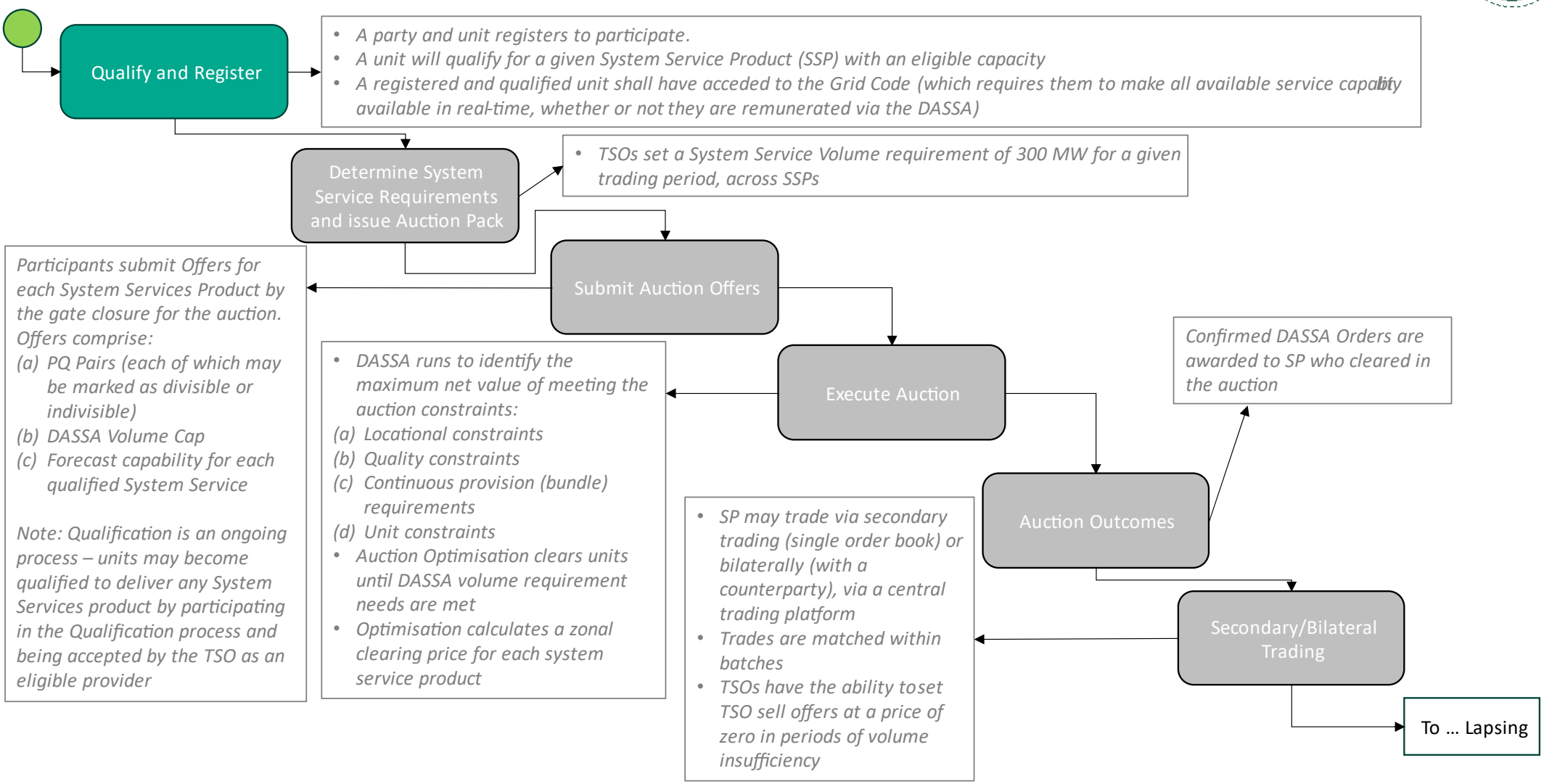
Challenges:

- Lack of flexibility to adjust for unforeseen system constraints, leading to potential system security issues.
- Technologies with less predictable availability (e.g., wind, solar) will be unable to fully participate as positions not known until close to real-time.
- Relies on the secondary market and balancing market to address any shortfalls post-DASSA.
- Increased risk of reserve shortfalls in real-time with no mechanism to correct volume deficits.
- Potential imbalance costs may rise due to insufficient reserve procurement.
- Greater reliance on the Balancing Market to resolve system service product needs in real-time could lead to inefficient dispatch and operational costs.
- Service providers may lack incentives to maintain availability beyond DASSA commitments and (minimum) grid code obligations, risking system reliability.
- Difficulties in managing renewable integration without the ability to adjust reserves post auction.
- Potential increase in costs to consumers due to less competitive procurement processes.
- No clear investment signal to investors (as no remuneration for services delivered in addition to Final DASSA Orders)

Option 2: "Grid Code Enhancements" (1 of 2)

2

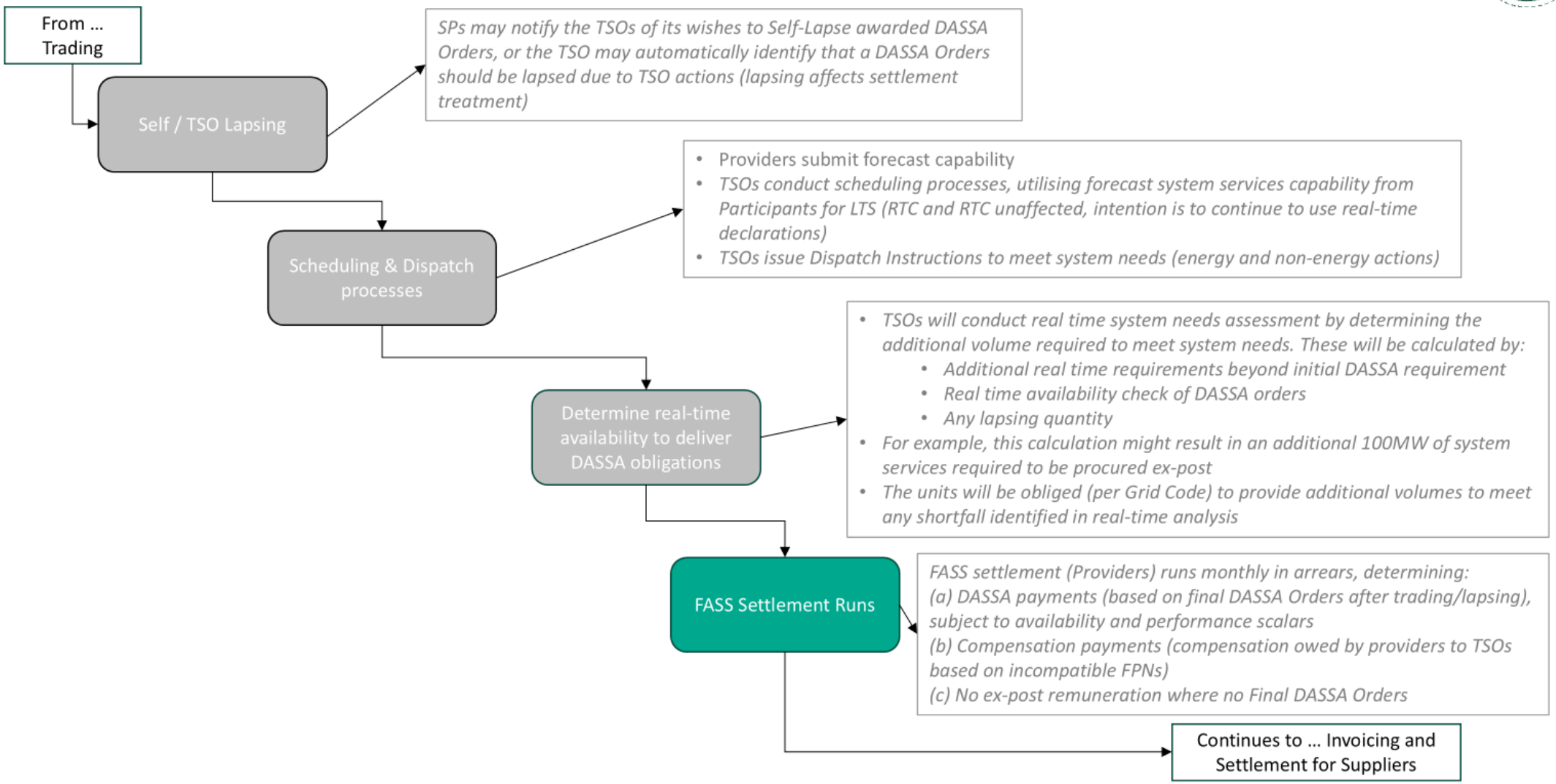
DAY IN THE LIFE



Option 2: "Grid Code Enhancements" (2 of 2)

2

DAY IN THE LIFE



Option 2: “Grid Code Enhancements”

2

FEATURES – BENEFITS -- CHALLENGES

Key Features

- Grid Code updated to require all Service Providers to declare their true availability
- All available volumes will be accessible by the TSOs in real-time
- Units will not be rewarded for procuring additional volumes

Benefits:

- Explicit obligation on all System Services Providers.
- Ensures system security needs are met.
- No effect on IT solution requirements.
- Unlikely to have an impact on FASS PIR or IT delivery timelines.

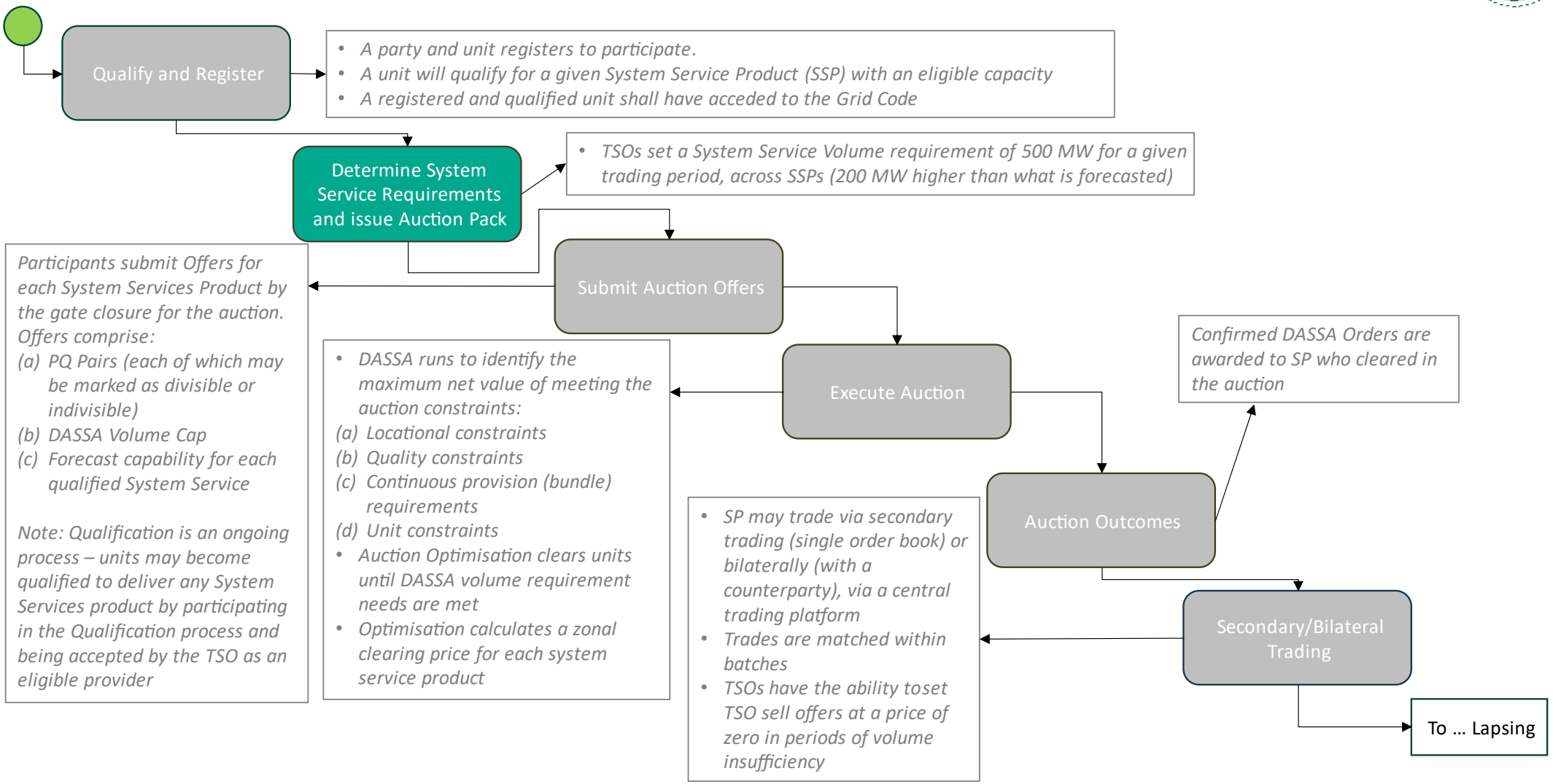
Challenges:

- Additional volumes which must be available/required will not be remunerated.
- May be difficult to enforce/monitor and could result in additional operational costs to undertake such activities.
- May not receive industry support.
- No incentive to remain available (beyond the Grid Code provisions).
- No clear investment signal to investors (as no remuneration for services delivered in addition to Final DASSA Orders).
- Grid Code changes may be difficult to clearly define, given that not all units are available for all System Services.
- Significant additional effort required to progress grid code modifications through the mod panel.

Option 3: "Over-Procure in the DASSA" (1 of 2)

3

DAY IN THE LIFE



Option 3: "Over-Procure in the DASSA" (2 of 2)

3

DAY IN THE LIFE

From … Trading

Self / TSO Lapsing

SPs may notify the TSOs of its wishes to Self-Lapse awarded DASSA Orders, or the TSO may automatically identify that a DASSA Orders should be lapsed due to TSO actions (lapsing affects settlement treatment)

Scheduling & Dispatch processes

- Providers submit forecast capability
- *TSOs conduct scheduling processes, utilising forecast system services capability from Participants for LTS (RTC and RTC unaffected, intention is to continue to use real-time declarations)*
- *TSOs issue Dispatch Instructions to meet system needs (energy and non-energy actions)*

Determine real-time availability to deliver DASSA obligations

- *TSOs will conduct real time system needs assessment by determining the additional volume required to meet system needs. These will be calculated by:*
  - *Additional real time requirements beyond initial DASSA requirement*
  - *Real time availability check of DASSA orders*
  - *Any lapsing quantity*
- *For example, this calculation might result in an additional 100MW of system services required to be procured ex-post*
- *The extra volumes procured in the DASSA (200MW) will be used to meet any shortfall identified in real-time*

FASS Settlement Runs

FASS settlement (Providers) runs monthly in arrears, determining:
(a) DASSA payments (based on final DASSA Orders after trading/lapsing), subject to availability and performance scalars
(b) Compensation payments (compensation owed by providers to TSOs based on incompatible FPNs)
(c) No ex-post remuneration where no Final DASSA Orders

Continues to… Invoicing and Settlement for Suppliers

Option 3: “Over-Procure in the DASSA”

3

FEATURES – BENEFITS -- CHALLENGES

Key Features

- DASSA is the only means of procuring system services
- DASSA is the only incentive to participate in DASSA & Secondary Trading
- No additional top up mechanism
- Relies on TSO secondary trading when there is volume insufficiency
- Over procure system service volume

Benefits:

- Simpler IT solution, eliminating the need for separate (e.g., ex post) top-up mechanism.
- Encourages stronger participation and commitment from providers during the DASSA auction, as no other mechanism exists.
- Reduces TSO operational overhead and administrative burden associated with running a separatetop-up mechanism.
- Unlikely to have impact onFASS PIR or IT delivery timelines
- Additional volume of service procured increased likelihood of meeting system needs being met.

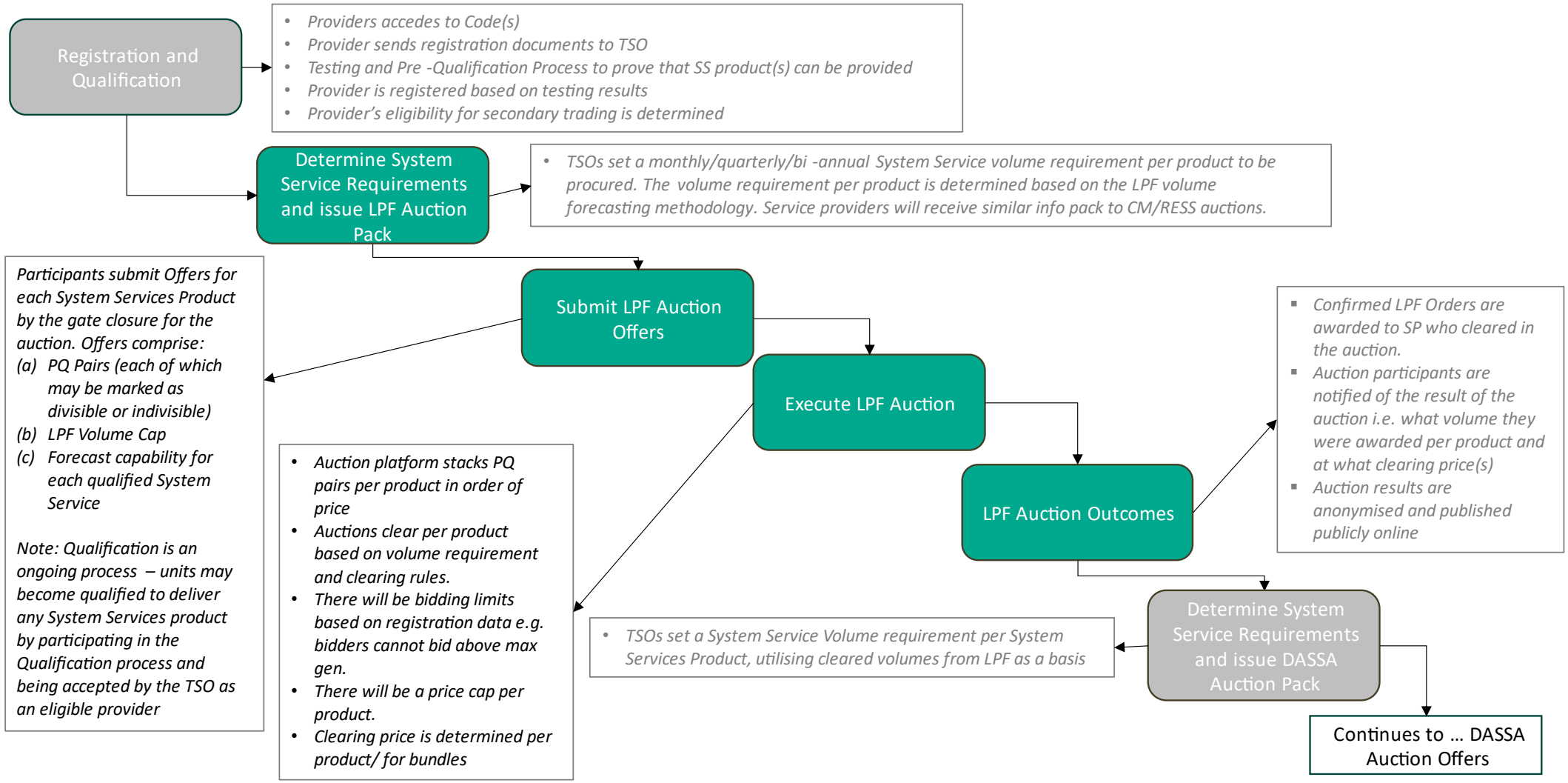
Challenges:

- Less predictable technologies (e.g., wind, solar) will be unable to fully participate as positions notknown until close to real-time.
- Relies on the secondary market and balancing market to address any shortfalls post-DASSA.
- Inefficient process as may lead to TSO over procuring at additional cost; pollutes imbalance costs and balancing energy/capacity
- Potential volume deficit in real time
- Potential imbalance costs may rise due to insufficient reserve procurement.
- Greater reliance on the Balancing Market couldlead to inefficient dispatch and operational costs.
- Lack of flexibility to adjust for unforeseen system constraints, leading to potential system security issues.
- Service providersmay lack incentivesto maintain availability beyond DASSA commitments and (minimum) grid code obligations, risking system reliability.
- Difficulties in managing renewable integration without the ability to adjust reserves post auction.
- Potential increase in costs to consumers (imperfections).
- No clear investment signal to investors (as no remuneration for services delivered in addition to Final DASSA Orders)

Option 4: "Procure baseload services via monthly/quarterly bi-annual auction (LPF)" (1 of 3)

4

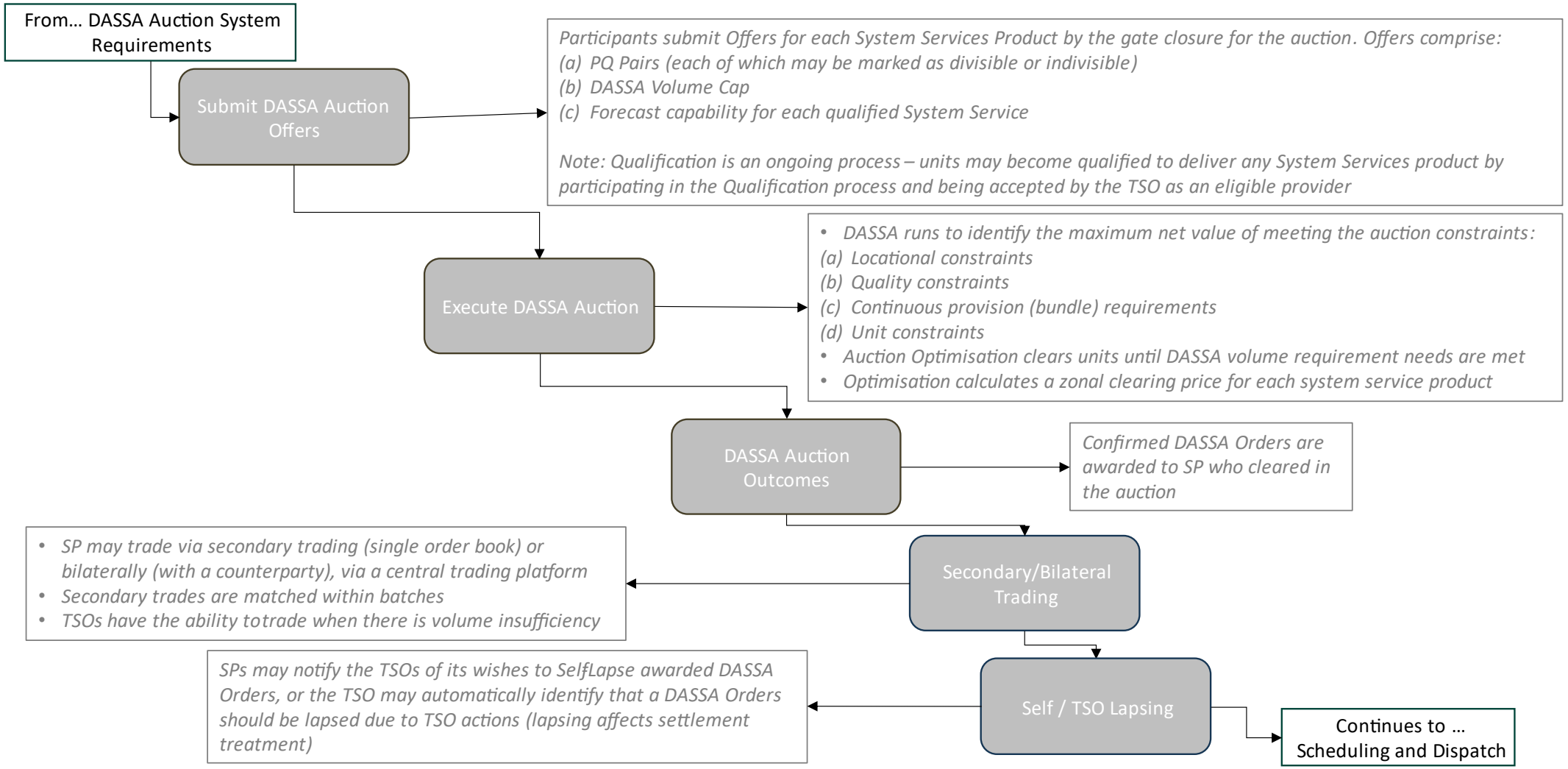
DAY IN THE LIFE



Option 4: "Procure baseload services via monthly/quarterly bi-annual auction (LPF)" (2 of 3)

4

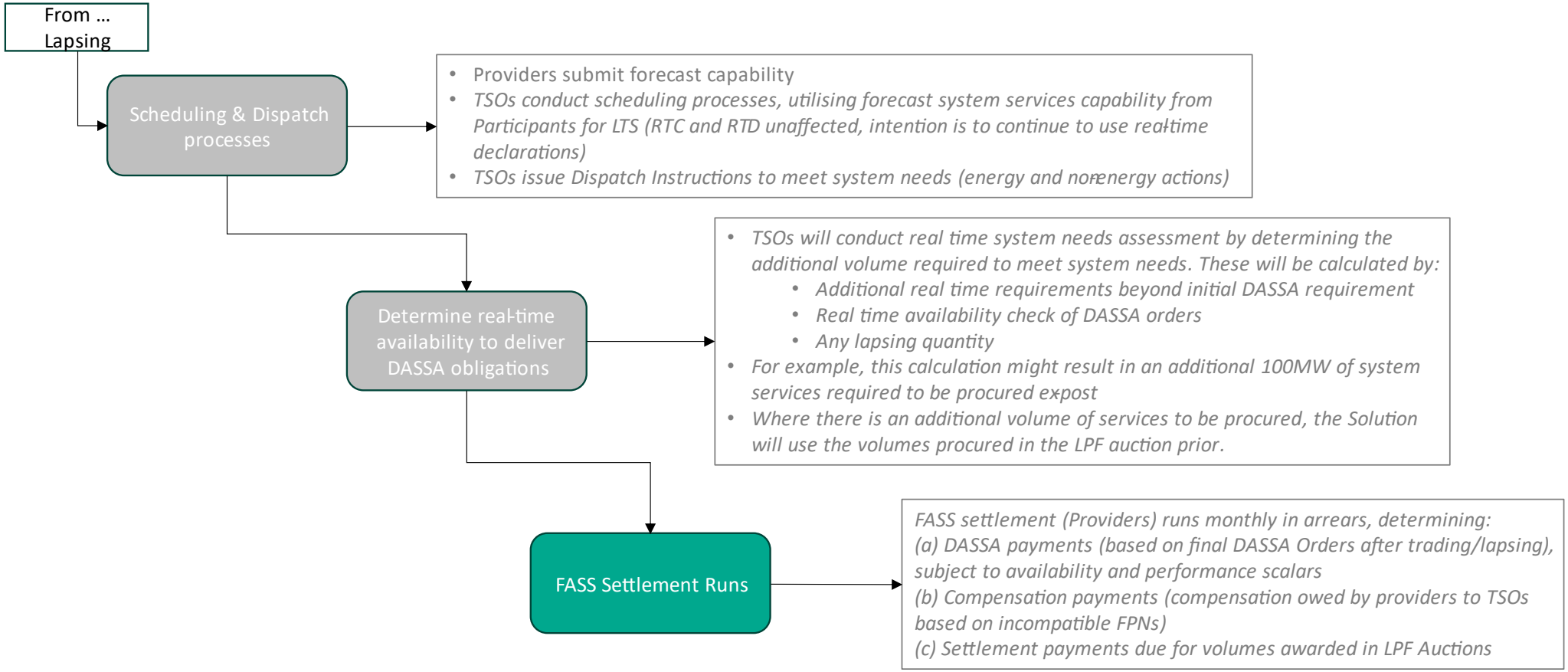
DAY IN THE LIFE



Option 4: “Procure baseload services via monthly/quarterly bi-annual auction (LPF)” (3 of 3)

4

DAY IN THE LIFE



Option 4: “Procure baseload services via monthly/quarterly bi-annual auction (LPF)”

4

FEATURES – BENEFITS -- CHALLENGES

Key Features

- Monthly/Quarterly/Bi-annual auctions for TSO-defined system services volumes
- Auctions in advance to DASSA, procuring “baseload” volumes
- DASSA remains the primary auction
- Regular re-procurement auction cycles

Benefits:

- Structured mechanism for procuring (balancing capacity) system services ahead of day-ahead procurement (DASSA) and (energy) Balancing Market.
- Facilitates additional revenue certainty for service providers, in advance of day-ahead stage.
- Enables some additional confidence for the TSO regarding volumes secured.
- Reduces reliance on last minute procurement mechanisms, enhancing operational efficiency.
- Creates a predictable market environment for service providers.
- Contributes to overall security as some volumes are secured well in advance and with a predictable cost.

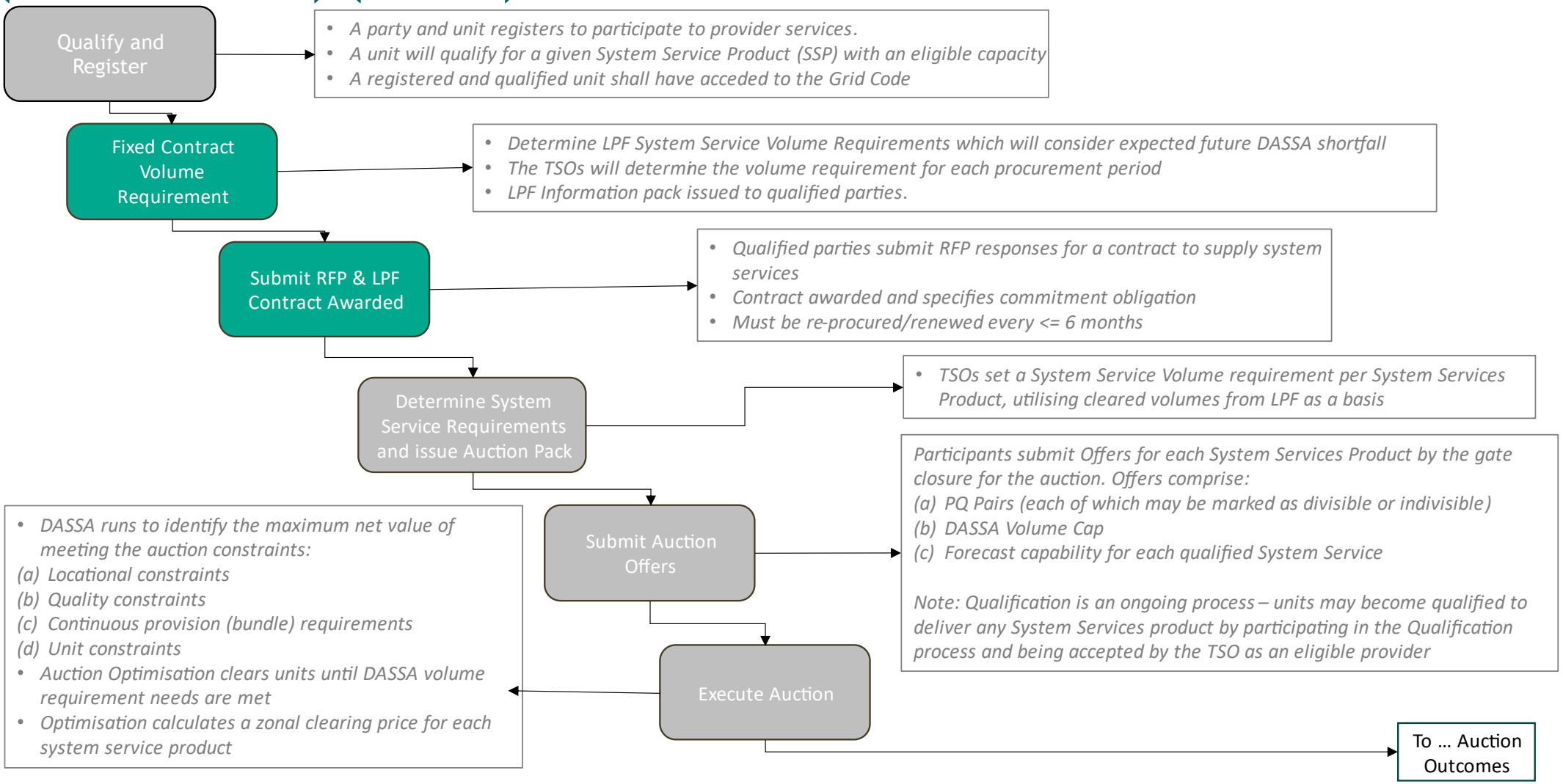
Challenges:

- Potential liquidity issues in DASSA as LPF may remove volumes from DASSA.
- Relies on the secondary market and balancing market to address any shortfalls post-DASSA.
- Increased risk of reserve shortfalls in realtime with no mechanism to correct volume deficits; provides no guarantee of meeting real time requirements.
- Significant reserve capacity may be excluded from DASSA and energy markets, leading to inefficiencies.
- Additional code development and IT upgrades increase FASS implementation complexity.
- Not aligned with baseline IT solution requirements; changes could impact on DASSA Go-Live and costs to be passed on to consumers).
- Renewables may be challenged to effectively participate in system services market, which may limit overall market participation and the goal of decarbonisation.

Option 5: “Procure “baseload” services via LPF contracts (<= 6 months) (1 of 2)”

5

DAY IN THE LIFE



Option 5: “Procure “baseload” services via LPF contracts (<= 6 months) (2 of 2)”

5

DAY IN THE LIFE

From … Auction Execution

Auction Outcomes

Confirmed DASSA Orders are awarded to SP who cleared in the auction

Secondary/Bilateral Trading

- *SP may trade via secondary trading (single order book) or bilaterally (with a counterparty), via a central trading platform*
- *Secondary trades are matched within batches*
- *TSOs have the ability totrade when there is volume insufficiency*

Self / TSO Lapsing

SPs may notify the TSOs of its wishes to SelfLapse awarded DASSA Orders, or the TSO may automatically identify that a DASSA Orders should be lapsed due to TSO actions (lapsing affects settlement treatment)

Scheduling & Dispatch processes

- Providers submit forecast capability
- *TSOs conduct scheduling processes, utilising forecast system services capability from Participants for LTS (RTC and RTC unaffected, intention is to continue to use real-time declarations)*
- *TSOs issue Dispatch Instructions to meet system needs (energy and non-energy actions)*

Determine real-time availability to deliver DASSA obligations

- *TSOs will conduct real time system needs assessment by determining the additional volume required to meet system needs. These will be calculated by:*
  - *Additional real time requirements beyond initial DASSA requirement*
  - *Real time availability check of DASSA orders*
  - *Any lapsing quantity*
- *For example, this calculation might identify a shortfall from DASSA Order Holders of 100MW of system services required to be procured using the LPF/ fixed contracts.*
- *Any DASSA shortfall will be considered in the (future) LPF/ fixed contracts volume methodology.*

FASS Settlement Runs

- *FASS settlement (Providers) runs monthly in arrears, determining:*

(a) *DASSA payments, subject to scalars*

(b) *DASSA Compensation payments*

(c) *LPF settlement (based on the LPF commitment obligations assessment), subject to performance monitoring*

Option 5: “Procure “baseload” services via LPF contracts (<= 6 months)”

5

FEATURES – BENEFITS -- CHALLENGES

Key Features

- Contractual arrangement for volumes procured prior to the DASSA
- Volumes procured competitively via Request For Proposal (RFP) every <=6 months
- DASSA remains the primary mechanism for procurement of reserve

Benefits:

- Provides a structured mechanism for procuring system services ahead of short-term energy and balancing markets.
- Facilitates additional revenue certainty for service providers.
- Ensures volume certainty for the TSO, allowing for improved management of system needs.
- Reduces reliance on last minute procurement solutions, enhancing operational efficiency.
- Creates a predictable market environment for service providers.
- Improves economic efficiency by securing essential services in advance, contributing to overall security.

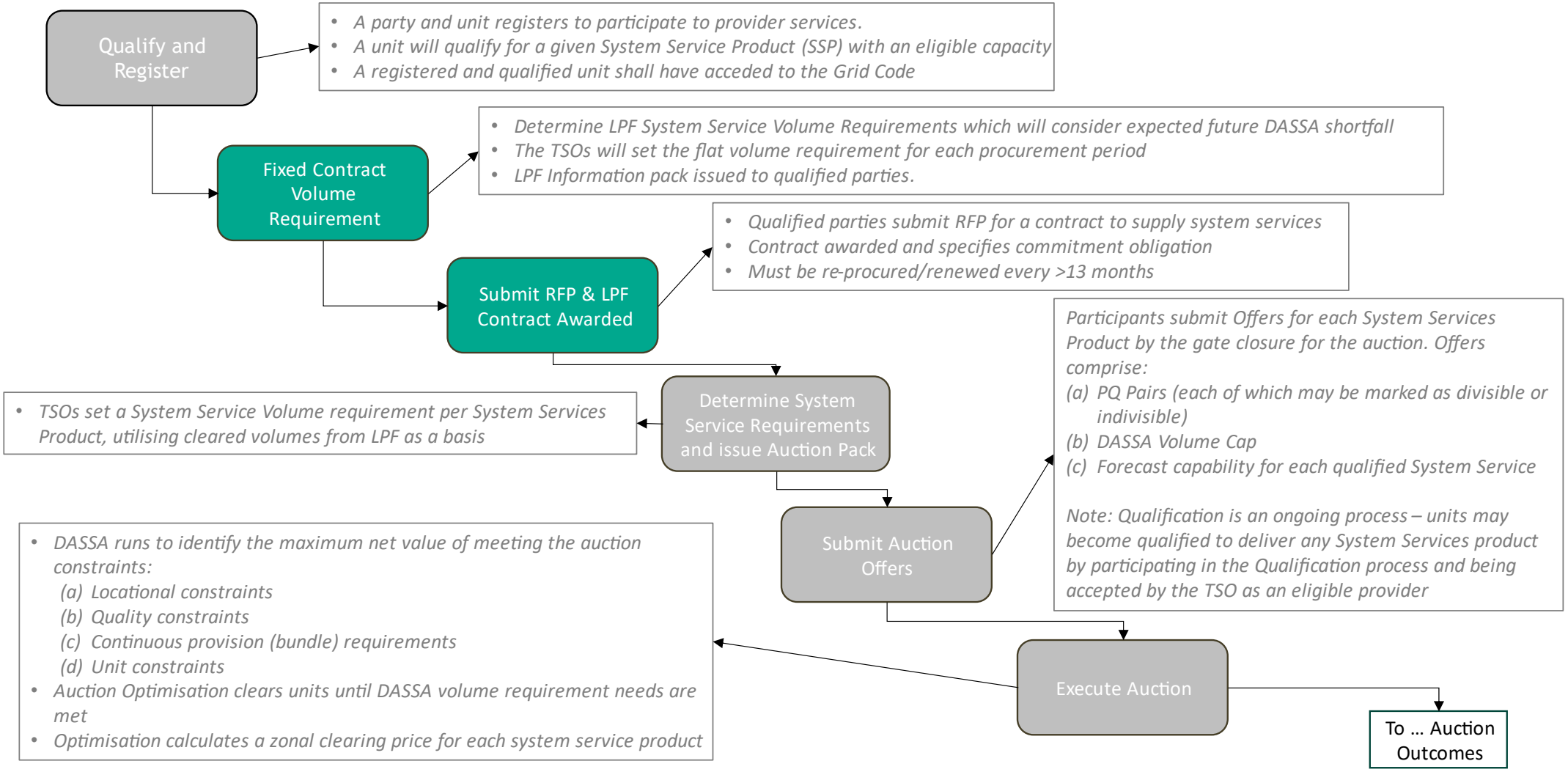
Challenges:

- Longer-term contracts limit flexibility to adapt to changing market conditions.
- May not represent most cost-efficient procurement of reserves.
- Potential liquidity issues in DASSA as LPF may draw from the same participant pool.
- No guarantee of meeting real time requirements.
- Significant reserve capacity may be excluded from DASSA and energy markets, leading to inefficiencies.
- Additional procurement development extra overhead.
- Additional costs may be passed on to consumers.
- Renewables may be challenged to effectively participate in system services market, which may limit overall market participation and the goal of decarbonisation.

Option 6: "Procure "baseload" services via long-term fixed contracts (LPF, > 13 months) (1 of 2)"

6

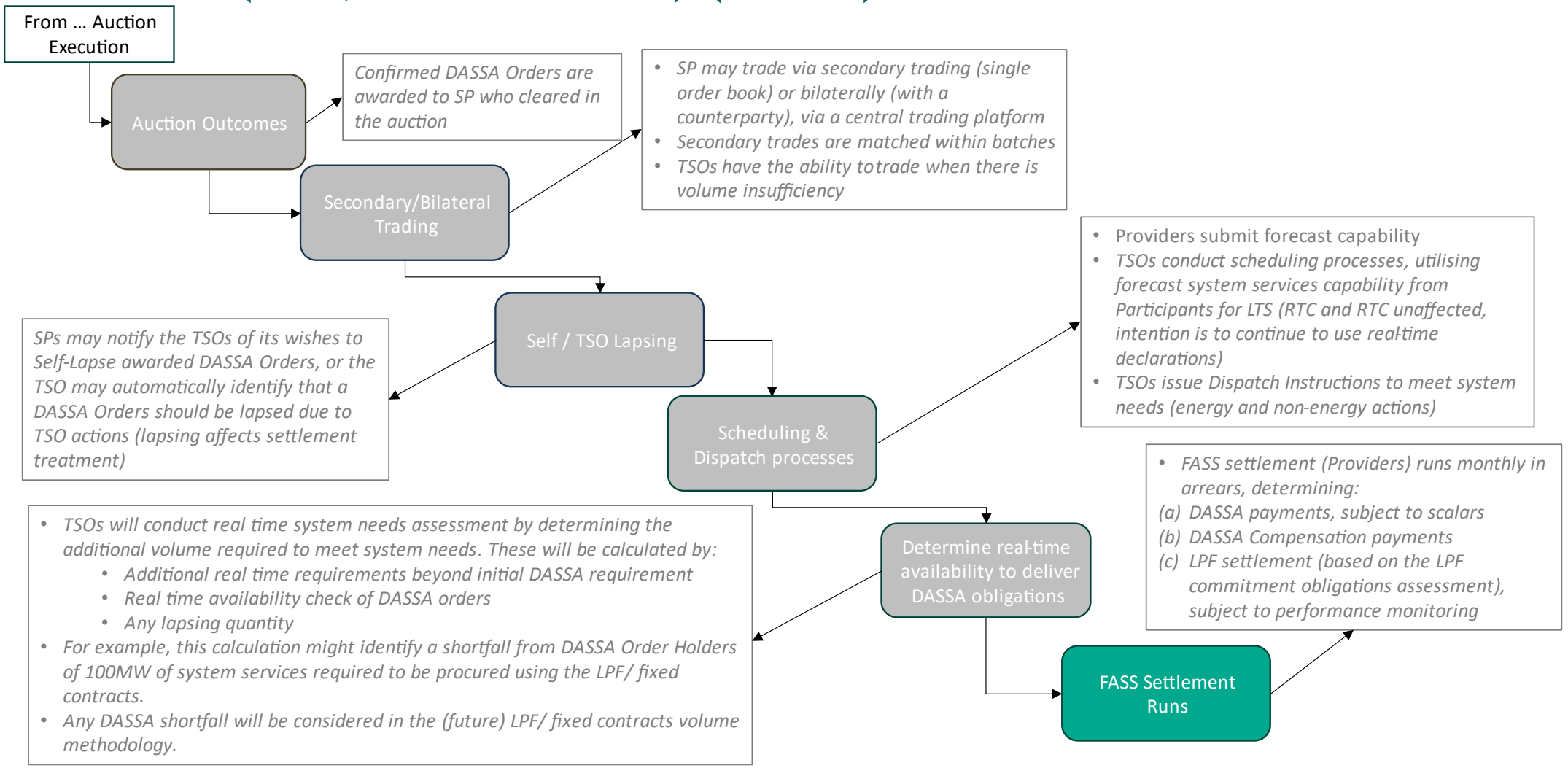
DAY IN THE LIFE



Option 6: “Procure “baseload” services via long-term fixed contracts (LPF, > 13 months) (2 of 2)”

6

DAY IN THE LIFE



Option 6: “Procure “baseload” services via long-term fixed contracts (LPF, > 13 months)”

6

FEATURES – BENEFITS -- CHALLENGES

Key Features

- Contractual arrangement for volumes procured prior to the DASSA
- Volumes procured competitively via Request For Proposal (RFP) every >13 months
- Must be re-procured/renewed every >13 months

Benefits:

- Provides a structured mechanism for procuring system services ahead of short-term energy and balancing markets.
- Facilitates additional revenue certainty for service providers.
- Ensures volume certainty for the TSO, allowing for improved management of system needs.
- Reduces reliance on last minute procurement solutions, enhancing operational efficiency.
- Creates a predictable market environment for service providers.
- Improves economic efficiency by securing essential services in advance, contributing to overall security.

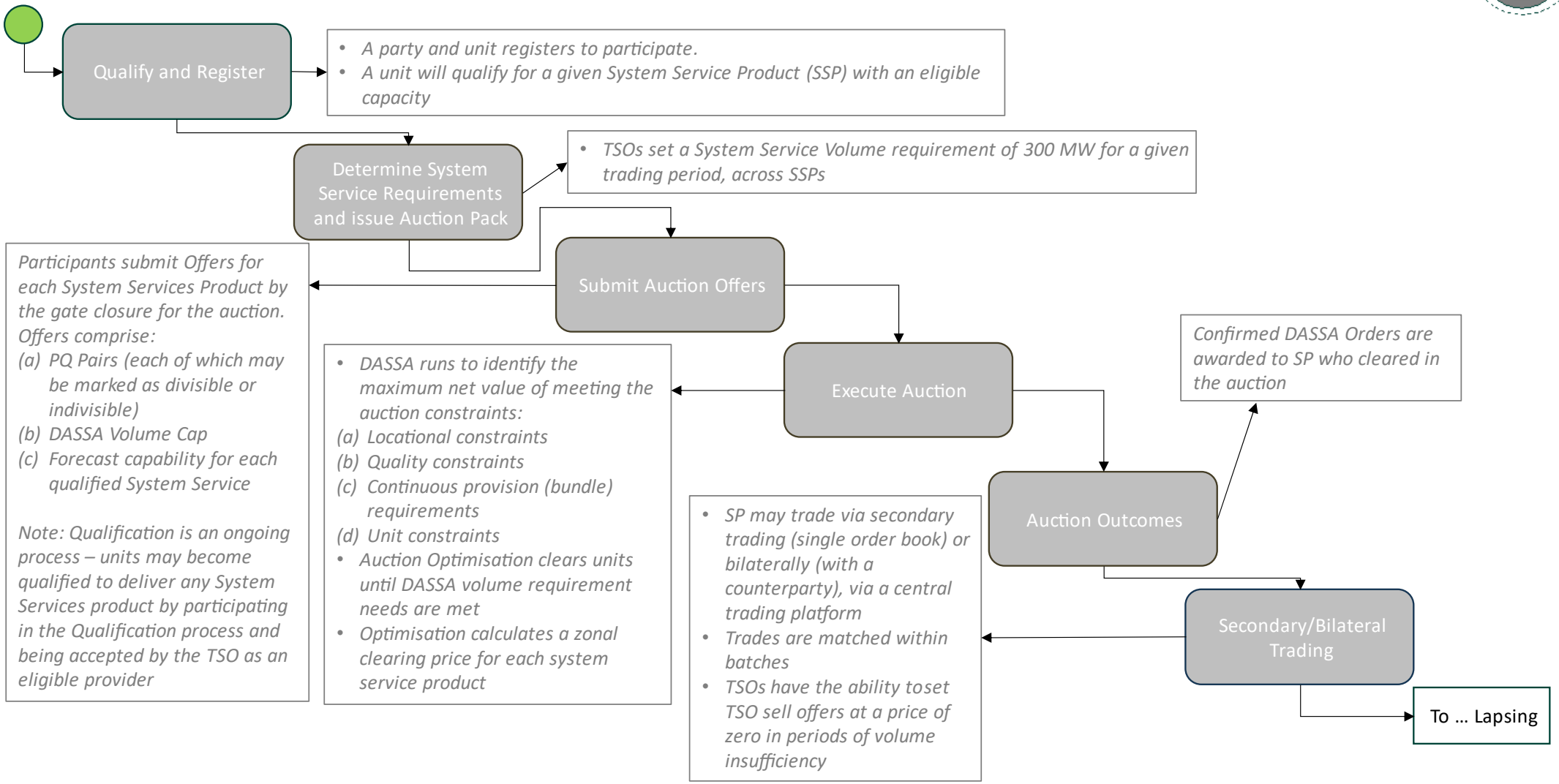
Challenges:

- Longer-term contracts limit flexibility to adapt to changing market conditions.
- May not represent most cost-efficient procurement of reserves.
- Potential liquidity issues in DASSA as LPF may draw from the same participant pool.
- No guarantee of meeting real time requirements.
- Significant reserve capacity may be excluded from DASSA and energy markets, leading to inefficiencies.
- Additional procurement development extra overhead.
- Additional costs may be passed on to consumers.
- Renewables may be challenged to effectively participate in system services market, which may limit overall market participation and the goal of decarbonisation.

Option 7: “Reconciliation of real time needs” (1 of 2)

7

DAY IN THE LIFE



Option 7: “Reconciliation of real time needs” (2 of 2)

7

DAY IN THE LIFE

From … Trading

Self / TSO Lapsing

SPs may notify the TSOs of its wishes to Self-Lapse awarded DASSA Orders, or the TSO may automatically identify that a DASSA Orders should be lapsed due to TSO actions (lapsing affects settlement treatment)

Scheduling & Dispatch processes

- Providers submit forecast capability
- *TSOs conduct scheduling processes, utilising forecast system services capability from Participants for LTS (RTC and RTC unaffected, intention is to continue to use real-time declarations)*
- *TSOs issue Dispatch Instructions to meet system needs (energy and non-energy actions)*

Determine real-time availability to deliver DASSA obligations

- *TSOs will conduct real time system needs assessment by determining the additional volume required to meet system needs. These will be calculated by:*
  - *Additional real time requirements beyond initial DASSA requirement*
  - *Real time availability check of DASSA orders*
  - *Any lapsing quantity*
- *For example, this calculation might result in an additional 100MW of system services required to be procured ex-post*
- *The reconciliation mechanism executes to assign 100MW to available units in real time from DASSA orders that did not clear in the DASSA*

FASS Settlement Runs

FASS settlement (Providers) runs monthly in arrears, determining:
(a) DASSA payments (based on final DASSA Orders after trading/lapsing), subject to availability and performance scalars
(b) Reconciliation Payment
(c) Compensation payments (compensation owed by providers to TSOs based on incompatible FPNs)

Continues to… Invoicing and Settlement for Suppliers

Option 7: “Reconciliation of real time needs”

7

FEATURES – BENEFITS -- CHALLENGES

Key Features

- Identify real-time system needs not procured in DASSA (residual needs)
- Identify assets that meet real-time needs and assign volumes
- Determine the remuneration rate applicable for residual needs
- Remunerate assets providing residual needs

Benefits:

- Enables all technologies to effectively participate.
- Financial incentive to remain available in real-time, beyond Final DASSA Order volumes.
- Service Providers paid for DASSA Orders and additional volumes required in real-time.
- Remuneration for volumes beyond Final DASSA Order volumes is procured competitively (based on submitted prices).
- Mechanism already within FASS IT solution requirements and PIR timescales.
- Provides clear investment signals to investors, as services provided will be remunerated.

Challenges:

- Potential for service providers to withhold trading in DASSA to benefit from reconciliation mechanism.
- Substantial ex-post analysis to determine volume requirements, availability determination & Adjusted Supply Curve.
- Minor additional operational overhead (running the additional processes).
- Moderate IT system complexity to operate.
- Providers unable to update their bids (remuneration derived from DASSA bids).

Appendix 2 – RAD Clearing process – Worked example

Below is a 'day in the life' example, illustrating the clearing for Dynamic POR (NI) in both the DASSA and the RAD.

Table 2: RAD Price/Quantity bid examples

Service Provider	Max Capacity	DASSA Bid (POR)		RAD Bid (POR)	
Unit	Quantity (MW)	Price (€)	Quantity (MW)	Price (€)	Quantity (MW)
A	75	10	70	8	75
B	75	30	70	15	75
C	75	45	70	16	75
D	75	20	70	14	75
E	75	30	70	13	75
F	75	25	70	11	75

Prerequisites

- All DASSA bids have been assumed to be 70MW, and all RAD bids have been assumed as each unit's qualified capacity of 75MW.
- All sample bid prices are illustrative and not assumed to reflect the true value of the service provision.
- Each Service provider is assumed to submit a single P/Q pair for both the DASSA and RAD auctions.
- DASSA Volume Requirement for Dynamic POR is set prior to the DASSA auction at 190MW.
- Following the DASSA auction, the sample offers above indicate that service providers A, D and F clear, receiving DASSA orders of 70MW, 70MW and 50MW respectively.

The DASSA and RAD merit orders will be cleared by an auction optimisation algorithm, accounting for multiple factors including volume constraints, bids and ties. The TSOs have discussed each factor in the Parameters and Scalars consultation paper. The clearing in this worked example is simplified; the actual clearing outcome could be different to those illustrated below.

Two hours before the Trading Period (one hour before Gate Closure of secondary trading), Unit D determines it will be unable to provide reserve services and places a Sell Order of 70MW on the secondary market. Initially, 20MW of this is traded through a Buy Order from Unit F, and a further 15MW is traded through a Buy Order from Unit E. The remaining 35MW of the original DASSA Order is not cleared in secondary trading, and is lapsed by Unit D. The final Adjusted DASSA position of service providers at the Gate Closure of secondary trading is that Units A, F and E hold DASSA Orders of 70MW, 70MW and 15MW respectively, with 35MW of DASSA Orders being lapsed and subject to a compensation payment.

Table 3- Held DASSA Orders - After Secondary Trading

Service Provider	DASSA Order Volume
A	70
D	0
E	15
F	70
[Volume Deficit]	35

Twenty minutes before the Trading Period in question, due to evolving constraints on the transmission system, the TSOs move Unit A to a position providing 15MW of energy, such that it will only have 55MW headroom available from the original DASSA order of 70MW. This will add a further 15MW to the volume deficit (Unit A will not be subject to a Compensation Payment).

Table 4 - Held DASSA Orders - After Post-GC TSO Redispatch

Service Provider	DASSA Order Volume
A	55
D	0
E	15
F	70
[Volume Deficit]	50

In real-time, Balancing Market bids (not shown in this example) will be used to determine the merit order of service providers available to provide balancing energy to the system. The TSOs assume that providers A, B and E are called on by the NCC to provide Balancing Energy and are paid according to their bids in the Balancing Market. Note that under EBGL Article 16, there can be no discrimination of bids for balancing energy and balancing capacity, and so no holder of a DASSA Order will receive preference to be called upon to provide balancing energy. Those who are called upon to provide balancing energy may or may not hold a DASSA Order. Service providers in receipt of DASSA Orders will be paid based on their final DASSA position, irrespective of whether they have been called upon to provide balancing energy, and those called upon will receive a payment for balancing energy via the Balancing Market.

The real-time analysis of system needs outlined in section 6.1.3.3 above identifies this deficit of 50MW from the day-ahead volume requirement to be met in the RAD. The RAD auction is then run ex-post, based on the availability of service providers in real-time. Unit A, with the lowest RAD bid of €8 has only 55MW of headroom available which is already allocated to its DASSA Order and has no headroom available to provide additional reserve in the RAD. Unit F has the second lowest RAD bid price of €11 but is unable to provide additional reserve after accounting for its buy order in secondary trading. In real-time, Unit E has 35MW of additional availability at the time of assessment and is cleared in the RAD for its bid at €13. During this assessment, it was determined that unit D, the unit that originally lapsed its DASSA Order, was available to provide the remaining 15MW required in the RAD. Unit D is the marginal bidder in the RAD, resulting in both units D and F clearing at a price of €14.

Note that despite being in the merit order in the RAD, Units A and F were not available to provide additional reserve above their DASSSA commitment in real-time. Per section 6.1.3.2 above, these service providers are not subject to commitment obligations on volumes bid into the RAD.

Table 5 - Final DASSA and RAD Volumes

Service Provider	DASSA Order Volume	RAD Volume
A	55	0
D	0	15
E	15	35
F	70	0
[Volume Deficit]	50	-

The RAD is reflective of a requirement for 'real-time reserve', and so it follows that the TSOs would not discriminate RAD bids based on the provision of balancing energy – units providing real-time reserve in the RAD would not be given preference for payment based on the outcomes of the Balancing Market. Provision of additional 'real-time reserve' would be remunerated in the RAD, with provision of balancing energy being remunerated in the Balancing Market.