Firm Frequency Response Market Information for Nov-17

Monthly Report

Published Sep-17

Please note that we are constantly making changes to this report and as a result the content and requirements may change on a monthly basis.

Key points

This Market Information Report is relevant for tenders submitted in **Oct-17** for delivery **between Nov-17 and Mar-18.**

Tenders from eligible service providers for Firm Frequency Response should be submitted by **Mon 02-Oct-2017** (1st business day) for all tenders.

National Grid will notify service providers of the outcome of the tender assessment, and preliminary nominations, by **Tue 17-Oct-2017** (12th business day).

Notes:

We will be limiting contracts to 6 months ahead of tender month only and a maximum of two years in duration. Therefore tenders should not start later than April 2017.

A number of changes have been made to the report including data used within all graphs and the removal of the 12 month volume table as the graphs have been changed to show requirement by settlement period.

Introduction

Firm Frequency Response (FFR) is the firm provision of Dynamic or non-Dynamic Response to changes in frequency. Unlike Mandatory Frequency Response, FFR is open to BMU and non-BMU providers, existing Mandatory Frequency Response providers and new providers alike. National Grid procures the services through a competitive tender process where tenders can be for low frequency services, high frequency services or both.

Submitted prices are compared to the costs of alternative actions to deliver the equivalent level of frequency response in the mandatory and optional market. More detail can be found in the assessment principles, the link can be found below.

This report provides information to current and potential providers about the volume, and time periods over which we are seeking to contract for frequency response services.

Highlights

In Sep-17, we received 121 FFR tenders from 29 units. More details on the tenders accepted/rejected are available from the post-assessment tender report.

We recognise that a number of providers use FFR to invest in new assets and we are looking at ways to facilitate this. We are currently focusing the FFR market on a maximum 6 month delivery date from tender month. Tenders must also be a maximum of 2 year duration from this date.

Response requirements are defined in terms of services that provide a full frequency range (referred to as a **Dynamic** service) and services providing a frequency set-point triggered response service (referred to as a **Static** service). The key principal of the Dynamic service is continuous delivery at frequencies near 50Hz to help maintain stable steady state frequency (pre-fault). Static services typically have a frequency trip point that is far enough away from 50Hz to be considered post event response. In order to control steady state frequency a certain volume of Dynamic response is required. This is referred to as the **Minimum Dynamic** requirement**.** Dynamic units, as described above, can be used to meet the full response requirement but Static units cannot meet the Minimum Dynamic requirement.

Links

Assessment Principles and Post-Assessment Tender Reports
http://www.nationalgrid.com/uk/Electricity/Balancing/services/frequencyresponse/ffr/

The Monthly Balancing Services Summary (MBSS) gives a monthly summary of the cost of services procured by service
http://www2.nationalgrid.com/UK/Industry-information/Electricity-transmission-operational-data/Report-explorer/Services-Reports/

Nov-17 Dynamic Requirement

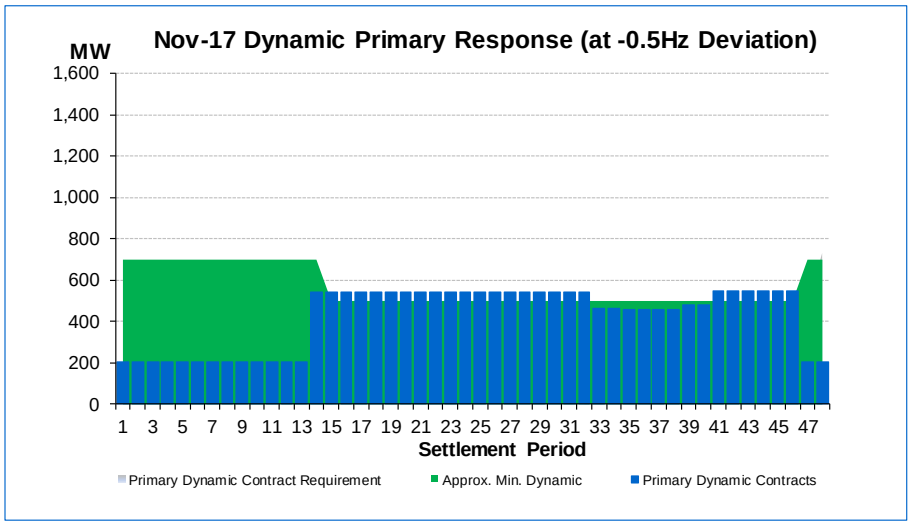
The three charts on this page display the volume of frequency response left to contract for the month ahead for **Dynamic** response. The blue bars represent existing contracted service provision including any optional non-FFR services routinely used that NG forecast to be cost effective for the month ahead.

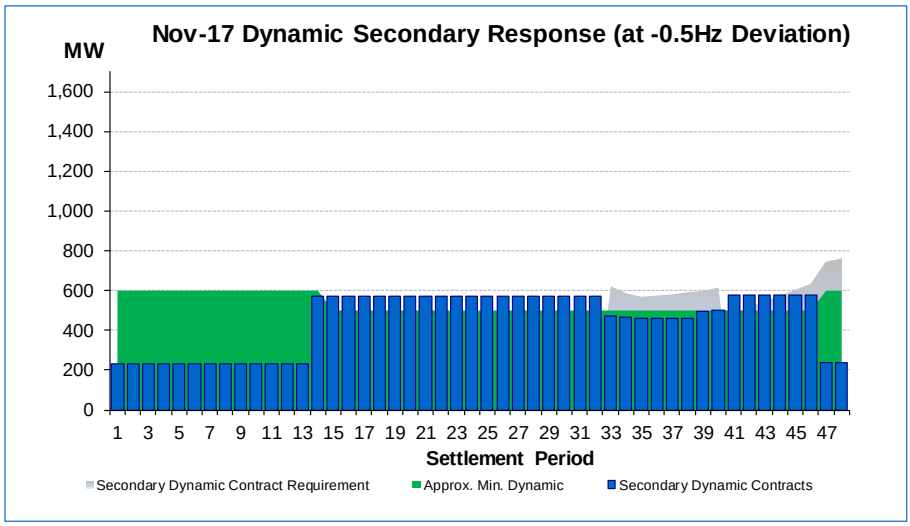
The green shaded area represents the Minimum Dynamic Requirement.

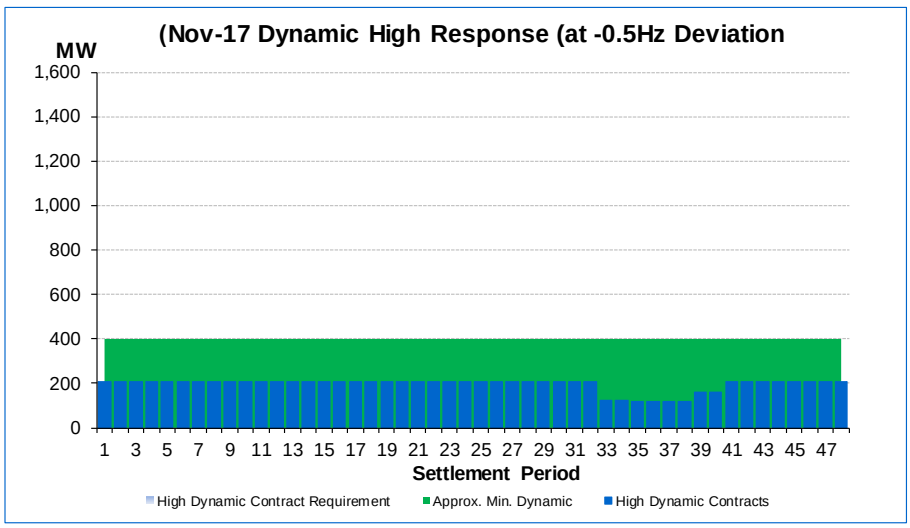
The blue/grey shaded area is the remaining volume to contract. This volume can be met from Dynamic or Static providers. As such, this volume also appears on the frequency set point charts on the next page.

Please note that the top line is not necessarily the total response requirement because volumes of Static services have been removed.

These charts represent a forecast average baseline requirement that NG would look to fill by contracting at month ahead. The actual requirement in real time will vary. Optional services and Mandatory Frequency Response will be used to make up any shortfall between contracted and real time requirement.







Nov-17 Static Requirement

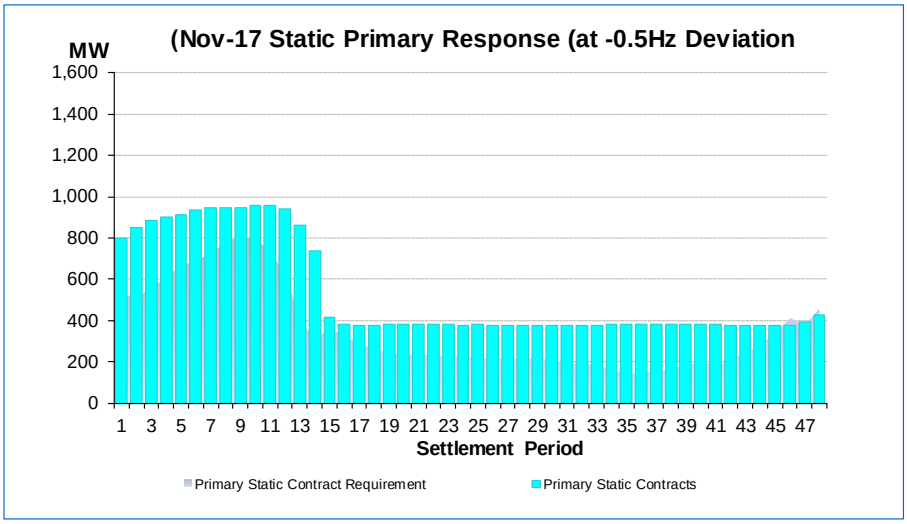
The three charts on this page display the volume of frequency response left to contract for the month ahead for **Static** response.

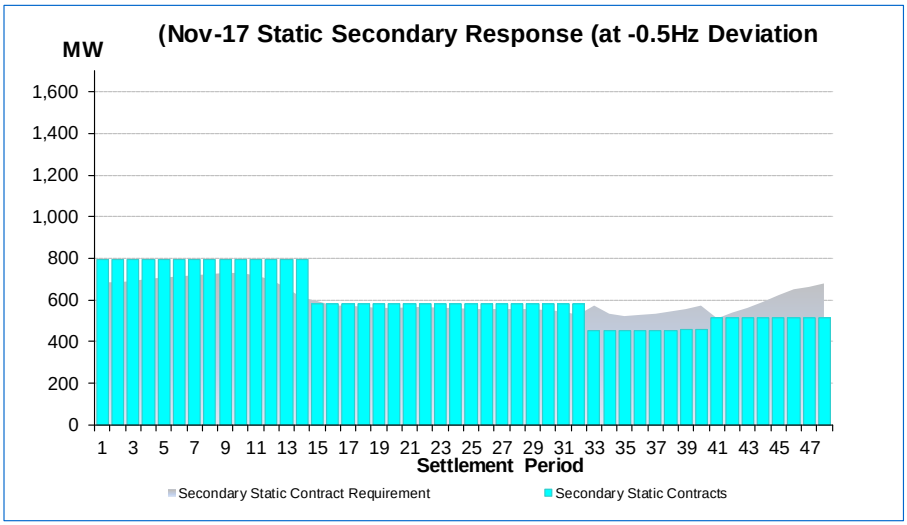
Static, or post-fault, response can be used to displace the remaining response requirements once the Minimum Dynamic proportion has been satisfied.

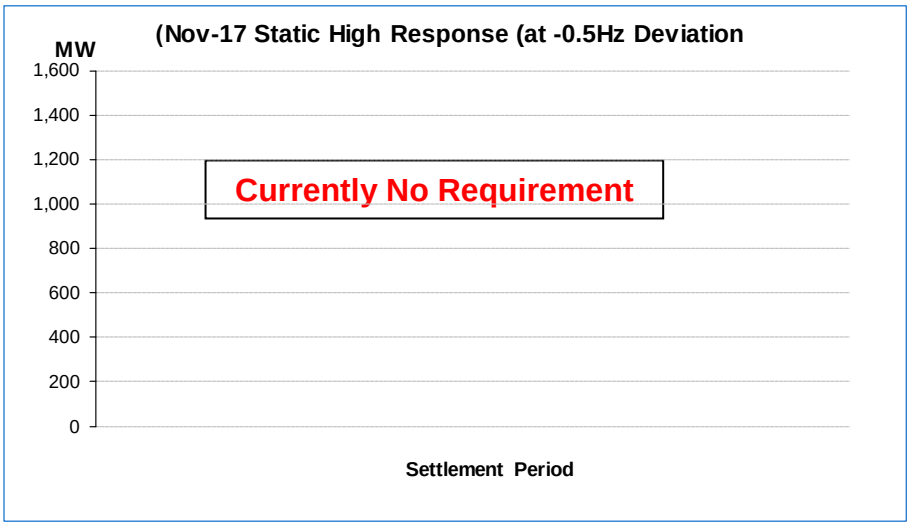
The light blue bars represent the existing contracted volume including any routinely used optional services that NG expects to be in merit in the stack for the month ahead.

The volume to contract represented by the blue/grey shaded area is the same volume that is displayed on the Dynamic service charts above as either service can provide this volume.

The frequency response requirements are calculated to ensure sufficient response capability to contain frequency to within certain limits following a specified size of generation or demand loss. One of the assumptions used is that the starting frequency when the loss occurs is 0.1Hz away from 50Hz. The requirement is calculated assuming a generic response profile from a Dynamic service as typically provided by the Mandatory response service. At 0.1Hz deviation a dynamic provider will have already delivered part of their response capability whilst a Static provider with a frequency trigger at >0.1Hz will not have delivered anything. This means that a Static provider can offset slightly more of the non-Minimum Dynamic requirement than a Dynamic provider of the same size. The requirement shown on the chart has therefore been adjusted to display the MW of static capability that could offset the response requirement.







Key points

There is currently no requirement for high static response due to the minimum dynamic requirement also being sufficient to secure for the normal demand loss.

Frequency Set-Point Triggered Services

The review of the Semi-Dynamic service referred to in the previous market information report has not yet been completed. Whilst this is ongoing National Grid is allowing Semi-Dynamic providers with an existing Framework Agreement the opportunity to tender into the FFR market on the conditions below. Given the duration of this arrangement, National Grid will not enter into any new semi-dynamic framework agreements until further notice.

- Semi-Dynamic tenders shall be assessed in the static market.
- Any Semi-Dynamic volume procured will be included in the static requirements holding.

A review of the suite of response services will be conducted with an update will be provided on the Semi-Dynamic service.

FFR Assessment Updates

Tenders received are assessed on the basis of the value they create and against the forecast of unit availability in the mandatory market. There are three main elements in the assessment that contribute towards this:

1. Value from offsetting Operating Margin actions within the Balancing Mechanism (BM). This is due to the reduction in the volume of actions needed to meet the requirements to create Reserve for Response.

    - For tenders submitted with a continuous availability i.e. throughout the day, the value proposition is clear and straightforward to assess. Difficulty arises however when providers submit tenders with periods of unavailability, particularly when the period of unavailability is at the time of day which has the most onerous requirement to create Operating Margin.

    - Operationally, the volume of actions required to create Operating Margin is determined at a half hourly level. The most onerous volume of actions will be at either the demand peak or demand trough. To ensure we meet the requirements in the most difficult half hour, it is not always possible to take actions for a single half-hour alone. The generation dynamics will sometimes result in actions having to be taken for a longer period of time.

    - For assessment purposes, the value of a tender with a period of unavailability will take account of generation dynamics and will be discounted to reflect the full action required to create the omitted Operating Margin provision. As mentioned above, this could be of a greater duration than the period of unavailability in the tender.

2. Value from offsetting Repositioning Costs. This is associated with the cost of instructing generation to be at optimal positional points to provide response.

3. Value from offsetting Holding Costs from Mandatory Frequency Response (MFR).

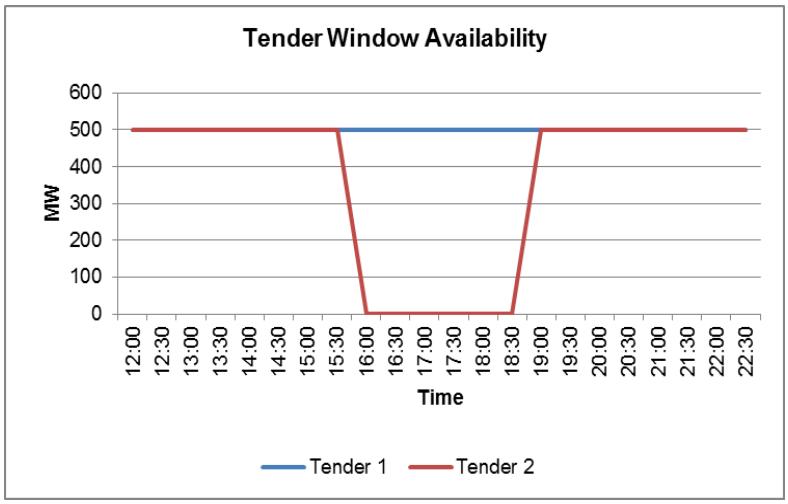
    - For both Repositioning and Holding Costs, there are additional costs – reduced value – associated with tenders with periods of unavailability. Similar to the cost of Operating Margin, a drop in response provision may require actions to be taken in advance to ensure that at the point of service unavailability, there is a smooth transition. These additional costs will be reflected in the value outturn of the tender.

Assessment of the value of these three main elements will also consider the impact of social, economic and political changes which will affect the pricing behaviour of the market. These include, but are not limited to:

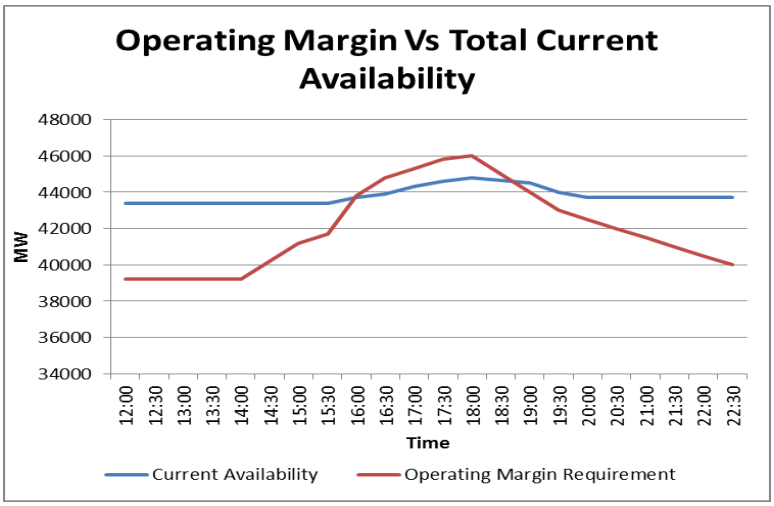
1. Regulatory Framework changes
2. Impacts of new technology
3. Closure of existing generation plants

A simplified example is provided below for illustrative purposes.

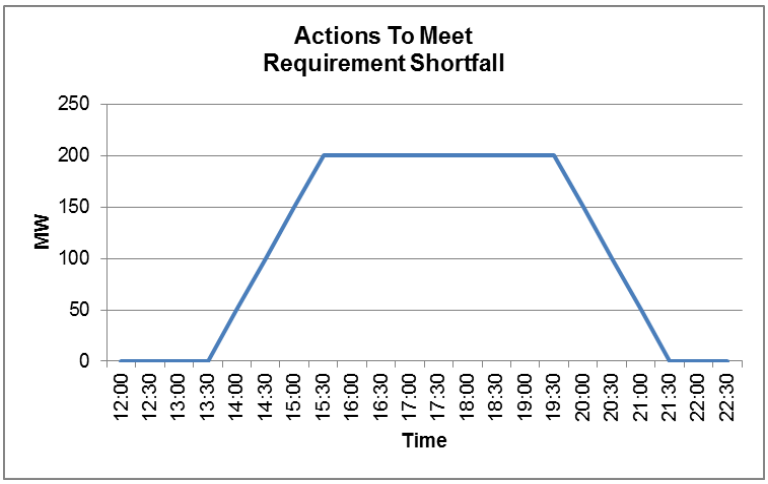
Two tenders are submitted for assessment with availability throughout the day. Tender 1 provides a continuous service whilst Tender 2 is unavailable between 16:00 and 19:00. This is displayed in the chart below.



The Operating Margin requirement (as shown by the red line) versus the total availability before any National Grid actions are required (as shown by the blue line) are displayed in the chart below. These assume that the submitted tenders are yet to be accepted. From the chart, a shortfall in meeting the Operating Margin requirements between 16:00 and 18:30 is observed.



To resolve this, National Grid must begin to take actions to ensure that the Operating Margin requirement is completely satisfied. Due to the technical parameters of available energy, and assuming only Tender 2 is accepted, additional Operating Margin will be created between 13:00-21:30 as per the below. If only Tender 1 is accepted under the same circumstances, the additional Operating Margin will not need to be created between 13:00-21:30.



Reason Codes

The table below provides guidance as to the reasons that a tender has been rejected. They can be matched against the numbers in the 'Reason Code' section of the Post Tender Report. This will be effective from Tender Round 94.

Where appropriate, new reasons will be added following each tender round.

No.	FFR Reason Codes	Definition
1	Beneficial but requirement already satisfied	While the price submitted was considered beneficial, on this occasion there were tenders that provided a higher benefit and were accepted first. This resulted in the requirement being satisfied.
2	Price not beneficial across tendered period	The price submitted was too high and did not provide any contract benefit against alternative actions including the mandatory and optional market.
3	Does not meet tender prerequisites	Please refer to the 'Technical Parameters' section using the following link to determine the criteria necessary to participate in the FFR market http://www2.nationalgrid.com/uk/services/balancing-services/frequency-response/firm-frequency-response/
4	Multiple tenders received for the same unit	Only the most valuable tender(s) of the total group of submitted tenders was considered.

What we are looking to Procure in the Short-Medium Term

This section aims to detail what we are looking to procure over the next few months:

- **Dynamic Response:**
    1. There is a requirement for overnight Dynamic Primary and Secondary response.
    2. The daytime Dynamic Primary and Secondary requirement has been satisfied until June 2018.
    3. Whilst a daytime Dynamic High requirement exists, there is more value in this service overnight due to footroom savings. Due to this, overnight only tender would be considered.

- **Static Response:**
    1. There is currently no requirement for Primary and High static response.
    2. There is a requirement for static Secondary overnight response. A longer duration, covering whole daytime periods would be more beneficial as we are trying to avoid a spikey response contracted profile. In order to cover the 1 – 3 hour period of response provision the ENCC has to procure additional energy to cover the before and after periods which sterilises the benefit of these tenders.

- All day response is 24 hours; Daytime is approximately between 07:00 and 23:00 and overnight is between 23:00 to 07:00.
- We are not looking to procure any services that start more than 6 months ahead of the tender month at this moment in time, via the FFR monthly tender round. Due to uncertainties in the future markets and the risks that this holds for us, we are aiming to clarify our long term procurement plan over the coming months.
- In all our assessments we look to procure contracts that have the most economic benefit against alternative costs and so what was accepted one month may not be the next depending on our forecasts of the alternative costs.
- We also look for tenders to have a window availability of a minimum of 5 hours to ensure a smooth overall response profile.

If you have any queries, suggestions or feedback on the content or format of the new report please contact your account manager or Andrew.Rice@nationalgrid.com

12-Month Total Requirement

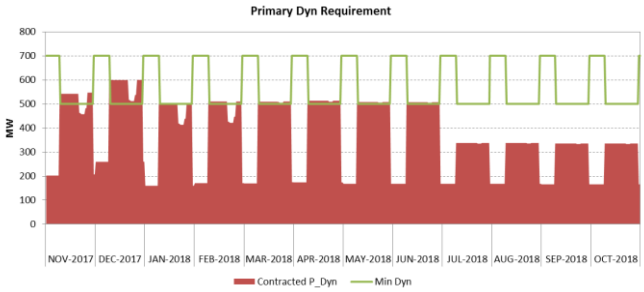
Please note that these graphs are reviewed regularly and may change month on month.

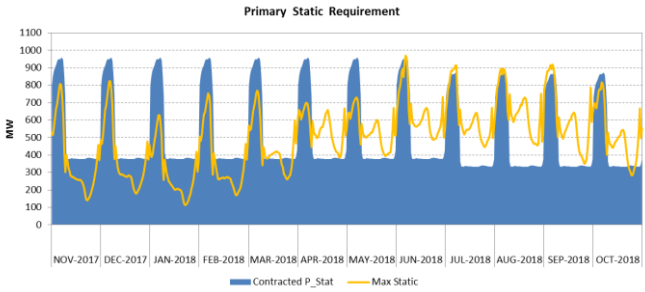
The following charts provide a breakdown of the Dynamic and Static requirements over the next 12 months. These are displayed by settlement periods within each month. The Minimum Dynamic requirement is represented by the green line and maximum Static is represented by the orange line. As mentioned above, any Static requirement can be met by either a Dynamic or Static service depending on which is more economical.

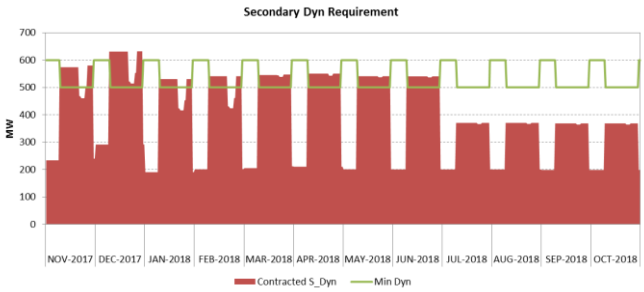
The area under each graph displays the total volume of contracts currently in place. This incorporates both firm and optional services procured through bilateral contracts. Historically they have been the lowest cost option compared to most tenders therefore they are instructed and also included in this report.

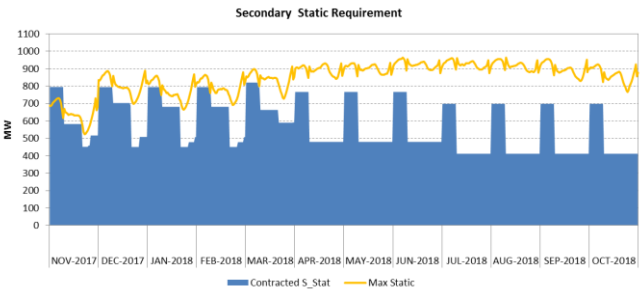
There is no daytime primary or secondary Dynamic requirement against our Minimum Dynamic requirement until July 2018. There still remains an overnight requirement to satisfy in both markets. A Dynamic High requirement still remains across the whole day.

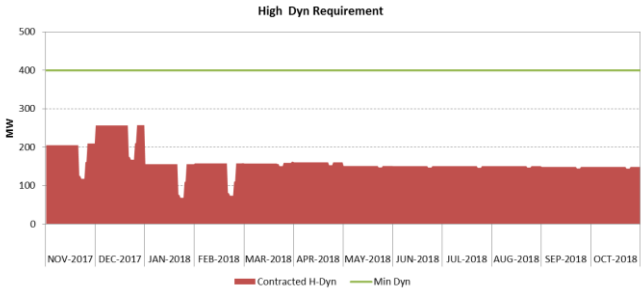
Static response can be contracted up to the orange line. There is a requirement for overnight secondary Static. A daytime requirement is not observed until January 2018.











Key points

The total response requirement is greater during the summer than winter.

The minimum dynamic requirement is typically greater overnight than during the daytime.

For High frequency response, the minimum dynamic response is greater than the requirement throughout the year. A static response service would therefore not be beneficial in meeting the requirement.

Contract Requirement Volume Tables

Nov-17 requirement - Volumes left to procure as shown in the charts on page 2 and 3

	Dynamic Amount required (MW)		
SETT_PERIOD	Primary	Secondary	High
1	497	366	195
2	497	366	195
3	497	366	195
4	497	366	195
5	497	366	195
6	497	366	195
7	497	366	195
8	497	366	195
9	497	366	195
10	497	366	195
11	497	366	195
12	497	366	195
13	497	366	195
14	157	26	195
15	0	0	195
16	0	0	195
17	0	0	195
18	0	0	195
19	0	0	195
20	0	0	195
21	0	0	195
22	0	0	195
23	0	0	195
24	0	0	195
25	0	0	195
26	0	0	195
27	0	0	195
28	0	0	195
29	0	0	195
30	0	0	195
31	0	0	195
32	0	0	195
33	36	31	274
34	38	32	275
35	42	39	282
36	42	39	282
37	42	39	282
38	42	39	282
39	18	2	239
40	16	0	238
41	0	0	190
42	0	0	190
43	0	0	190
44	0	0	190
45	0	0	190
46	0	0	190
47	493	360	190
48	493	360	190

	Static Amount required (MW)		
SETT_PERIOD	Primary	Secondary	High
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	14	0
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24	0	0	0
25	0	0	0
26	0	0	0
27	0	0	0
28	0	0	0
29	0	0	0
30	0	0	0
31	0	0	0
32	0	0	0
33	0	123	0
34	0	84	0
35	0	70	0
36	0	75	0
37	0	82	0
38	0	93	0
39	0	99	0
40	0	116	0
41	0	0	0
42	0	22	0
43	0	47	0
44	0	77	0
45	0	107	0
46	34	134	0
47	0	145	0
48	30	163	0