# Firm Frequency Response Market Information for Jul-16

Monthly Report

**Published May-16**

**Please note that we have amended our requirement calculations this month and so the graphs may differ from previous months. This is an ongoing process so there may be changes month on month going forward.**

## Key points

This Market Information Report is relevant for tenders submitted in **Jun-16** for delivery in **Jul-16**.

Tenders from eligible service providers for Firm Frequency Response should be submitted by **Wed 01-Jun-2016** (1st business day) for all tenders.

National Grid will notify service providers of the outcome of the tender assessment, and preliminary nominations, by **Thu 16-Jun-2016** (12th business day).

### Notes:

In order to reduce variations in tender submissions, our preference is to limit the term of forward contracts to a maximum of two years. In addition tenders should not start later than 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 alternatives to deliver the equivalent level of frequency response. 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 of, and time periods over which, we are seeking to contract for frequency response services.

## Highlights

In May-16, we received 206 FFR tenders from 33 units. More details on the tenders accepted/rejected are available from the post-assessment tender report.

In Dec-15 NG reviewed the assessment process in response to significant market changes. This resulted in defining the response requirements in terms of services that provide a full frequency range dynamic service (referred to as **Dynamic**) and services providing a frequency set-point triggered response service whether static or dynamic (referred to as **Static**). 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/

# Jul-16 Dynamic Requirement

The three charts on this page display the volume of frequency response to contract for the month ahead from **Dynamic** services. 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.

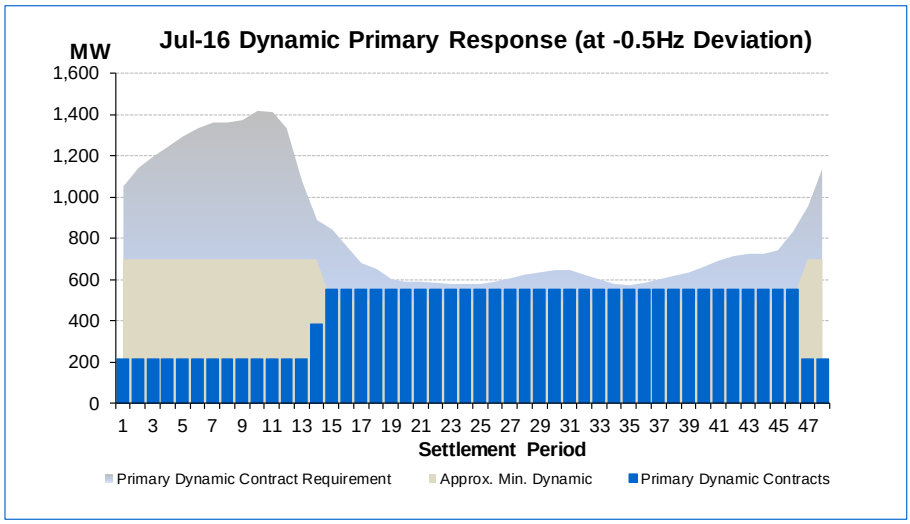
The beige shaded area represents the Minimum Dynamic Requirement.

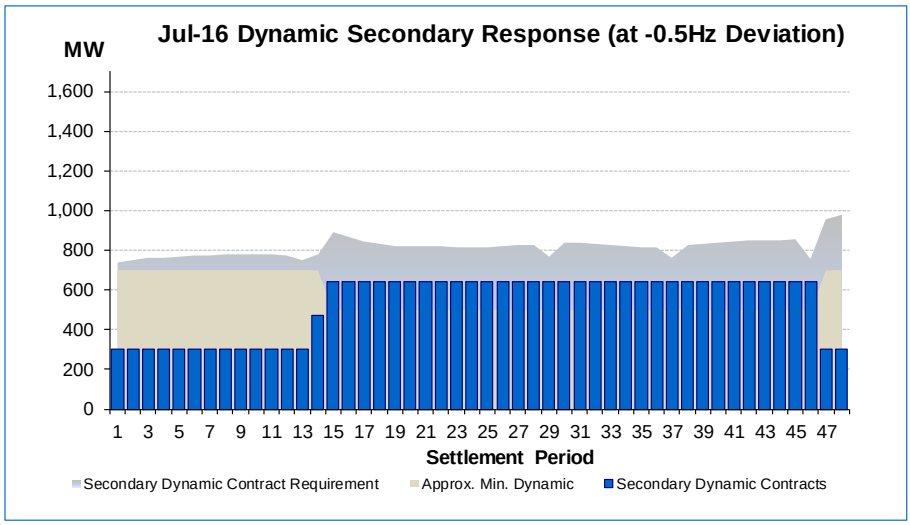
The blue/grey shaded area is the remaining volume to contract. This volume can be met from Dynamic or Static providers. As such this volume also appears on the frequency set point charts on the next page.

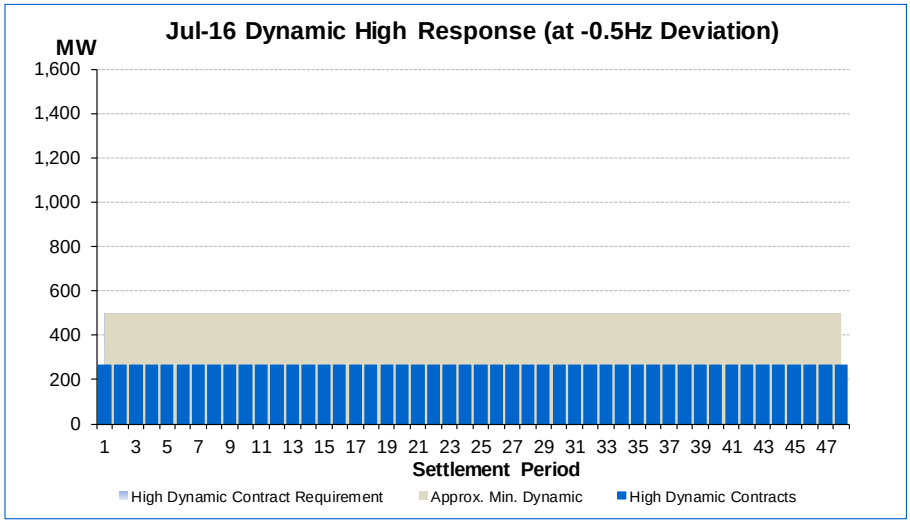
Please note that the top line is not necessarily the total response requirement because volumes of Static services have been removed.

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.

The approximate Minimum Dynamic Requirement is shown as well as the total response requirements.



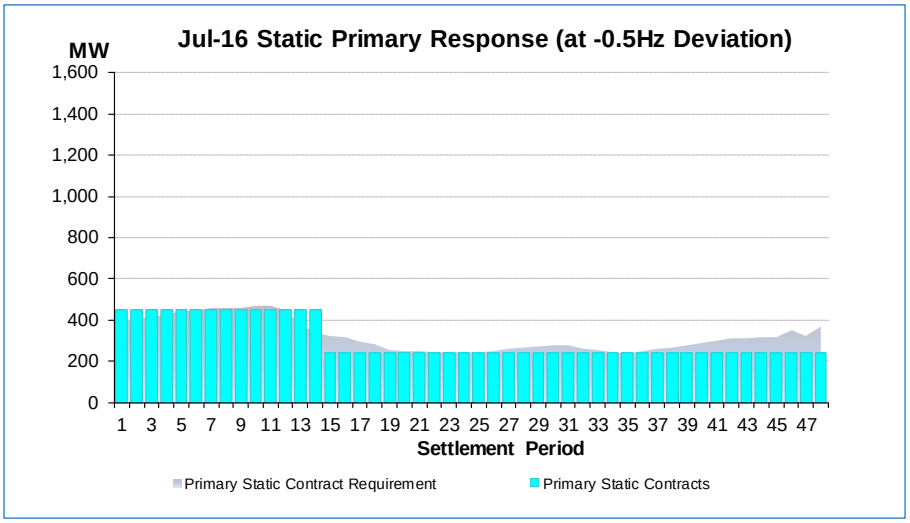
# Jul-16 Static Requirement

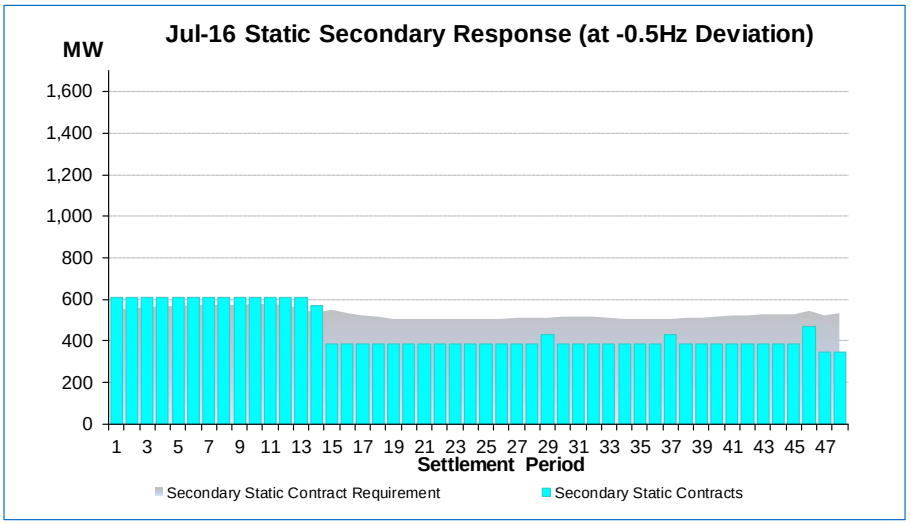
The three charts on this page display the volume to contract for **Static** response services.

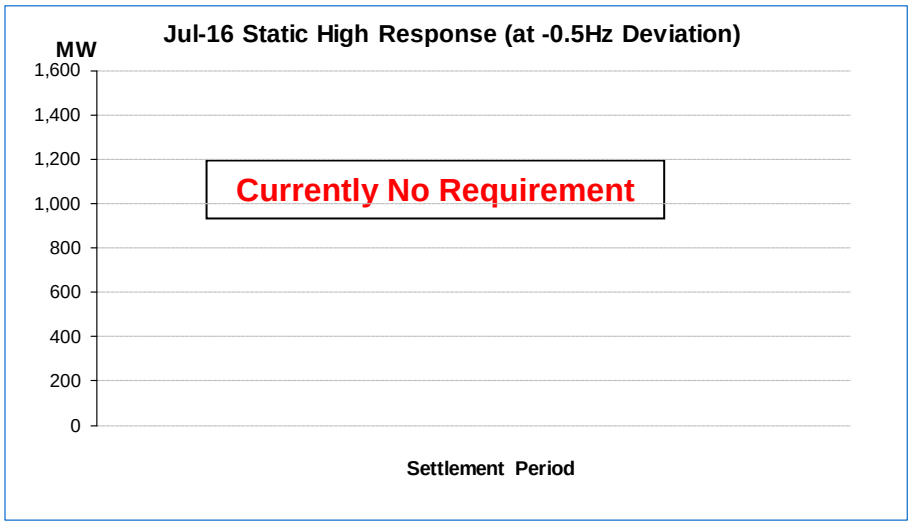
Static, or post-fault, response can be used to displace the non-Minimum Dynamic proportion of the response requirements. The volume to contract is the same volume that is displayed on the Dynamic service charts above. Either service can provide the volume.

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 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

The response requirement for secondary is the largest of the 3 static requirements.

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.

## Semi-Dynamic Service

For providers wishing to tender in a semi-dynamic service, subject to compliance and testing, it must fit into one of the 3 following categories with the 4th being normal static provision:

- **Types of Semi-Dynamic response in order of preference**:
    1. Proportional response after actuation at the trigger frequency. Drops to 0MW when system frequency returns to 50Hz, proportional response remains available for 30min. With an instant or short recovery period to the trigger frequency after 30min.
    2. As above except the proportional response ceases after frequency returns to 50Hz, instant or short recovery period to the trigger frequency.
    3. Full output after actuation at the trigger frequency. Full output set to reduce to zero at 49.95Hz or 50Hz, current system requirement is 50% at 49.95Hz, 50% at 50Hz. An instant recovery or short recovery period upon automatic ceasing.
    4. Normal static response where full output is achieved after actuation at trigger frequency. Response continues for full 30mins regardless of frequency.

There is a limited volume that we are looking to procure of this semi-dynamic service; this number will vary as it is dependent on a number of different factors. This will be assessed on the same basis as static units; however we will apply an uplift to these tenders to signify the additional benefits this service will provide above regular static. This uplift is to be determined by the Assessment team where we look at system and service volume requirements and current contracts to try and deduce the quantitative benefit of the service. As per the above, we do recognise that there are different types of static, however at this point in time we **only see additional value in Type 1 and so we will be applying a 5% uplift to these tenders only**. We will be reviewing this on a monthly basis and if this changes we will publish it within this report.

**At the moment this uplift is an indicative figure as the analysis to derive the true value will take time, therefore we will publish the absolute uplift in the near future and therefore we will update this figure each month in the market information report.**

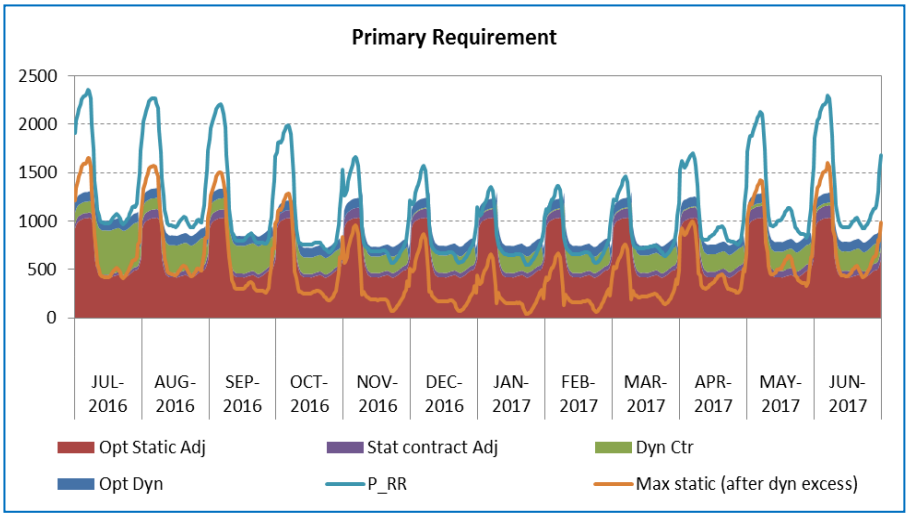
Providers wishing to consider these services **must sign a new Dynamic Framework Agreement** which will be available by the end of May and the earliest that they could deliver the service will be 1st September 2016 subject to compliance and testing.

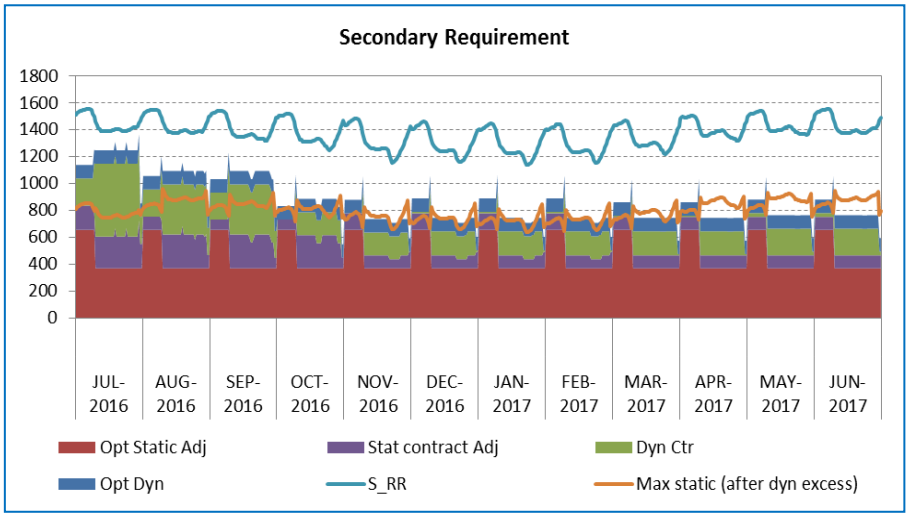
# 12-Month Total Requirement

**Please note that these graphs are our initial trial at increasing transparency for the next 12 months and so these will be reviewed and may change month on month.**

The following charts show the requirement over the next 12 months. The charts provide an estimate of the response requirements by settlement period. This also includes current contracts and optional services. These are bilateral contracts with no upfront fees for providing the service. Historically they have been the lowest cost option compared to most tenders therefore they are instructed and also included in this report.

Static can be contracted up to the orange line and so we can see there is little requirement for secondary static overnight until August but there is a large daytime requirement. Dynamic can be procured up to the blue line on each graph where we can see there is larger overnight requirement.



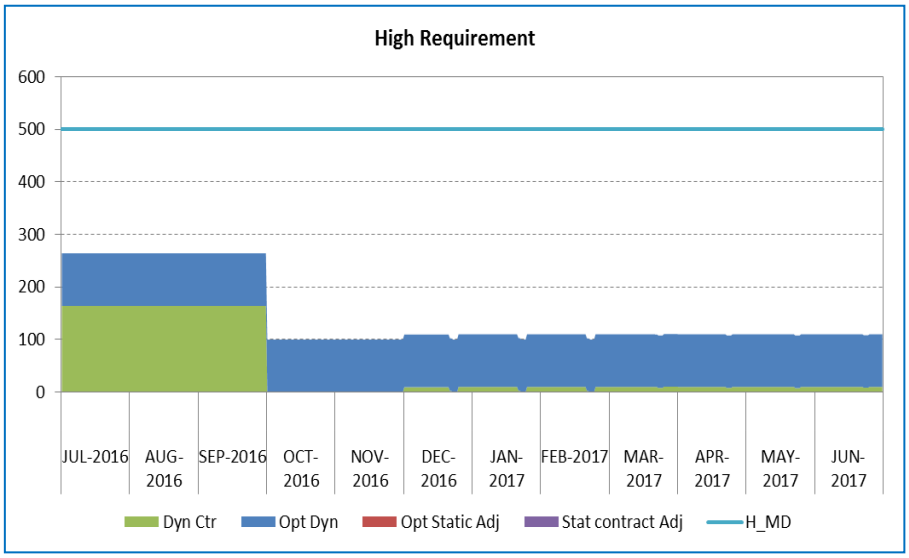

## Key points

The response requirement is greater during the summer than winter.

The response requirement is greater overnight than during the daytime

The primary and secondary response requirements are greater than the minimum dynamic throughout the year. A static response service could therefore be beneficial in meeting the total requirement.

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



# Contract Requirement Volume Tables

**Jul-16 requirement -** Volumes left to procure as shown in the charts on page 2 and 3

| Settlement Period | Dynamic Amount required (MW) | | |
|---|---|---|---|
| | Primary | Secondary | High |
| 1 | 841 | 438 | 236 |
| 2 | 931 | 451 | 236 |
| 3 | 986 | 459 | 236 |
| 4 | 1029 | 463 | 236 |
| 5 | 1082 | 468 | 236 |
| 6 | 1120 | 473 | 236 |
| 7 | 1147 | 476 | 236 |
| 8 | 1151 | 476 | 236 |
| 9 | 1158 | 477 | 236 |
| 10 | 1205 | 482 | 236 |
| 11 | 1197 | 481 | 236 |
| 12 | 1120 | 474 | 236 |
| 13 | 869 | 447 | 236 |
| 14 | 504 | 307 | 236 |
| 15 | 291 | 249 | 236 |
| 16 | 209 | 225 | 236 |
| 17 | 129 | 204 | 236 |
| 18 | 97 | 194 | 236 |
| 19 | 45 | 183 | 236 |
| 20 | 37 | 179 | 236 |
| 21 | 36 | 179 | 236 |
| 22 | 29 | 178 | 236 |
| 23 | 25 | 177 | 236 |
| 24 | 24 | 177 | 236 |
| 25 | 23 | 177 | 236 |
| 26 | 39 | 180 | 236 |
| 27 | 55 | 184 | 236 |
| 28 | 70 | 188 | 236 |
| 29 | 79 | 130 | 236 |
| 30 | 93 | 195 | 236 |
| 31 | 93 | 196 | 236 |
| 32 | 73 | 193 | 236 |
| 33 | 49 | 187 | 236 |
| 34 | 24 | 180 | 236 |
| 35 | 19 | 176 | 236 |
| 36 | 29 | 177 | 236 |
| 37 | 48 | 120 | 236 |
| 38 | 66 | 186 | 236 |
| 39 | 84 | 190 | 236 |
| 40 | 110 | 197 | 236 |
| 41 | 138 | 203 | 236 |
| 42 | 161 | 208 | 236 |
| 43 | 169 | 210 | 236 |
| 44 | 172 | 210 | 236 |
| 45 | 188 | 216 | 236 |
| 46 | 281 | 115 | 236 |
| 47 | 745 | 656 | 236 |
| 48 | 924 | 678 | 236 |

| Settlement Period | Static Amount required (MW) | | |
|---|---|---|---|
| | 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 | 5 | 0 | 0 |
| 8 | 4 | 0 | 0 |
| 9 | 5 | 0 | 0 |
| 10 | 18 | 0 | 0 |
| 11 | 15 | 0 | 0 |
| 12 | 0 | 0 | 0 |
| 13 | 0 | 0 | 0 |
| 14 | 0 | 0 | 0 |
| 15 | 81 | 170 | 0 |
| 16 | 74 | 153 | 0 |
| 17 | 50 | 138 | 0 |
| 18 | 40 | 132 | 0 |
| 19 | 12 | 125 | 0 |
| 20 | 9 | 122 | 0 |
| 21 | 9 | 122 | 0 |
| 22 | 5 | 121 | 0 |
| 23 | 2 | 120 | 0 |
| 24 | 2 | 120 | 0 |
| 25 | 1 | 120 | 0 |
| 26 | 10 | 122 | 0 |
| 27 | 18 | 125 | 0 |
| 28 | 25 | 128 | 0 |
| 29 | 29 | 88 | 0 |
| 30 | 35 | 133 | 0 |
| 31 | 33 | 133 | 0 |
| 32 | 22 | 131 | 0 |
| 33 | 11 | 127 | 0 |
| 34 | 0 | 122 | 0 |
| 35 | 0 | 120 | 0 |
| 36 | 5 | 120 | 0 |
| 37 | 16 | 81 | 0 |
| 38 | 25 | 126 | 0 |
| 39 | 34 | 129 | 0 |
| 40 | 46 | 134 | 0 |
| 41 | 59 | 138 | 0 |
| 42 | 69 | 142 | 0 |
| 43 | 72 | 143 | 0 |
| 44 | 76 | 143 | 0 |
| 45 | 76 | 147 | 0 |
| 46 | 107 | 78 | 0 |
| 47 | 80 | 175 | 0 |
| 48 | 128 | 190 | 0 |

**12 month requirement –** Volumes left to procure as shown on page 4

We have removed these tables for the short run as we have amended the 12month ahead graphs to represent per settlement period.

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