

Firm Frequency Response Market Information for Oct-16

Monthly Report

Published Aug-16

Key points

This Market Information Report is relevant for tenders submitted in **Sep-16** for delivery **between Oct-16 and Mar-17**

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

National Grid will notify service providers of the outcome of the tender assessment, and preliminary nominations, by **Fri 16-Sep-2016** (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 March 2017. Also tenders must be for existing assets.

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.

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 every month.

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 Aug-16, we received 135 FFR tenders from 26 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 currently looking at ways to facilitate this and so focussing the FFR market on a maximum 6 month delivery date from tender month. Also tenders must be a maximum of 2 year duration from this date.

In Dec-15 National Grid (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/>

Oct-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.

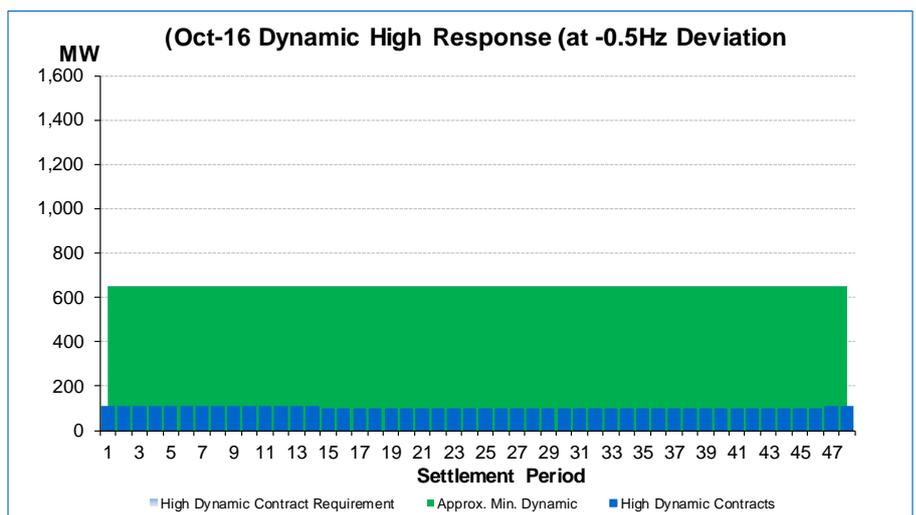
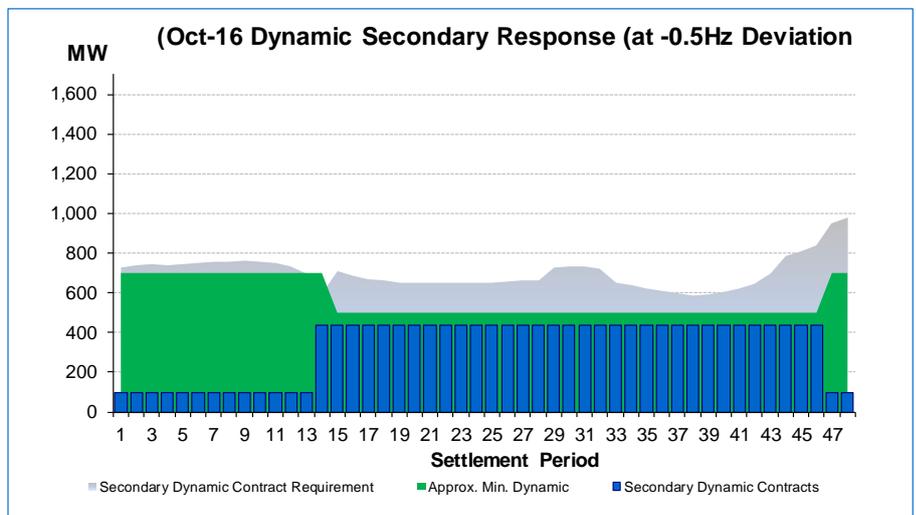
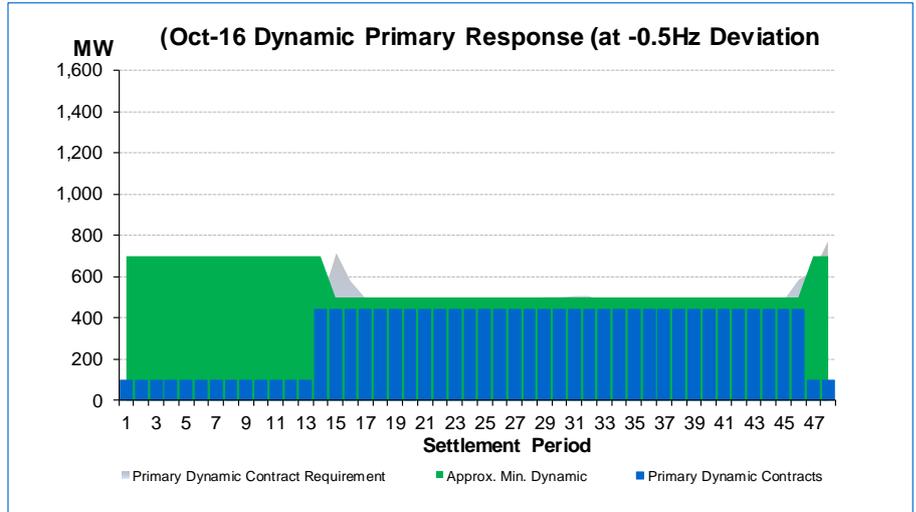
The green shaded area represents the Minimum Dynamic Requirement.

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.

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



Oct-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.

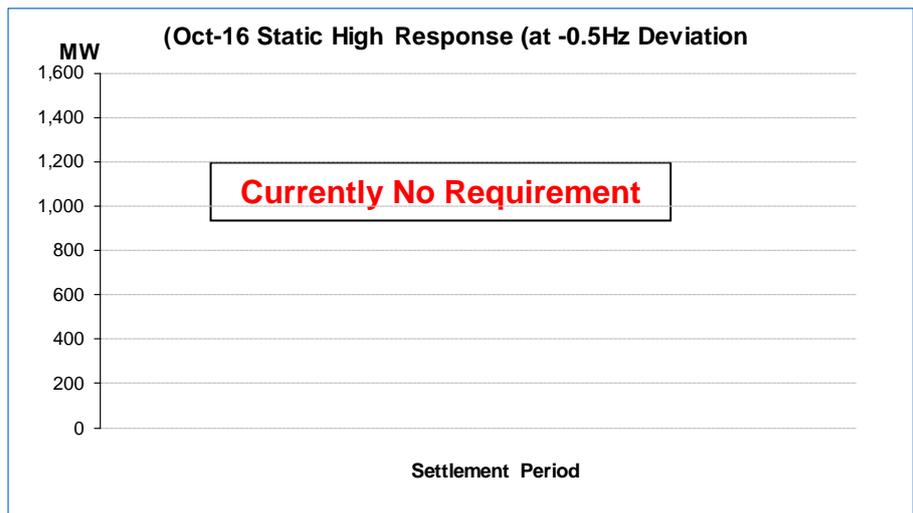
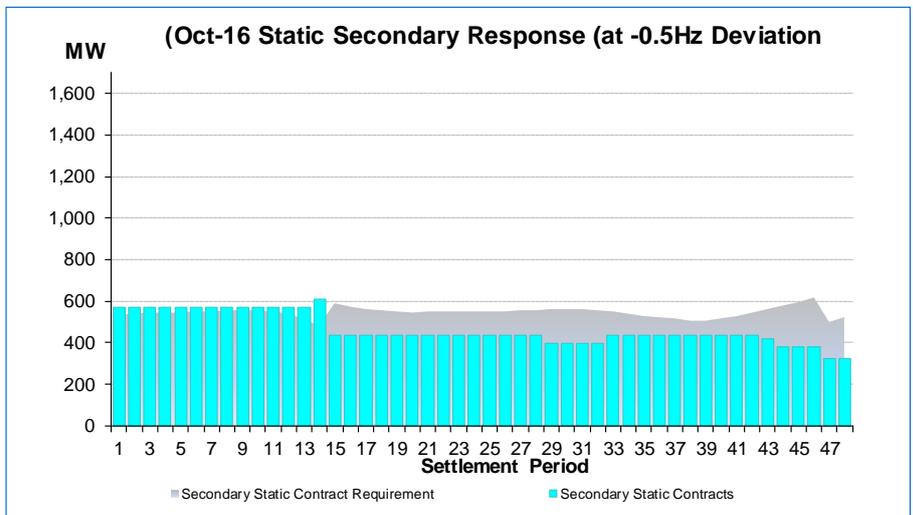
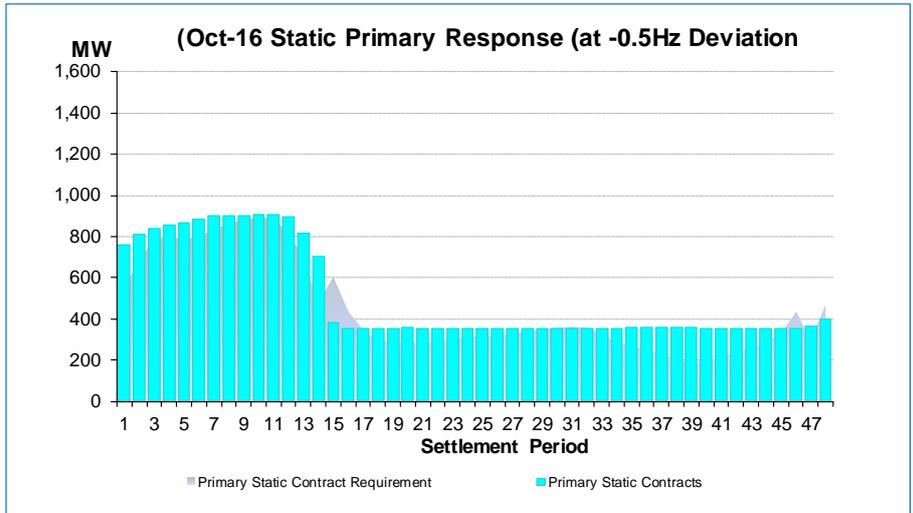
The light blue bars represent the existing contracted volume including any routinely used optional services that NG expects to be in merit in the stack for the month ahead.

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.



Frequency Set-Point Triggered Services

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:

- **Preferences of frequency set-point triggered services in order:**
 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 as these services only support post-fault. 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 is available and the earliest that they could deliver the service will be 1st October 2016 subject to compliance and testing.

12-Month Total Requirement

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

The following charts show the total requirement (blue line) 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. There is little requirement for secondary static overnight until but there is a large daytime requirement. Dynamic can be procured up to the blue line on each graph, there is large overnight requirement.

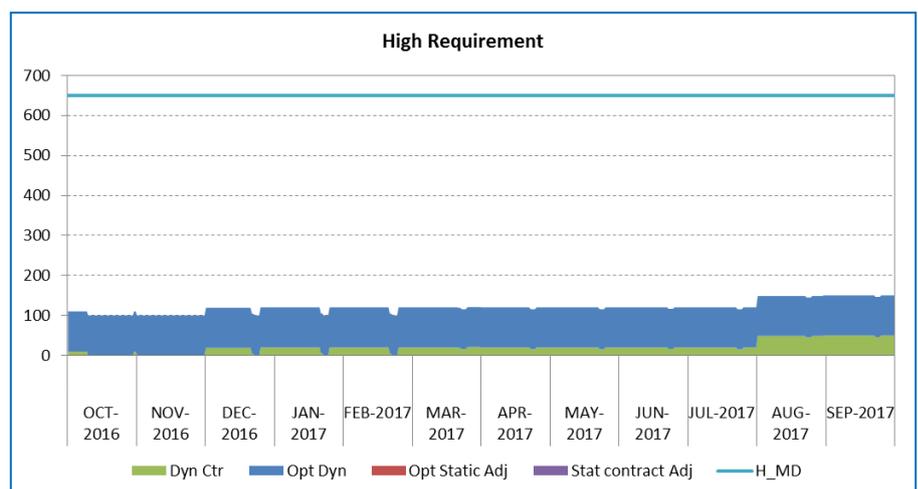
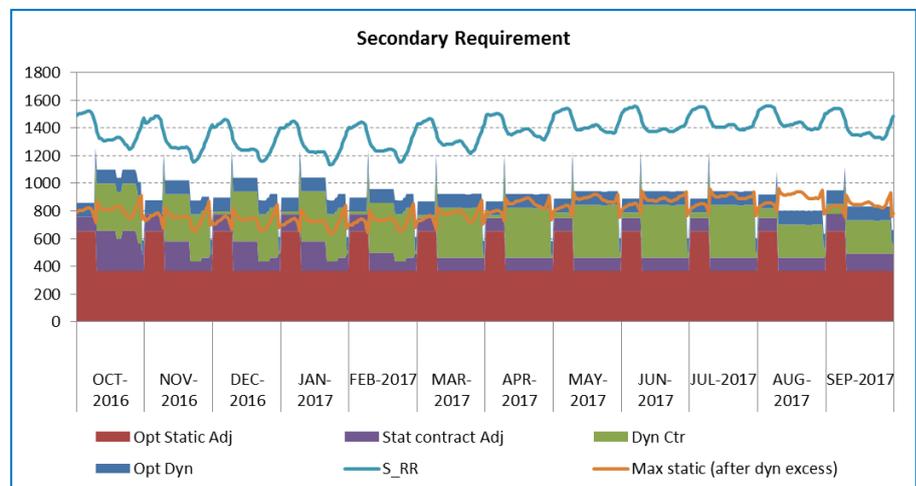
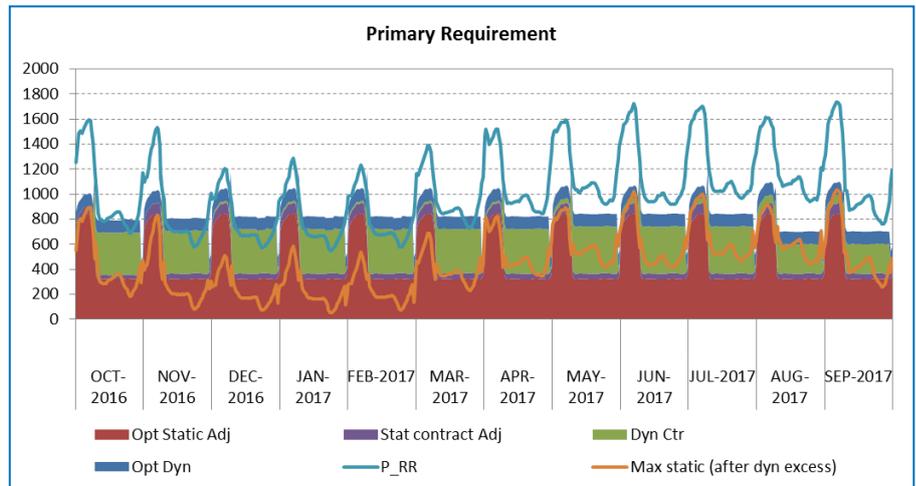
Key points

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.



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

To add clarity to the above graphs, this section aims to detail what we are looking to procure going forward:

- **Dynamic Response:**
 1. We would like to procure more Secondary all day response, where there is more value during the day and so daytime tenders would also be welcome. Where a provider wishes to tender for the whole day we also advise that additional day time and night time tenders are submitted.
 2. We need High response throughout the day to meet our minimum dynamic response, however there is more value in this service overnight due to footroom savings and so we would also consider overnight only tenders.
 - Current operational feedback is that during summer next year we will have a large requirement for overnight and weekend high response.
- **Static Response:**
 1. Primary static requirement is currently full against our requirements.
 2. We are looking for more Secondary daytime response. A longer duration, covering the whole daytime period would be more beneficial as opposed to tendering for shorter durations. As we are trying to avoid a spikey response contracted profile, as to cover the 1 – 2.5hour 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 previously accepted may not be optimal in future months, subject to our forecasts of the alternative costs.

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

Contract Requirement Volume Tables

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

SETT_PERIOD	Dynamic Amount required (MW)		
	Primary	Secondary	High
1	391	630	540
2	489	642	540
3	547	643	540
4	551	642	540
5	519	647	540
6	518	652	540
7	537	657	540
8	566	660	540
9	583	661	540
10	588	660	540
11	582	651	540
12	525	637	540
13	486	600	540
14	41	160	540
15	280	272	550
16	140	246	550
17	56	229	550
18	4	224	550
19	1	214	550
20	0	210	550
21	0	210	550
22	0	211	550
23	9	211	550
24	18	212	550
25	25	212	550
26	28	216	550
27	39	221	550
28	50	226	550
29	62	289	550
30	64	292	550
31	69	292	550
32	68	285	550
33	39	214	550
34	0	198	550
35	0	183	550
36	0	174	550
37	0	161	550
38	0	149	550
39	0	151	550
40	0	167	550
41	0	185	550
42	0	208	550
43	0	259	550
44	0	346	550
45	45	372	550
46	146	402	550
47	530	854	540
48	674	880	540

SETT_PERIOD	Static Amount required (MW)		
	Primary	Secondary	High
1	0	30	0
2	0	42	0
3	0	43	0
4	0	42	0
5	0	47	0
6	0	52	0
7	0	57	0
8	0	60	0
9	0	61	0
10	0	60	0
11	0	51	0
12	0	37	0
13	0	0	0
14	0	0	0
15	220	212	0
16	80	186	0
17	0	169	0
18	0	164	0
19	0	154	0
20	0	150	0
21	0	150	0
22	0	151	0
23	0	151	0
24	0	152	0
25	0	152	0
26	0	156	0
27	0	161	0
28	0	166	0
29	2	229	0
30	4	232	0
31	9	232	0
32	8	225	0
33	0	154	0
34	0	138	0
35	0	123	0
36	0	114	0
37	0	101	0
38	0	89	0
39	0	91	0
40	0	107	0
41	0	125	0
42	0	148	0
43	0	199	0
44	0	286	0
45	0	312	0
46	86	342	0
47	0	254	0
48	74	280	0