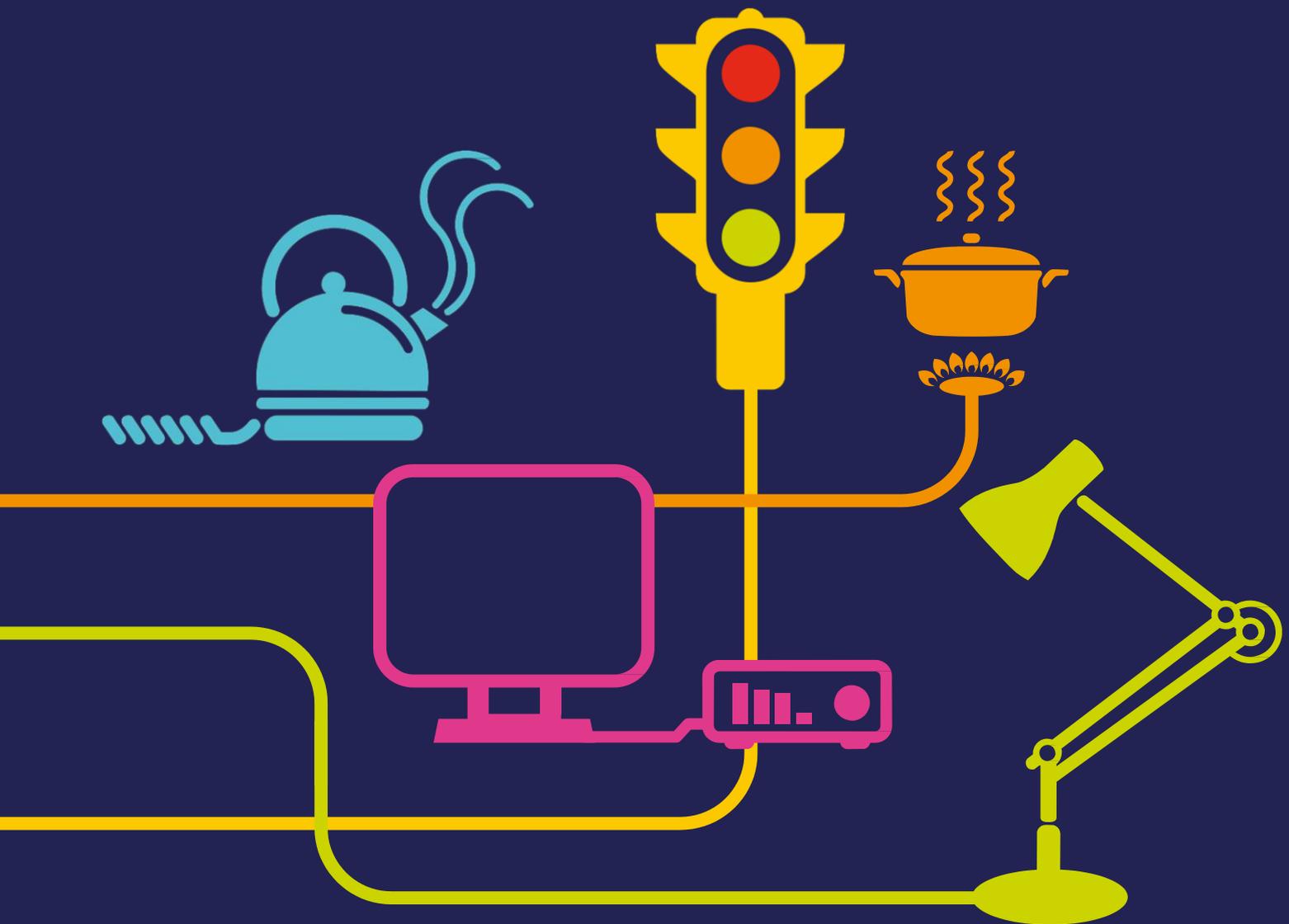


Reactive Power – Obligatory *(Synchronous Generation)*



A guide to the services procured by National Grid to manage voltages on the transmission system

“National Grid is an international electricity and gas company responsible for operating the electricity and gas transmission systems across Great Britain”

What is reactive power?

Reactive Power describes the background energy movement in an Alternating Current (AC) system arising from the production of electric and magnetic fields. Devices which store energy by virtue of a magnetic field produced by a flow of current are said to absorb reactive power; those which store energy by virtue of electric fields are said to generate reactive power. The flows of Reactive Power on the system will affect Voltage levels. Unlike system frequency, which is consistent across the network, voltages experienced at points across the system form a 'voltage profile', which is uniquely related to the prevailing real and reactive power supply and demand. National Grid must manage voltage levels on a local level to meet the varying needs of the system.



What is the service?

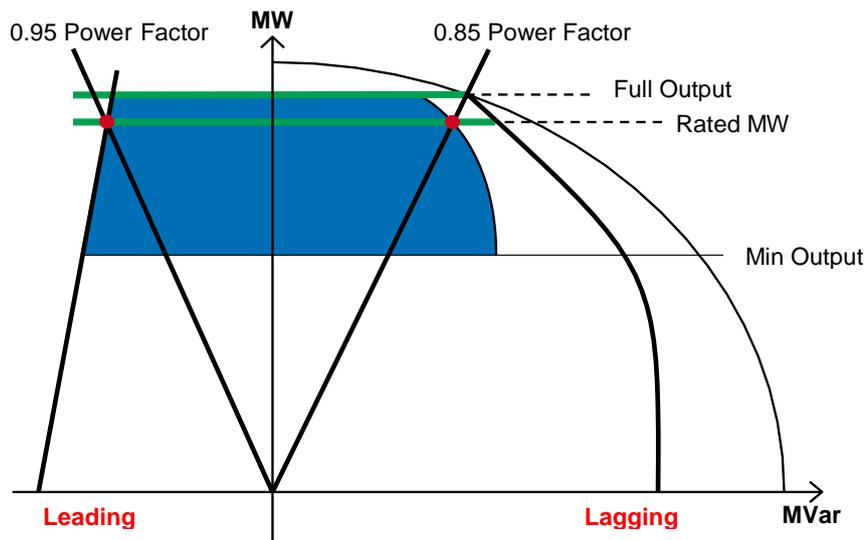
The Obligatory Reactive Power Service (ORPS) is the provision of mandatory varying Reactive Power output. At any given output the Generators may be requested to produce or absorb reactive power to help manage system voltages close to its point of connection. Generally, all transmission connected generators over 47MW are required to have the capability to provide this service, as set out in the Grid Code.

How is it dispatched?

Generators are generally instructed to a target MVar level that must be reached within 2 minutes. This target will sit within the Reactive Performance capability of the Generator, outlined in their Performance Chart an example of this is displayed in Figure 1.

Instructions for Reactive Power are normally sent from National Grid to the Generator via an Electronic Dispatch Logging (EDL) system.

Figure 1: Example Synchronous Generator Reactive Performance Chart



What are the technical requirements for Reactive Power?

The minimum technical requirements state that the reactive power provider must:

- Be capable of supplying their rated power output (MW) at any point between the limits 0.85 power factor lagging and 0.95 power factor leading at the BMU terminals.
- Have the short circuit ratio of the BMU less than 0.5.
- Keep the reactive power output under steady state conditions fully available with the voltage range of $\pm 5\%$.
- Have a continuously acting automatic excitation control system to provide constant terminal voltage control of the BMU without instability over the entire operating range of the BMU.

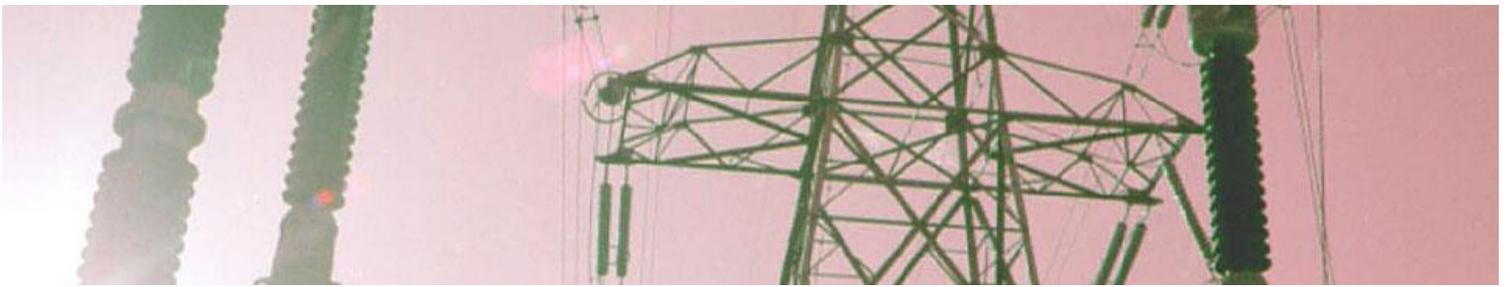
How is the service procured and paid?

The ORPS is paid via the Default Payment Arrangements, outlined below. The contractual form of the service is captured in the Mandatory Services Agreement (MSA).

Default Payment Arrangements

Under the Default Payment Mechanism, National Grid pays all service providers for utilisation in £/MVarh. This Utilisation payment is updated monthly in line with market indicators as set out in Schedule 3 of the CUSC.

The provider will be paid from the date that the Mandatory Service Agreement (MSA) is signed. This is regardless of whether or not they are instructed for reactive power, as the provider will naturally drift between leading or lagging rather than constantly staying at zero MVar.



Contact:

Commercial.operation@nationalgrid.com

Information:

For more information on Balancing Services please visit

<http://www2.nationalgrid.com/UK/Services/Balancing-services/Reactive-power-services/Obligatory-Reactive-Power/>