

Triad

This paper sets out the background to Triad and the use of it as a tool for managing peak demand on the electricity network. The paper covers:

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1. **Summary**

Dealing with peaks in demand for electricity, particularly during the winter months, is one of the many challenges facing National Grid as system operator.

An important way of managing demand is the use of the Triad charging system – a tool that has been in place since the early 1990s and which is targeted specifically at large industrial and commercial users of electricity.

These customers have meters that measure their electricity consumption on a half-hourly basis (half-hour metered demand). How much they pay is determined by their demand during the Triads.

Electricity suppliers pay use of system charges based on the half-hour metered demand they supply and often pass this charge on to their customers.

The Triad charging system is one way that large industrial users of electricity can reduce their energy charges by reducing consumption over peak periods. This can be done by switching off plant at a time that might coincide with one of the three half-hour periods of peak demand or using available on site generation. If charges were based on energy use throughout the year then their bills would likely be much higher.

Reducing consumption or using onsite back up generation avoids building more infrastructure which ultimately costs each of us more through our electricity bills and may have further environmental benefits.

Customers will assess the trade-off in value between receiving payments for provision of a service, reducing their TNUoS costs through Triad avoidance and taking a continuous supply of electricity (e.g. value of uninterrupted production).

The ‘smoothing’ effect of the Triad system on electricity demand helps to keep our network running more efficiently. It also reduces the need for new generators and helps us to keep the necessary margin or buffer between supply and demand in terms of security of supply.

In summary, Triads have been around for a long time and they do an important job. They help to reduce peaks in demand and save the country as a whole from building more power lines and power stations, thereby reducing overall costs for each and every one of us.

2. Background to Triad

What are the triads?

The Triad is used as a short hand way to describe the three half-hours of highest demand on the GB electricity transmission system between November and February each year, which are separated from the system peak demand and from each other by at least 10 Clear Days. This identifies peak electricity demand at three points during the winter in order to minimise energy consumption. They represent periods for which half-hourly metered demand (and small scale generation) will be charged (or paid) Demand Transmission Network Use of System (TNUoS) charges.

National Grid does not forecast the Triads and they are not known in advance. Instead we use settlement data, which is a detailed analysis of demand after the event, to work out the Triads in the March following the 'Triad season'.

The charging methodology provides an economic signal for consumers to avoid taking demand over periods of high demand that will potentially form Triads (Triad avoidance). The reduction in Peak demand through Triad avoidance helps to reduce the overall level of transmission investment which would otherwise be required.

Dealing with unpredictability

70% of demand is not half-hour metered, but instead comes from homes and small businesses. This means that how cold it is, when it gets dark and daily routine all have a big influence on demand.

The weather is an important factor because Triads usually coincide with cold snaps but milder, wet winters can mean there is less variation in peak demand. This can lead to a bigger influence on Triads from half-hour demand plus the impact of embedded wind generation, which has the effect of offsetting some of the demand at certain times. Milder winters can mean that Triads are less predictable.

Many suppliers provide a Triad forecasting service designed to help customers on half-hour metered demand to reduce their bills. National Grid issues notice of a 'tight margin' between the available power stations generating energy and expected demand. But the market often responds to these notices by reducing demand, which in turn reduces the likelihood of a Triad.

Individual businesses may suspend early evening production between 20 and 30 times each winter to try to avoid the Triads and reduce their bills. However, the unpredictability of the Triads means there is no guarantee of avoiding infrastructure charges by doing this and is a commercial decision for individual consumers.

The unpredictability itself acts as a driver for reduced demand both terms in quantity and the period over which the demand reduction applies and although being able to predict Triads is efficient from an Industry point of view, too much predictability reduces the effect of the Triads and impacts on the need to invest in network reinforcement.

3. Charging methodology

National Grid sets Transmission Network Use of System (TNUoS) tariffs for Generation and Demand annually at the end of January. The tariffs reflect the impact customers have on the cost to maintain and invest in the Transmission network.

The tariffs, are made up of two underlying elements, which when added together make up the overall wider tariff; the Locational and Residual elements. The Locational element provides a signal to customers about the impact they have on transmission costs. The Residual element ensures that National Grid collects the total revenue allowed by Ofgem for all transmission companies based on their price controls. These tariffs serve two purposes: to provide information to customers about the transmission cost of connecting in different parts of the country and to recover the total allowed revenues of the onshore and offshore transmission owners.

To provide information about the cost of connecting in different parts of the network, National Grid determines a locationally varying component of TNUoS tariffs using a model of power flows on the transmission system. This model considers the impact that increases in generation and demand have on power flows at times of peak demand.

Where a change in demand or generation increases power flows, tariffs reflect the need to maintain existing assets or invest going forward. Where either demand or generation locating in a particular area leads to lower flows on the transmission system, this benefit is also reflected in tariffs i.e. demand charges are lower in the north of Great Britain. In order to calculate likely flows on the network, information about the generation and demand connected to the network is used in conjunction with the electrical characteristics of the circuits that link these.

4. Governance

Triad arrangements are set out in the Connection and Use of System Code (the CUSC). Any CUSC party can propose a change to these arrangements by submitting a CUSC modification proposal. Such proposals are evidence based and require that any proposal better meets the CUSC objectives and will ultimately deliver a better deal for end consumers.

A CUSC modification is defined by a defect and the proposer needs to clearly identify what the defect is usually along with a solution to the defect. A CUSC workgroup is then set up to look at the proposed modification and will also develop their own solutions.

All credible modification proposals that have broad support are presented to Ofgem, along with the original proposal and evidence for Ofgem to review and make a decision. National Grid can work with any party that wishes to raise a modification and provide guidance to ensure that any submission has the best chance of success.

Proposals for a modification, should be sent to: cusc.team@nationalgrid.com

The Transmission Charging Methodologies Forum (TCMF) is established under the CUSC, with the aim of providing a forum for regular discussion between interested parties and National Grid on development of the charging methodologies.



All existing or prospective Connection and Use of System Code (CUSC) parties can send a representative to the meeting. In addition, representatives from other industry bodies are invited.

If you would like to attend future TCMF meetings please contact the CUSC team at cusc.team@nationalgrid.com.