

[www.inenco.com](http://www.inenco.com)



# Demand Management The Ultimate Guide

Embracing flexibility and optimising your energy usage

## SUPPLY AND DEMAND

Whenever you use electricity, whether you're using a computer or charging your phone, you are using a limited resource. Electricity can't be stored in large quantities, so keeping up with demand is a constant concern for those involved in supplying it.

### What is Demand Management?

The world of the Future Utilities Manager will continue to change in the years leading up to 2030, affected by the actions of countries working towards Sustainable Development Goals (SDGs) and the Paris Agreement. Resource constraints and air quality will continue to drive efficiency measures, improvements in the built environment, and innovation in the transport sector. The impacts of Brexit will become clearer.

As a result, energy regulation is set to become more complex, operating costs will increase, and power supply and procurement solutions are going to become more diverse.

National Grid is responsible for balancing the electricity system.



National Grid is the organisation responsible for 'balancing' the energy network – making sure that the supply of electricity is equal to the demand for every minute of every day.



Demand management is important as it's one of the ways that the system stays balanced, but it can also be a key source of income for businesses. Businesses that participate in demand side response schemes are paid simply for being available to respond if needed, with many schemes paying higher rates if a business is actually called on to adapt their demand. If National Grid can call on businesses to shift their consumption rather than paying generators to produce contingency volume, they can also make substantial savings.



Managing demand has become increasingly important to businesses and generators since the inception of the Capacity Market (which we cover in more detail on page 4 & 7) in winter 2017. Generators are paid to make capacity available in periods of peak demand, while businesses are charged more for consumption during these times, so demand management should now be priority for both.

## WHEN SHOULD I REDUCE CONSUMPTION?

Now you know what demand management is and why it's important, we're sure you'll want to get involved! It can be difficult to know where to start though – here's a quick overview of the best times to reduce your consumption.

National Grid is the organisation responsible for 'balancing' the energy network – making sure that the supply of electricity is equal to the demand for every minute of every day.

### DUoS bands

Demand management is the process of adapting the times at which electricity is used – the 'demand' – to match predicted generation – the 'supply' – during those periods.

National Grid is responsible for balancing the electricity system. It asks generators, businesses and consumers to increase or decrease their electricity use to ensure that supply and demand match. During peak demand periods, it may ask businesses to turn down their production to relieve some of the stress on the grid. The same businesses might also be asked to increase their demand or reduce their generation in periods of high generation but low demand.

DUoS use Red, Amber and Green bands to categorise different charges. If you use electricity during a Red time band (typically 4-7pm Mon-Fri, but this varies among distribution networks) you will

face the highest charges, whereas if you can shift consumption to a Green time band then you could reduce your costs substantially.

These time tariffs will be changing once DCP228 is implemented, which will be at some point between April 2018 and April 2019. DCP228 will flatten out the charging structure, making the difference between the tariffs less significant, so Red band tariffs will be slightly lower while Amber and Green tariffs will rise. Despite these changes, it will still pay to avoid Red band periods!

Go for green - If you can keep your electricity consumption within the green and amber bands as much as possible, you'll keep costs to a minimum!

### Triads

While the Triads may sound like something out of a sci-fi film, they're really the three half-hourly periods during the winter (Nov-Feb) that have the highest consumption. This is important for your business because your TNUoS (Transmission Network Use of System) costs will be based on your consumption during those three periods.

This means that if you want to keep your transmission costs low, it pays to reduce your consumption as much as possible during the Triads. The tricky thing is that National Grid only announces when the Triad periods were in the following March, once it's analysed all of its winter data and found the three periods when demand was at its highest. But how can businesses know when to turn down their consumption if the Triads aren't forecast in advance?

Did you know? Inenco successfully predicted all three Triads last winter (2017/18).

The best way to avoid being caught out by Triads is to turn down your electricity consumption during peak times over the winter period. Could you adjust your production schedule or switch to on-site generation during these times? While it can't be guaranteed, most Triads occur between 5-6.30pm, when industrial electricity use coincides with people getting home from work and putting the kettle on. Last winter, all three Triads occurred between 5-6.30pm.

### Capacity Capability

The Capacity Market, starts in October and is one of the ways that the government is working to make sure that electricity supply can continue to meet demand. Auctions are held, allowing businesses with the ability to generate electricity to bid for Capacity Agreements. If a business wins a Capacity Agreement, they must supply an agreed volume of electricity to the Grid, which they are paid for based on the auction clearing price.

Businesses with Capacity Agreements in place were paid £6.95 per kilowatt hour (kwh) during the Capacity Market in winter 2017/18.

Businesses will see a new charge on their bill this winter – the Capacity Market levy – which will cover the cost of running the Capacity Market and the cost of paying the generators that provide extra capacity. Suppliers initially fund these costs, as they're charged according to their market share between the hours of 4-7pm (the peak demand period) from November to February. They then pass these costs onto their customers.

Some of these costs will be based on your time of use – put simply, if you use electricity in peak demand periods, you will be charged more. From November 2017 to February 2018, if your businesses has half-hourly meters then you will have been charged £31 per MWh for any energy you consumed between 4-7pm. These costs can really add up! To keep costs down, we recommend that all business take steps to reduce their consumption as much as possible during peak demand hours in winter.

Red

Amber

Green

## Finding your flexibility

So now you know when to turn down your consumption, it's time to think about how you can do it!

## Reducing consumption: long-term changes

Before your business or organisation can start to consider demand management schemes, it's a good idea to carry out an energy audit. This will show you how energy is currently being used within your building/s and should enable you to make long-term changes to reduce energy consumption.

Analysing energy use is an important first step and we can work with you to identify areas for improvement that will deliver cost and carbon savings. If your business is large enough to have had an ESOS (Energy Savings Opportunities Scheme) assessment carried out, you may have already identified a number of energy saving measures that will benefit your business. Inenco can help with this – we take a packaged approach that ensures you're fully compliant with ESOS legislation, and we'll give you a comprehensive report detailing where your organisation can make energy savings.

Measures can be as simple as turning off lights and machinery when they're not in use, upgrading heating and air conditioning systems or fitting LED lighting. There will be plenty of opportunities and many of them will be low-cost, or won't cost anything at all.

Staff awareness and engagement is crucial to making long-term changes and achieving savings, so we recommend getting employees on board through regular communication such as team meetings, company newsletters and energy efficiency posters. It might take time to change procedures and staff behaviour, but you'll probably find you already have some energy efficiency ambassadors within your business.



## Reducing consumption: flexible assets

With more renewable generation feeding into the energy system, organisations with flexible assets are increasingly attractive, and are well-placed to earn revenue from helping National Grid to keep the system balanced.

Many businesses have flexible assets which can be used for demand management – examples include refrigeration equipment, compressors and on-site generators. Understanding when and how to reduce consumption and navigate the different opportunities can be complex, so it often pays to work with industry insiders (like Inenco!) to understand what flexibility you have, and find the right strategy to meet your organisation's needs.

By reviewing your consumption patterns and understanding your critical business processes, you'll be able to identify when and how to reduce consumption, or switch to on-site generation, without affecting your operational performance.

## On-site generation: building the business case

Investing in on-site energy generation offers a range of benefits, including lower energy bills and security of supply, and it might enable you to participate in demand management more easily. The technologies to consider include combined heat and power (CHP) and renewables such as solar PV and wind power.

The experts at Inenco will assess the viability of your renewable generation, project managing the whole process for you and ensuring that you get the best return. It's important to remember that low-carbon and renewable technologies are not a 'one size fits all' solution; they need to be appropriate for the building in question and sized correctly, to ensure savings targets can be achieved.

If you're unsure whether on-site generation is right for you, Inenco can advise you by carrying out an investigation into factors such as the source of energy, grid connection requirements and funding for your business. Inenco can also support you with the necessary survey, planning permissions and other admin (like registering your project with Ofgem) required for on-site generation.



## Be responsive

If your business has the potential to generate more energy than it needs, you may be able to profit by participating in a demand side response scheme.

## What is demand side response?

Demand side response (DSR) involves businesses being financially rewarded for turning down, shifting their electricity use and generating back to the grid during periods of peak demand. It's one of the ways that National Grid can ensure that supply will meet demand.

## How can my business get involved in DSR?

There are a number of different demand side response schemes and some will suit your business more than others – let's take a look:

## The Capacity Market

If your business uses a lot of electricity, you may be able to enter the Capacity Market auctions and bid for a Capacity Agreement. Aggregators can also enable smaller electricity users to participate in the Capacity Market by grouping the capacity of a number of small businesses together. As a participating business, you'll receive a Capacity Market Warning to alert you that you need to reduce your demand or switch to on-site generation.

Be aware that once you've signed an agreement, your business is obliged to provide National Grid with the agreed amount of electricity – if you don't, then you'll face hefty penalty charges.

## Frequency response

The frequency of the UK's electrical grid system is constantly changing in response to supply and demand levels – if demand is greater than supply, the frequency dips, and if supply is greater than demand then the frequency rises. National Grid is responsible for ensuring that frequency stays balanced between 49.5 and 50.5Hz.

If there's a sudden change in the frequency, for example if a power station fails, National Grid must take action immediately to rebalance it. Frequency response can help them to do this. Businesses sign up to participate in a frequency response scheme in advance, agreeing that their assets can be turned on or off automatically during frequency response events, which usually only last for a short period.

Not every business will be able to take part in frequency response, as assets must be able to be adjusted remotely and respond within seconds of the National Grid requesting action. Those that are eligible, however, could see significant returns.



## Demand turn up

National Grid's Demand Turn Up service is another option for large electricity users. There are times when supply far exceeds demand, such as evenings and weekends, which means the Grid has to pay wind farms to shut down. This can be really costly, so National Grid aims to increase demand during these times rather than turn off the wind farms. That's where the Demand Turn Up service comes in – businesses with large consumption are paid to increase their consumption when wind output is too high for the level of demand.

**In 2017 the National Grid procured 262MW of response from businesses through Demand Turn Up**

Businesses are usually able to get involved in Demand Turn Up between March and October. If your business is eligible and chosen to participate, you are paid to be available to increase consumption during certain windows of time, and you receive payment whether or not you're asked to turn up during those times. If you are asked to shift consumption to a period of low demand, you are paid a Utilisation Payment – which is considerably higher than the availability payment.

## STOR

Does your business have generation assets on site? If so, you could participate in National Grid's Short Term Operating Reserve (STOR) market.

Not every business with on-site generation will be eligible for STOR: as National Grid is relying on your business to provide electricity on demand, renewable methods of generation aren't accepted, and you need to be able to provide a minimum of 3MW of generation. Businesses that meet these requirements can enter National Grid's tender process.

If your tender is accepted, you will need to be available to generate your agreed MWs during the availability windows set. You'll be paid one rate to be available during these periods, and a higher rate if you are called upon to provide capacity.



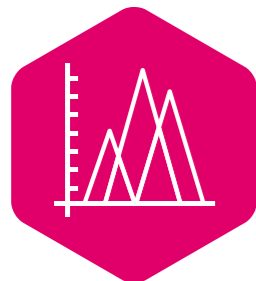
## Optimising your energy usage.

### Our top five tips:



#### Get to grips with your usage

Now you know about all the benefits of demand management, you're probably keen to get the ball rolling, but first you need to understand your current position. Take a look at your historical electricity bills to get a good idea of how much electricity you're using now, so you can measure if any optimisation strategies you adopt are effective.



#### Be aware of expensive periods

Your time of use can make a big difference to your bills, so make sure that you know which times carry the highest rates. If you can shift your consumption away from the typical peak demand period of 4-7pm (or reduce it), you should be able to avoid excessive transmission costs. Contact your supplier to get accurate DUoS band times for your site.



#### Embrace flexibility

If you have flexible assets or on-site generation, you should be able to benefit from demand management schemes. The first step should always be to carry out an energy audit and make some long-term changes to reduce overall energy consumption.



#### It pays to be responsive

Thanks to aggregators, demand side response is accessible to more businesses than ever. If your business can be flexible with its capacity by turning consumption up or down, or switching to on-site generation at critical times, there should be a demand side response scheme for you.



#### Speak to the industry experts

Don't miss out on the benefits of demand management because you feel that you don't have the time or the expertise in-house to get involved. The team at Inenco has 50 years of experience in the energy industry and we have a range of services that make managing your demand totally hassle-free.

## How can Inenco help your business to get involved in demand management?

01

We can carry out an audit of your costs and consumption to give you a detailed picture of how, when and where you're using electricity, and recommend ways to make a tangible difference to your bottom line.

02

We'll advise you on how you can reduce your consumption so you can avoid incurring excessive costs during peak demand periods.

03

We can help you to participate in demand response by identifying a suitable scheme for you and ensuring that it integrates into your wider energy strategy.

Ready to start managing your demand? Call Inenco today on 08451 46 36 26 or email [enquiries@inenco.com](mailto:enquiries@inenco.com)