Grid Code Development Open Energi Briefing

June 2016

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Open Energi | **Timeline**

2003
Technology patents filed

2006
Initial venture capital funding

2008
£3.1m Indesit fridge trial

2010
10 year 200 store agreement

2011
Ombu Group invest (Invesco Perpetual)

2014
Winners Business Green Leaders Awards

2016
40+ corporate customers & growing

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Proposition | **Customer Assets**

By sharing flexible energy demand customers can **earn revenues** equivalent to 5-10% of their energy bill and **avoid peak tariff charges**

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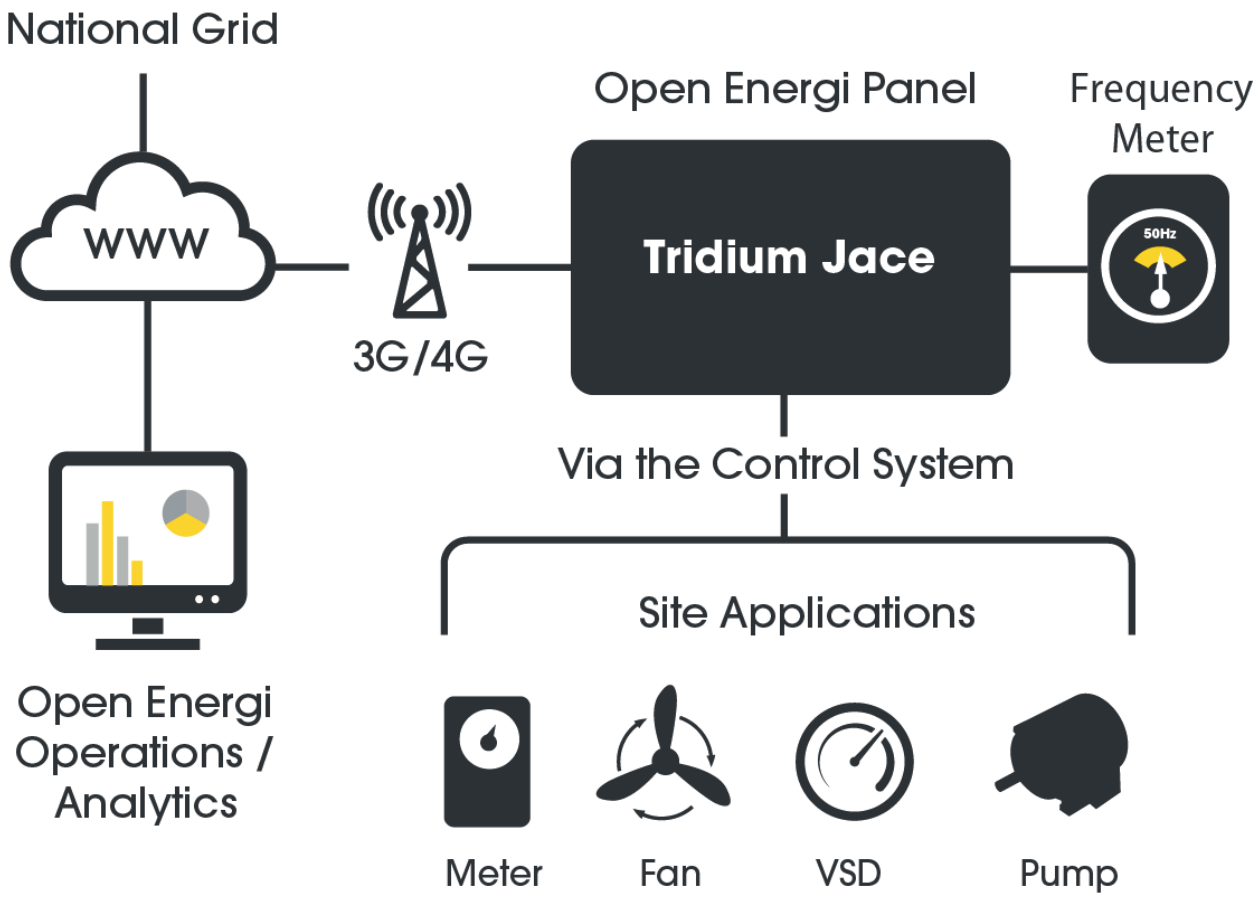
Hardware | **Architecture**

Equipment is installed on site to react to a given signal and meter the reaction



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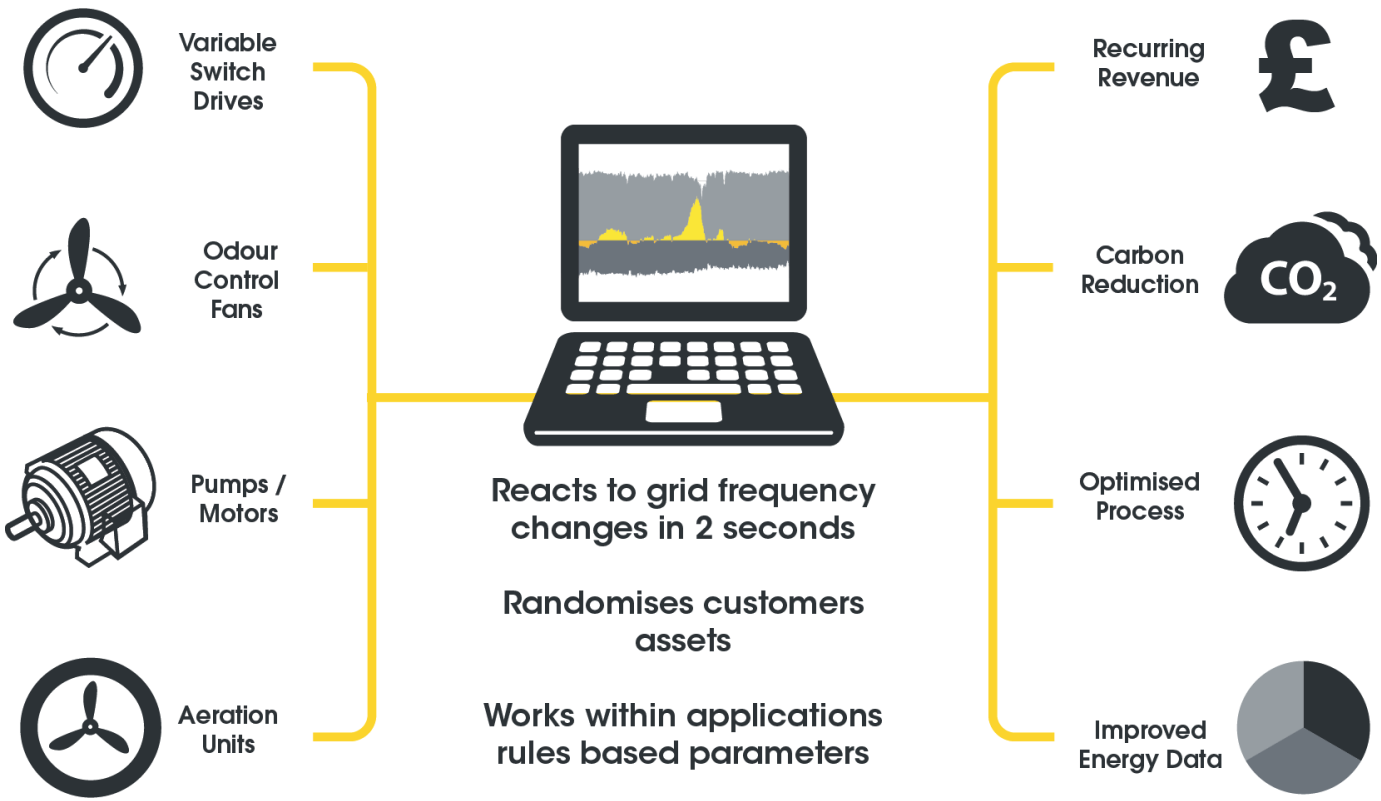
Business Case | **Clients**

The revenue to clients is a driver but absolutely not the only parameter that will cause them to participate in Demand Response



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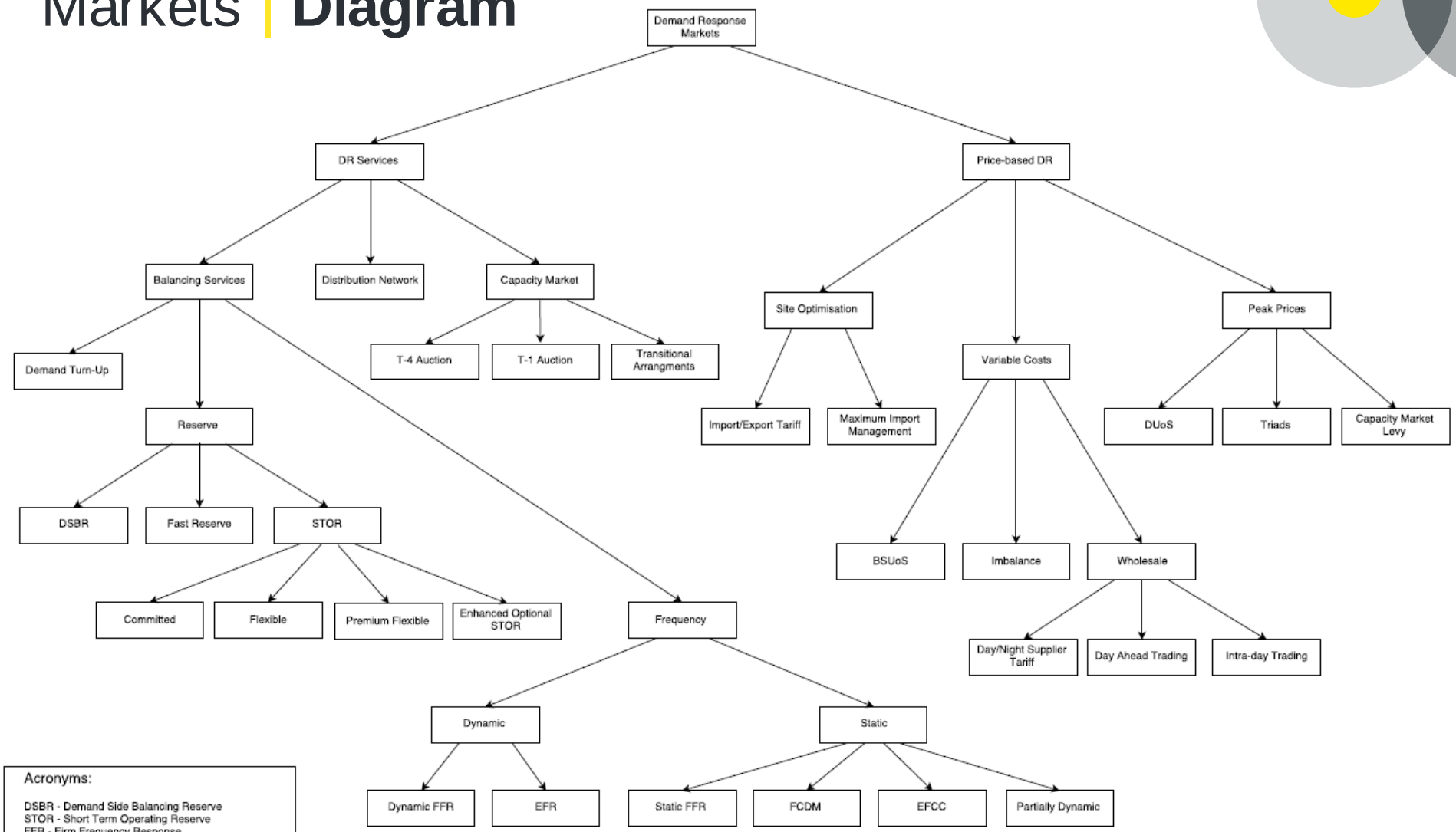
Markets | **Diagram**



Acronyms:

DSBR - Demand Side Balancing Reserve
STOR - Short Term Operating Reserve
FFR - Firm Frequency Response
EFR - Enhanced Frequency Response
FCDM - Frequency Control by Demand Management
EFCC - Enhanced Frequency Control Capability
BSUoS - Balancing Service Use of System
DUoS - Distribution Use of System

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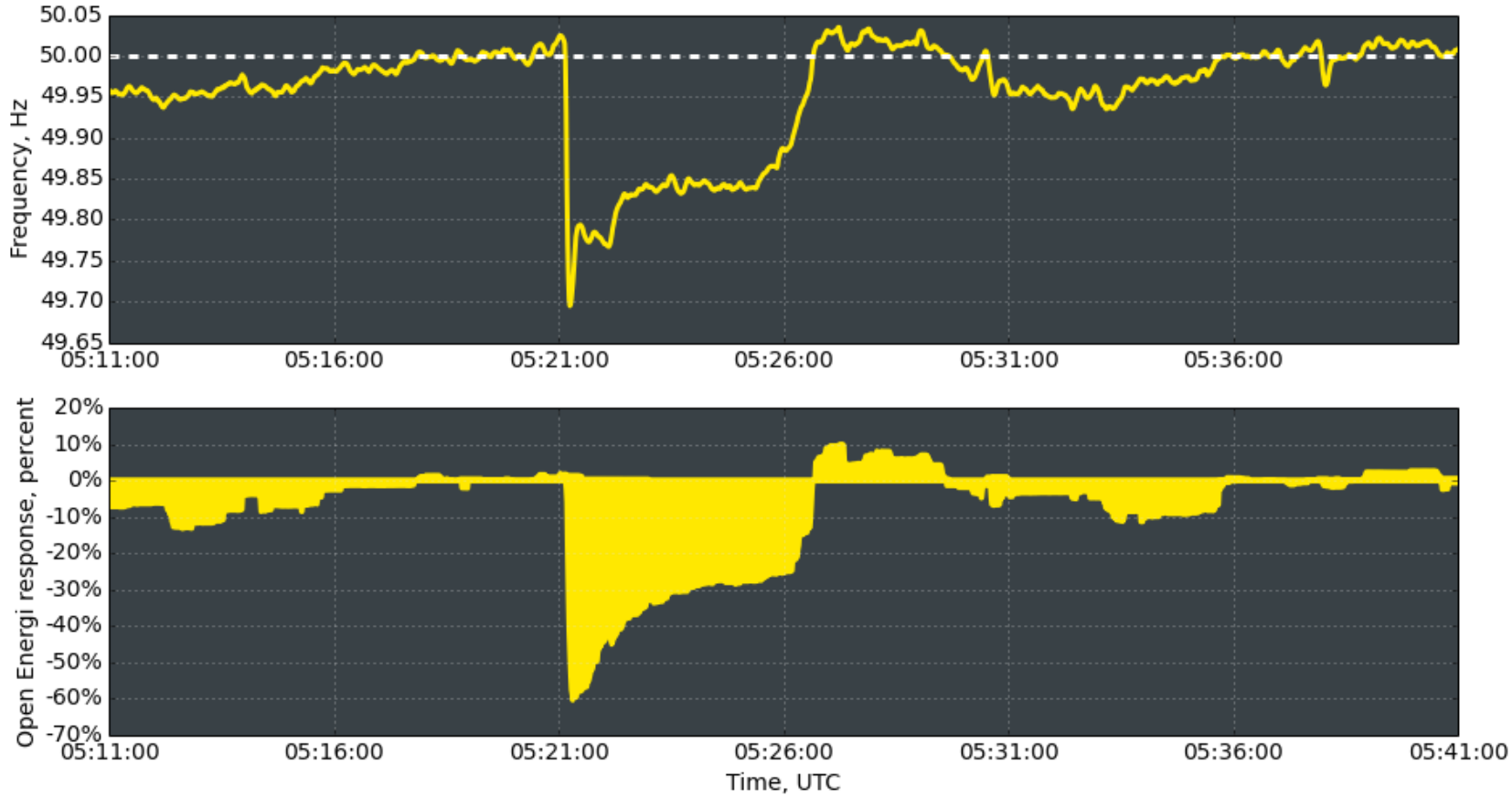
Frequency Response | **August Event**

The graph shows Open Energi's response to an **interconnector trip** in August



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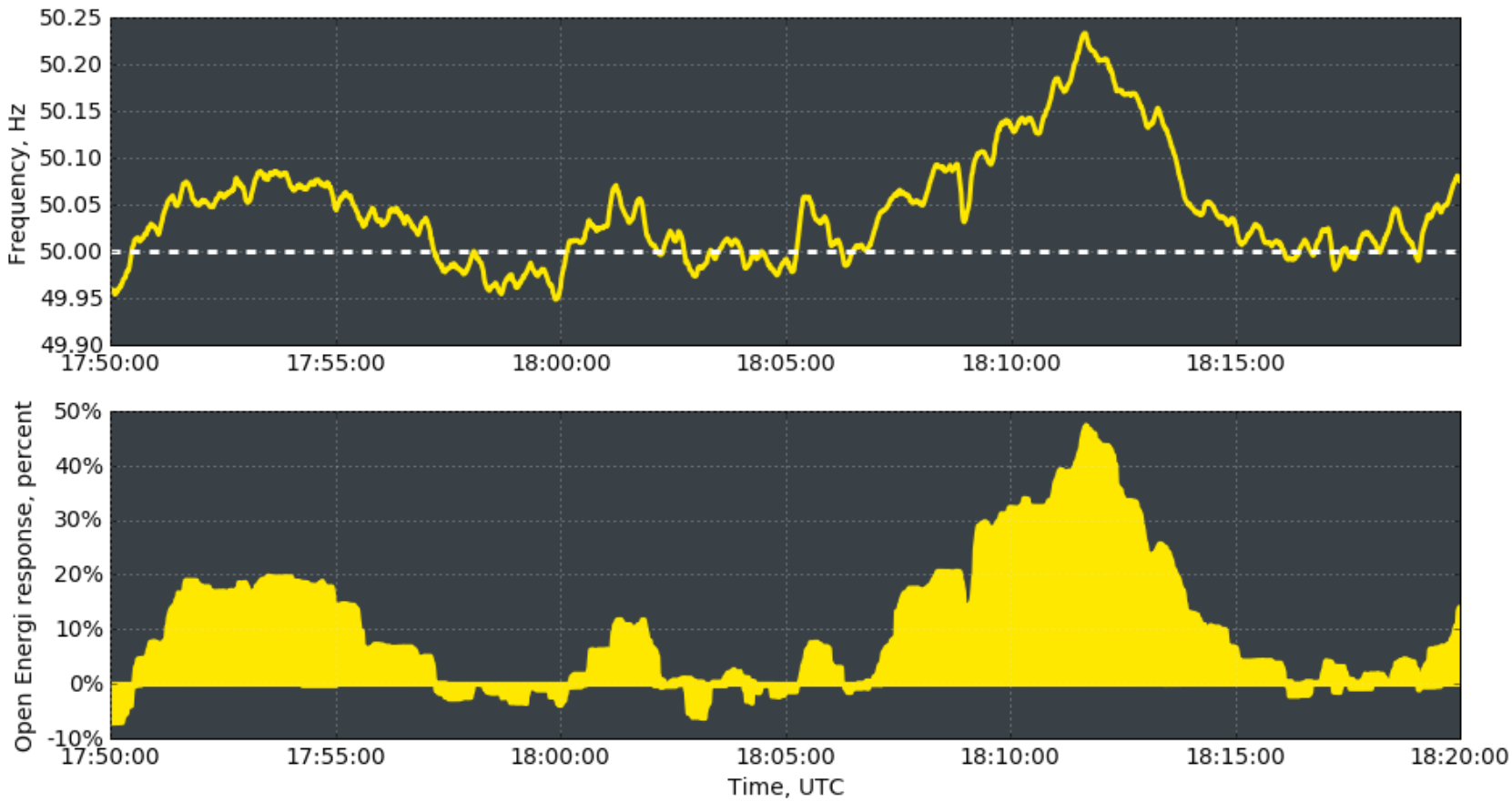
Frequency Response | **September Event**

and it works on windy September evenings too…



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Open Energi | **Company Structure**

The flow of cash is simple however the number of capabilities we have had to develop as an Aggregator is not

- **Cashflow**

TSO (National Grid)

↓

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Clients

- **Capabilities**

- ‘Trading’
- TSO Service Delivery
- Technical Sales
- Commercial
- Implementation
- Operations
- Technical Infrastructure
- Back office

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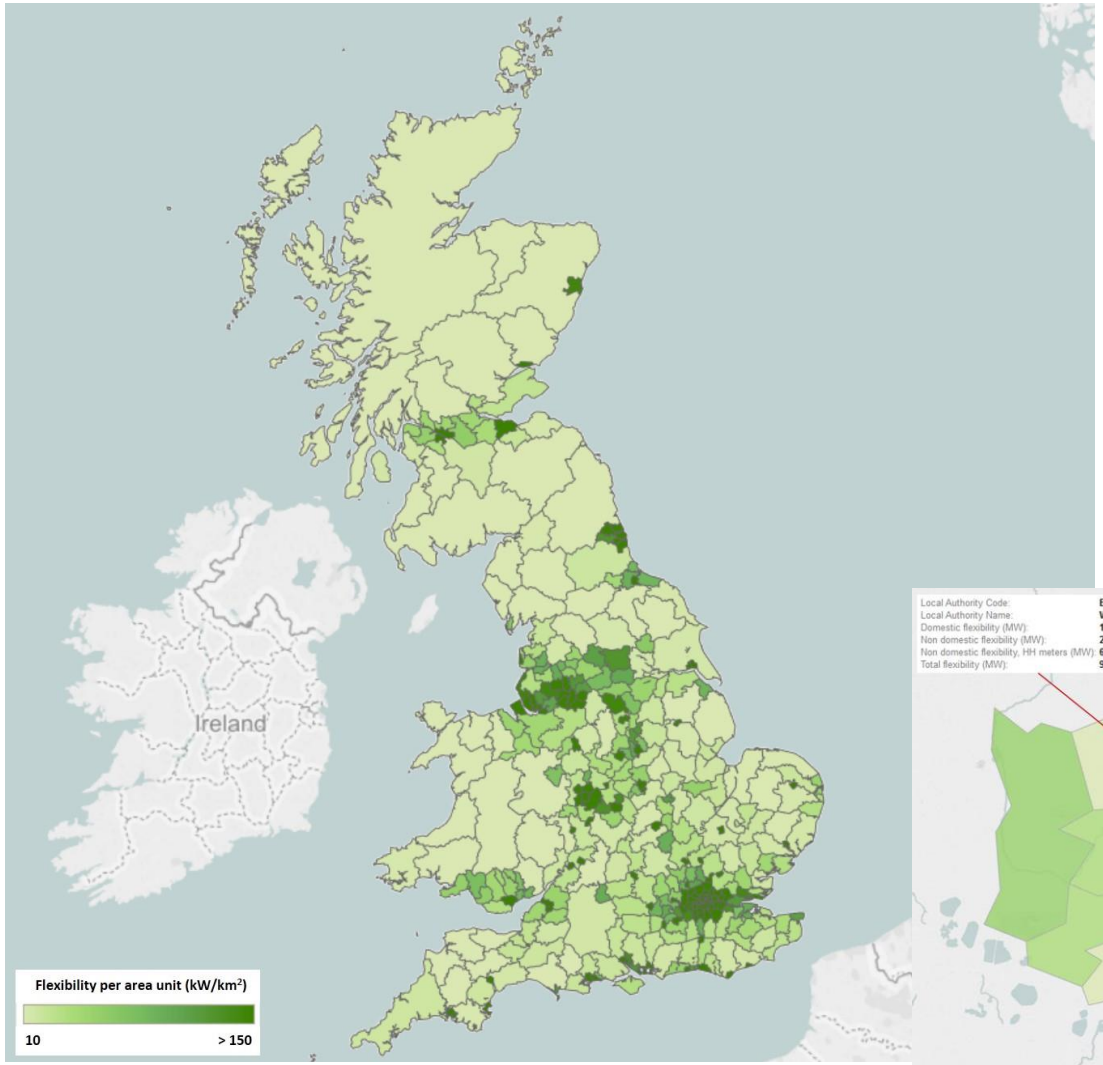
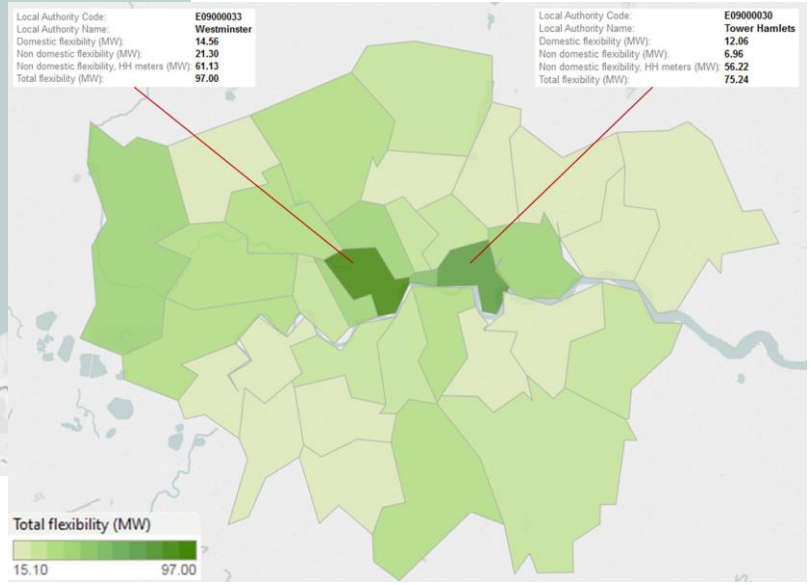
DSR | **Can it scale?**



6GW



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March 2016, Financial Times

About | **Open Energi**

Open Energi is an **established National Grid Demand Response Aggregator** providing service to some of the **UK's most respected organisations**

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Case Study | **Water Sector**

Open Energi is working closely with the water sector to help **deliver sustainable water** in line with **Ofwat strategy**

> "Water and wastewater treatment is a really energy intensive process – power is one of our biggest operating costs – so we're looking both inside and outside our business to see how we can work smarter.
>
> That means using less power and being willing to be flexible in the way we use that power."

Andy Pennick
Energy Manager
United Utilities

Andy Pennick Energy Manager, United Utilities

A dynamic approach to managing energy

North West water company United Utilities is well on the way to building a 'virtual power station'. One year after signing a contract for 'Dynamic Demand', the company is seeing how getting smarter with energy use can pay dividends and boost green credentials.

With new powered treatment processes coming on line to meet higher environmental standards and the increasing cost of energy, United Utilities decided it needed to take a strategic look at its energy usage if it was to keep costs sustainable for customers.

We know that

biggest costs

less, generate

more smartly.

lot of work on

efficient equip

generating some

own electricity.

Aeration lanes

other renewable sources. But it was the "getting smarter" that led us to trialling a demand response technology called Dynamic Demand.

What is demand response?

The National Grid meets the UK's demand for power around the clock. Traditionally, when the demand increases, the grid ramps up power generation, perhaps by bringing a coal or gas-fired power station online. As demand reduces, the power generation can be throttled back.

Demand response looks at the equation the other way round. It's a simple idea using some very clever technology. When demand increases the system looks to see where non-

often we can be flexible about when we need to use it thanks to the storage available in our assets.

Take clean water pumps for example. Some service reservoirs have many hours of storage and the pumps do not necessarily have to operate immediately when water levels start to fall. Another good example for wastewater is the air blowers on activated sludge plants. When managed, there is headroom available in the process that allows for flexibility in precisely when the air blowers need to cut in, especially suitable for those with variable speed drives.

In 2014, we decided to run a demand response trial at three sites: Houghton water pumping station, Bolton WwTW

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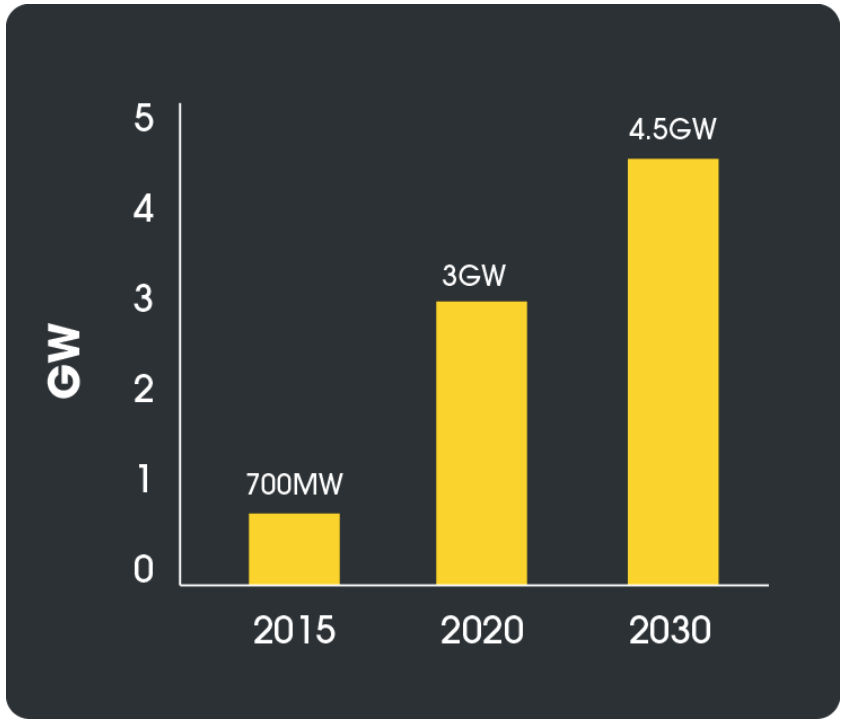
Energy System | **Grid Targets**

Power Responsive campaign launched by National Grid in summer 2015 to bring about a **step change in demand-side response** (DSR) activity by 2020

- National Grid has set a goal of delivering **30-50% DSR participation** for it's schemes by 2020
- **Targeting 3GW of flexible demand** that can be adjusted amid quick changes in renewables output - **a 328% market increase from 700MW today**
- Cost of balancing services today is c£1 billion per annum



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