



Goldilocks...

... and the three lessons for modernising the power system.

As you may have heard, the energy system is going through enormous change. The huge, centralised power stations that eat dinosaurs for food are going out of fashion. They are being blown away by the growth of distributed renewables and other new technologies.

The transformation isn't limited to the supply side; the way that we all use energy is changing too. Just look at how our preference for on-demand TV has changed the Great British phenomenon of the TV pickup - when millions of us would reach for the kettle immediately after the end of our favourite programme. Now that we watch what we want whenever we want, our behaviours are less coordinated and there are far fewer of those surges in electricity demand.

Changes like these mean that way that we operate the system has to change too. National Grid, in its role as the Electricity System Operator, needs to ensure that power supply equals demand, every second of every day. We have a range of toolsets to help to us do this, which now need to be renewed to meet the needs of the modern power system. One of these toolsets is called 'frequency response services', which involve service providers varying their generation or demand to help keep the nation's supply and demand in balance and keep the system frequency at 50Hz \pm 1%.

People often refer to Goldilocks when they are talking about getting things 'just right'. For example our planet lies in the Goldilocks zone – it's not too hot and not too cold, and there are countless other examples. As we design the new frequency response services we want to get things just right too. There's a lot at stake, frequency response is a fundamental part of system security (keeping the lights on) and in 2017/18 the market for frequency response services was worth £140m.

Here are three other lessons from Goldilocks worth thinking about when making any changes:

1. The solution isn't always obvious – The challenge of the design starts with identifying the fundamental technical requirements. This involves asking really challenging questions to find what the system actually needs. It can be particularly difficult when few have had to engage with the fundamentals for a long time, while everything 'just worked'.

2. Experimentation is necessary – A consequence of the first point is that we need to test our ideas and be prepared to iterate through designs until we find one that meets the requirements. This will necessarily involve looking for evidence to disprove our theories and assumptions, which can sometimes sit uncomfortably!

“The power stations that eat dinosaurs for food are going out of fashion”

3. Involve your stakeholders – At the end of the story, Goldilocks is awoken by the friendly bears, but jumps out of the window and runs away. This is hardly a good model for stakeholder engagement. It's vital to involve your stakeholders at the right level. They will contribute insights which help to identify and resolve issues before implementation.

Frequency response is just one of many areas of exciting developments for GB's power system. You can find out more about the [future of balancing services](#) online.

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