

Andrew Jenkins
www.andrewjenkins.co.uk
Twitter: @JenksAndrew

InTEGReL: Taking a Whole Energy Systems Approach

5 February 2019

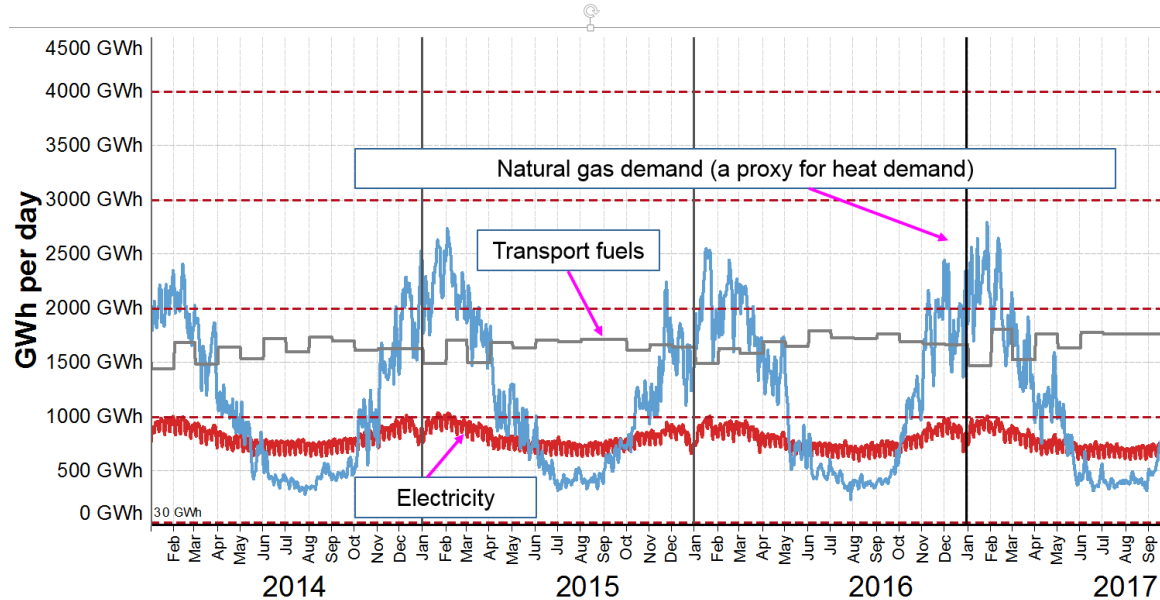


Scope

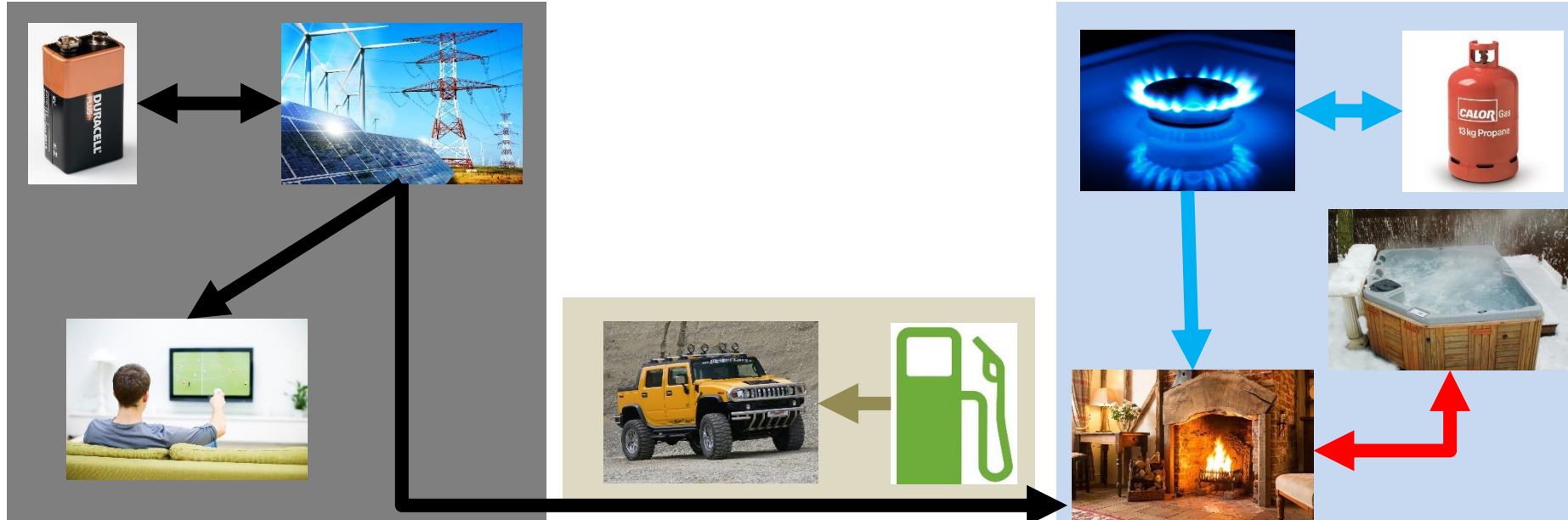
- The UK ‘whole energy system’
- InTEGReL
- Newcastle University at InTEGReL
- Market opportunities

Whole energy system

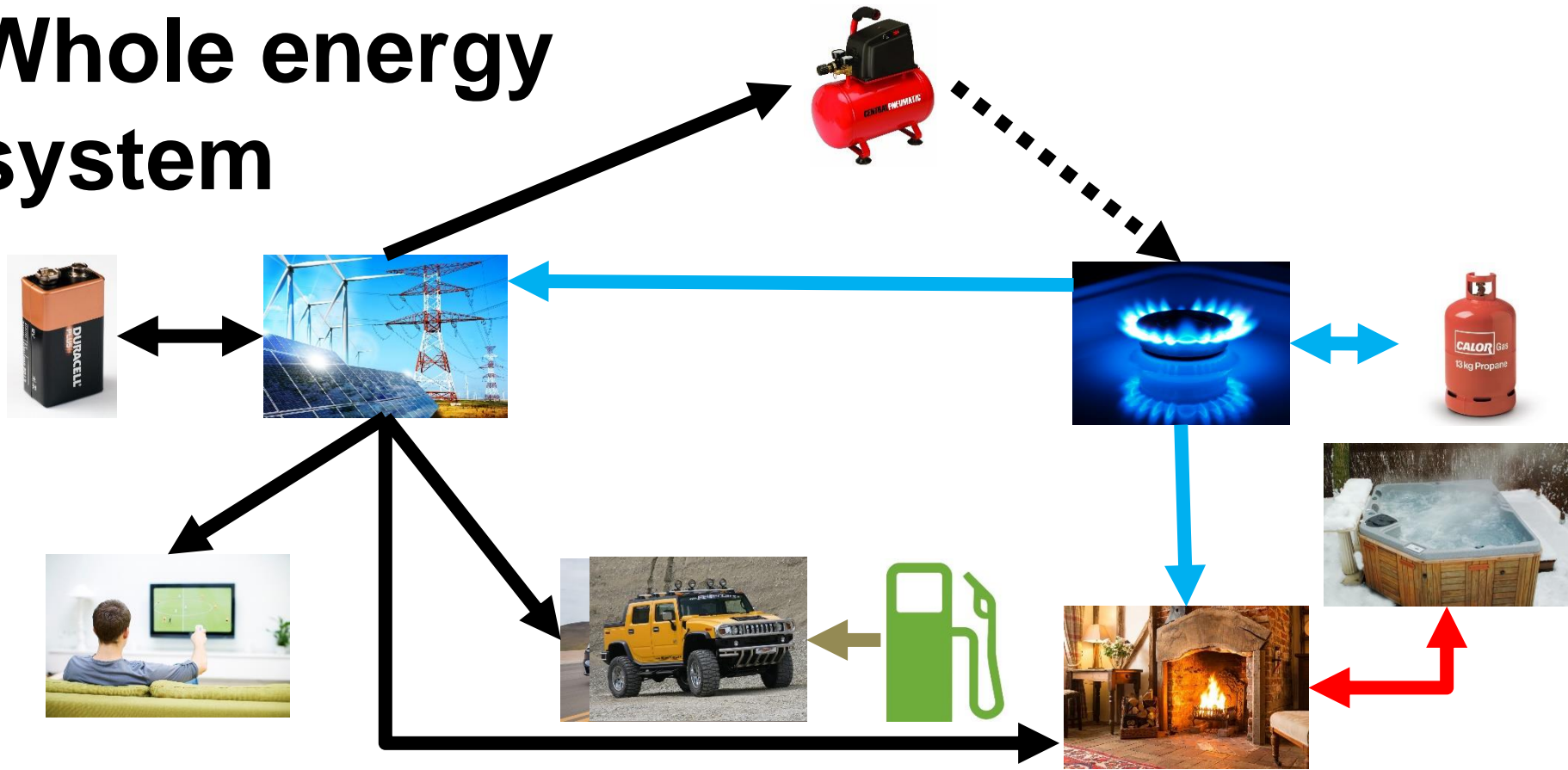
Great Britain's Energy Vectors – in GWh per day



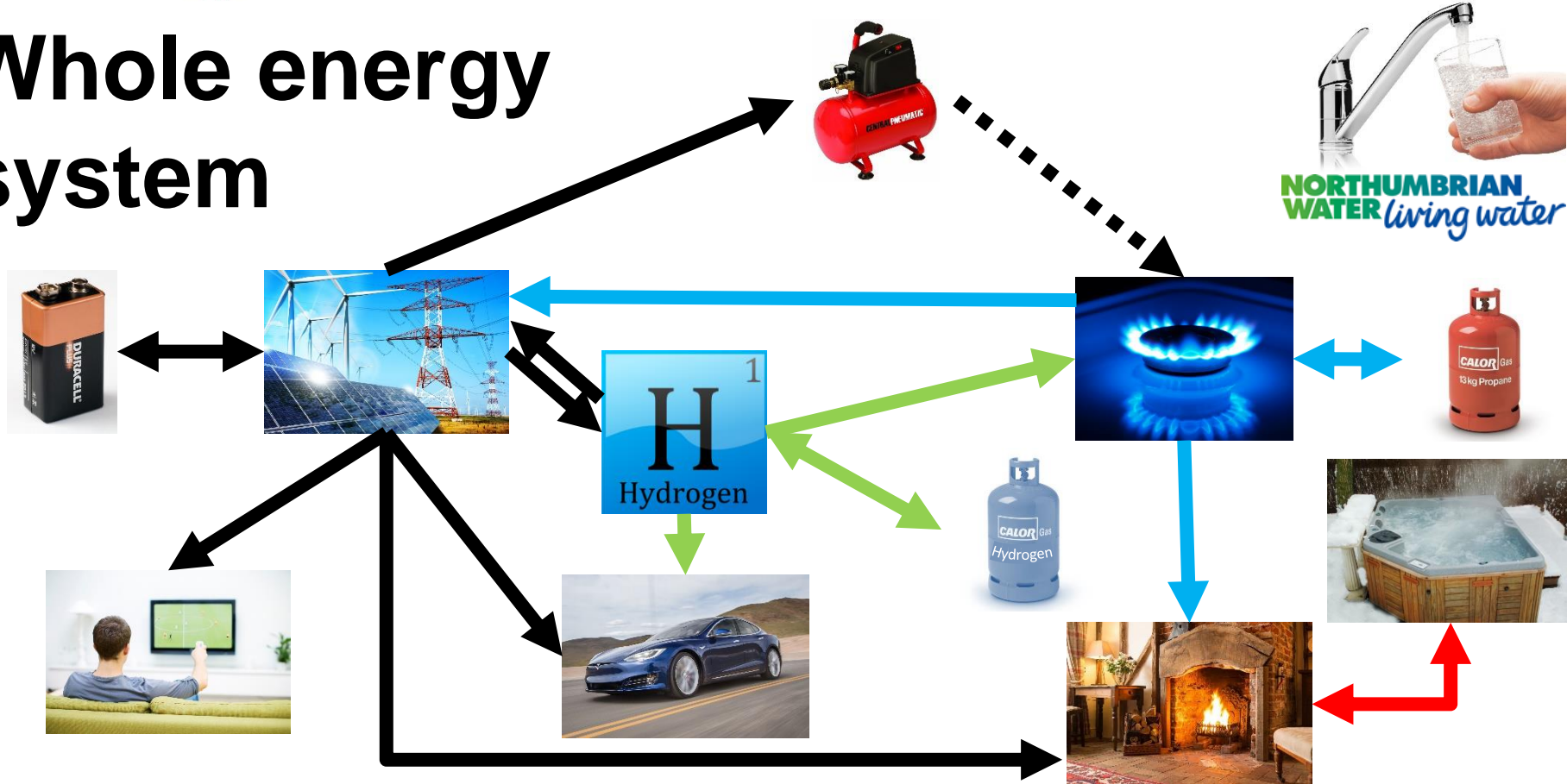
Whole energy system



Whole energy system



Whole energy system

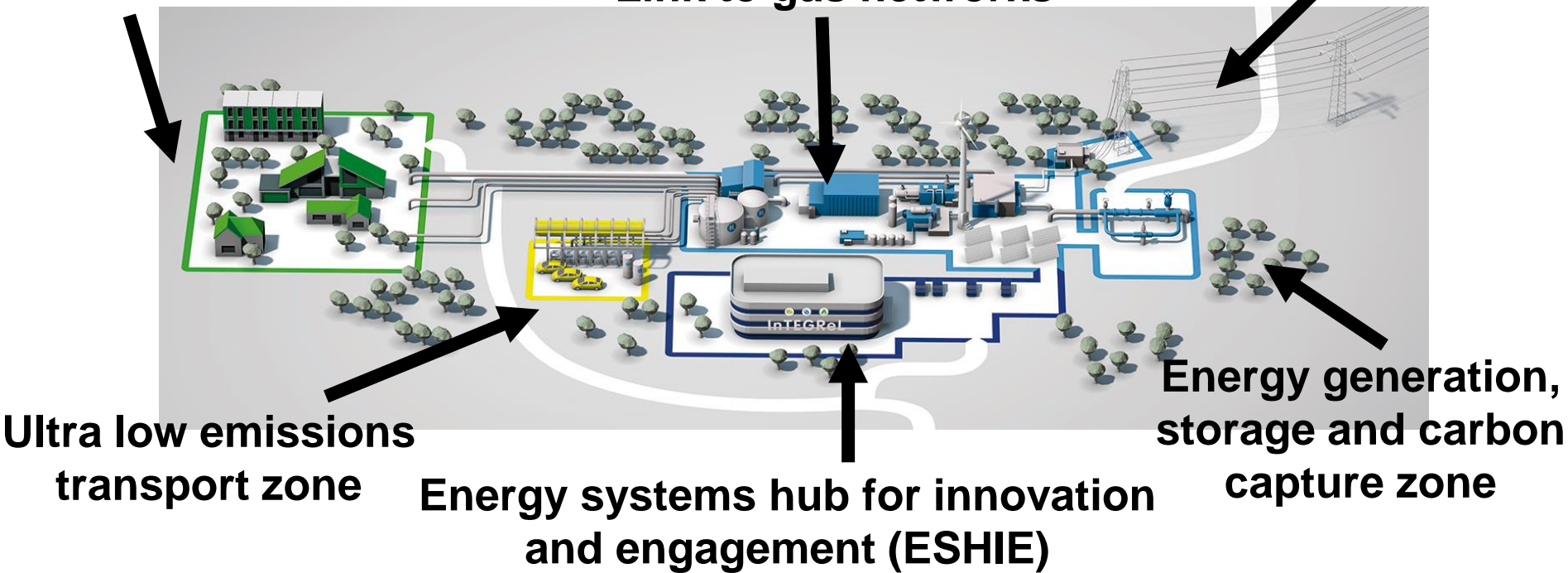


InTEGReL

Link to electrical
networks

Link to gas networks

Customer energy
village

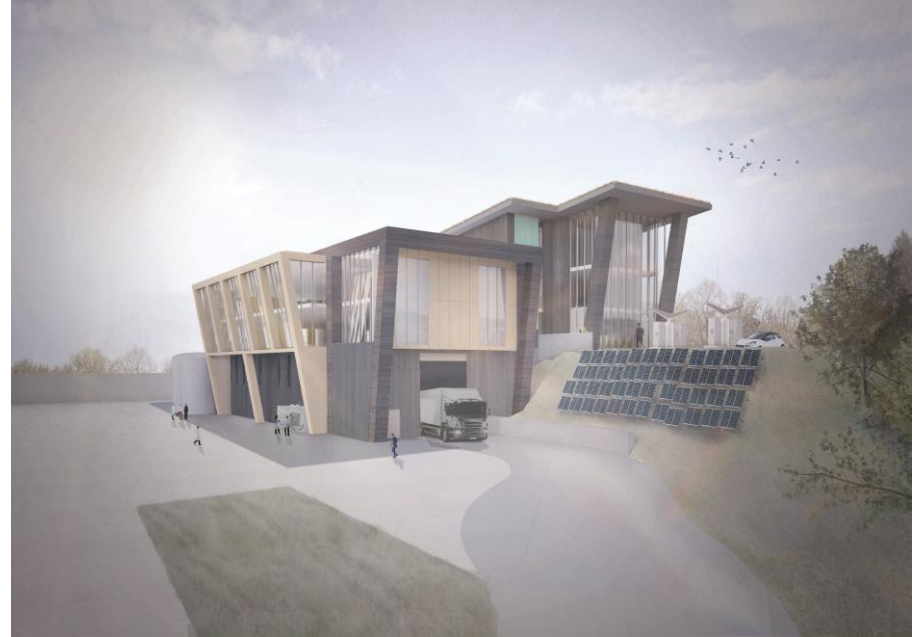


Energy generation,
storage and carbon
capture zone

Energy systems hub for innovation
and engagement (ESHIE)

Ultra low emissions
transport zone

ESHIE at InTEGReL



Opportunities at ESHIE

- Research and demonstration of any energy conversion or storage technology
- Influencing human/business behaviour and energy use
- Artificial intelligence, big data, 5G, IoT
- Access to world leading academics at the £20m National Centre for Energy Systems Integration (CESI)
- Links to the £30m National Innovation Centre for Data (NICD)
- Office space nearby at Newcastle Helix

Market opportunities

Northern Powergrid seeking expressions of interest for flexibility services:

~14 MW for 2019/20

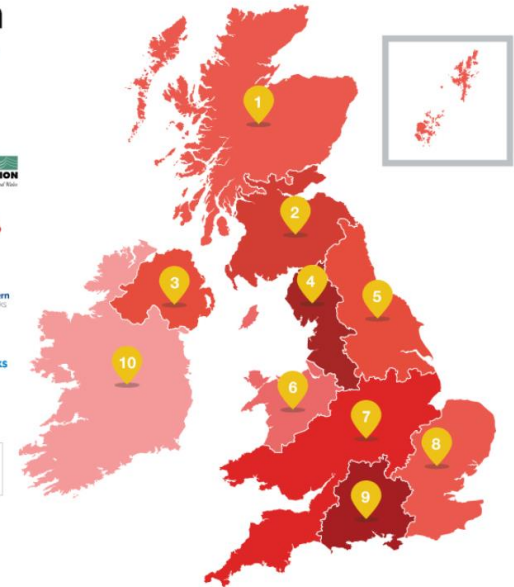
~40 MW for 2023-2030

<https://www.northernpowergrid.com/>

Electricity Distribution

- | | | | |
|---|--|----|---|
| 1 |  | 6 |  |
| 2 |  | 7 |  |
| 3 |  | 8 |  |
| 4 |  | 9 |  |
| 5 |  | 10 |  |

gtn Independent distribution network operators
...making utility networks



Market opportunities

National Grid Balancing Services

<https://www.nationalgrideso.com/balancing-services>



Frequency response services

Our licence obligation is to control system frequency at 50Hz plus or minus 1%. Find out how to work with us.

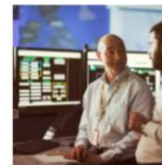
> Find out more



Reserve services

Find out how we access sources of extra power, so we can manage unforeseen demand increase or generation unavailability.

> Find out more



System security services

Find out about the techniques and services we use to help maintain the security and quality of electricity supply across Britain's transmission system.

> Find out more



Trading

Power exchange trades, forward trades, and balancing contract enactment to meet forecast requirements at minimum cost in advance of the balancing mechanism.

> Find out more



Reactive power services

The flows of reactive power on the system affect voltage levels. Find out about the services we use to manage this.

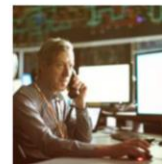
> Find out more



Demand side response (DSR)

Demand side response (DSR) is all about intelligent energy use. Find out how DSR can help business and consumers save on total energy costs and reduce their carbon footprint.

> Find out more



Settlements

Find the forms you need to set up or change bank details with us, to change a reactive meter, change a contract or want to find out about statements, estimates and invoicing.

> Find out more



Future of balancing services

A smart, flexible system that makes the best use of all the energy resources available will enable us to meet our customers' needs in a balanced, efficient and economical way.

> Find out more

Any questions?

A.m.jenkins@newcastle.ac.uk

www.andrewjenkins.co.uk

Twitter: @JenksAndrew