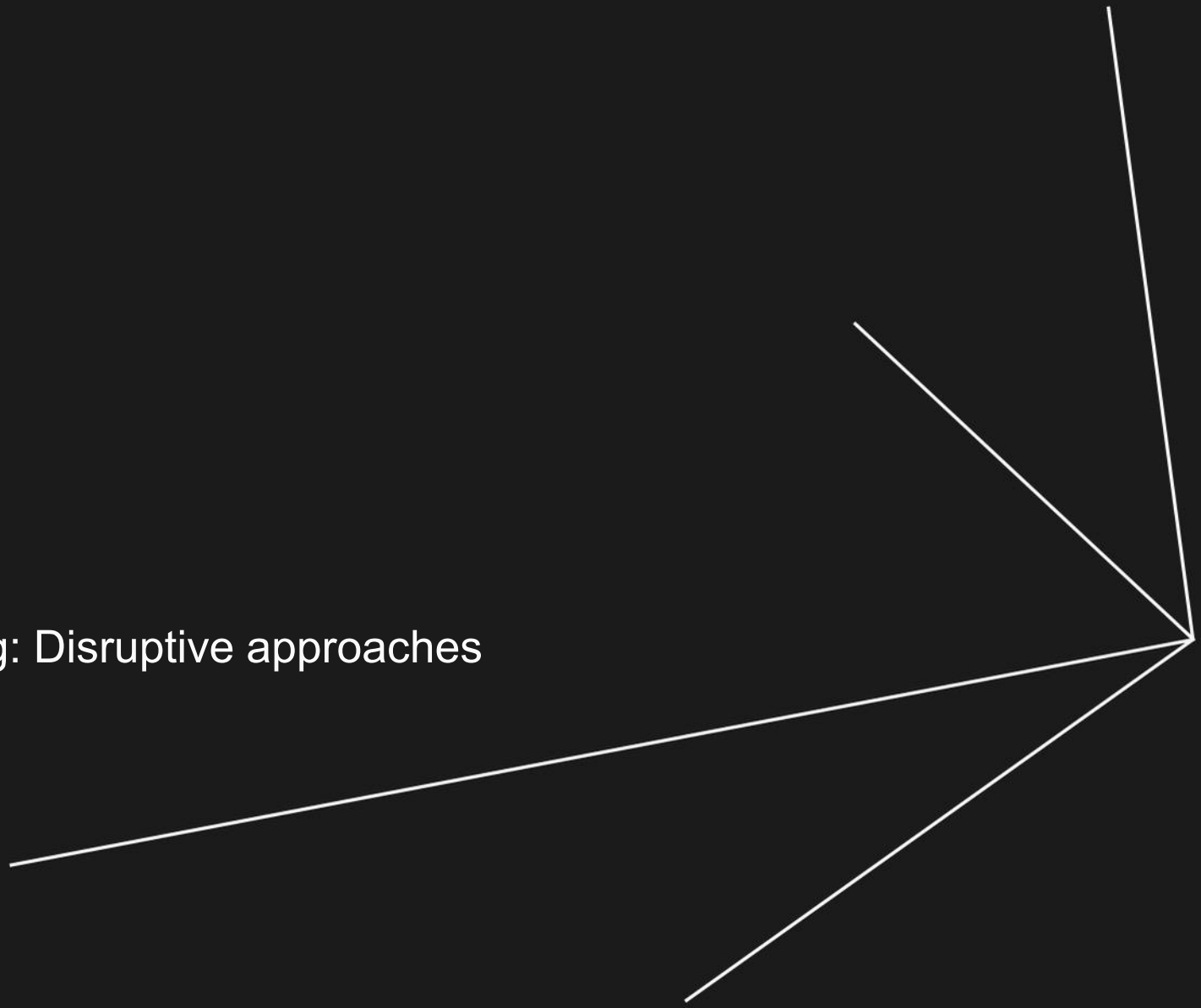
GasNetNew

Decarbonising UK domestic heating: Disruptive approaches



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20-minutes on gas linepack storage per domestic meter

Curiosity on how much gas linepack is utilised on a daily basis per domestic gas boiler. High level assessment for now – as – linepack is not (as far as I am aware) allocated on either a domestic or non-domestic basis.

Firstly – a big thanks to Joe Day who helped with the GasNetNew project and also to Mostafa Nostratabadi for pulling together updates of the linepack data. The aim is to have these data published early next year

20-minutes on gas linepack storage per domestic meter

Interesting to consider that whatever the level of linepack storage on a daily basis, that its costs and value to the wider system are unknown

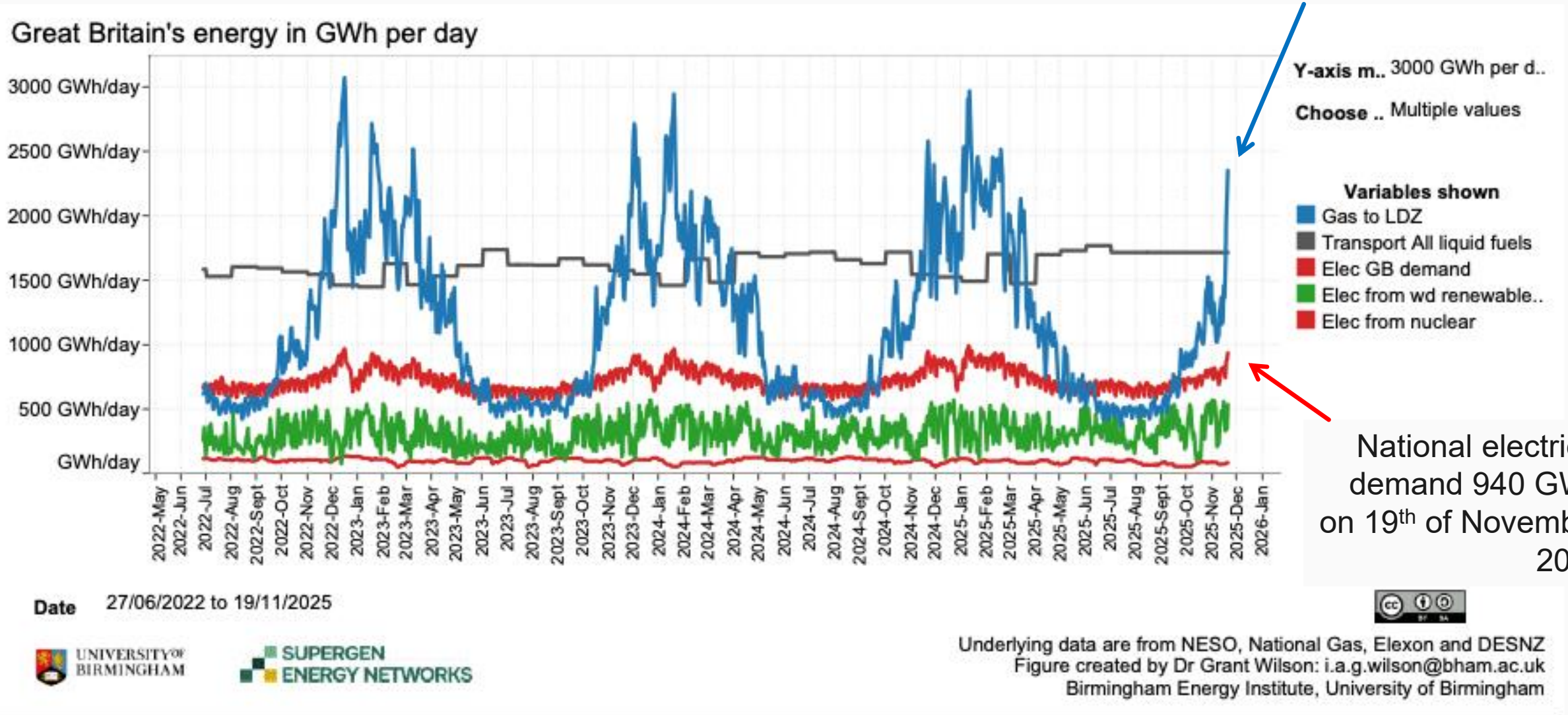
Can I have a quick show of hands on an order of magnitude guess for how much gas linepack in the local gas system has been over the last couple of days when it is divided by the number of domestic gas boilers?

Hands up for 100 kWh? 10 kWh? 1 kWh? 0.1 kWh?

Now lets look at this weeks (w/c Mon 17th November 2025) cold snap and its effect on Britain's energy systems

Daily representation of gas and electrical data

Local gas demand 2354 GWh on 19th of November 2025



National electrical demand 940 GWh on 19th of November 2025

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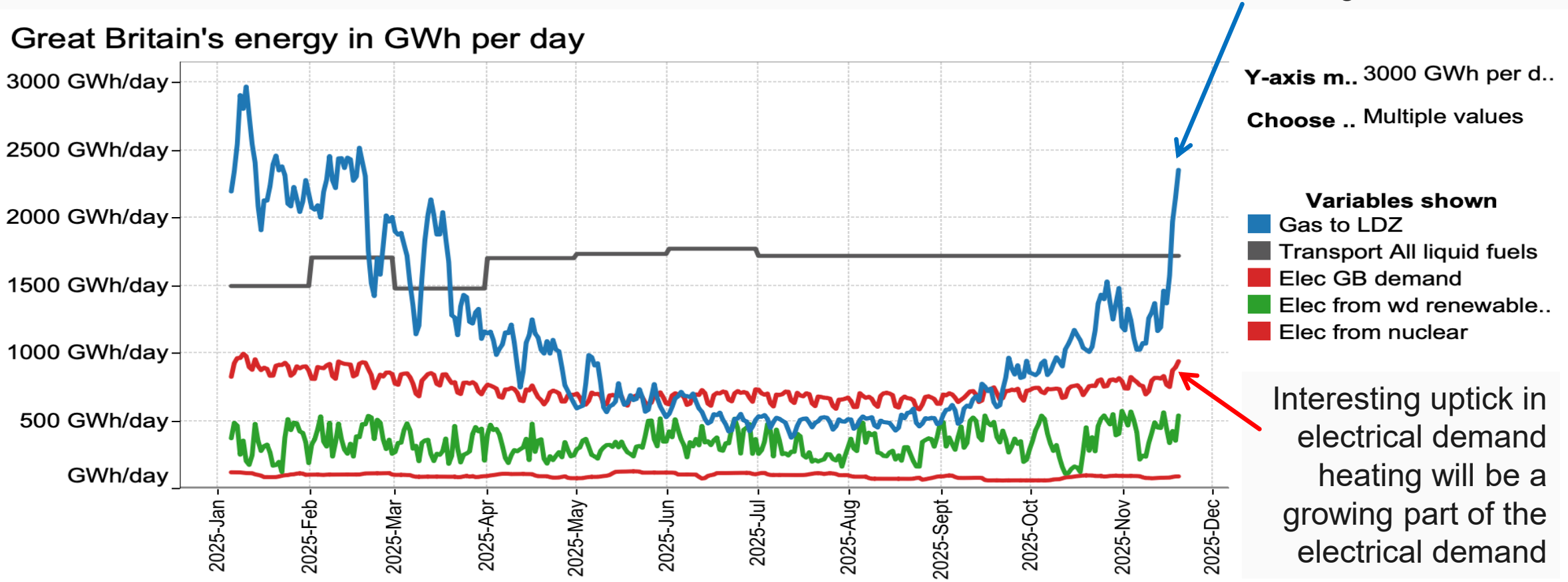
SUPERGEN ENERGY NETWORKS

	Daily national electrical demand GWh	Increase of daily demand from 15th to 19th of November +GWh	Daily local gas demand GWh	Increase of daily demand from 15th to 19th of November +GWh
2025-11-15	766022	----------	1368227	----------
2025-11-16	750406		1572997	
2025-11-17	873691		1973856	
2025-11-18	894967		2149646	
2025-11-19	940163	+174141	2354447	+986220

Daily representation of gas and electrical data

Expected uptick in gas demand



Interesting uptick in electrical demand heating will be a growing part of the electrical demand

Date 05/01/2025 to 19/11/2025

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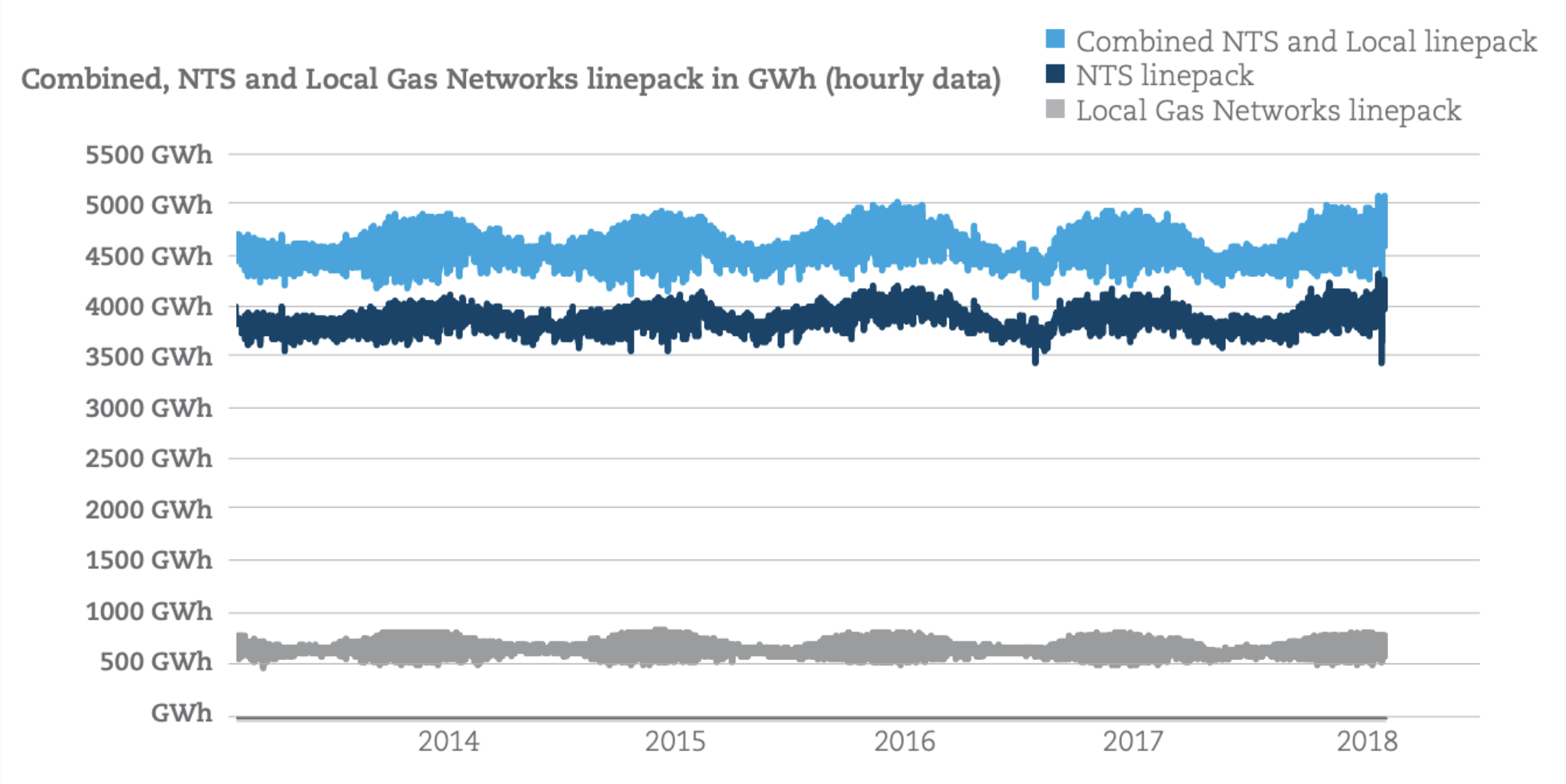
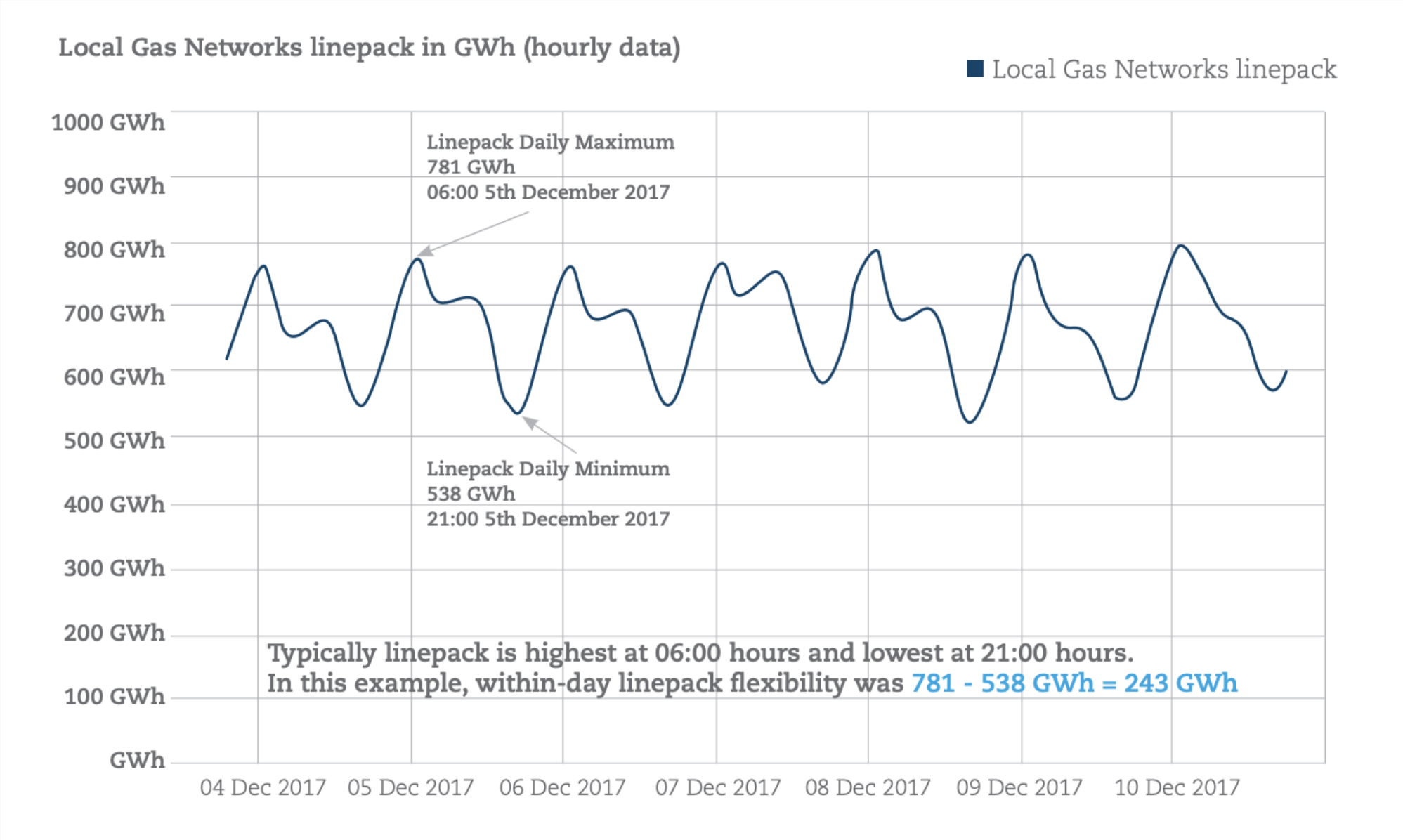
SUPERGEN ENERGY NETWORKS

Underlying data are from NESO, National Gas, Elexon and DESNZ
Figure created by Dr Grant Wilson: i.a.g.wilson@bham.ac.uk
Birmingham Energy Institute, University of Birmingham

Amount of gas in linepack – NTS and Local Distribution Zones



Amount of gas in linepack – Local Distribution Zones only



Scale of domestic heating challenge

25 million[1] domestic gas boilers (not including non-domestic gas boilers here)

Assuming each one is at the lower end of the individual gas boiler capacity scale – at **18 kW**

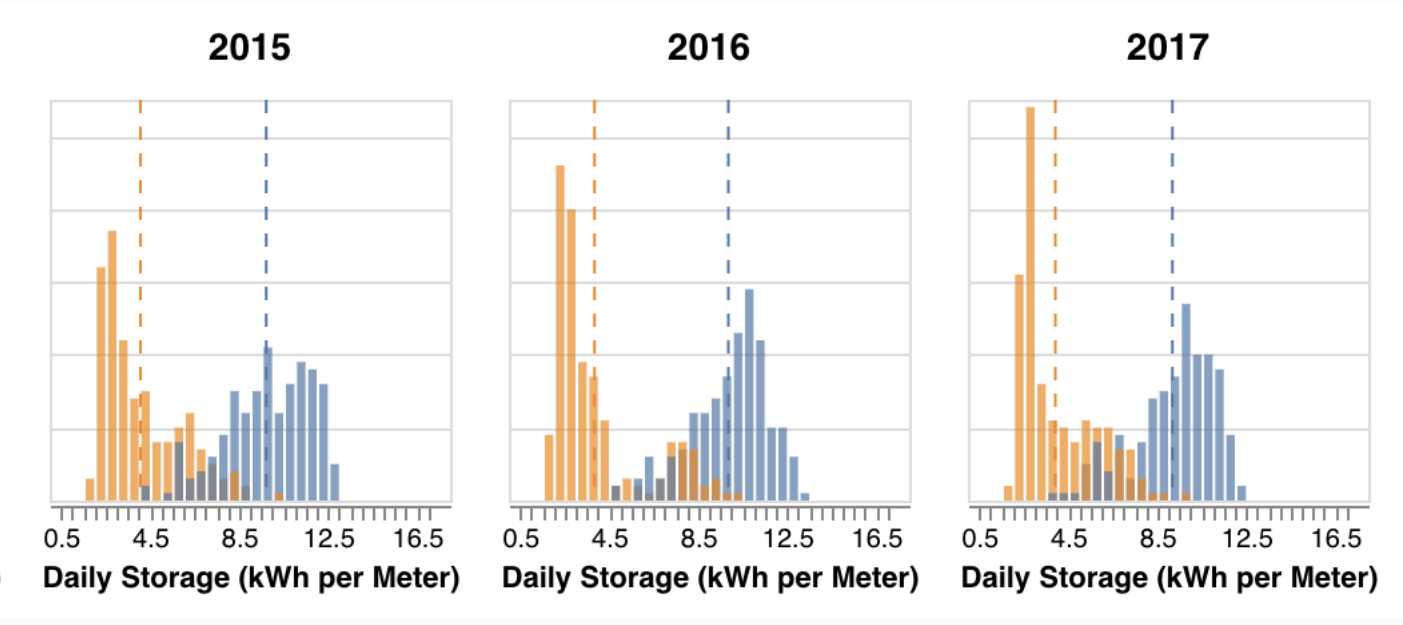
This gives a quantum of gas demand of **450 GW.** Thankfully there is a diversity of demand meaning that boilers will not demand gas from the gas network at the same time.

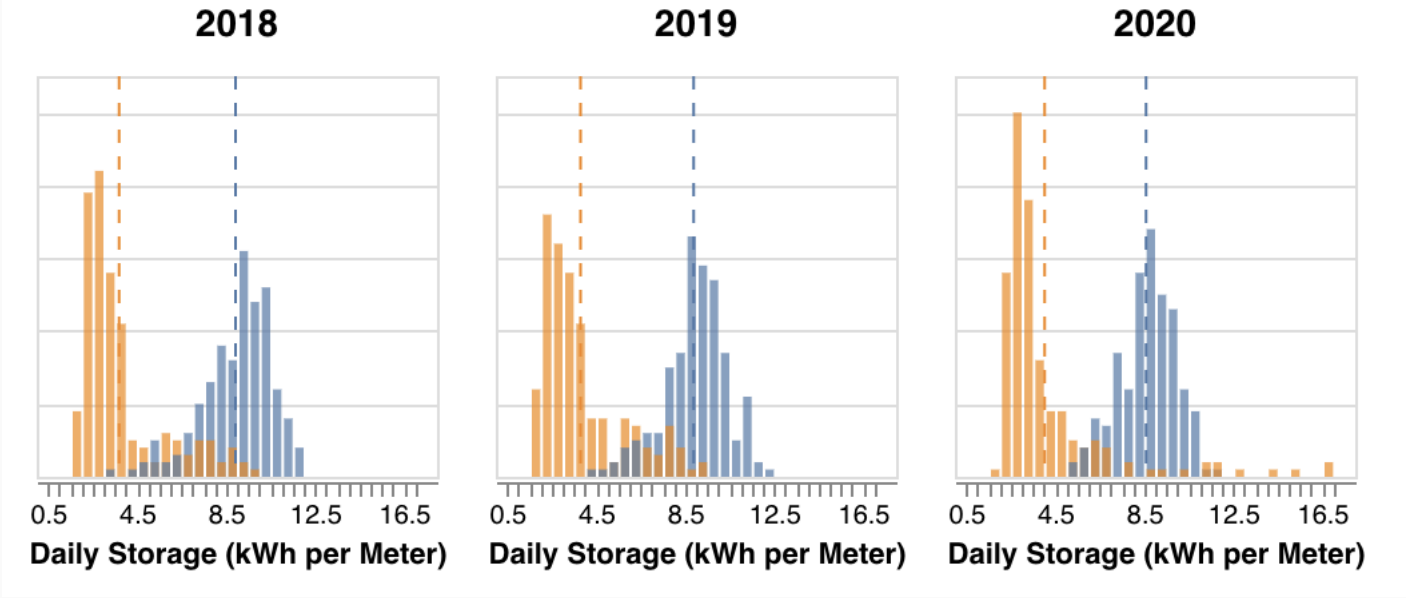
But – lets look at some values from hourly demand from the local distribution zone data (the gas demand that is at a local level).

[1] https://www.gov.uk/government/statistics/sub-national-estimates-of-households-not-connected-to-the-gas-network

accessed 2025-11-20

Daily linepack storage per domestic boiler by season – in kWh per meter





	Apr-Sep	Oct-Mar
2013	1.86	8.16
2014	3.37	9.16
2015	4.08	9.73
2016	3.86	9.86
2017	3.92	9.20
2018	3.70	8.94
2019	3.80	8.90
2020	4.04	8.60
2021	6.09	8.99

in kWh per meter

Daily linepack storage per domestic boiler by season – in kWh per meter

115 days when local distribution zone demand was between 2300 and 2400 GWh (the 19th was 2354 GWh)

Using 25,000,000 gas meters gives an average daily linepack demand of 9.7 kWh

I believe we should try to better understand the costs of providing this – and the value that this brings to the wider energy system.

It would seem that currently linepack is paid as part of the overall bundle of costs of running the national and local gas systems (historically the compressor stations are on the transmission network, not the local gas networks).

Should we pay for storage separately to the transit of energy?

Daily linepack storage per domestic boiler by season – in kWh per meter

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Similar electrical demand to heat-pumps?

1.5 kW

Not the same heat output – but – a similar electrical demand input?

2.8 kW

£1 billion would fund about 28 million of the 2.8 kW electric space heaters – broadly one for every domestic gas meter

Should we pay for storage separately to the transit of energy?

We seem to be prepared to do this for the electrical network – so – perhaps we should also consider this for heat networks and gas networks too

Fresh Solar Installed Tesla Powerwall 3 Battery 13.5kW (specs say 13.5 kWh)

★★★★★ 5.0 (2)

Item #523505

Online Price	£8,499.99
Less	- £1,000.00
Your Price	£7,499.99

Price valid from 27/10/2025 to 23/11/2025. While stock lasts

Shipping Included. Item may be available in your local warehouse, prices may vary.

Features

- 13.5kW solar battery storage
- Indoor or outdoor installation rated IP55

A few caveats around this high level analysis

- The linepack data is felt to be of high quality.
- The number of gas meters are also felt to be of high quality
- The amount of linepack that domestic gas meters use in comparison to non-domestic gas meters is unknown and uncertain – in the this analysis – all of the linepack has been assumed to be utilised by domestic gas meters – which is unlikely to be the case in practice.

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