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The evolution of economic regulation of the energy sector to reflect Net Zero

A presentation and discussion on how the role of regulation has developed over time, and how this might need to change further in the future

Speaker: Dr Gavin Knott, Chief Economist, Ofgem, 26 November 2024

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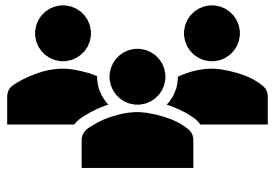
- Who is Ofgem, what do we do, and why?
- How has our role evolved?
- How might it further evolve in the future, to help the energy sector meet the challenges of Net Zero?

Ofgem and GEMA's responsibilities



Gas and Electricity Markets Authority (GEMA) is the **governing body that makes decisions**. It comprises **non-executive and executive members, plus one non-executive chair.**

GEMA operates through the **Office of Gas and Electricity Markets (Ofgem).** It is a non-ministerial government department and an independent National Regulatory Authority. Our Principal Objective is to **protect the interests of existing and future energy consumers**. We are the **independent economic regulator** of gas and electricity markets in England, Scotland and Wales under the Utilities Act 2000.

Our duties and powers are set out in legislation set by **Parliament.** These change over time, and most recently we were given a duty to have regard to **net zero targets** and also to **economic growth.**

Ofgem's main jurisdiction is in Great Britain, regulating licensed companies and administering environmental and social schemes on behalf of the government. Ofgem also has competition and consumer enforcement powers. It does have some functions in Northern Ireland connected to the administration of certain schemes in that jurisdiction.

Our focus is to deliver the best possible outcomes for consumers - across a range of interests

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	Objective	Sub-objective
Fair Prices	Costs are efficient and fairly distributed. Undue price discrimination is prevented and action to minimise consumer welfare risks (e.g. fuel poverty and self-disconnection) is supported.	• Prevent excessive profits • Achieve cost efficiency • Protect consumer welfare
Quality & Standards	Customer services throughout the energy supply chain are accessible, transparent and responsive. Consumers are suitably empowered and protected from harm, with enhanced protections for the vulnerable.	• Accessible & responsive • Transparent & enables choice • Enhanced protections for the vulnerable
Low-cost Transition	Sustainable, carbon-free energy and associated infrastructure at least cost to consumers (and taxpayers). Consumers are supported to make greener choices and are fairly rewarded for their contributions to the system.	• Enable infrastructure & markets required for net zero transition • Minimises net cost of transition • Apply innovative solutions to support & protect consumers
Resilience	Consumers have secure supply and trust that industry participants are resilient to market shocks. The sector attracts sufficient long-term investment to deliver consumer interests.	• Maintain security of supply • Robustness to market developments and external shocks • Ensure sector is investable

The framework above was developed through consumer engagement. It sets out the range of outcomes we seek to deliver for consumers and is used to better inform policy development and decision making. The aim is to allow us to account for the trade-offs inherent to much of energy regulation.

Britain's has a diverse set of energy consumers – with very different needs

Ofgem's principal objective to protect the interests of current and future energy consumers **covers both households and businesses**

Domestic consumers: 29.5m households

- Domestic consumers are diverse, in terms of their energy usage (when, what and how much), behaviours (level of engagement with energy system) and needs.
- 24.3m are connected to the gas grid, so use electricity and gas. Others use alternative sources, traditionally electric (expensive), oil boilers (high carbon) or newer systems, such as heat pumps or heat networks.
- 66% pay by monthly direct debit, 15% are on pre-payment meters, 7% pay quarterly through cash or cheque, and 12% through other forms.
- Across consumers there are a range of vulnerabilities:
  - Government estimate 4.7m GB households are in fuel poverty although wider estimates are much higher.
  - There are a wide range of further social, medical and mental health needs that also need to be considered.

Non domestic consumers: over 5.5mn diverse consumers

- The non-domestic energy market is much more variable, ranging from small businesses through to large energy users (such as steelworks)
  - 5.3m 'microbusinesses'
  - 250k small/ medium sized enterprises
  - 8k large industrial and commercial users (with significant variation in needs within this group)
- There are fewer regulatory protections (e.g. no price cap or universal service obligation) in place for non-domestic consumers.
- There are also an estimated 900,000 households who are supplied via non-domestic contracts and don't have full domestic protections.

The sector consists of the generation, transport and supply of energy to consumers

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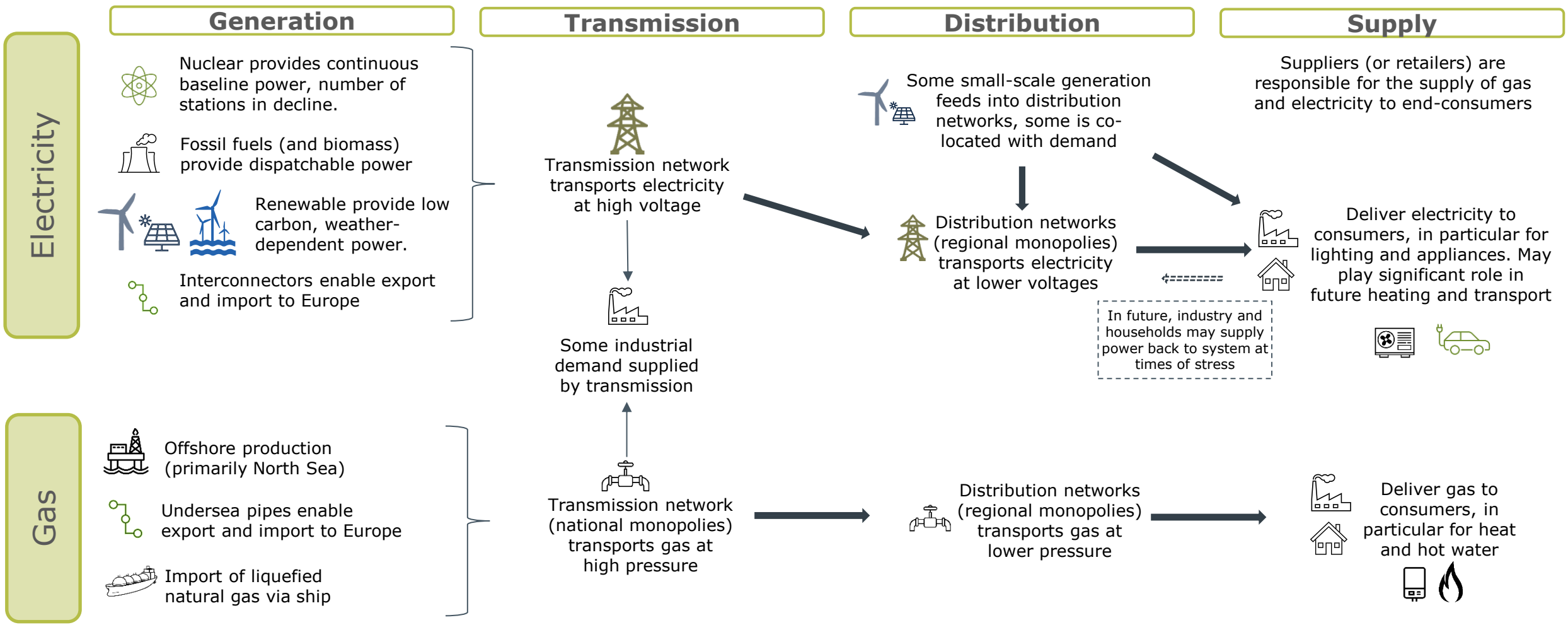
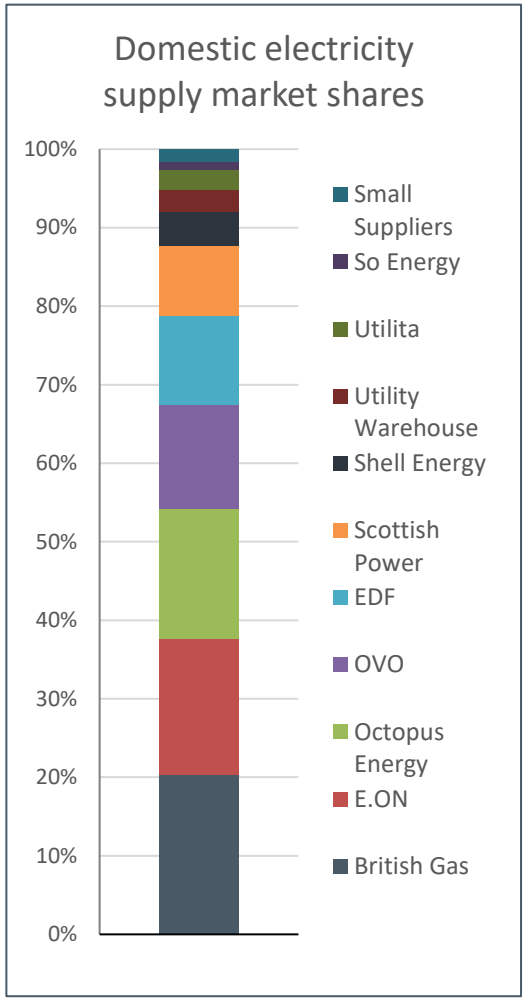
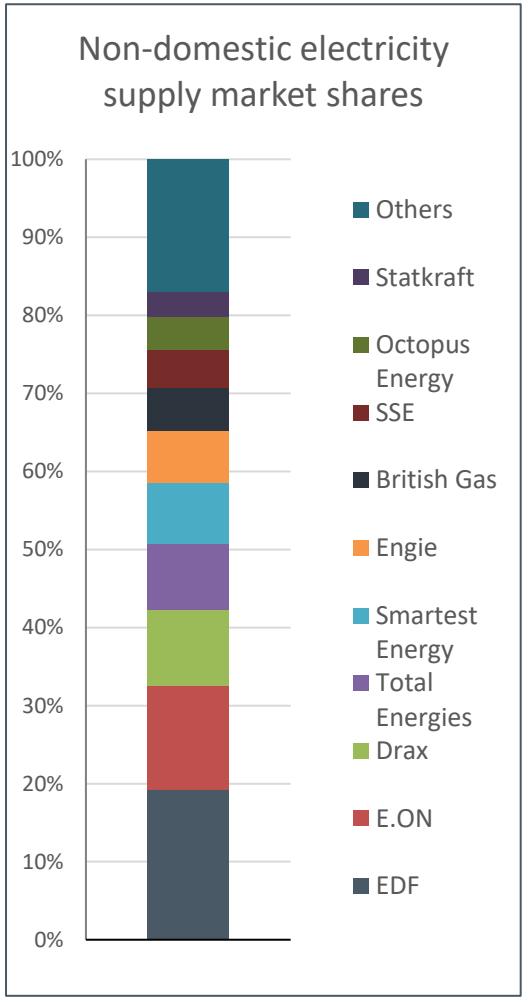


Within this system new technologies and the use of data make it possible to move demand, store electricity and efficiently utilise small scale generation such as solar

Retailers are the principal interface with energy consumers



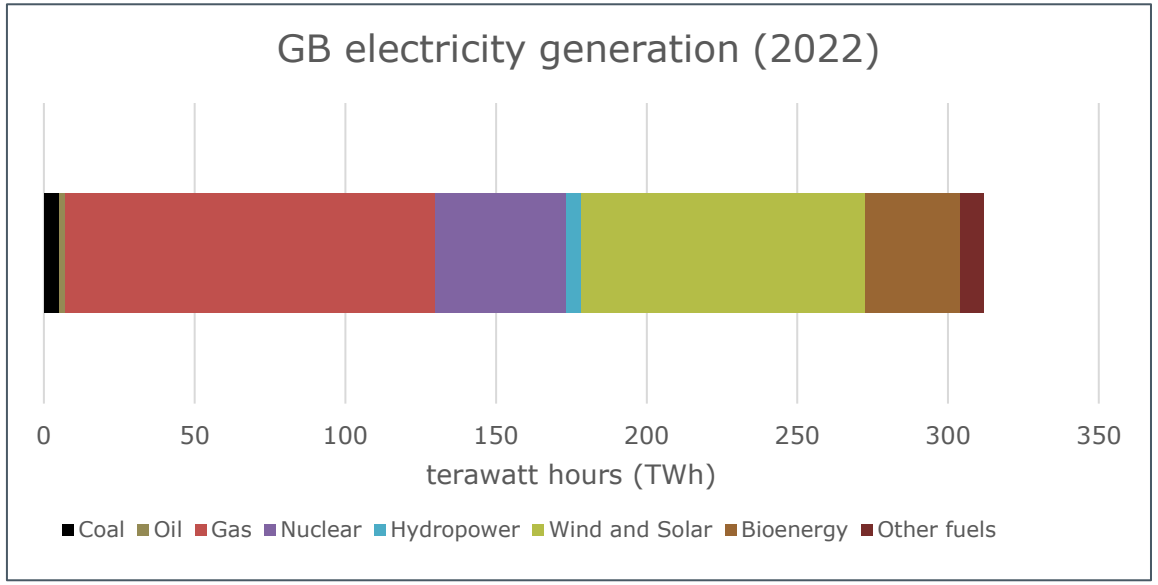
NB: suppliers shares differ slightly regarding gas, with British Gas with a larger 28% market share

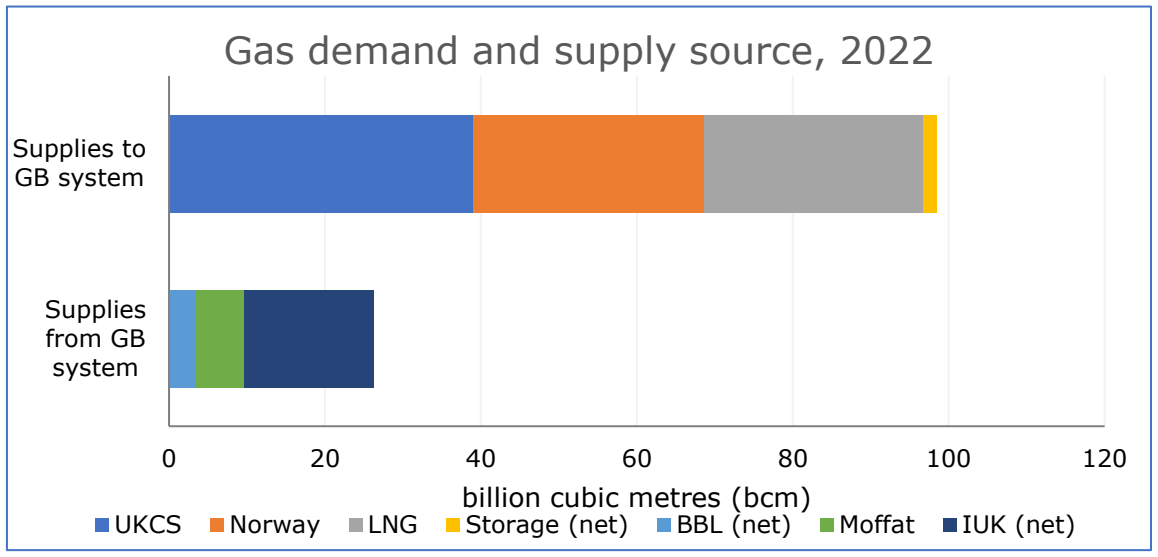


NB: for large industrial and commercial only, shares vary for other market segments and gas

- Although the domestic market has 21 companies, with 6 retailers serving 88% of the market
- The market is comprised of companies which have operated since the privatisation of the sector ('incumbents') and challenger brands, some of which are well established, such as Octopus and Ovo.
- The non-domestic market is comprised of a larger number of suppliers (62), in part due to the higher heterogeneity of business customers (in consumption levels, needs/preferences and ways of using energy).
- Ofgem **regulates the retail markets for the purpose of protecting consumers** but the way we do, and the balance between the role of competition and regulation, have changed significantly over time.

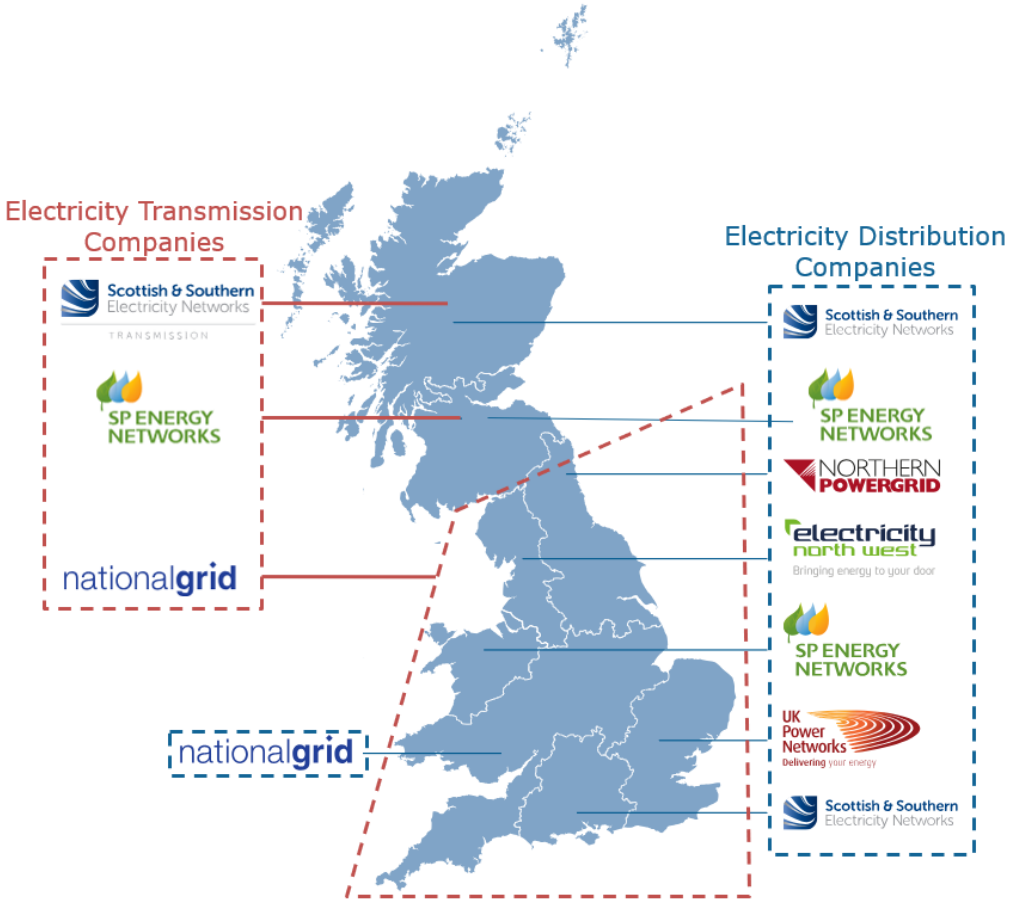
Electricity generation is changing fast towards renewables, while our gas demand increasingly relies on imports





- Electricity generation is already undergoing a dramatic transformation:
  - Demand has reduced over recent years, but will increase dramatically as we move transport to electric vehicles, possibly home heating to heat pumps and part of our industry to electricity.
  - Renewable energy has increased dramatically since 2000, from virtually zero to 43% of our overall generation.
  - We are increasingly using imports of energy from abroad, and new technologies to store and move our electricity use – such as large scale batteries and better use of data / AI.
- We are increasingly reliant on international gas, as supply from the UK's own gas reserves has declined 47% from 2008. We import gas through interconnectors and through liquified natural gas (on boats).

Networks connect generation and gas both onshore and offshore



- Electricity networks connect generation to demand and are monopolies
  - Transmission lines connect the system nationally at a high voltage, while distribution is the local network to homes and businesses.
  - We also have two forms of offshore network: connections for offshore wind; and interconnectors - used to import /export electricity from/ to other countries.
- The gas network is similar – is has transmission, distribution and interconnectors.
- Both will need to change (either to expand or decline) as our energy system changes.
- Ofgem **regulates the level of charges for the networks, how costs are recovered from different customer groups, and also the quality of service provided by network companies.** These are heavily regulated monopoly businesses.

There are 26 separate network companies. National Grid owns by far the largest electricity network – with the largest transmission network and the recent acquisition of one of the distribution operators.

How Ofgem’s role has evolved

Ofgem's role has grown over time:

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We regulate three complex markets:

Retail market

Energy suppliers buy energy on wholesale markets and recover system costs from customers, and provide additional services

Wholesale market

Wholesale markets link electricity generation and gas production with energy retailers. The market is worth at least £300bn a year (but substantially higher during recent volatility)

Heat market

Soon to regulate heat networks from communal-scale systems to large districts and residential developments. Around 14,000 networks operated by 3,000 organisations, serving c.500,000 customers (households and businesses)

And the essential energy infrastructure:

Physical Infrastructure

Onshore and offshore network regulation – setting revenues and targets.
New regimes for large scale low carbon infrastructure regimes - nuclear power, carbon capture and hydrogen.

Energy system security & efficiency

Monitoring and planning to ensure that the system is set up to meet everyone's demand

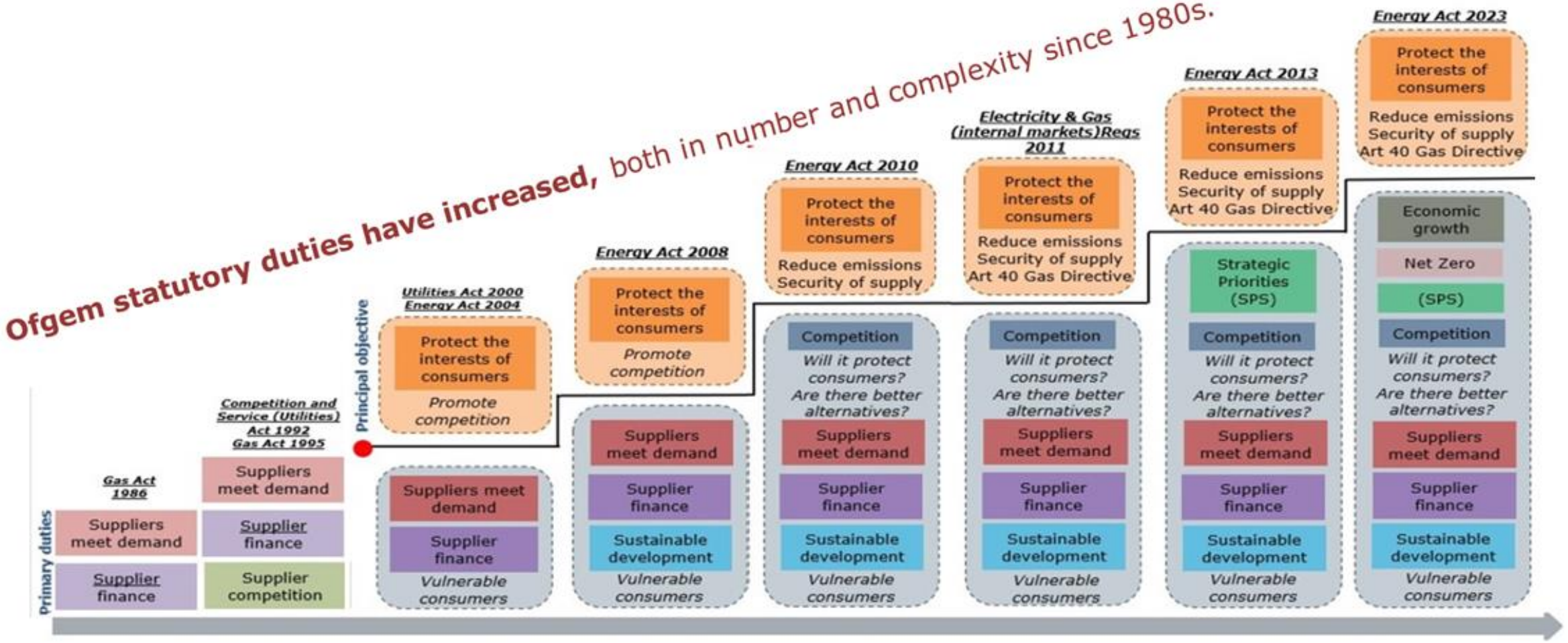
Overseeing network charging and the transition to new technologies – such as use of data/ batteries.

Cyber security

Regulating as 'joint competent authority' with DESNZ the cyber security of large scale critical national infrastructure.

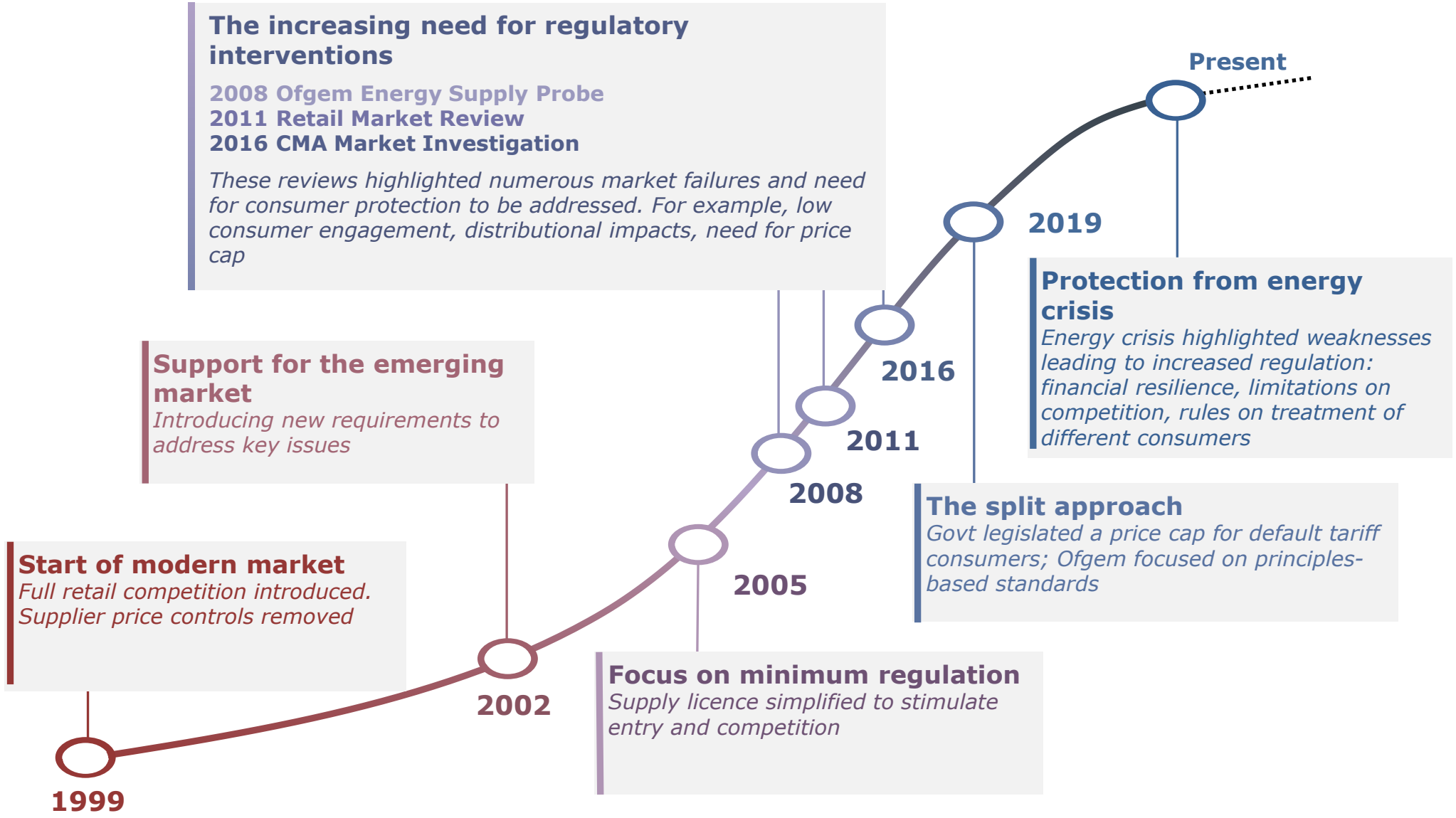
Government is responsible for Contracts for Difference which are the key driver of investment in renewable generation, and support for other generation technologies

This is implemented through legislation that gives Ofgem duties and powers



Why does this happen?

In markets, evidence has emerged about the effectiveness of retail competition



In infrastructure, the big challenges will be delivering the investments and system changes needed for Net Zero

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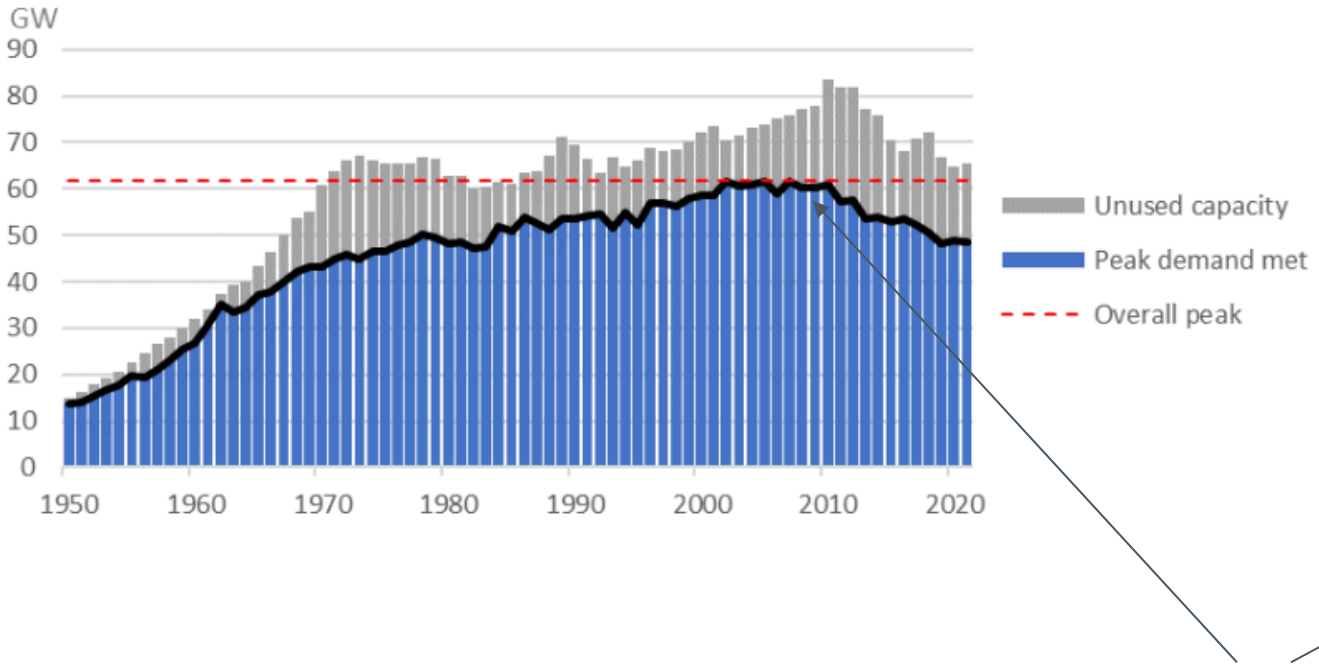

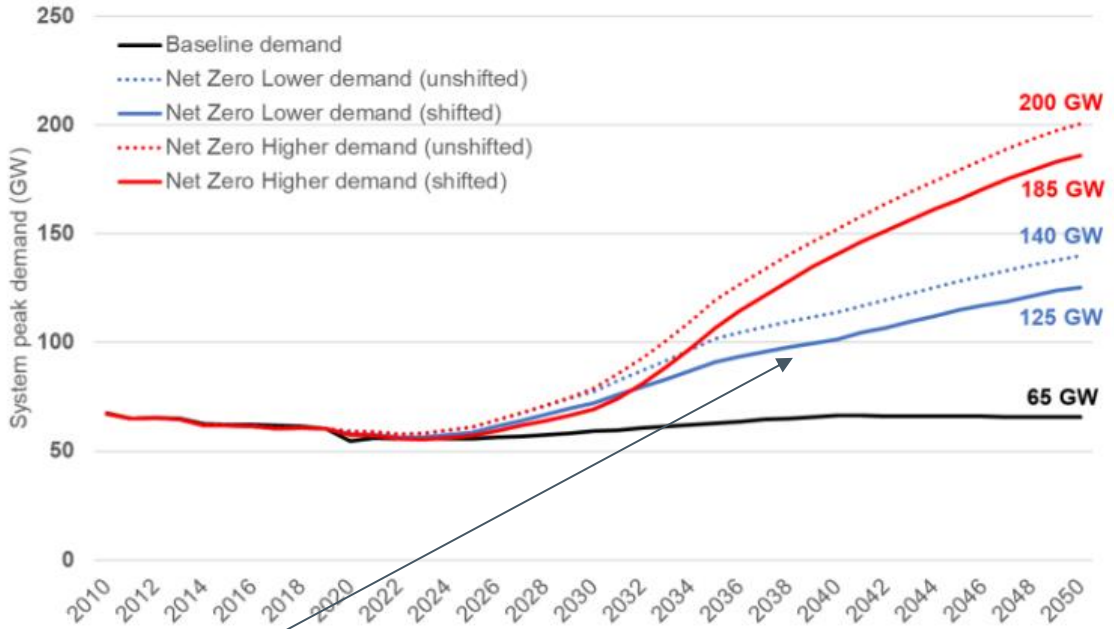

The pattern of demand has been different throughout the life of economic regulation to that expected for the future

How Ofgem’s role might evolve

There are now three public institutions that will drive change across the energy sector

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UK Government

Democratically accountable

Responsible for setting the policy and regulatory framework for the gas and electricity sectors in the UK.

Department for Energy Security & Net Zero (DESNZ), sponsor department for Ofgem.

Responsibilities:

- delivering security of energy supply
- ensuring properly functioning energy markets
- encouraging greater energy efficiency
- seizing the opportunities of net zero to lead the world in new green industries

Strategy and Policy Statement further guides Ofgem & the System Operator objectives.

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Independent energy regulator of Great Britain.

Non-ministerial department, directly accountable to UK Parliament for performance of functions and duties.

Priorities defined by principal objective: **protect the interests of current and future energy consumers**.

Have regard to:

- security of power & gas supply
- efficiency + financeability
- Net zero
- interests of the 'vulnerable'

Funded by levy on industry paid for by consumers through bills.

NESO National Energy System Operator

Electricity system operator **ensures the reliable delivery of electricity** at efficient cost.

Manages system balance and operability, facilitates competitive markets and whole system outcomes.

In 2022, we set out our joint commitment with DESNZ to proceed with the creation of the **Future System Operation (FSO),** as an expert, impartial body with an important duty to facilitate net zero whilst also maintaining a resilient, and affordable system. This was incorporated in autumn 2024 as the NESO.

The NESO will carry out all functions of the ESO. Ofgem will continue to regulate the entity.

Greater co-ordination will be necessary to achieve effective outcomes

The greater co-ordination needed to meet whole system objectives is starting…

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Future Systems and Network Regulation: Framework Decision Overview

Department for Energy Security & Net Zero

Scottish Government
Riaghaltas na h-Alba

Review of Electricity Market Arrangements

Second Consultation Document

Llywodraeth Cymru
Welsh Government

We are better prepared to deliver changes needed for Net Zero – but there are many challenges

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The green transition provides real opportunities: but there are important risks

Opportunities

- Shift to renewable energy has the potential to reduce bills for consumers
- Moving away from fossil fuels will reduce volatility in energy bills
- The green transition provides incentives for innovation: those consumers that want to could benefit from a greater range of services, improving market outcomes
- Opportunity for the whole system to benefit from the investments in co-ordination triggered by the need to meet transition targets (but also risks around adaptation)

Risks

- New consumer harms arise from new sources of energy + new products that are hard to predict
- The plans for the transition are very hard to deliver – supply chain issues and technical uncertainty
- Uncertain and hard to measure effects on resilience
- Risk that consumers do not respond to price signals, system costs rise and competition does not deliver (either due to market failure or because regulation does not keep up)
- Risks that the transition is seen as unfair (ie. adverse distributional outcomes) – either actual or perceived – with adverse effects on consumer engagement

Q & A