

Following IPCC's 'Global Warming of 1.5°C' Report – Policy briefing supporting suppliers of renewable electricity to reduce UK GHG emissions.

Overview

- To limit global warming to below 1.5°C, large reductions in greenhouse gas (GHG) emissions are required.¹
- The UK is also not on track to reach its own national legally binding GHG emissions reduction targets.²
- The energy sector is the UK's second largest GHG emitter³ – behind transport – and future electricity demand is set to increase.⁴
- Increasing the availability of Renewable Electricity (RE) tariffs – where 100% of electricity is generated by renewable sources – can help reduce GHG emissions.
- Collectively, the 'Big 6' energy suppliers currently offer 2 RE tariffs whilst 15 small and medium suppliers offer exclusively 100% RE tariffs.⁵
- UK government legislation has increased competition in the energy sector. This has led to an increased number of suppliers of RE tariffs.
- To further increase the share of electricity generated by RE, the government can enforce policies to:
 - Visualise emissions on household energy bills.
 - Increase awareness of the true cost of 100% RE tariffs.
 - Offer tax exemptions for suppliers of 100% RE tariffs.

Background

Global warming is likely to already reach 1.5°C above pre-industrial levels “between 2030 and 2052 if it continues to increase at the current rate” unless drastic action is taken.¹ Moreover, current policies would lead to a global surface temperature increase of 3.5°C – significantly

higher than what is considered 'safe'. Subsequently, IPCC's '1.5°C Report' highlights that further emission reductions are required.

In the UK, the legally binding Climate Change Act (2008) requires national GHG emission reductions of at least 80% by 2050, relative to 1990 levels.⁶ To achieve this, periodical targets require emissions to reach certain levels in 5-year periods referred to as 'Carbon Budgets'.

As the energy sector has the second highest level of GHG emissions (25% of total emissions, or 120.2 MtCO_{2eq} in 2016)³, the UK government has committed to supporting RE sources – such as solar and wind – that emit no GHGs in the energy generation process.

With a decreasing cost in RE generation, 2017 saw RE supplying 29.4% (98.9 TWh) of the UK's total electricity supply.⁷ The amount of generated RE has increased 9-fold between 2000 and 2017⁷, which helped reduce GHG emissions from the energy sector by 100.8 MtCO_{2eq} (46%) between 2000 and 2016.³

Despite this, the UK is currently not on track to reach the 4th and 5th Carbon Budgets, meaning that more GHG emission reductions are required to achieve the 2050 target².

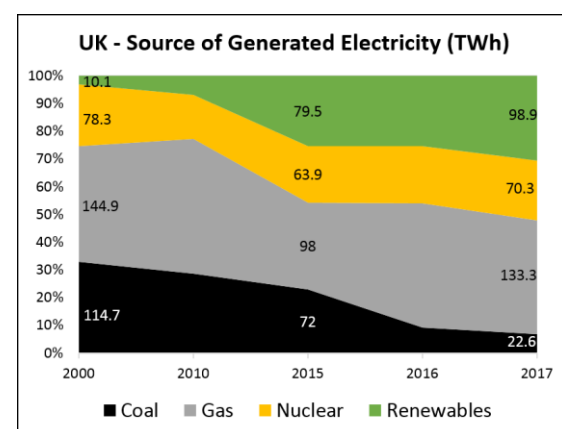


Figure 1 | Generated Electricity (TWh) in the UK between 2000 and 2017 as a proportion of the total energy supply (%)^{3, X}

Energy Companies

In the UK, registered energy suppliers can either generate their own electricity or purchase energy from the wholesale market. This is then transferred through the National Grid to households and businesses.

The UK energy supplier market can broadly be divided into two groups. Firstly, the 'Big 6' energy companies – British Gas, SSE, E.ON, EDF Energy, Scottish Power, and RWE Npower – which jointly supplied 77% of UK households in Q2 of 2018.⁸ Secondly, the 'small and medium energy suppliers' supplied 23% of UK households with electricity Q2 of 2018.⁸ The market share of the 'Big 6' has been falling an average 4.6% per annum since 2012.⁸ In 2017, the average energy mix of the 'Big 6' included 23.4% of RE⁹ whilst none currently offer a 100% RE tariff.¹⁰

The number of active domestic 'small and medium energy suppliers' increased from 6 in 2010 to 60 in Q2 of 2018.¹¹ Whilst there are 15 suppliers that supply exclusively 100% renewable electricity, the average share of all 'small and medium energy suppliers' lay at 49.4% in 2017.⁹ This higher rate saved 1.06 MtCO_{2eq} in 2017.¹²

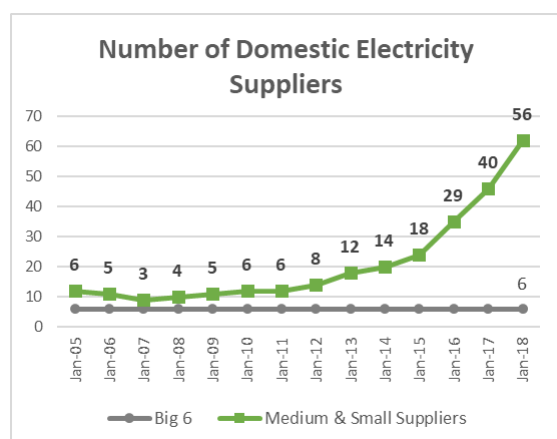


Figure 2 | Number of Energy Suppliers in the UK energy market between 2004 and 2017.¹¹

Implemented Policies

The current UK energy market was shaped by recent government policy. With a total of 10 to 14 active energy suppliers between 2004 and 2010 and RE supplying 7% electricity in 2010⁷, the UK government passed legislation to increase competition and RE supply.

The Renewables Obligation and Renewables Obligation Scotland were set out by the Utilities Act 2000 and were implemented between 2002 and 2005.¹³ They require all energy suppliers to supply an ever-increasing, agreed-upon amount of RE to consumers. If this target is not met, suppliers 'buy-out' the difference at a set price through Renewable Obligation Certificates. This encourages a growth in the proportion of RE supplied by all suppliers and reduces the total carbon emissions from the UK energy sector.

	'Big 6'	Small and Medium Electricity Suppliers (incl. 100% RE)
Market Share (Q4 2017)	77% ⁸	23% ⁸
Average CO₂ Emissions (Kg CO_{2eq}) per MWh (2017)	258 ⁹	204 ⁹
Generated Electricity (MWh) – Total (2017)^x	85,131,000	19,969,000
Total Emissions (MtCO_{2eq}) (2017)^y	22	4.1

Table 1 | Impact comparison of energy supply. Big 6 vs. 'small energy suppliers'.

^x Average market share for 2017 * MWh of energy generated for domestic purposes⁷

^y Generated Electricity (MWh) - Total (2017) * Kg CO₂/MWh - Supplier Average (2017). Divided by 1,000,000 to get Mt.

The Climate Change Levy (CCL) was introduced in the Finance Act 2000 and imposes a tax on energy use to encourage more energy efficient behaviour of businesses.¹⁴ Originally, RE was exempt from the CCL, yet the UK Government's 2015 Summer Budget abolished this exemption.¹⁵

Market entry for energy companies was further simplified by exempting 'small suppliers' – those with less than 250,000 customers – of the Energy Company Obligation (ECO) which reduces costs and allows for 'small suppliers' to stay competitive.¹⁶ As many RE tariffs are offered by 'small suppliers', RE can be supplied at a competitive price which increased demand for RE and increased competition in the UK energy market.

Demand for RE

Consumer-led demand for RE tariffs has increased the share of RE generated in the UK. UK support for RE lies at 85%¹⁷ and this is, in part, why consumers are voluntarily willing-to-pay 15% more RE than for conventional energy.¹⁸

However, these high levels of support for RE have not yet transferred to consumption as mostly small and medium energy suppliers (who have 23% market share) offer RE tariffs, amongst other tariffs. Reasons for this have been found to be:

- Lack of understanding of energy market and trust in energy suppliers.¹⁹
- Certain demographic groups – such as low-income individuals – still see too many barriers for switching energy suppliers despite possible cost savings.²⁰

Future Energy Consumption

Future UK electricity demand will depend on factors such as the growth rate of electric cars, and the future reliance on natural gas. The National Grid modelled that with high levels of electrification in all industries, annual electricity demand will reach 475 TWh by 2050.⁴ In 2017, the UK generated 335.9 TWh of electricity and 46.4% was supplied by the fossil fuel sources coal and gas⁷ [Box 4]. If current proportions of each fuel source remain stable, an electricity demand of 475 TWh would lead to GHG emissions from energy alone reaching 165 MtCO_{2eq} a year in 2050,²¹ already exceeding the limit of total emissions for all sectors – 159 MtCO_{2eq} – required to reach the 2050 Climate Change Act Target.

Alongside the failure to reach legally binding targets, high emissions from the energy sector would increase the likelihood of climate change related impacts in the UK such as increased frequency of extreme weather events,²² and extreme weather-related mortality.²³

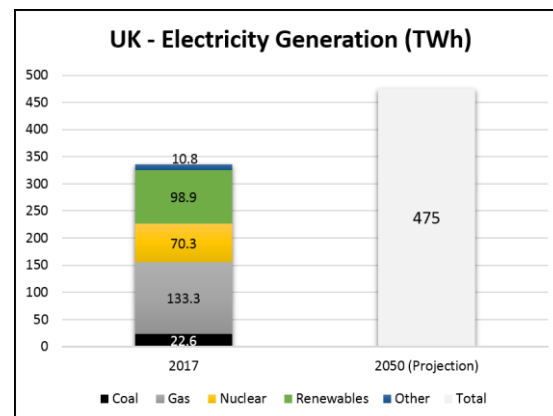


Figure 3 | UK electricity generation by source (TWh) in 2017⁷ and 2050 (prediction made by the National Grid)⁴

Policies to Increase RE Supply and Demand

Implement Legislation to Encourage RE Supply

Low prices are the main driver for switching to another energy supplier.²⁴ Tax exemptions for suppliers of RE – such as the ECO exemption for ‘small suppliers’ – would allow RE suppliers to reduce costs and provide low-cost RE to consumers.

Creating a progressive structure – where providing 100% RE provides the largest tax exemptions – would encourage suppliers to purchase more RE on the wholesale market.

Whilst further tax exemptions could negatively impact the UK’s tax revenue, the tax could eventually be reduced or abolished once an agreed-upon level of RE supply has been achieved.

Education and Awareness

Despite 85% of UK public supporting RE¹⁷, misconceptions still act as a barrier to customers selecting RE suppliers. Consumers do not trust RE due to misconceptions around electricity generation and supply. Moreover, consumers overestimate the price of RE.¹⁹

Increased awareness and knowledge through government-funded educational programs could reduce misconceptions and increase demand for RE.

Visualise

A government-regulated, and standardised visualisation of the carbon footprint of any energy bill – regardless of supplier – could increase awareness of carbon footprints and the importance of RE.

Enforcing a standardised element onto all energy bills could provide complex. However, energy suppliers are aware of their sources of energy and related carbon emissions, due to the requirement for them to disclose these periodically. If this information is simplified

and transferred onto each energy bill in a standardised and visually appealing way, awareness of carbon footprints and GHG emissions could increase demand for RE.

Incentivising the ‘Big 6’ to supply RE tariffs

Whilst in recent months the ‘Big 6’ have started to offer RE tariffs, the majority of their customers – who make up ca. 21 million households – are not on 100% RE tariffs. By incentivising the largest energy suppliers to offer more RE tariffs, existing customers could more easily switch to a RE tariff without having to leave their suppliers altogether.

This incentive could similarly come in the form of a tax exemption, where an increased share of customers that are on a 100% RE tariff decreases the amount of taxes energy suppliers are required to pay.

Whilst a tax exemption would decrease the tax revenue for the government, if priced correctly, it would be offset by lower climate change mitigation and adaption costs as a higher share of renewable energy will help limit the detrimental effects of climate change on the UK economy.

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