



Transitioning to renewable power

Nearly all the benefits we enjoy as a developed country have been made by using fossil fuels. Like many countries our development has been made possible by mining our reserves of coal, extracting oil and gas from our coastal seas and importing more to satisfy demand. These fossil fuels were formed millions of years ago when plants captured the sun's energy and were buried deep underground, slowly transforming into coal, oil and gas. The Earth must have been a very green place for such a long time, a timescale that is more than most of us can imagine. All plants capture atmospheric CO₂ so that they can grow, turning it into stems, leaves and seeds. The CO₂ of ancient plants is still there but changed into new structures which have been fossilised. So when we burn fossil fuels, or burn materials we make from them such as plastics, we release that CO₂ back into the atmosphere where it prevents heat from the sun radiating back into space. It insulates the world, which has been gradually warming up. The average global temperature is now about 1.5 °C above what it was at the end of the 19th century. That doesn't seem much. If you turned up your central heating by that much, would you really notice it? The oceans have been absorbing a lot of the extra heat so we haven't noticed it quite as much on land. Researchers at the University of Oxford calculated that the total heat taken up by the oceans over the past 150 years is about 1000 times the annual energy use across the whole world. Other scientists reckon that the heat taken up by the sea between 1990 and 2015 is as much as the detonation of three Hiroshima atomic bombs per second for the whole of that period. That excess energy has to go somewhere. Without action, the climate will continue to change with the heat of the oceans feeding the weather making it more changeable and more extreme. The more we put off doing something, the harder and more expensive it will be to stop or reverse.

We are currently on track to reach an annual average global temperature of 2.8 °C about the pre-industrial level. Things may look bad now but if we reach that level, things will be much worse. We need to make big cuts in greenhouse gas emissions now. A key part of achieving this reduction is to replace coal, oil and gas with renewable energy sources – solar, wind and hydro, with perhaps some nuclear to provide a stable base. This does carry economic risks both for countries that produce fossil fuels and for those that rely on them for power. Last month (April) we saw how vulnerable the UK is to instability in oil and gas prices because we import most of our oil and gas. Not that using our North Sea reserves would make much difference as any oil or gas from there would be sold at international prices.

The UK has invested heavily in renewable energy over the last 10 years and reduced our reliance on fossil fuels (Table 1). In 2025, most of this was wind power with none from coal (Table 2). According to DNV, a global quality assurance and risk management company based in Norway, we will not completely decarbonise the electricity system by 2030 and will still need gas for power generation for 15% of demand in that year. In the next five years, the UK will likely only double wind power capacity and treble solar PV, which means

missing the target of 2030. Unfortunately, we will miss the Nationally Determined Contribution for 2035 agreed in the IPCC Paris Agreement, reducing greenhouse gas emissions by only 30%, which is around half of what is needed. And we are off track to reach the legally-binding target of net zero by 2050 (Figure 1).

Table 1. Percentage of renewable energy per year (National Grid data)

Year	% of UK energy mix	
	Renewables	Fossil Fuels
2016	14.5	49.9
2017	20.3	44.7
2018	27.6	42.4
2019	31.5	40.1
2020	37.5	35.1
2021	33.7	38.6
2022	37.5	39.7
2023	39.5	32.2
2024	42.2	25.5
2025	44.5	26.1

Table 2. Electricity generation in UK 2025 (Ember Energy)

Power source	Terawatt hours (TWh)	% used in electricity generation
Coal	0	0
Other fossil (oil etc)	12.8	4.4
Gas	90.9	31.4
Nuclear	36.4	12.6
Other renewables	0	0
Bioenergy	41.2	14.2
Hydro	5.55	1.9
Wind	83.3	28.8
Solar	19.3	6.7

Even as more of our energy needs are supplied by electricity generation, the overall demand will fall due to improved efficiency. On the other hand, the system will be more affected by variations in supply and demand such that it will have to become much more flexible. Currently, that flexibility is from gas-fired power stations that can be turned on and off quite quickly and from interconnectors (where power is supplied from France etc). It is

predicted that by 2050 and beyond, about 75% of the flexibility will be provided by battery storage and the rest from interconnectors. This means that there will be major investments in battery technology.

Now, in 2026, around 75% of energy demand is satisfied by fossil fuels, mainly gas. DNV believes this will fall to about 20% with electricity providing over half of total demand. They calculate that by 2060, 70% of UK homes will be heated by electricity. Through to 2050, electricity should become more affordable as we use less and less gas. Households bills

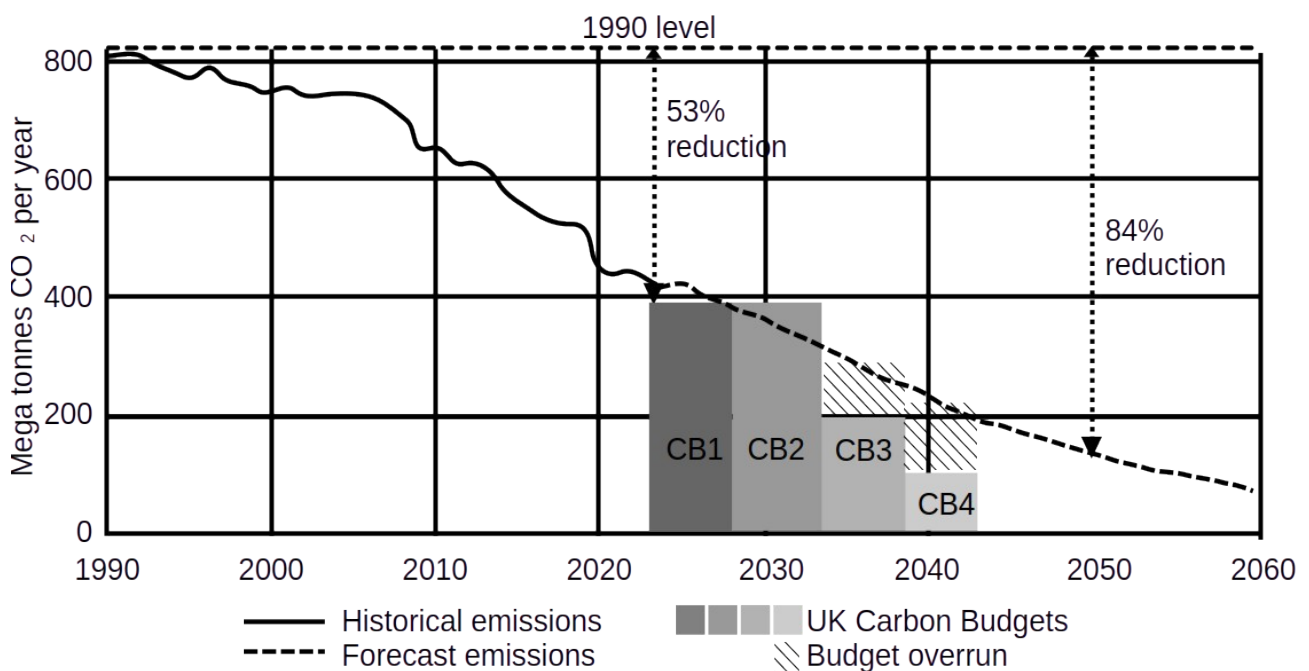


Figure 1. UK total greenhouse gas emissions.
Redrawn from DNV: Energy Transition Outlook. UK 2026

will be 20% of 2021 levels, primarily due to the more efficient utilisation of energy. Heat pumps are probably going to be the main way we heat our homes but we will need to have significant investment to improve the insulation of buildings. Both private cars and commercial transport will be electric but aviation will still use significant amounts of fossil fuels. Shipping will rely on a mix of bioenergy, ammonia, synthetic e-fuels as well as fossil fuels.

With so much of the UK relying on electricity, we have to have major development of storage systems. So far, we have installed lithium ion batteries but long term storage is expected to grow rapidly by 2029 – 2030. It is expected that pumped hydro storage will be expanding. It has languished for many years but looks set to make a come-back in the future. Even electric vehicles (EVs) can be used for storage when plugged in via a smart meter. It is predicted that by 2060 nearly 40% of battery storage capacity could be provided in this way.

Whilst we are not properly on track to meet emission targets by 2050, nevertheless, there are significant changes happening that will help us on the way. We do need to have more investment and be more motivated to make the necessary changes. What we do not need is to step backwards and start using more oil and gas. That will condemn future generations to greater hardship, a worsening environment and spiralling costs. Fortunately, the UK, Europe and many other countries are transitioning away from fossil fuel use and are switching to clean energy. The future is beginning to look very slightly brighter.

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We'd love to have some new members with new ideas to support our community. Contact the Cold Ash Parish Greening Group chair, Richard Marshall: marshalr@btinternet.com