



## Renewables are on the march

How many things do you have that are powered by electricity? A quick scan of what we have at home comes to about 30, though some such as the food mixer or the chain saw are only used occasionally. Of the total, some are permanently plugged in – the fridge-freezer for example – and others are on stand-by when not actually being used. Reflecting on how this has changed since 2015 shows that we have probably doubled the number of appliances that we had then. Our total energy use has increased as we have acquired more ‘stuff’. There has been some recent analysis of how all this power is generated.

The International Energy Agency (IEA) works to improve the reliability of energy systems around the world. It encourages member and associate countries, a total of 45, to improve the affordability and sustainability of their power supply. The IEA has just published its 2025 report that reviews what happened to power supply systems in 2024. The total energy demand in 2024 grew by 2.2 % compared with the previous year, which was much faster than from 2013 to 2023, when it averaged 1.3 % per year. However, the demand for electricity grew by 4.3 %, which was the largest ever recorded excepting the years when we were recovering from recession. Of that 4.3 % increase, renewable power generation accounted for 38 %, then natural gas at 28 %, coal (15 %), oil (11 %) and nuclear (8 %). Because of the major contribution of renewables to the mix, the rise in carbon emissions only grew by 0.8 %, compared with 1.2 % in 2023.

One of the key factors driving up demand were the higher global temperatures in 2024, which was until 2025, the warmest year on record. The demand for air conditioning and other cooling technologies was 20 % higher than the long-term average, especially in China, India and the USA. The IEA estimates that the increase in the demand for coal was entirely driven by the need for extra cooling.

We are still using lots of oil to power our economies but less than in the period 2021 to 2023. We almost got back to the demand levels of 2009 – 2019 (Figure 1). In China, the increase in use of oil dropped from 8.7 % in 2023 (driven by the post-pandemic recovery) to only 0.8 % in 2024. The adoption of electric vehicles and lorries powered by natural gas was largely responsible for this change. On the other hand, oil is still needed for the petrochemical industry and this led to the overall increase in demand.

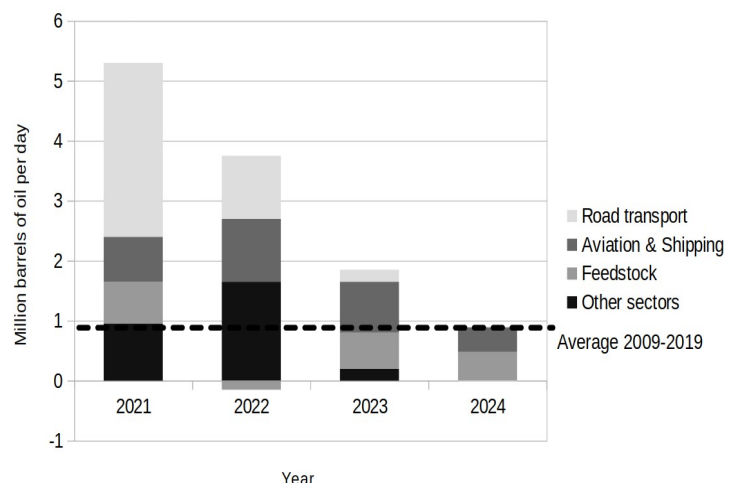


Figure 1. Global oil demand by sector 2012 – 2024  
International Energy Authority, Creative Commons Licence

The demand for electricity increased significantly in 2024 compared with most previous years, with only 2023 seeing a decline in advanced countries. Analysis shows that this increase was mostly in the buildings sector, which accounted for more than half of the increase.

Industry was responsible for almost 40 % of the growth and electric vehicles over 8 %. The growth in electric vehicles continued from 2023 when less than 14 million were sold, whereas in 2024 sales totalled 17 million, which is more than 20 % of all car sales for that year. Most of that growth (40 %) was in China (Figure 2).

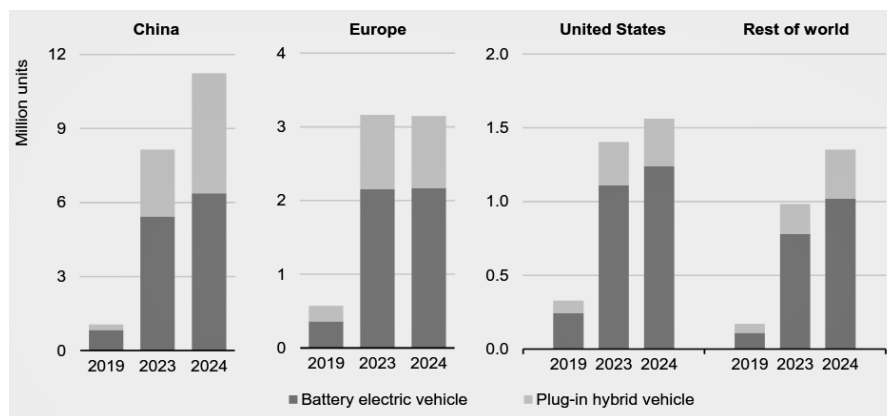


Figure 2. Electric car sales in selected markets. International Energy Authority, Creative Commons Licence

Globally, there was an increase in electricity generation of 4 % during 2024, compared with an average of only 2.6 % from 2010 to 2023. Over 1200 Tera Watt hours (TWh) of power were generated in 2024. (We measure home consumption in kilowatt hours – kWh; A TWh is 1000,000,000 kWh). Over 80 % of that was generated by renewables and nuclear power (Figure 3).

The biggest increase in renewable power generation came from solar PV, which increased by around 480 TWh. According to the IEA, solar PV has been doubling each year since 2016. There was a smaller but significant increase in wind power (180 TWh) but this was limited by licencing problems in some cases. Nuclear also increased. In terms of actual generating capacity, solar PV grew by nearly 30 % to 550 GW (giga watts) so that the world had a total solar generating capacity of 2.2 TW. Combined solar PV and wind power generation provided 95 % of the total growth. Hydropower was boosted too by major projects in China, Africa and SE Asia.

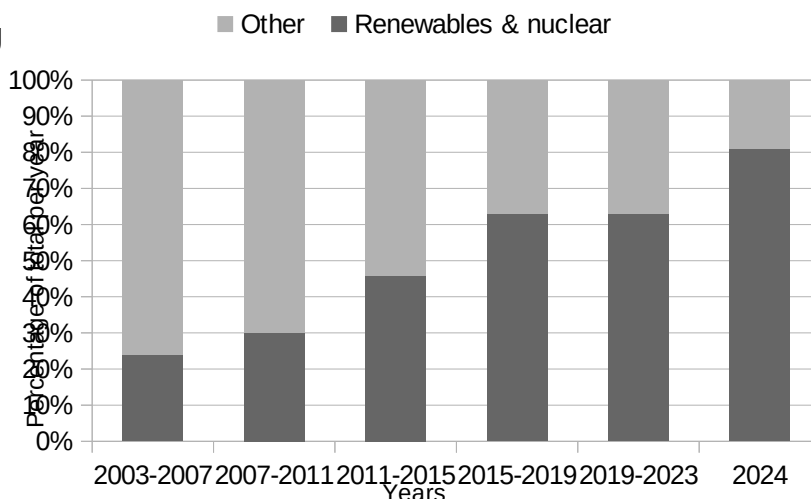


Figure 3. Share of increase in global electricity generation 2003-2024. International Energy Authority, Creative Commons Licence

Whilst China still does consume huge amount of fossil fuels, it is making great strides to expand renewables. In 2024, it added over 400 GW of wind and solar capacity compared with the EU's 60 GW, mainly in Germany, Italy and Spain. China does emit more carbon dioxide than any other nation due to the rising internal demand for electricity that is satisfied by burning natural gas and coal. In part that increase has been driven by extreme heatwaves and the need for air conditioning, refrigeration etc. In India, there was a similar

pattern but from a lower base. The USA continues to be the largest emitter of CO<sub>2</sub> though this has declined over the years as the use of coal has dropped. The EU still produces a lot of CO<sub>2</sub> but it did decrease by 2.2 % in 2024. Most of that drop was due to using less coal. Across the EU, electricity generation from wind and solar PV overtook that from coal and gas. In total, renewables provided nearly 50 % of the electricity generated.

More electricity is being generated by renewables – wind, solar PV, hydropower and nuclear – but we are still very reliant on fossil fuels. The demand keeps increasing year on year as we get more appliances and gadgets that need power. As the climate changes and globally we experience extremes of weather, more air conditioning units are switched on. Even in the UK, where domestic air conditioning was once very rare, the market is expected to increase annually by almost 3.7 % until 2030. We also have many devices that are on stand-by when not in use. Many of us have older equipment that may use 10 watts each which increases our bills. The latest ones use less than 1 W but even that can add up over the year with multiple appliances. This power consumption is sometimes called ‘vampire power’ as each device draws power without us really noticing. An individual household may not use much of this but when added up across thousands of homes, it adds significantly to the overall demand for electricity. The IEA has estimated that stand-by power produces up to 1 % of the global CO<sub>2</sub> emissions. If you can turn it off, do so, especially when you go away on holiday.

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