



# Energy Miles 2016

## How we worked it out

**There's currently no published data which pinpoints exactly where the UK imports fuel from to power its fossil and nuclear electricity generators, so we've used the data that's out there to work it out for ourselves.**

There's no clear mechanism to tell us where we've imported a lump of coal, a therm of gas or a rod of uranium from, so we've had a look into all the various countries we import them from. In the case of nuclear, we had to look directly at the suppliers of uranium. Once we've pooled all of this information, we split it proportionally against the each component of the UK's electricity fuel mix; which is published annually by the Department of Energy and Climate Change (DECC).

You can check the data we used in this analysis by clicking on the links below – there are a couple of steps in the process:

1. UK Fuel Mix Disclosure – the electricity grid mix of where UK consumers get their electricity from is used to form the basis of our calculations. This gives us a clear, annually-updated snapshot of exactly what proportion of our electricity comes from coal, nuclear, gas, renewable and “other” generators. “Other” means an energy source other than coal, natural gas, nuclear or renewables. This may include a very small amount of electricity that is imported from France and the Netherlands via interconnectors.
2. Fuels that have been imported do not fit one, specific purpose. Natural gas, for example, is used in manufacturing, burned to generate electricity and is distributed around our gas network to heat our homes and cook our food. Because the data is held this way, we looked at the countries we import all fuel from – and split these proportionally against the coal and gas components of the UK's electricity fuel mix. We don't quite know how much of our imported fuels are used for a specific purpose. That data sadly isn't available. For nuclear, we had to look at who exactly supplies uranium to the UK's nuclear plants.
3. We've also had a look into which elements of our fuel mix come by boat or by pipe. It would be pretty difficult to get coal, uranium or solid biomass into the UK from mainland Europe by pipe – so these particular parts are all assumed to come by boat. Gas, can be delivered to the UK in two ways: via pipelines under the sea bed; or as liquid gas (Liquid Natural Gas – LNG), which is assumed to come in by boat.

**A bit more detail on each of the components in the analysis is below:**

### Gas

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Our data is based on the physical imports of gas into the UK for 2015/16. As there's no published information on what proportion of our gas imported from any particular country goes towards heating, manufacturing or electricity generation we've assumed that the gas used specifically for electricity generation is proportionally equal to total UK gas imports.

The majority of gas imported into the UK comes from interconnection with the European network via pipelines from Norway, the Netherlands and Belgium. However this doesn't tell us where it has originally been sourced from – for example, gas imported from Belgium may itself have been imported from Germany. In cases like this, we calculated



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the net flow of gas between countries allowing us to estimate the original source of all gas imported into the UK via its three interconnectors.

## Coal

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Again it's impossible to determine the exact end-use for each tonne of solid fuel imported, however DECC does provide a summary of the specific countries we've imported coal from. We combined this with data from Eurostat (who provide more detailed information) to estimate the origin of imported coal. We have assumed the coal used for electricity production to be steam coal (coking coal is generally used for steel production, and anthracite coal in metal smelting and fabrication industries). We have split the steam coal import data for 2015/16 proportionally against the all countries within the published national data. It's also not possible to determine what 'type' of coal the UK produces, so we've assumed that all domestic coal production is steam coal.

## Uranium

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National data for uranium imports is not available in the same level of detail as published for gas or coal, so we had to look at the UK nuclear generators, their ownership and who is providing them with fuel. As UK nuclear capacity is almost exclusively owned by EDF, with fuel supplied to them by Areva, we've looked their global uranium production and assumed that the imports to the UK are proportional to their global sources of production in 2015/16.

## Renewables

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For renewable technologies such as wind, hydro and solar there is no imported fuel, as all this generation comes from the UK's own, natural resources. However electricity generation technologies such as biomass do require fuel. Some of this fuel is imported. In fact, DECC data shows that the only renewable fuel used in electricity generation that is imported is plant biomass used in biomass fired power stations. Looking at further DECC data for 2015/16, we are able to calculate what proportion of the renewable part of the UK's fuel mix is attributable to biomass – it is assumed that the remainder uses fuel sourced domestically from the UK.

Unfortunately, there is no information about where this biomass comes from. There are multiple biomass generators in the UK, but we could find only one that releases information about the origin of its biomass. Thankfully, this one station is responsible for the majority of the UK's electricity that comes from biomass, so we first calculated exactly what proportion it was responsible for, then using its data we were able to attribute an origin to the biomass used in this type of generation. The origin of the biomass used in other biomass fired power stations is unknown.

## The 'unknowns'

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In our final analysis we were unable to determine a source for 4.4% of the fuel used to generate electricity in the UK. This is made up of:

1. The 2.5% of the UK fuel mix for electricity that is listed as 'other'. We have been unable to perform further analysis on this element.
2. The remainder of the unknown comes from the biomass imports (as discussed above).



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## References

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Electricity Fuel Mix disclosure:  
[UK Electricity Fuel Mix \(DECC, 2015-2016\)](#)

Gas-specific data:  
[EU-27 Gas Import Data \(Eurostat, Table nrg\\_124m\)](#)

Coal-specific data:  
[Supply and consumption of coal \(DECC, ET 2.1\)](#)  
[Coal imports \(DECC, ET 2.4\)](#)  
[EU-27 Solid Fuel Import Data \(Eurostat, Table nrg\\_122m\)](#)

Uranium production and usage data:  
[Nuclear Power in the United Kingdom](#)  
[Areva's 2015 Reference Document](#)

Renewables-specific data:  
[Renewables and waste: commodity balances \(DECC, DUKES 6.1-6.3\)](#)  
[Renewable electricity capacity and generation \(DECC, ET 6.1\)](#)  
[Drax 2015 electricity output from biomass](#)  
[Drax biomass supply](#)

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## Other data in our calculations

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### Miles travelled

To calculate the average distance travelled by the fuels we import, we first calculated the amount each country contributed to our imports as a percentage. We then calculated the distance as the crow flies between the import country's capital and London. We used this figure as the average distance the fuel had travelled. In reality the true distance will depend on a number of factors, such as where the fuel was extracted and what route it had taken to arrive in the UK. Using these two sets of figures, we calculated a weighted average and arrived at the average distance travelled by imported fuels. <http://www.freemaptools.com/how-far-is-it-between.htm>

### Rounding

This is a large piece of work, requiring a disaggregation of multiple datasets before we were able to re-build the bigger picture. Due to the granularity of the data used – often to thousands of a whole number and often using different metrics and measures, and the methods employed to interrogate it all, the rounding of numbers is an issue we've had to contend with. To make them easier to interpret and to make sure we weren't overwhelming the audience with numbers, we decided to work to just one decimal place on the infographics produced.