

Stephanie Willis (Engineering) – Scandinavia, 2013

This summer I spent 5 weeks in a Ford Transit van exploring Scandinavia. An interest in large-scale sustainable energy production prompted me to visit 3 countries that are far ahead of the UK in the race to reduce reliance on fossil fuels.

I had spent the month before my trip working for Siemens Wind Power in Denmark. There I gained an appreciation of the scale the Danes are working on to supply 18.9% of their electricity with wind power. The Danes entered the wind industry in the 1970's and they now produce 50% of all wind turbines produced in the world.

A short drive through Denmark saw us on a ferry over to Norway. Norway is a country which has many natural favors but which has also managed its resources in an exemplary manner. From almost the moment we started driving it was evident why the renewable energy mix is so different here. The steep hills left no space for wind to flow. Instead there was water everywhere. In the 2000 miles we drove in Norway I do not think we saw a hillside without a waterfall coming down it. The potential for hydropower production was plain to see.

Our first stop in Norway took us to the home of a Structural Engineer who manages the construction of hydroelectric power plants. He explained a little of the current thinking on Hydro in Norway. With 99% of mainland Norway's electricity being supplied by hydropower, the Norwegians are starting to get picky. Recent political moves have meant that the production of new dams is slowing, as people don't want more valleys flooded. Instead the technology will have to improve so that existing power stations can be renovated to match demand.

In Rjukan, west of Oslo, we visited a site interesting in both engineering and historical terms. In 1911, the world's largest power plant was built here to harness the energy of the huge Rjukan waterfalls. This power station was an Allied target in the Second World War as the power was being used to create the Deuterium used in Nazi atomic research.

We spent the next 3 weeks driving north, exploring the mountains, lakes, rivers and glaciers that hold the key to Norway's 'free' energy supply. From Trondheim we drove east to Sweden where the countryside became dramatically flatter and once more peppered with wind turbines rather than water falls. The geographical coupling of nations rich in hydro potential and those with large wind potential is an energy supply dream. Hydro can be used to store wind power to allow supply to match demand.

These 3 forward thinking countries in which government policy has subsidized and supported renewable technologies are now seeing enormous benefit. There are clearly some helpful geographic factors but as an engineer looking at the UK's energy supply, this trip has definitely given me a concept of the sort of scale on which we need to invest in renewables and of the advantages in can bring.