

Energy Transition League:

What are other islands doing to become self-sufficient in green electricity?

The Energy and Sustainability Centre IOM (ESC) gave a [talk](#) on 13 July 2023 to the Chamber of Commerce Business Sustainability Group. Below is a precis of what was presented.

The Isle of Man has embarked on the path to carbon-free energy with the announcement of plans for 30 MW renewable power. This will help our economy but it might surprise people to see how far other islands have already got (Figure 1).

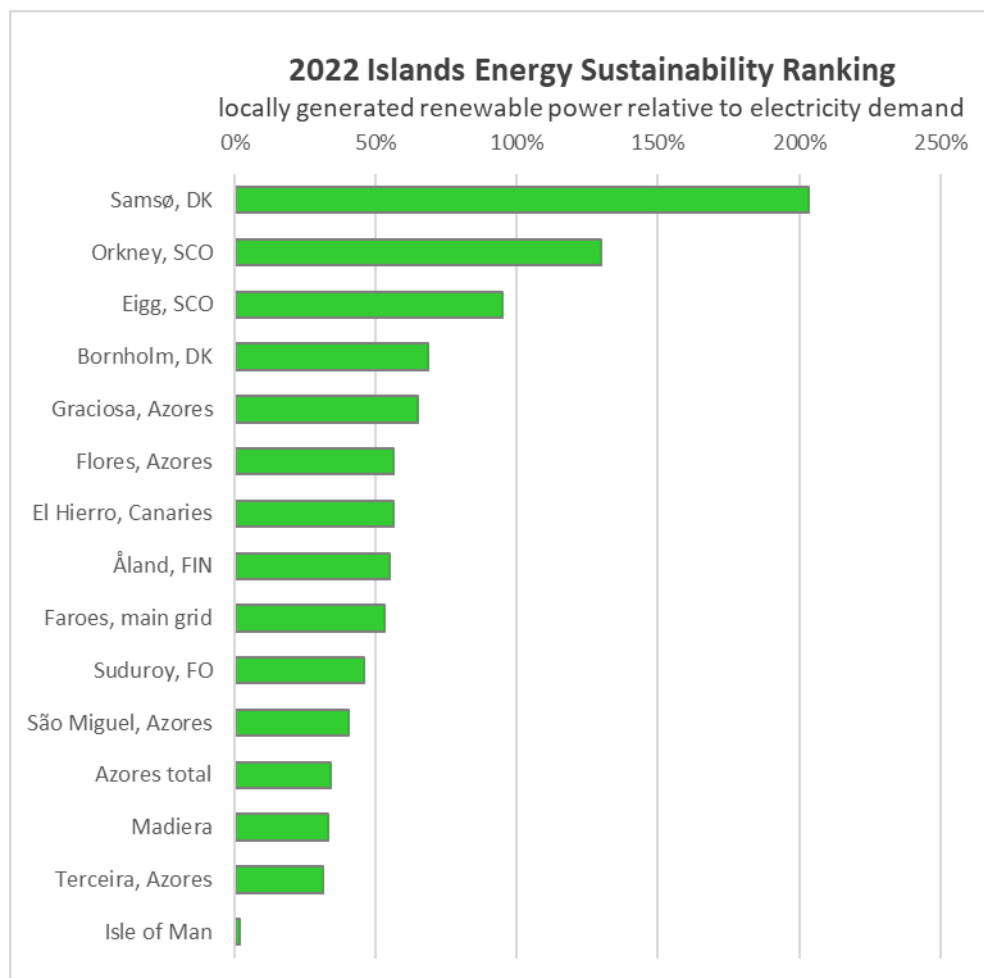


Figure 1. Degree of islands' self-sufficiency in renewable electricity relative to demand.

By generating their own power, these islands have been partially protected from the volatility of global energy prices (Figure 2). Apart from Orkneys (which is linked to UK prices), they all pay less for their own electricity than the Isle of Man where at present we are almost entirely dependent on imported gas and oil (Figure 3).

The future plans of these islands are also fairly clear, most of them having set a roadmap to 100% sustainable electricity by 2030 (Figure 4). This improves their energy security. The risk that an external supply of

electricity or gas will be cut-off by an attack on a subsea cable or pipeline has become relatively high since Russia's invasion of Ukraine (Figure 5).

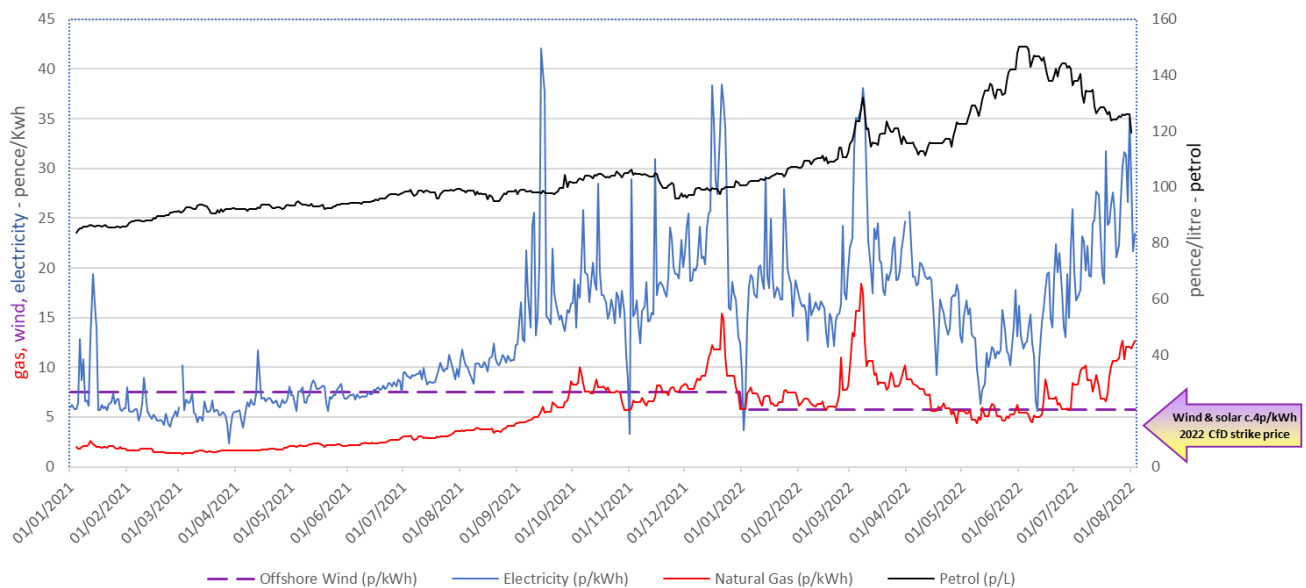


Figure 2. Oil- and gas-related energy prices have been in turmoil since late 2021 (red, blue and black curves) whereas renewable energy is characterised by stable prices which have fallen over time (e.g. purple line).

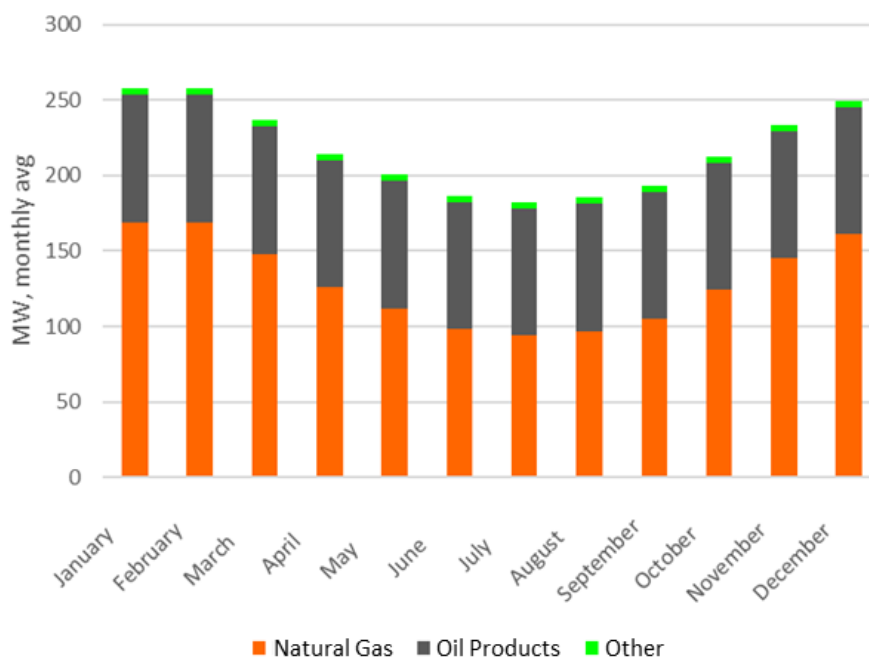


Figure 3. Over the year, most of the power used in the Isle of Man (electricity, heating and transport) comes from oil and gas.

In contrast, the current plans for the Isle of Man in 2030 involve supplying around 80% of our electricity through a new subsea cable or interconnector to the UK. This would put us in the position of not being able to predict prices nor control our energy-related emissions.

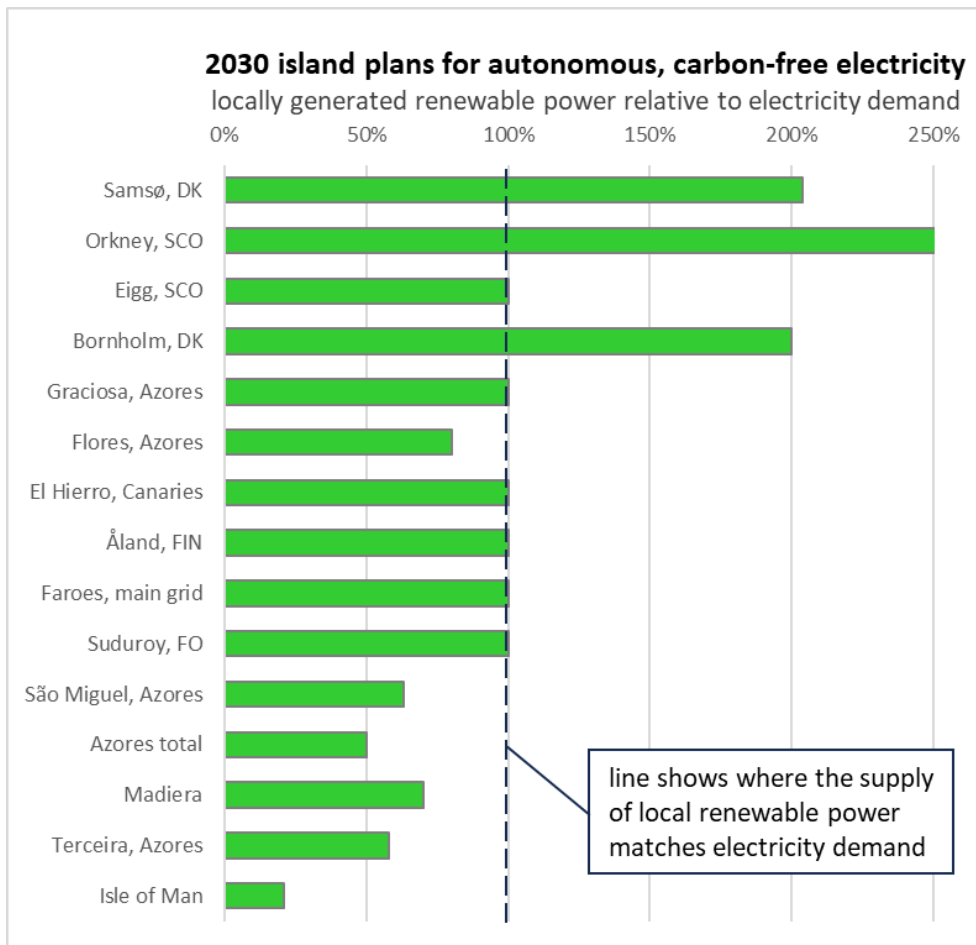


Figure 4. Island plans for self-sufficiency in renewable electricity by 2030.

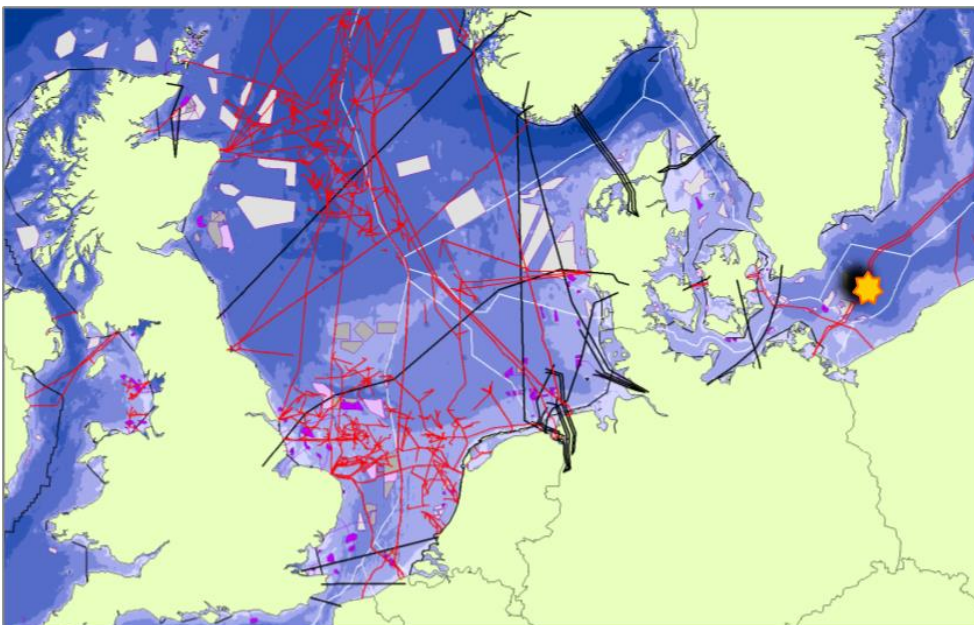


Figure 5. Map showing subsea oil & gas pipelines (red lines) and electricity interconnector (black lines) in northern Europe. The location of the Nord Stream gas pipeline explosions is also indicated (orange star).

Most of the Island's carbon footprint is related to energy (Figure 6).

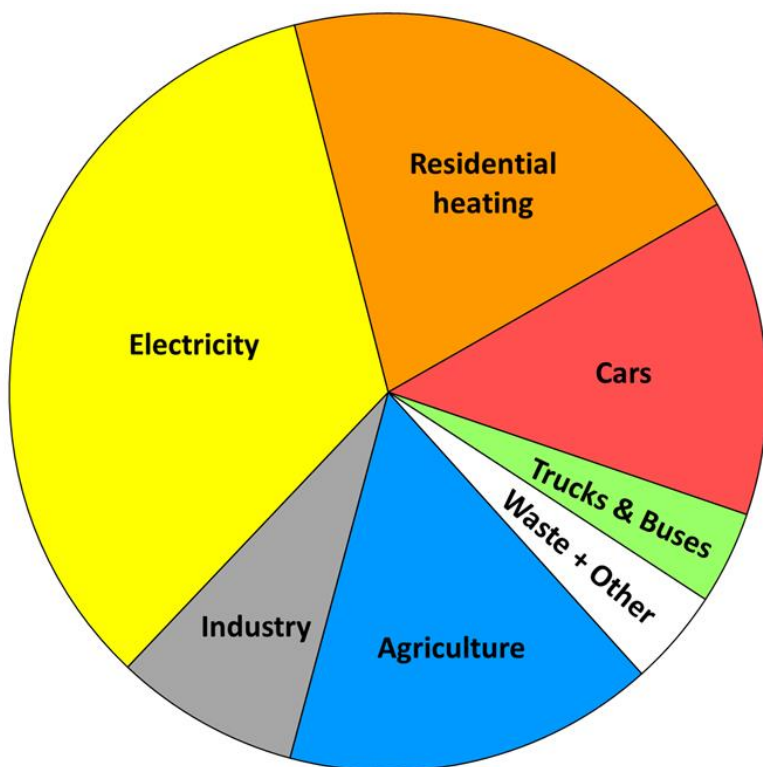


Figure 6. Proportional representation of Isle of Man's direct emissions of greenhouse gases for 2019. The total amount emitted was equivalent to 700,000 tonnes of carbon dioxide or an average of 8.2 tonnes per person, of which 78% comes from using oil and gas used for power in electricity, heating and transport.

On the Isle of Man, the planned 30 MW capacity of renewables would supply only one fifth of the current electricity demand. This might seem counterintuitive, given that the average electricity demand is just over 40 MW. The reason is that the quoted capacity of a wind farm or solar park is the maximum that can be generated when it is very windy or very sunny. Most of the time less is produced. Thus, the average power that would be generated from 30 MW of Manx renewables would be somewhere between 3 MW and 10 MW, depending on the balance between solar and wind and their strength at the different sites.

Approximately one quarter of the energy that the Isle of Man uses is in the form of electricity. The remaining 75% is for heating and transport. In the future, these two sectors may become largely electrified as heat pumps and battery-powered vehicles take over. This implies that the Island will need a lot more electricity, maybe as much as 150 MW based on average current demand. Energy efficiencies, more flexible consumption and alternatives such as district heating may help reduce this but it is hard to escape the fact that the Island's electricity grid will have to be significantly upgraded to cope with the increased load.

Using simulation software, the Energy & Sustainability Centre has been investigating how the Isle of Man can produce all its own power from renewable sources. There are in fact many options so it may be more a question of what offers the best value for the Island. Watch this space!

David G. Quirk, Energy & Sustainability Centre IOM, 19 July 2023.

For more information please visit www.energysustainabilitycentre.im

