St. Ninian's High School
Scoill Ard Noo Ninian

Independent Learning Task

<table>
<tr><td>Subject</td><td>Science</td></tr>
<tr><td>ILP #3</td><td>Powering our Island</td></tr>
<tr><td>Week set:</td><td>Week 17</td></tr>
<tr><td>Duration:</td><td>1-2 hours</td></tr>
<tr><td>Hand in:</td><td>Week 19</td></tr>
<tr><td>Instructions:</td><td>Your task is to write a report. You should research possible methods of electricity generation on the Isle of Man, suggest which you think would be best for our island and explain your choices.
You should submit your work electronically as either a word document or pdf. Your work should be approximately one page of A4 and can include writing and images.</td></tr>
<tr><td>Skills:</td><td>• Developing your writing skills.
• Developing your research skills.
• Making an argument.</td></tr>
<tr><td>Marking schema:</td><td>
<table>
<tr><th>Secure</th><th>Developing</th><th>Excellent</th></tr>
<tr><td>- Chooses at least one method of electricity generation.
- Gives at least one pro/con for that method.</td><td>- Chooses at least one method of electricity generation.
- Gives both pros and cons for each method chosen.
- Explains why a chosen method of electricity generation is better than another.</td><td>- Chooses at least one method electricity generation.
- Gives pros and cons for each method chosen.
- Explain why one method is better than another.
- Use real data from your research to improve the quality of your answer.</td></tr>
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<tr><td>Additional guidance or help:</td><td>To help you, read the views of different people about the Isle of Man's energy future in the included prompt material.</td></tr>
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Powering our island - What's the problem?

The Isle of Man currently consumes around 400 GWh of electricity each year [1]. There is a peak demand of around 75MW but can fall as low as 25MW [2]. Most of our electricity is produced by burning natural gas at the power station in Pulrose, Douglas (CCGT). This power station needs to be replaced by 2035, possibly sooner! The government have committed to trying to ensure that 75% of the island's electricity generation is renewable by 2035 and the island achieves 'net zero' emissions by 2050 [3].

There are several possibilities the island could explore such as:

- Continue to burn fossil fuels (replace the power station at Pulrose with a new version of the same thing)
- Transition to nuclear power (small modular nuclear reactors)
- Transition to renewables (solar, wind, tidal, wave, etc.)
- Energy storage (batteries, gravity battery, hydrogen energy storage, pumped hydroelectric storage)
- Build a new submarine cable with greater capacity allowing us to buy all our electricity from the UK

Read the opinions below to give you some ideas.

1. Government Member

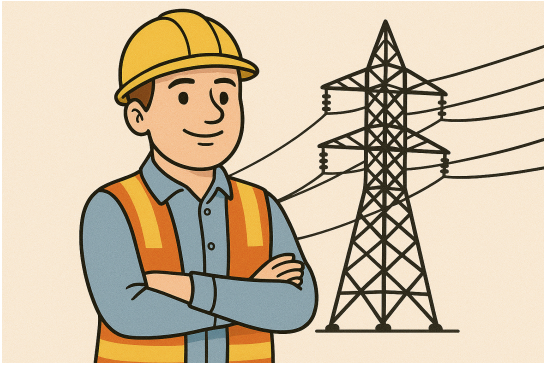
"The island must have the ability to produce its own power. We'd like to see the population grow in future and this could mean more power is needed. The island has committed to a net zero strategy, and this should be considered in any decisions about our energy future. However, the priority must be that the lights always stay on."

2. Environmental campaigner

"The Isle of Man was the first jurisdiction to be designated as a UNESCO Biosphere reserve. We should be a world leader in renewable energy and absolutely not be getting most of our energy from burning fossil fuels."

3. Electrical engineer

"Renewable energy is a fine idea but there are certain challenges. The amount of power generated changes depending on the weather which is hard to manage. We would also need an alternative source, such as fossil fuels, or a way to store excess energy from hot/windy days".



4. Business owner

"The Isle of Man has some of the most expensive electricity in the world at around £0.30 per kWh. This harms businesses and slows our economy. Any plan for the future should aim to reduce the unit cost."

5. Land owner

"The Isle of Man doesn't need wind turbines or solar panels. This is a beautiful place and I wouldn't want to see our island covered in machines. We produce some of the best food in the world and we shouldn't be risking it for renewable energy generation."

Bibliography

[1] I. govt. [Online]. Available: https://www.gov.im/media/1373858/iom-in-numbers-open-data-030523.xlsx.

[2] I. govt. [Online]. Available: https://www.gov.im/news/2023/feb/15/work-begins-on-ambitious-plan-to-decarbonise-islands-electricity-generation-by-2030/.

[3] I. Net Zero. [Online]. Available: https://consult.gov.im/cabinet-office/climate-change-plan-2022-2027/supporting_documents/Future%20Energy%20Scenarios%20Supporting%20Document.pdf.