TALAN
Positive innovation

Department for the Economy

Using our **deep sector knowledge** of the renewable energy market, Talan created a **holistic solution** for Northern Ireland's wind energy curtailment.

THE CHALLENGE

The Northern Ireland Department for the Economy faces a significant challenge with increasing levels of wind energy being **curtailed** or **constrained**, referred to as Dispatched Down wind.

In 2023, Northern Ireland experienced **a loss of 539 GWh of wind energy** due to these constraints, leading to high compensation payments to wind farm operators for the unused energy.

This wasted clean energy not only represented a **financial burden** but also hindered the region's efforts to **reduce carbon emissions** and transition to a sustainable energy future.

The client required support from consultants with **deep sector knowledge** to find an innovative solution to utilise this otherwise wasted wind energy effectively.

THE SOLUTION

Talan was approached to **develop a holistic solution** for the client. The proposed solution involved using the Dispatched Down wind energy to power electrolysers for the production of green hydrogen. This approach aimed to convert the excess wind energy into a **valuable energy vector** and storage mechanism. The green hydrogen produced could then be stored and used when needed, providing a **flexible and sustainable energy source**.

The project investigated the **costs and feasibility** of this method, comparing it to other hydrogen production routes and assessing the potential role of government subsidies in lowering production costs.

Our analysis included scenarios with varying installed wind capacities and Dispatch Down levels, highlighting the potential benefits of integrating offshore wind capacity to increase hydrogen production efficiency.

Four scenarios were investigated:

- 2025 (1.7 GW onshore capacity)
- 2030 (2.5 GW onshore capacity)
- 2030 (2.5 GW onshore + 0.5 GW offshore capacity)
- 2030 (2.5 GW onshore + 1 GW offshore capacity)

each with varying Dispatch Down wind energy levels.

The costs modelled within this report are specific to these scenarios and do not take into consideration further changes to capacities and Dispatch Down levels.

The development of onshore installed wind capacity is expected to increase to **2.5 GW by 2030**. However, renewable usage and grid capacity is also set to increase. Offshore wind capacity is also expected to be developed by 2030, with a goal of 1 GW offshore capacity from the end of 2025. There is currently no offshore wind capacity. Dispatch Down levels were estimated based on these scenarios, and the costs of hydrogen production via Dispatched Down wind-powered electrolysis were compared to the potential cost of compensation to wind farm operators for Dispatching Down Wind supply.

The project also explored the role of **government subsidies** in lowering the Dispatched Down wind-powered green hydrogen production costs. This included analysis on a range of **potential subsidies** that could be applied to electricity costs, before quantifying the cost of these potential subsidy schemes to the Government in monetary terms. It was evaluated how these **green hydrogen production** costs compare to theoretical potential compensation costs of that would-be Dispatched Down wind power, paid by the grid operator to the wind farm operator.

THE IMPACT

Our team provided an assessment and commentary on what these findings imply on the potential of **policy and national strategy** to unlock the use of green hydrogen production to avoid curtailment was then provided.

Implementing our solution could have a transformative impact on Northern Ireland's energy landscape.

By utilising Dispatched Down Wind to produce green hydrogen, the region could **significantly reduce wasted energy** and **lower compensation payments** to wind farm operators.

The project estimated that with the addition of offshore wind capacity, the cost of producing hydrogen could become **more competitive**, potentially **saving up to £145.4 million per year** compared to potential compensation payments. This approach would not only **enhance the economic viability** of wind energy but also support Northern Ireland's goals of reducing carbon emissions and achieving a sustainable energy future.

Additionally, the produced green hydrogen could be used for various applications, including energy storage, grid balancing, and as a fuel for transportation and industry.