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With the UN Climate Conference, COP26, coming to the UK in November 2020, what actions would you propose to decarbonise one of the following sectors:

- Industry
- Aviation
- Energy

In this essay I will explore the methods by which government action can drive the shift towards a zero-carbon or low carbon generation structure. The UK plan for this was laid out in the National Energy and Climate Plan (NECP), which is a long-term framework for future legislative development.

Carbon Tariffs are one of the simplest ways for a government to encourage a shift to renewable power sources, as it increases the relative cost effectiveness of renewable power sources. Carbon tariffs are also easy to implement for government bodies, as they are revenue-positive, which can fund other initiatives. The uses for this funding can vary enormously, and some of those methods are explored below.

Government investment into research funding and technology initiatives can greatly accelerate development. The Energy Innovation Needs Assessment (EINA) project was created by the UK government in 2019 to allow for a more coherent and strategic investment system to develop and enhance the UK technology and research industries. The focus of the EINA was on the clean energy technology initiatives, which focus on promoting the development of clean energy technology, which can allow for new solutions to be developed more quickly. This investment can often be revenue positive in the long term, as it promotes economic development and helps with the creation of high paying jobs. These developing technologies can be accelerated in their development with the support of the large-scale infrastructure and investment put in place through the EINA project. These subsidies allow disruptive new technologies to be developed, where corporate funding may not be available due to the possible disruption to other sectors new developments can cause.

Another method by which central government can increase the rate of decarbonisation of the energy industry is to engage more directly in plant construction. In the past large government infrastructure projects of this nature were commonplace, but most recent developments are private sector funded. The last major project by the UK government was the construction of Sizewell B, which opened in 1996, and since then all major plant construction has been funded by the private sector. The advantage of government plant construction is that the priorities of the construction can be focussed on targets other than profitability. This shift of focus can allow government constructed plants to spearhead new technologies. However, this technological spearheading can cause issues with timescale or budget, which is a risk many political parties are not willing to take, as the backlash from failed or over-budget projects can be severe. This was seen with the calls to cancel Sizewell B as it was over budget well before

completion. The other approach to new plant construction is to encourage low-carbon generation projects is through the use of contracts for difference, which guarantee a purchase price of power from a new-build plant to make the investment more secure, however these contracts can result in a higher cost of power for the consumer due to overpayment for power when demand is low.

The use of smaller initiatives within the EINA project allows for the goal of reducing emission within the energy sector by 80% on 1990 levels by 2050 to be met, as the ambitiousness of the goal requires significant changes across the industry, not just at the top level. These initiatives include home efficiency initiatives, which reduce demand for power at a base level, inter-country interconnectors, which allow for a more stable grid through plants in other countries being able to cover spikes in demand. This interconnectedness is being enhanced, as the NECP outlines 9.5GW of interconnector infrastructure between the UK mainland and the island of Ireland. The grid in the island of Ireland is already interconnected with the Irish common power market allowing for full interconnectedness on the island. This does however increase interdependence between countries, which can have political costs, especially in a post-Brexit UK.

Overall the combination of government initiatives like those laid out in the NECP allow for the development of the energy sector to be steered towards a decarbonised future, but due to the complexity of the issue no single method can be considered a solution, instead a combination of many methods will need to be employed.