

Written Evidence Submitted by Microcab Industries Ltd (HNZ0075)

In the past few weeks several of our European neighbours have put hydrogen at the forefront of their future energy plans and the funding to support it, including [Germany](#), [Norway](#), [Portugal](#) and the [EU](#) itself. This is in addition to the efforts of [Japan](#) to become a world leader using the Tokyo Olympics, [China's](#) move in to hydrogen and hydrogen vehicles (FCEVs) in mid-2019, likely to be endorsed and enlarged in the next 5 year plan due in 2021, and [California's consolidation](#) of their push into renewables and hydrogen. These are a ringing endorsement of the hydrogen economy as the best solution to reducing emissions quickly enough to hit the various targets set, and the advantages seen by those economies to being ahead of the world in the associated technologies to provide benefits and jobs to their economies to replace and overtake those provided by fossil fuels.

As yet the UK has not got a co-ordinated Hydrogen strategy nor a clear position on where such a strategy would sit in general energy policy, and both of these are essential to moving forward and the APPG Hydrogen Inquiry is a welcome step in that direction. It should also be pointed out that the [UK's Integrated National Energy and Climate Plan \(NECP\)](#) was drawn up in early 2019 but has not been implemented since. A comprehensive updated Energy Plan/Strategy would seem to be essential in terms of planning the UK's energy future in the decade to come, which promises to produce radical change worldwide in energy policy and use.

[Microcab Industries Ltd](#)

This submission is made on behalf of Microcab Industries Ltd who are the world leaders in small-scale manufacturing of leanweight FCEVs built on circular economy principles, (which they are developing into a mass manufacturing capability). Microcab's design philosophy, as shown in its current fleet of 10 roadworthy (UK & EU) vehicles, is:

1. To minimise or eliminate all emissions and so address climate change and air pollution;
2. To maximise the efficiency of any of its products in terms of resources used;
3. To maximise the lifecycle of the vehicle through longevity, and the replacement and reusability of all parts of the vehicle and so create a circular economy;
4. To enhance the lives of users and non-users of light vehicle transportation;
5. To do all of the above while maintaining the current and future safety and functional standards of light vehicles.

Being a vehicle manufacturer, this submission will concentrate on the transport and automotive sectors, though it should be made apparent that the benefits of a hydrogen economy are that it can replace and improve all aspects of energy, and the flexibility, revenue streams and supply chains all interlink and enhance the whole economy and individual sectors.

Earlier Microcab Responses to the UK target of 2035

Microcab Industries Ltd has already provided responses to the UK Government on many of these questions in three documents in February 2020 when the UK Government first announced the new targets, as follows:

1. The report/plan itself ([link here](#)) ; and
2. An addendum on how to expand Hydrogen Refuelling Stations (HRSs) cheaply according to population and geography in the UK ([link here](#)); and
3. A Powerpoint presentation (in pdf) on the current and future state of Hydrogen Technology use as of January 2020 ([link here](#)).

Additionally a recent updated version of these documents addressing the Hydrogen Economy in Scotland, and containing more detailed information on different sectors of industry is in a Microcab response to a Scottish Government Questionnaire [here](#).

What the Microcab report is based on economically is several studies on hydrogen and renewables the most notable of which is an analysis of 139 countries by Stanford University about the economic advantages and possibilities of large scale transition to renewables and hydrogen over the next 30 years referred to [here](#), with individual analyses of 139 countries [here](#), and a summary of the projected means of energy production, including the production of associated new jobs in the UK at 2050 [here](#).

Hydrogen and FCEVs potential roles

In the short term the most impact and visibility of the hydrogen economy will be in transportation as the technology is most advanced and tested in this sector, which this depends on infrastructure. Microcab have shown that half the country in its main population centres could be served by only 20-25 Hydrogen refuelling stations within 2-3 years (HRSs) costing an estimate of £20-30m in total (cf. £400m for charging points).

Further, the spread of FC bus fleets and HGV use will result in HRSs which could be made available to the public, especially as they will be in city centres. Commercial and public sector fleets are also a logical starting place for FCEV use and so HRSs, which could be fuelled by renewables on site.

As this infrastructure develops it will provide jobs and benefits in the supply chains and manufacture of the required technologies, many of whose leading companies are based in the UK (such as ITM Power and Logan Energy). It will also provide the stimulus for the manufacture and marketing of FCEVs, which in turn will develop the supply chains, manufacture and development of the required technologies. At the moment the UK is held back in this because the largest manufacturers (Toyota and Hyundai) will not sell vehicles more than 25 Miles from an HRS resulting in very low sales of FCEVs despite the demand. However targeted funding (which can be on a matched basis with industry as is being done with charge points) and facilitation by government (which can co-ordinate the various branches of the H2/FCEV industries and companies and provide regulatory and financial incentivisation) would mean that the UK could soon catch up, and indeed overtake, its nearest rivals.

In the medium term the UK should be aiming at the same kinds of targets as its peer countries (2030 - 1m FCEVs, nationwide coverage of HRSs). At the same time it would be developing the know how and technologies to promote rollout of hydrogen and renewables worldwide as these could provide vital energy solutions to the 75% of the world that has little energy security or reliability, as well as to the most developed nations. Microcab estimated at the beginning of the year that a tipping point would have been reached by 2025 on choosing hydrogen as a major energy source in the major economies, and by 2030 it would be apparent it was to be dominant (with renewables). That means technologies such as FCEVs (and including heating, gas grids, domestic supply, etc) will advance and become the dominant technologies in their individual sectors, and each of these will support each other, and the development of green production of hydrogen on a national level.. As the question of emissions becomes controlled and targets become more clearly achievable, the focus will change to resources and the circular economy towards the end of the 2030s and thereafter.

The UK is in a good position to develop these technologies and is already advanced in renewables (40% of electricity generation in the UK, and 75% in Scotland). The UK also has a large amount of technological and academic expertise and knowledge to be able to exploit the forthcoming energy revolutions, and could develop these into a major industrial strategy for the UK to create major world-beating industries for the decades to come - if the investment is forthcoming now or in the immediate future.

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