

Written Evidence Submitted by the Nuclear Industry Association (NIA)

(HNZ0036)

1. The Nuclear Industry Association (NIA) welcomes the chance to respond to the Science & Technology Committee inquiry on 'The role of hydrogen in achieving net zero'.
2. The NIA is the trade association and representative body for the civil nuclear industry in the UK. We represent around 250 companies operating across all aspects of the nuclear fuel cycle. This includes the current and prospective operators of nuclear power stations, the international designers and vendors of nuclear power stations, and those engaged in decommissioning, waste management and nuclear liabilities management.
3. The NIA, in consultation with its members and the Department of Business, Energy & Industrial Strategy (BEIS), is due to publish a report on the role of nuclear energy in hydrogen production and the sector's vision for 2050 at the end of January 2021, a copy of which we are happy to circulate to the members of the Science & Technology Committee on its publication.

Nuclear power and hydrogen

The NIA believes that clean hydrogen has an important role to play in a future low-carbon energy system in the support of Net Zero by 2050, as well as helping to decarbonise other energy-intensive industries such as transport and heating.

However, in order to meet its full potential, Government need to consider all current technologies with the ability to produce clean hydrogen, particularly those that produce hydrogen through electrolysis, such as nuclear and renewables.

Either through electrolysis, or from the use of primary heat from nuclear power stations, nuclear offers an efficient, carbon-free alternative to producing hydrogen, and is an option that doesn't rely on unproven technologies. Nuclear, alongside renewables, is the only currently available at-scale option for clean hydrogen production.

The NIA has calculated that in 2050 the nuclear industry is capable of an additional 18GW of capacity focused solely on the production of hydrogen and district heating, either from large-scale plants or small reactors.

A recent report by the Nuclear Innovation and Research Advisory Board (NIRAB) states that clean hydrogen from nuclear energy could be produced for \$2.5/kg-H₂, compared to the cost of production from natural gas with CCS is in the region of \$2.3/kg-H₂ where electrolysis is not available. This showcases that hydrogen production from nuclear is not only highly cost-competitive but commercially viable given the status of CCS technology at this given time.

There is also further evidence that suggests producing hydrogen from nuclear is of similar cost to technologies with carbon emissions equivalent to renewables.

While CCS has been identified as a low-cost option to produce hydrogen in the future, the technology is not yet commercially viable and there are no large-scale projects currently operating so this conclusion cannot yet be confirmed.

The NIA believes that CCS will play an important role in stimulating the UK's hydrogen market but green hydrogen, whether from nuclear or renewables should be the default

Case study: Sizewell C

Sizewell C has the potential to make huge quantities of green hydrogen, using both electricity and heat and help the East of England take a lead in the new hydrogen economy. Heat assisted green hydrogen is projected to be more efficient and cheaper (by around 10%) than hydrogen produced from electricity only.

The new nuclear project in Suffolk is looking to develop a demonstration electrolyser of around 2MW and around the size of a shipping container, capable of producing up to 800kg of hydrogen per day. This low-carbon hydrogen could be used in buses transporting construction workers to and from site, to provide cleaner shipping at nearby ports and to provide clean heat and power to manufacturing around the facility. In the longer term a permanent larger facility supplied with low-carbon heat and power by Sizewell C could produce hydrogen at scale.

In November 2020, Sizewell C issued an Expression of Interest (EoI) seeking partners to develop its hydrogen demonstrator project, which will be powered by Sizewell B. Next steps include a Innovate UK funded study on transitioning from a diesel to a hydrogen fleet of vehicles, for which the team at Sizewell C is partnering with East Suffolk Council.

option for producing hydrogen the UK in the long-term.

The NIA is preparing a full paper on the contribution that nuclear power can make to green hydrogen production for the end of this month and will share with the Committee when it is published. It will contain more detail examining the potential of nuclear technologies to produce hydrogen, system investments to facilitate hydrogen deployment and policy recommendations for Government. We would be happy to discuss these with the Committee if of interest.

(January 2021)