

Written Evidence Submitted by Ryse Hydrogen and Wrightbus

(HNZ0057)

Ryse Hydrogen plans to build green hydrogen production plants at 5 strategic locations across the UK – Herne Bay, South Wales, Scotland and Northern Ireland. These will be the UK's first network of green hydrogen production sites and could produce over 17,000 tonnes per year of hydrogen when up and running. Together, all 5 plants would unlock £130m of investment to kick start the UK hydrogen economy. The planned plant at Herne Bay (which has been granted planning permission), for example, would initially install an 8.8MW electrolyser with capacity to produce between 4 and 5 tonnes of hydrogen per day. These plants will provide some of the crucial capacity needed to power hydrogen fuelled transport and other applications such as heating.

Wrightbus – a bus manufacturer based in Ballymena, Northern Ireland – has developed the world's first hydrogen electric double decker bus. Our first fleet of these buses are already in operation in Aberdeen and more fleets will enter service in London, Dublin, Belfast and Birmingham in the coming months. Advanced conversations are underway with many local authorities who see hydrogen mobility as playing a key role in their decarbonisation plans. These UK made zero emission buses, alongside electric buses, could revolutionise the UK bus industry and significantly reduce carbon emissions from transport.

Summary of Recommendations

- **Government must bring forward a UK hydrogen strategy at the earliest possible opportunity.** The Committee should ensure that publication of the hydrogen strategy remains an immediate priority of Government in order to unlock significant private investment and seize the UK's competitive advantage.
- **The 5GW by 2030 target for hydrogen production was a positive first step, but in order to accelerate progress towards net zero, Government should look to develop a more ambitious target over the course of the year.** Whilst we welcome the initial ambition set out in the Prime Minister's Ten Point Plan, we believe this target could be revised upwards. A more ambitious target will also ensure the UK remains competitive in the global hydrogen market. Scotland alone, for example, has set a target to reach 5GW of hydrogen production by 2030, while France and Germany have also set more ambitious targets
- **Government should recognise UK-made hydrogen buses are the key first use case of hydrogen which can unlock the wider potential of this fuel.** All three UK bus manufacturers make a hydrogen bus, meaning we are global leaders in this transport technology. Buses can be rolled out at scale which provides an efficient and cost-effective means to rapidly increase demand for hydrogen and reduce unit costs for future users. Investment in centralised refuelling infrastructure at depots will be critical to integrating these into the bus network and accelerating their deployment. The forthcoming Transport Decarbonisation Plan and National Bus Strategy should be technology neutral in order that hydrogen can compete on a level playing field with all-battery electric technology. The Government must also deliver on the All Hydrogen Bus town project it has discussed with the Transport Select Committee.
- **Financial support by Government should not be viewed as a panacea; the deployment of key policy levers is also needed** to remove blockages to private sector investment and provide the mechanisms necessary to implement the hydrogen strategy. Where possible, Government should ensure that existing mechanisms are aligned with its ambitions on hydrogen, for example by reforming the Bus Service Operators Grant (BSOG) and Renewable Transport Fuel Obligation (RTFO):
 - The BSOG is a £600m per year fund that subsidises the cost of diesel for bus operators. No zero-emission fuel is covered by the BSOG. **A simple switch, from fossil fuels to green fuels (hydrogen for hydrogen buses and electricity for battery electric buses), would deliver an immediate push to bus operators to**

invest in zero-emission buses at no additional cost to the taxpayer. Increasing demand for hydrogen fuel from these buses will drive private investment in the production of green hydrogen.

- The RTFO is a significant roadblock to unlocking the private investment required to meet and exceed the PM's 5GW hydrogen production target. Currently, the rules insist that to qualify, hydrogen must be produced with electricity from **new** renewable resources. This greatly restricts where in the UK hydrogen production facilities can be based. For example, there are no plans for new offshore windfarms in the North East, Wales or NI. New wind farms can take five years to be built. **Government should change the RTFO to include electricity from any renewable resources.** This would have a beneficial impact on the Government's levelling up agenda via the creation of hundreds of high-quality jobs in coastal areas within the lifespan of this Parliament. Until now, the RTFO has been governed by EU regulation. This is exactly the sort of regulatory change we should be making with our new-found Brexit freedoms, and allow the UK to pull ahead in the green hydrogen industry. The DfT is set to launch a consultation on the RTFO this month.
- To coordinate the development of a UK hydrogen economy, **a cross-Government taskforce should be established, bringing together HMT, BEIS, DfT, DEFRA and MHCLG, as well as the devolved administrations.** The taskforce should be chaired at Ministerial level to ensure the appropriate level of accountability and impetus to deliver the UK hydrogen strategy. This taskforce should function in addition to the BEIS Hydrogen Advisory Council which brings together Government and industry.
- In order to rapidly scale the nascent hydrogen market, **supply and demand must be increased in parallel.** Support for either production or demand alone without the other will result in coordination risks, limiting the level of initial investment. A lack of coordinated development will also allow other countries which have more comprehensive hydrogen strategies and financial incentives to steal a march.
- **Government must recognise that green hydrogen can be produced at scale today, whilst blue hydrogen is still several years away.** This means the UK Government's target of 5GW of "low-carbon" hydrogen production by 2030 must be urgently split to provide separate targets for green and blue hydrogen. In addition, following the Scottish Government setting their own target for 5GW of hydrogen production by 2030, the UK Government should revise up its own production target.
- **Government should increase the number of hydrogen hubs across the UK.** The Teesside Hydrogen Transport Hub is a welcome development, however many more areas across England, Wales, Scotland and NI are keen to develop their own regional hydrogen economies. Powers and funding must be made available to scale up the number of hydrogen hubs, which can quickly scale up Net Zero activity in industry, transport and energy.
- **The Government must deliver on its commitment to buy 4,000 zero emission buses by 2024,** to ensure the recovery does not become car-led, undermining the ambition to reach net zero by 2050. So far, funding to buy only 500 of the promised 4,000 buses is being made available by HM Treasury (during financial year 2021/22). Bus operators and UK bus manufacturers have developed an innovative bus leasing model which would sufficiently reduce the financial burden of transitioning to zero emission buses. We recommend forming an urgent taskforce to bring together bus manufacturers, operators and investors with HMT, DfT and BEIS to discuss the proposed pathways in detail and agree a process that will deliver the remaining 3,500 buses by 2024.

Introduction

Ryse Hydrogen and Wrightbus are at the forefront of building a UK hydrogen economy. We welcome the Prime Minister's Ten Point Plan, specifically the ambitions for "Driving Growth of Low Carbon Hydrogen". Furthermore, we welcome the support for hydrogen brought forward in the National Infrastructure Strategy, Spending Review and Energy White Paper. Together with the Prime Minister's Ten Point Plan, these documents have set a high-

level vision for hydrogen and provided initial funding to support the development and adoption of hydrogen, including a £240 million 'Net Zero Hydrogen Fund'. This is a critical first step towards enabling the hydrogen to support net zero.

As the Committee on Climate Change (CCC) has said, **the UK will not meet its net zero targets without significant investment in the hydrogen economy.** To achieve the target and deliver the much-needed contribution to net zero, UK hydrogen production capacity must expand to the size of the UK's current fleet of gas-fired power stations. The CCC recommended that Government should develop a strategy for hydrogen and aim for large scale hydrogen trials in the early 2020s. Urgent action must be taken if the UK is to meet its current target of producing 5GW of hydrogen by 2030.

The UK has the potential to be a leader in the global hydrogen economy. But without action, other countries will steal a march on the UK, leaving the country at a technological and industrial disadvantage globally and harming our ability to reach net zero while growing the economy. Other countries, such as Germany, Japan, Portugal and China, have already published strategies, committed funding and are developing financing frameworks. The Hydrogen Taskforce estimates that scaling up hydrogen solutions in the UK could unlock £18bn in GVA and 75,000 jobs by 2035, driving significant growth in regions right across the UK.¹

To ensure hydrogen can fulfil its potential to make a significant contribution to reaching net zero, Ryse Hydrogen and Wrightbus recommend that the Committee holds the Government to account on the following key steps:

- **Government must bring forward a UK hydrogen strategy at the earliest possible opportunity.** Despite earlier suggestions that the Government would publish a hydrogen strategy in Q1 2021, the National Infrastructure Strategy suggests this could be delayed by up to 12 months. A strategy is vital to give the private sector the clarity and confidence it needs to invest in hydrogen production and use cases. The Committee should ensure that publication of the hydrogen strategy remains an immediate priority of Government in order to unlock significant private investment and seize the UK's competitive advantage.
- **In order to reach net zero by 2050, Government should set a more ambitious target for the production of hydrogen than 5GW by 2030.** Whilst we welcome the initial ambition set out in the Prime Minister's Ten Point Plan, we believe this target could be revised upwards. A more ambitious target will also ensure the UK remains competitive in the global hydrogen market. Scotland alone, for example, has set a target to reach 5GW of hydrogen production by 2030. *Table 1 sets out the commitments for hydrogen production made globally.*

Country	Hydrogen Production Target
China	30GW by 2030
South Korea	15GW by 2040
Chile	5GW by 2025
France	6.5GW by 2030
UK	5GW by 2030
Italy	5GW by 2030
Germany	5GW by 2030
Spain	4GW by 2030

¹ Hydrogen Taskforce, [Economic Impact Assessment](#), 12 August 2020.

TABLE 1

- **Government should recognise UK-made hydrogen buses are the key first use case of hydrogen which can unlock the wider potential of this fuel.** All three UK bus manufacturers make a hydrogen bus, meaning we are global leaders in this transport technology. Buses can be rolled out at scale which provides an efficient and cost-effective means to rapidly increase demand for hydrogen and reduce the unit costs for future users. Investment in centralised refuelling infrastructure at depots will be critical to integrating these into the bus network and accelerating their deployment. The forthcoming Transport Decarbonisation Plan and National Bus Strategy should be technology neutral in order that hydrogen can compete on a level playing field with all-battery electric technology. The Government must also deliver on the All Hydrogen Bus town project it has discussed with the Transport Select Committee.
- **Financial support by Government should not be viewed as a panacea; the deployment of key policy levers is also needed** to remove blockages to private sector investment and provide the mechanisms necessary to the implement the hydrogen strategy. Where possible, Government should ensure that existing mechanisms are aligned with its ambitions on hydrogen, for example by reforming the BSOG and RTFO. This will help to kick start the UK hydrogen economy.
- To coordinate the development of a UK hydrogen economy, **a cross-Government taskforce should be established, bringing together HMT, BEIS, DfT, DEFRA and MHCLG, as well as the devolved administrations.** The taskforce should be chaired at Ministerial level to ensure the appropriate level of accountability and impetus to deliver the UK hydrogen strategy. This taskforce should function in addition to the BEIS Hydrogen Advisory Council which brings together Government and industry.

Building a UK Hydrogen Economy

In order to rapidly scale the nascent hydrogen market, **supply and demand must be increased in parallel.** Support for either production or demand alone without the other will result in coordination risks, limiting the level of initial investment. A lack of coordinated development will also allow other countries which have more comprehensive hydrogen strategies and financial incentives to steal a march. Not only will local areas miss out from significant investment and jobs which are sustainable in the long term, the UK will be beholden to the speed and nature of roll out in other countries. For example, some countries may prioritise the production of brown and blue hydrogen over renewable hydrogen which in the long term could prove detrimental to the UK's net zero ambitions if it then must import hydrogen.

Government must recognise that green hydrogen can be produced at scale today, whilst blue hydrogen is still several years away. This means the UK Government's target of 5GW of "low-carbon" hydrogen production by 2030 must be urgently split to provide separate targets for green and blue hydrogen. In addition, following the Scottish Government setting their own target for 5GW of hydrogen production by 2030, the UK Government should revise up its own production target.

Promoting the production of and demand for renewable or 'green' hydrogen should be the focus of the Government's Hydrogen Strategy. The Hydrogen Taskforce estimates green hydrogen production alone will create 9,847 jobs and deliver over £1.3bn of GVA for the UK by 2035.² This presents a great opportunity to support the economic levelling up of all nations and regions of the UK.

To ensure renewable hydrogen can be scaled up at the rate required to reach net zero, new wind generation capacity must be brought online alongside hydrogen production plants to power electrolyzers. In doing so, this

² Hydrogen Taskforce, [Economic Impact Assessment](#), 12 August 2020

new source of demand for renewable power will create a virtuous circle, particularly if Government provides long term hydrogen supply contracts, unlocking further growth in the renewable industry with widespread benefits across the UK supply chain. This will support the commitment in the Prime Minister's Ten Point Plan to quadruple the UK's production of wind power to 40GW by 2030 and maximise the potential value to the economy by supporting the growth of the UK's already extensive wind industry. As the UK is already a world leader in the offshore wind industry, this competitive advantage should be seized to propel the hydrogen economy forward.

Careful consideration will though be required to ensure that policies intended to promote the longer-term ambitions for renewable hydrogen do not stunt the growth of the overall hydrogen economy. This not only applies to any funding provided but also policies introduced more widely across Government. Departments will need to coordinate their work as a result. 'Blue' and 'brown' hydrogen have a role to play as enablers of the early hydrogen economy by meeting growing demand whilst renewable hydrogen plants are brought online.

Two critical policies which could be reformed to help accelerate progress on building a UK hydrogen economy to meet net zero by 2050 are the BSOG and RTFO:

- The BSOG is a £600m per year fund that subsidises the cost of diesel for bus operators. No zero-emission fuel is covered by the BSOG. **A simple switch, from fossil fuels to green fuels (hydrogen for hydrogen buses and electricity for battery electric buses), would deliver an immediate push to bus operators to invest in zero-emission buses at no additional cost to the taxpayer.** Increasing demand for hydrogen fuel from these buses will drive private investment in the production of green hydrogen.
- The RTFO is a significant roadblock to unlocking the private investment required to meet and exceed the PM's 5GW hydrogen production target. Currently, the rules insist that to qualify, hydrogen must be produced with electricity from new renewable resources. This greatly restricts where in the UK hydrogen production facilities can be based. For example, there are no plans for new offshore windfarms in the North East, Wales or NI. New wind farms can take five years to be built. **Government should change the RTFO to include electricity from any renewable resources.** This would have a beneficial impact on HM Treasury revenues via the creation of hundreds of new jobs in coastal areas within the lifespan of this Parliament. Until now, the RTFO has been governed by EU regulation. This is exactly the sort of regulatory change we should be making with our new-found Brexit freedoms, and allow the UK to pull ahead in the green hydrogen industry. The DfT is set to launch a consultation on the RTFO this month.

To maximise the full potential of hydrogen across the economy, including in decarbonising heat networks, trains, HGVs, aviation and maritime, hydrogen policy needs to be coordinated and joined-up across Government to stimulate meaningful investment and action.

Government should also increase the number of hydrogen hubs across the UK. The Teesside Hydrogen Transport Hub is a welcome development, however many more areas across England, Wales, Scotland and NI are keen to develop their own regional hydrogen economies. Powers and funding must be made available to scale up the number of hydrogen hubs, which can quickly scale up Net Zero activity in industry, transport and energy. This would create a strong foundation for a UK hydrogen economy by concentrating economic benefit and developing an expert workforce at strategic locations, as well as capitalising on existing academic leadership. There is also potential for hubs in Scotland, Northern Ireland and Wales which would kick start a hydrogen economy capable of driving the UK to net zero by 2050.

Buses as a key to unlocking the hydrogen economy

The Government must deliver on its commitment to buy 4,000 zero emission buses by 2024, to ensure the recovery does not become car-led, undermining the ambition to reach net zero by 2050. So far, funding to buy only 500 of the promised 4,000 buses is being made available by HM Treasury (during financial year 2021/22). Bus operators and UK bus manufacturers have developed an innovative bus leasing model which would sufficiently

reduce the financial burden of transitioning to zero emission buses. We recommend forming an urgent taskforce to bring together bus manufacturers, operators and investors with HMT, DfT and BEIS to discuss the proposed pathways in detail and agree a process that will deliver the remaining 3,500 buses by 2024.

Transitioning to zero emission buses will support the UK's drive towards net zero by 2050. The Government has committed to buy "4,000 brand-new buses – zero-carbon, British-built buses" by 2024. But this ambition will need to be quickly scaled up to replace the 40,000 buses currently on the UK's roads. **Maintaining a high-quality, convenient bus service is imperative to provide a viable zero emission alternative to get cars off the road, particularly for those on the lowest incomes.**

UK-made hydrogen buses are made by all three UK bus manufacturers. This means the UK is ahead of the world in this Net Zero transport technology. Wrightbus' first fleet of these buses is already in operation in Aberdeen and more fleets will enter service in London, Dublin, Belfast and Birmingham in the coming months. Advanced conversations are underway with many local authorities who see hydrogen mobility as playing a key role in their decarbonisation plans. These UK made zero emission buses, alongside electric buses, could revolutionise the UK bus industry and significantly reduce carbon emissions from transport.

Hydrogen buses are already cost competitive with battery electric equivalent models and provide a credible alternative, but further cost reductions can be realised. For example, if 3,000 hydrogen fuel cell buses are manufactured over five years, Wrightbus believe the final sales price can fall from £450,000 at present to below £300,000 as a relatively modest scale is reached – which could in turn rapidly accelerate the pace of local area decarbonisation plans.

However, bus operators have seen a collapse in business due to Covid-19, which has badly affected their financial position with an unavoidable knock-on effect on the bus manufacturing industry. As a result, orders for new buses have fallen by over 30% in 2020 and there is very little visibility for 2021. This is by far the biggest and sharpest fall in business the industry has ever faced. **Such pressure on revenues threatens the ability of bus operators to transition their current fleets to zero emission models and with it the UK's push to reach net zero by 2050.**

Several major UK operators have already committed to switching to zero emission buses. Currently, bus operators purchase new buses upfront with a double-deck zero emission bus – both hydrogen and battery electric – costing c.£450,000, compared to a diesel equivalent at £230,000. **Given their current financial positions, it is not feasible for operators to begin decarbonising their fleets.**

Buses are at the centre of communities across the UK. Research by the Centre for Cities shows that buses remain a critical service, particularly for those on the lowest incomes, and will be integral to public transport systems post-pandemic.³ In 2018/19 4.32bn bus journeys were taken across the UK.⁴ The Government has already provided £600m of funding to bus operators in order to support them through this challenging time. However, with passenger numbers likely to remain depressed in the coming months, **a new approach is needed to keep the UK bus industry trading and ensure the recovery does not become car-led, undermining the ambition to reach net zero by 2050.**

As a solution, bus operators and UK bus manufacturers have approached Government with different financial incentive packages to accelerate the transition to zero emission buses. One current project is requesting a part subsidy for the difference in the hydrogen fuel cell bus price, compared to the diesel bus price, to help make the costs more manageable.

Working with private financiers, the buses will then benefit from an innovative bus leasing model which would sufficiently reduce the financial burden of transitioning to zero emission buses. This would enable operators to lease new zero emission buses on a monthly basis, rather than purchasing outright, to reduce upfront costs and

³ Centre for Cities, [Where next for buses after the pandemic?](#), 28 July 2020.

⁴ Independent Transport Commission, [The shape of changing bus demand in England](#), January 2020.

improving cash flow whilst passenger numbers remain low. Such an approach could accelerate the transition to a zero-emission bus network, increasing orders for new battery electric and hydrogen buses, in turn supporting bus manufacturers. It is essential that hydrogen and battery electric technologies can compete on a level playing field to drive down costs such that the transition to a zero-emission transport network can be realised at the best value for money. The model could also harness private investment to fund the purchase of a fleet of zero emission buses and provide the necessary infrastructure, in a similar way to the ROSCOs in the rail sector.

To support the delivery of the transition to zero emission buses and ensure a joined-up approach across Government, we recommend forming a taskforce to bring together bus manufacturers, operators and investors with HMT, DfT and BEIS to discuss the proposed pathways in detail.

Competition between net zero transport technologies will however be crucial to drive forward technological innovation and bring down costs to deliver the net zero transition at the lowest cost for consumers and taxpayers. **The Committee should strongly encourage the Department for Transport to make the forthcoming National Bus Strategy technology neutral** in order to promote the roll out of zero emission buses and other hydrogen vehicles across the UK. This will ensure that competition between zero-emission bus technologies continues to drive the greatest efficiencies and value for passengers, as well as kick-starting the hydrogen economy.

Rolling out hydrogen buses will also improve private sector delivery capabilities, reducing the risk associated with financing other use cases for hydrogen by applying these learnings. The economies of scale and increased demand for hydrogen will also drive down the costs of the technology and improve the economic case for other uses.

Conclusion

Hydrogen presents an opportunity to put the UK on a path to a green recovery and ensure that reaching net zero by 2050 is possible. UK companies have developed hydrogen technology capable of decarbonising the most challenging parts of the economy, which would create jobs and drive growth. But without support in these early stages, other countries will steal a march on the UK. The Government must act now to ensure that the UK can capitalise on its advantage in the hydrogen economy to reach net zero.

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