

Written Evidence Submitted by Thames Estuary Growth Board (HNZ0015)

As Thames Estuary is the UK's number one government-backed growth opportunity, we have a significant role to play in the country's economy post Brexit and post Covid-19, and in supporting the UK aim of net zero carbon by 2050.

In November 2020, our Hydrogen Summit revealed the Thames Estuary's huge and unparalleled potential for hydrogen. We have started work on our Hydrogen Investment Strategy which will outline how a hydrogen ecosystem can be successfully realised within the Thames Estuary. This is important not just for our carbon reduction ambitions but also in supporting the levelling up of the Estuary with the rest of the UK. Our investment strategy will not only set out a compelling case for investment, but it will also highlight the wider benefits such as opportunities for skills and training, environmental benefits, employment opportunities, improved health outcomes and attracting investment. Initial high-level analysis has identified close to £45bn of combined GVA growth and below the line system savings could be projected across the project lifecycle for an energy infrastructure project on the scale possible within the Thames Estuary Growth Region.

Our Hydrogen Summit heard from Ineos, Shell, EDF, Orsted, National Grid as key industry figures all who are grasping the opportunities hydrogen presents. We heard from a range of businesses innovating in this space (Ryse, E2Go) and a range of industry figures from consultancy and academia. The clear consistent message is that there is a huge ambition for investment in the UK's hydrogen infrastructure, but clarity is needed on Government policy and support to unlock investment.

Our response is structured in response to the questions from the call for evidence.

1. The suitability of the Government's announced plans for "Driving the Growth of Low Carbon Hydrogen", including:
 - the focus, scale and timescales of the proposed measures;
 - how the proposed measures—and any other recommended measures—could best be co-ordinated;
 - the dependency of the Government's proposed plans on carbon capture and storage, any risks associated with this and how any risks should be mitigated; and
 - potential business models that could attract private investment and stimulate widespread adoption of hydrogen as a Net Zero fuel;

The Governments announcements so far in relation to driving the growth of low carbon hydrogen are a good start, but much more is needed. The Hydrogen Strategy, expected in 2021, needs to build on this to identify clearly how the UK will use hydrogen as a key contributor to achieving net zero by 2050. The scale of the contribution that hydrogen can make in reaching this aim does not seem to be reflected in the level of support to date.

There is a real opportunity for the UK to become a global leader in the development of hydrogen. This also provides a route to supporting wider growth within the UK, supporting the levelling up across the country. However, the scale of interest and investment so far does not appear to match progress and commitments being made in other countries. Investors are moving away from fossil fuels and see hydrogen as a significant opportunity.

A key aspect that we would wish to see in the hydrogen strategy is how the Government would support the development of the hydrogen economy using mechanisms used in other sectors. The Government has used Contract for Difference mechanisms to support the development of the offshore renewable sector, so a similar approach would potentially work well in establishing

investment in hydrogen production. The Government could also consider supporting investment in infrastructure to support storage and distribution. We heard at our Hydrogen Summit from Blackrock, a prominent global asset manager who indicated that there is significant interest across the world in investment in hydrogen infrastructure. However, the projects are not coming forward. A favourable policy framework will go a long way to supporting confidence and enabling investable projects to be delivered. This is where the UK could take the opportunity to create the conditions to unlock this investment interest.

We should start from the position of manufacturing hydrogen using renewable sources of energy in the most carbon neutral way possible. This will mean investment in renewable energy sources. Renewable energy is not easily stored, so hydrogen can be a means by which excess supply from renewable sources when there is little demand (eg overnight) could be used to produce hydrogen, thereby exploiting energy that would not be used. The Government will need to consider a balance of manufacture that favours the production of green hydrogen to ensure investment made now contributes to the achievement of net zero by 2050.

2. The progress of recent and ongoing trials of hydrogen in the UK and abroad, and the next steps to most effectively build on this progress;

We need to move on to the next stage with trials and pilots. The use of hydrogen may well be proven in some applications on a small scale, but we need to now demonstrate to end users and consumers that hydrogen can work in real life applications. For example, working with logistics companies to use hydrogen instead of diesel for larger vehicles. This would demonstrate how hydrogen could work both to the host organisation and to the wider market. We need to prove the technology and how it works 'in real life'.

We also need to use this next stage of trials to also send a clear signal to end users and investors to drive uptake and create a virtuous circle which will drive demand and a transition away from fossil fuels.

Public services across the UK could have a significant role to play here, with a large fleet of vehicles supporting services ranging from public transport to waste collection. With the end of petrol and diesel vehicle sales in 2030, this leaves 9 years to support these fleets in their transition. Now is the time to start testing and trialling hydrogen applications at scale, building on some of the smaller trials that have recently started. As well as providing a real world test, it will also serve to build confidence in the technology/fuel and also has the benefit of being able to build up demand for hydrogen.

Through this approach, the Government (both directly and through Local Government) has influence over a large part of generating the demand for hydrogen. This creates a much more favourable context for investment because there is a known set of secured end users. The public sector would be able to show a true leadership role in the transition, but this will clearly need support from Government to even up the costs of continuing with fossil fuels vs the adoption of hydrogen.

3. The engineering and commercial challenges associated with using hydrogen as a fuel, including production, storage, distribution and metrology, and how the Government could best address these;

As we scale up the use of hydrogen, the development of the infrastructure must keep pace. We do not want to create a scenario where we are locked in to importing fuel for the long term or relying on production that is not low or zero carbon.

The petrochemical and chemical industries by their nature have significant experience of handling products such as hydrogen. The role the Government could consider, bearing in mind

the net zero by 2050 ambition, is to support the development of a green hydrogen infrastructure from the outset. The Government could consider providing further support to projects that support the net zero aim.

The Government may also consider the support to major infrastructure (storage and distribution networks) as a way of providing support to the sector and reducing up front costs. This will also support the narrowing of the costs between fossil fuels and hydrogen. This could be through range of mechanisms such as co-investment with the energy sector.

The Government will also need to drive a co-ordinated approach to the regulatory picture. There are a range of regulatory contexts (Planning, Energy, Environmental, Health & Safety etc.) which have a role to play in the regulation of hydrogen. Work needs to take place now, and swiftly, to create a clear regulatory framework within which the hydrogen sector can develop. The hydrogen strategy, when published, should contain a clear programme through which this regulatory picture will be developed.

4. The infrastructure that hydrogen as a Net Zero fuel will require in the short- and longer-term, and any associated risks and opportunities;

The manufacture of hydrogen must be supported by energy produced by renewable means. This will require a clear understanding of the demand curve for hydrogen, but also understanding how the UK's renewable energy generation capacity will keep pace with this demand.

The big challenge is going to be keeping demand, supply and storage in balance but also delivering ongoing growth. We will need a storage and distribution network that ensures 100% reliability for end users (fuel is always available when needed), capacity within the storage infrastructure to deal with possible fluctuations in manufacture.

As demand increases, the supply and distribution network will evolve. In the first instance, it may be port/industrial cluster centric because this is where current demand appears to be highest. This may favour 'return to base' type transport operations. However, we will need to consider how we can then support longer distance traffic that will need to refuel. The strategic route networks across the country will therefore need to be a key part of the refuelling infrastructure roll out to support the use of hydrogen for longer distance traffic.

Distribution should also be supported by hydrogen and renewable sources. Having green hydrogen delivered to refuelling stations by diesel tanker undermines its green status and does not send out a positive message. There could also be a greater role for transport by water, again hydrogen powered, because this will allow greater volumes to be moved and support wider uses such as maritime and inland waterways.

5. Cost-benefit analysis of using hydrogen to meet Net Zero as well as the potential environmental impact of technologies required for its widespread use; and

The Thames Estuary Hydrogen Strategy will enable us to respond in more detail to this when it is complete in Spring 2021.

6. The relative advantages and disadvantages of hydrogen compared to other low-carbon options (such as electrification or heat networks), the applications for which hydrogen should be prioritised and why, and how any uncertainty in the optimal technology should be managed.

Within the Thames Estuary, we see hydrogen forming part of a wider energy picture as we move towards 2050. We are focussing our efforts on hydrogen because our initial work

indicates that we have a demand in the Estuary that fits very well with what hydrogen can offer us. We have a range of uses – maritime, logistics and transport – where hydrogen appears to be the optimum solution. Other energy sources do not offer the same intensity or come with further complications. We also have a number of characteristics that suit hydrogen – access to renewable energy, distribution networks and also the capability to produce a compelling demand case. We are preparing an investment strategy and plan to show how hydrogen infrastructure can be delivered within the Thames Estuary. This will be ready in Spring 2021.

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