A ROAD MAP FOR THE FURTHER DEPLOYMENT OF THE HYDROGEN ECONOMY

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Delivering the Hydrogen Economy North West:

A Road Map for the Further Deployment of the Hydrogen Economy

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May 2019
Conclusion

…..the figures quoted above suggest that the hydrogen route might well be cheaper than the electricity route…..

….. could only be delivered on the basis of a major strategic decision by the Government and a clear vision of the future low-carbon energy system

……..require a very clear and determined government strategy; it is likely that it would only make sense if there was an overall vision of a hydrogen- based energy economy…. 
The hydrogen economy
The Workshops Activities

Activities hosted throughout the sessions included:
- Challenges, barriers, risks and opportunity mapping
- Sub-group business models (production, transportation and retail)
- Business plans (Dragons Den style pitch)
- Group Road-mapping
- Briefing note to Claire Perry, responsible politician
- Conclusion sharing and cross-collaboration
Key Themes

- Incremental build up of demand and supply
- Public transport and return to base fleets as stage one
- Blending and industrial decarbonisation via establishment of regional hubs
- Hydrogen production from constrained renewables and methane reformation with CCS
- Gather evidence to support case for 100% conversion
- Reduce dependence on single big government decision
- Build consumer acceptance
- Develop regulatory and market models with large elements of competition and equitable socialisation costs
- Use next 5 years to implement demonstration and real projects.
Next steps

- Pilots & scale demos
- Public understanding
- Coordinated research
- Learn from overseas
- Policy and market design
- Jobs and employment

Learn from overseas

Policy and market design

Coordinated research

Public understanding

Jobs and employment

Pilots & scale demos

Next steps
Committee for Climate Change: Net Zero report

Development of a hydrogen economy to service demands for some industrial processes, for energy-dense applications in long-distance HGVs and ships, and for electricity and heating in peak periods. By 2050, a new low-carbon industry is needed with UK hydrogen production capacity of comparable size to the UK’s current fleet of gas-fired power stations.

Delivery must progress with far greater urgency. Many current plans are insufficiently ambitious; others are proceeding too slowly, even for the current 80% target:

• Over ten years after the Climate Change Act was passed, there is still no serious plan for decarbonising UK heating systems and no large-scale trials have begun for either heat pumps or hydrogen.
**Figure 2. UK net-zero GHG scenario**

<table>
<thead>
<tr>
<th>Category</th>
<th>2020s</th>
<th>2030s</th>
<th>2040s</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELECTRICITY</td>
<td>Largely decarbonise electricity; renewables, flexibility, coal phase-out</td>
<td>Expand electricity system, decarbonise mid-morning/peak generation (e.g. using hydrogen), deploy bioenergy with CCS</td>
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<tr>
<td>HYDROGEN</td>
<td>Start large-scale hydrogen production with CCS</td>
<td>Widespread deployment in industry, use in back-up electricity generation, heavier vehicles (e.g. HGVs, trains) potentially switch to hydrogen</td>
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<tr>
<td>BUILDINGS</td>
<td>Efficiency, heat networks, heat pumps (new-build, off-gas, hybrids)</td>
<td>Widespread electrification, expand heat networks, gas grids potentially</td>
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<tr>
<td>ROAD TRANSPORT</td>
<td>Ramp up EV market, decisions on HGVs</td>
<td>Turn over fleets to zero-emission vehicles: cars &amp; vans before HGVs</td>
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<tr>
<td>INDUSTRY</td>
<td>Initial CCS clusters, energy &amp; resource efficiency</td>
<td>Further CCS, widespread use of hydrogen, some electrification</td>
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<tr>
<td>AGRICULTURE</td>
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<td>Healthy diets, reduced food waste, tree growing and low-carbon farming practices</td>
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<tr>
<td>AVIATION</td>
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<td>Operational measures, new plane efficiency, constrained demand growth, limited sustainable biofuels</td>
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<tr>
<td>SHIPPING</td>
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<td>Operational measures, new ship fuel efficiency, use of ammonia</td>
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<td>WASTE</td>
<td>Reduce waste, increase recycling rates, landfill ban for biodegradable waste</td>
<td>Limit emissions from combustion of non-bio-wastes (e.g. Deploy measures to reduce emissions from waste water)</td>
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<tr>
<td>F-GASES</td>
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<td>Move almost completely away from F-gases</td>
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<tr>
<td>GREENHOUSE GAS REMOVALS</td>
<td>Develop options &amp; policy framework</td>
<td>Deployment of BECCS in various forms, demonstrate direct air capture of CO₂, other removals depending on progress</td>
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<tr>
<td>INFRASTRUCTURE</td>
<td>Industrial CCS clusters, decisions on gas grid &amp; HGV infrastructure, expand vehicle charging &amp; electricity grids</td>
<td>Hydrogen supply for industry &amp; potentially buildings, roll-out of infrastructure for hydrogen and electricity grids, more CCS infrastructure, electricity network expansion</td>
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<tr>
<td>CO-BENEFITS</td>
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<td>Health benefits due to improved air quality, healthier diets and more walking &amp; cycling Clean growth and industrial opportunities</td>
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