UKPIA

This document summarises UKPIA's ideas on how low carbon fuels can help the UK deliver net zero greenhouse gas emissions by 2050 and what Government can do to help the downstream sector play its part.

How the UK can develop the Low Carbon Fuels it needs as we move towards Net Zero:

What approach to technology is needed to cut Green House Gas emissions most efficiently?

We believe that a 'technology neutral' approach rather one which focuses on any specific technology will achieve the greatest carbon savings.

The types of technology needed:

UKPIA analysis of future demand suggest that a range of Low Carbon Fuels (LCF) will be needed to reduce greenhouse gas (GHG) emissions at the scale required in addition to the electrification of transport.

How should the UK plan for the future demand of LCFs?

Careful analysis of demand and supply is needed to ensure that LCFs can be introduced at the scale required to meet Net Zero as their use transitions over time from road to other sectors. Such analysis will help determine whether policy interventions may be required to further incentivise supply.

More LCF will be required:

LCFs supply won't fully meet future fuel demand as we move to Net Zero, according to our assessment. And we believe that the development of no future 'silver bullet' technologies should be relied on to plug gaps in supply for example in Heavy Goods Vehicles and aviation.

How should the UK incentivise production of the best LCFs?

The Renewable Transport Fuels Obligation (RTFO) should move from its current approach where the obligation is met by the volume of renewable fuels added, to a GHG emissions approach, where the obligation is met by reducing Carbon Dioxide (CO_2) emissions by a set amount.

Many kinds of LCFs are needed:

In addition to more traditional biofuels, LCFs such as renewable fuels of Non-Biological Origin, Recycled Carbon Fuel as well as liquid and gaseous fuels associated with Carbon Capture, Utilisation and Storage (CCSU) offer opportunities to decarbonise.

How can hydrogen be best used as a fuel?

All types of low carbon hydrogen, including Green, Blue and Pink need to be supported to meeting the rising demand for the energy source.

The Government's LCF Strategy should encourage the further development of hydrogen supply chains to meet future demand. Several trials are seeking to overcome challenges associated with the supply and distribution of the hydrogen required in the future. These should continue and be expanded, and the learnings shared.

Several types of aviation fuel will be needed:

According to UKPIA analysis, low carbon aviation is likely to need battery, hydrogen, and Sustainable Aviation Fuel (SAF) technologies depending on the type of aircraft, future developments in aircraft design, as well as length of flight.

The future role of Internal Combustion Engine vehicles:

Studies have concluded that Internal Combustion Engine (ICE) powered vehicles will be around for a considerable time, despite announced phase out dates for the sale of new light vehicles. ICE vehicles can offer a decarbonisation solution in a technology neutral approach.

Hydrogen powered ICE engines will offer a similar reduction in CO_2 emissions as Hydrogen Fuel Cells and aftertreatment could be used to bring Nitrogen Oxide emissions within acceptable levels.

What the downstream sector needs to play its part in delivering LCFs needed for Net Zero:

What does the downstream sector need to secure its future role?

There needs to be a level playing field with key competitor countries such as those in the European Union to encourage investment in the technologies required to achieve Net Zero.

The sector is facing unequal costs:

UKPIA analysis shows the UK Emissions Trading Scheme (UK-ETS) as well as UK energy costs place a significant financial burden on the sector compared with competitor countries in the European Union.

How should the UK-ETS be revamped so companies can invest?

The cost of the UK-ETS should align with the EU-ETS and UK energy costs should be similar to those seen by competitor countries. This will give business owners the confidence needed for future investment in the UK

But we are still investing in LCF projects:

The Downstream Sector is currently investing heavily in LCFs to help the UK transition to Net Zero. The sector is producing low carbon biofuels, SAFs, delivering Electric Vehicle charging networks and large scale hydrogen and CCUS projects

How should the downstream's distribution system be utilised?

The UK has a robust system in place for the distribution of liquid fuels from the point of production, or import, to the consumer. This national asset should be retained as much as possible through the energy transition, and ideally form part of the LCF Strategy.

Hydrogen projects include:

Phillips 66 Humber Refinery near Immingham is producing thousands of tonnes of SAF that will now help power a number of British Airways flights. The SAF is produced from sustainable waste feedstock at the refinery and British Airways will add it into the existing pipeline infrastructure that directly feeds several UK airports including London Heathrow.

How can competitions be used to develop LCFs?

UKPIA recognises Government steps to support the development of LCFs by funding research through competitions. These competitions should be technologically neutral to ensure they achieve the largest UK greenhouse gas savings at the lowest cost.

A project that removes carbon from the air:

Advanced Biofuel Solutions Ltd has won a £4.8m grant under a BEIS competition to develop technologies that remove carbon emissions from the atmosphere to create LCFs.

The Biohydrogen Greenhouse Gas Removal Demonstration Project, undertaken in collaboration with Progressive Energy Ltd and University College London, will convert household waste into biohydrogen for use in the transport sector.

The award comes from the Direct Air Capture Removal Innovation Programme; Phase 2 of the competition which provides funding from the Net Zero Innovation Portfolio (NZIP).

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