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# Supporting the UK's transition to hydrogen powered HGVs

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**Our partnership**



**THE MIDLANDS HAS A LONG HISTORY OF AUTOMOTIVE EXPERTISE AND A STRONG FREIGHT AND LOGISTICS SECTOR AS WELL AS KEY REFUELLING ASSETS ALREADY IN PLACE INCLUDING THE TYSELEY ENERGY PARK IN BIRMINGHAM**

**Clean, hydrogen powered heavy goods vehicles (HGVs) could become a reality on UK roads thanks to a Midlands project supported by the Department for Transport's Zero Emission Road Freight programme, which aims to introduce 44-tonne, hydrogen trucks into the UK and develop new hydrogen refuelling infrastructure.**

The first phase of the H2GVMids project was a feasibility study, to prepare the ground for a green-hydrogen fuelled 44-tonne truck demonstration programme in the Midlands. The study involved identifying all of the necessary infrastructure required, including hydrogen refuelling stations (HRS), sourcing of hydrogen trucks, identifying sources of hydrogen as well as developing a business case and delivery system, and establishing a trial lease system for truck operators.

The project was led by EDF and project managed by the Energy Research Accelerator (ERA) with support from the Midlands Engine and a host of other companies including Cenex, Adelan, HORIBA MIRA, MDS Transmodal, Arcola Energy, Toyota, Intelligent Energy, Motive Fuels, and Tyseley Energy Park in Birmingham.

Following the successful completion of the project the consortium now has the opportunity to bid for the next phase of funding to bring a large-scale demonstration of 44-tonne HGVs and the associated infrastructure to the Midlands, where there is a long history of automotive expertise and a strong freight and logistics sector as well as key refuelling assets already in place including the Tyseley Energy Park in Birmingham.



Pictures: Hydrogen HGVs, designed by Viritech



## About the H2GVMids feasibility study

The first phase of the H2GVMids project was based around the development of a feasibility study. The study examined:

- An appropriate specification for a 44-tonne HGV truck to operate in the UK, including a detailed analysis of the fuel requirements and fuel efficiency
- Modelling of logistics routes across the Midlands in collaboration with logistics organisations
- A plan for the optimal distribution of hydrogen refuelling stations, capacity requirements and a plan for the generation of hydrogen with both on- and off-site options
- An evaluation of the skills required to underpin a hydrogen freight programme
- A map of Midlands-based supply and value chains to identify gaps and opportunities

## Our recommendations

Our project considered a series of options and pathways for a Midlands-centred demonstration at a scale of between 50 and 89 trucks. The options appraised a variety of timescales for deployment, geographic coverage, subsidy regimes, and operational models from leasing to ownership. In addition, the needs of the logistics operators have been assessed and integrated, as have the skill requirements for the sector. Crucially, the study also assessed the potential for UK based hydrogen truck manufacturing with an assessment of the Midlands automotive supply chain and the key gaps which need to be plugged for the manufacture of a UK 44-tonne hydrogen truck.

The conclusion is that the Midlands is in an extremely strong position to deliver a hydrogen truck trial which builds off the existing refuelling stations and supports the development of up to three further refuelling stations with the first hydrogen trucks on the road in 2023.

If successful, our demonstration would start with a back to base model, utilising already operational Motive refuelling station at Tyseley Energy Park in Birmingham and the planned one at HORIBA MIRA in Nuneaton. Trucks with a range of approximately 200km would be able to operate within a 100km radius of base. In later phases additional refuelling stations would be linked into the demonstration, allowing a more open network where trucks could be operated on routes including to Teesside and a range of other locations.

The H2GVMids trial will also link up with the strategic hydrogen activities in Teesside through the Tees Green Hydrogen project, which is led by EDF Renewables and Hynamics.

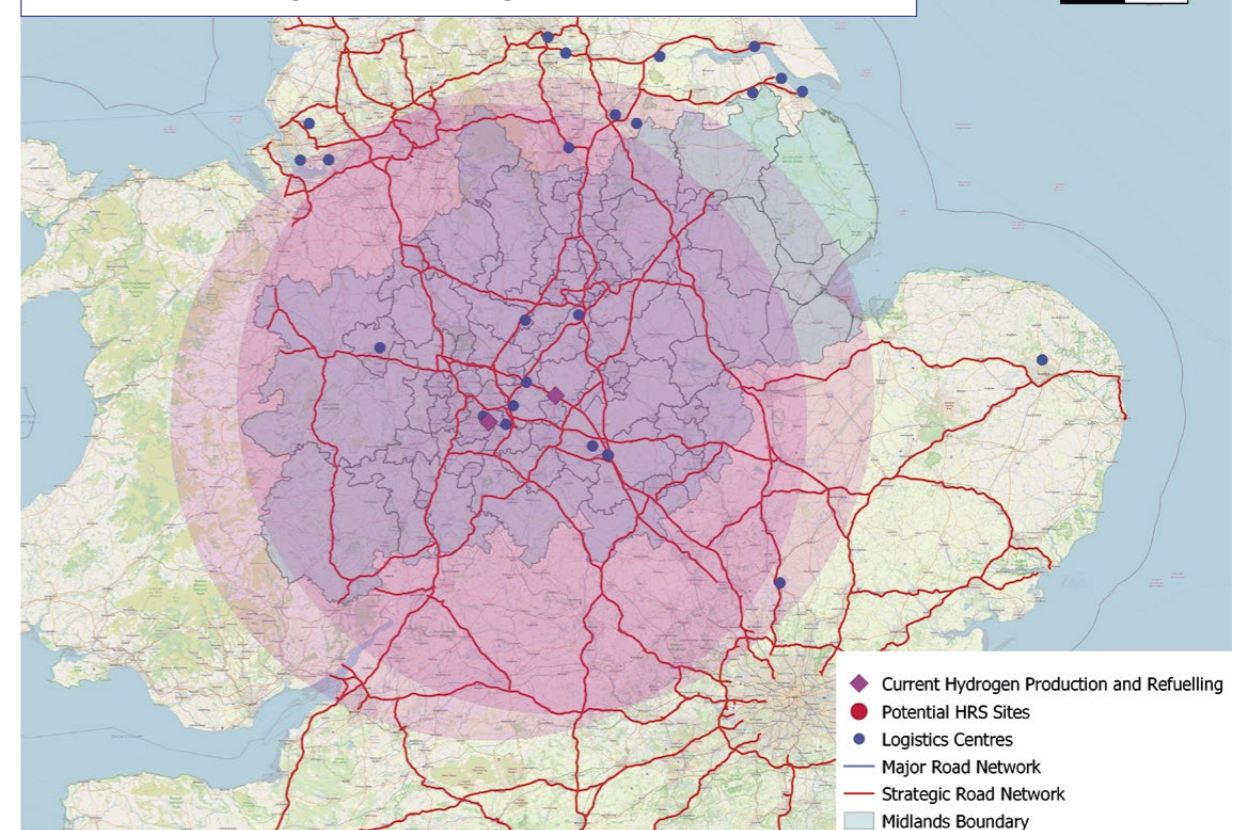
**Supports the development of up to three further refuelling stations with the first hydrogen trucks on the road in 2023**

**Trucks with a range of approximately 200km would be able to operate across the Midlands**

Figure 1: Current and potential hydrogen refuelling stations for the trial



Figure 2: Back to base, using current infrastructure for a 100 mile radius, 200 mile range based on a 35kg tank



# Creating a hydrogen fuelled HGV network for the Midlands and UK

## Wider benefits to the regional economy

The proposed H2GVMids programme will introduce hydrogen trucks to the UK at a large scale and hopefully demonstrate to hauliers and logistics businesses that they can migrate to hydrogen fuelled trucks. One of the key conclusions of the feasibility study is that not only is there a need to develop a full-trial demonstrator but there is a need to proactively support the creation of a Midlands based hydrogen HGV manufacturing sector, particularly given the huge market potential.

Beyond the potential for decarbonisation, the hydrogen truck sector presents a very significant growth and jobs opportunity for the Midlands and UK. The oldest fuel cell technology businesses in the UK (Adelan and Intelligent Energy) grew in the Midlands, and UK expertise is concentrated in this region through associated activities. In parallel with a hydrogen truck demonstration programme, there is an opportunity to help the automotive sector realign to take advantage of the growth in this rapidly emerging sector, to avoid the UK relying on importing hydrogen technologies and vehicles.

Our feasibility study shows that 85% of the components needed for a hydrogen fuel cell HGV could be manufactured within the Midlands, either through existing product suppliers or through direct transferability of manufacturing. Targeted future funding could establish early hydrogen technology supply chains in the UK, in line with the Midlands Engine Green Growth Strategy, and accelerating the global progress in net-zero solutions.



**85% OF THE COMPONENTS NEEDED FOR A HYDROGEN FUEL CELL HGV COULD BE MANUFACTURED WITHIN THE MIDLANDS**



Picture: Motive's Hydrogen Refuelling Station at Tyseley Energy Park.

## Why the Midlands

Almost a quarter of all British goods move through the Midlands at some point. The region is traversed by complex networks of road and rail infrastructure. Immingham, the largest port in the UK by tonnage handled and the biggest deep-water port on the Humber lies in the East of the region, while East Midlands Airport, the UK's busiest pure cargo airport sits centrally. The region is also home to two successful Freeport applications at East Midlands Airport and the Humber.

The Midlands is the Golden Triangle for logistics with a large number of organisations having distribution centres in the region. It has the highest national concentration of road and rail freight in the UK and lies within four hours by road of 90% of UK businesses. Freight contributes to over 20% of the road-based Midlands transport carbon emissions, in addition to the PM and NOX emissions and the associated health impacts.

The Midlands is also at the leading edge of hydrogen refuelling, with the existing 1 tonne per day ITM electrolyser at Tyseley Energy Park in Birmingham, being one of the largest, greenest and cleanest sources of hydrogen in Europe. The further development of a hydrogen refuelling station at Nuneaton at the HORIBA MIRA site establishes a ready-to-go platform for hydrogen truck trials. The Midlands has already established itself as leading with hydrogen transport, with the West Midlands already operating 20 hydrogen buses and has secured a further 124 hydrogen buses making it the largest concentration of hydrogen buses in the western world.

The Midlands is also at the heart of the automotive industry, with significant expertise across the region. Toyota, and Jaguar Land Rover with existing fuel cell vehicle expertise and electric car production are also Midlands based.

**THE MIDLANDS HAS THE HIGHEST NATIONAL CONCENTRATION OF ROAD AND RAIL FREIGHT IN THE UK AND LIES WITHIN FOUR HOURS BY ROAD OF 90% OF UK BUSINESSES**



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