

Safety Features:

- Side impact-absorbing framework around hydrogen tanks;
- Hydrogen refuelling cut-off strategy;
- Vehicle dynamic & static hydrogen leak detection with engine shut-down;
- Hydrogen tanks located underneath allowing gas to escape quickly and efficiently in the unlikely event of a leak;
- No design or structural changes have been made nor any safety features changed to seat-belt systems, airbags, braking system, or locking systems.



Hydrogen-Diesel Hybrid Vans in Aberdeen City Council's fleet



For further information go to

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HyTrEc

Hydrogen Transport Economy
for the North Sea Region

The Hydrogen Transport Economy (HyTrEc) project aims to improve access to and advance the adoption of hydrogen as an alternative energy vector across the North Sea Region. The project will identify and address structural impediments constraining development of, access to and adoption of this alternative fuel in urban and rural settings.

As part of the HyTrEc Aberdeen project, the Council is trialling two hydrogen diesel hybrid vans, integrating them into the Council's fleet. A range of operational data is being collected for example fuel consumption, routes driven and location which will be used to analyse vehicle performance and will aid the development of the next generation of the technology.

Our experience will be shared and compared with our project partners, some of which are trialling similar technologies.



Overview:

- Two Ford transit vans have been converted using Revolve H₂ICED technology (dual fuelled internal combustion engine);
- This hybrid vehicle acts as a bridging technology, producing less emissions than a conventional diesel vehicle whilst being cheaper than a fuel cell vehicle. The hybrid burns hydrogen, whilst fuel cell electric vehicles use hydrogen in a chemical process to produce electricity to run an electric motor with water vapour being the only emission

Benefits over conventional-fueled vehicles:

- Improved environmental performance with a 70% reduction in carbon dioxide emissions and a 40% reduction in nitrogen oxide emissions;
- Promotes renewable energies (if H₂ from a renewable source);
- Improves corporate social responsibility for fleet operators;
- Attracts business benefits from lower road and fuel taxes;
- A lower emission vehicle solution with tailpipe emissions of 59g/km CO₂ under test conditions.

Engine and Fuel System features:

- Dual-fuel selection switch (H₂/Diesel);
- There are 3 operating modes using different concentrations of hydrogen and diesel;
- The engine will always initially start on diesel fuel. It will then automatically switch to H₂ if pre-selected, once the engine reaches normal operating temperature (after approx. 2 miles);
- Compressed hydrogen with electronic fuel injection;
- 350 bar (5000 psi) storage pressure;
- 350 bar refuelling pressure via industry standard WEH TK16 nozzle.

Hydrogen Tanks:

- Manufactured by Dynetek Industries Ltd;
- 2 x 74 litre carbon fibre reinforced H₂ storage tanks mounted underneath the vehicle;
- 4.5 kg of fuel = 90-125 mile range approximately (in addition to the normal diesel fuel range);
- H₂ tanks are subjected to the following tests: pendulum impact, drop test, bonfire test, armour piercing bullet penetration, extreme temperature cycling and environmental fluids exposure;
- The 2 tanks add an additional 250kg to the weight of the van;
- Underfloor location of fuel tanks - does not affect load space and maintains existing ground clearance.