

Zero Emission Innovation – Commercial vehicles

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The state of innovation - ZEV

- Current focus on innovation in Commercial Transport is for 40-44 tonne freight vehicles.
- Several programmes outlined in this presentation.
- There is the plug in van grant to help fleets switch to BEV solutions – there are plenty of providers who can offer vehicles.
- Digital solutions important to join the dots – loads of companies offering this service to properly understand your duty cycles.
- Infrastructure innovation focuses on Vehicle to Everything(V2X)
- Future funding will be dependent on government spending reviews which are upcoming

Zero emission HGV and infrastructure programme

- Funded by the Department for Transport & delivered in partnership with Innovate UK
- Demonstration of hundreds of battery electric & hydrogen fuel cell heavy goods vehicles in real world applications, with funded deployment of public & depot charging & refuelling infrastructure
- Independent technical evaluation conducted by Ricardo

Funded two-year installation and purchasing phase (- 25/26)

Five year on the road demonstration (until 2030/31)



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Zero emission HGV and Infrastructure Demonstrator programme

Objectives

- Create an evidence base on which technology (or technology mix) is best suited to decarbonise UK's heaviest road freight vehicles (40-44t trucks);
- Grow confidence in the sector to encourage long-term investment planning and decision making;
- Provide an understanding of the future infrastructure needs and approach to deployment;
- Support the transition to a fully zero emission fleet;
- Identify standards and regulations that present barriers to the uptake of zero emission HGVs.



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GRIDSERVE – Project Electric Freightway

- Project is live since July 2023
- 140 battery electric HGVs provided by DAF, Volvo and Renault.
- 220 chargers across motorway service areas, truck stops and commercial depots
- £100m+ project, including **£62.7m funding**
- Producing reports with Hitachi on various topics



140 BEV

Voltempo – eFREIGHT 2030

- Next-generation eHGVs, Renault Trucks, DAF and Scania
- SME focus and UK charging technology, aiming for open-access depots
- **£49.2 funding**, project value >£63m
- Project is live since January 2024
- Aiming to prove business cases and enable operators involved to switch 20% of fleets to ZE HGVs by 2030



100 BEV

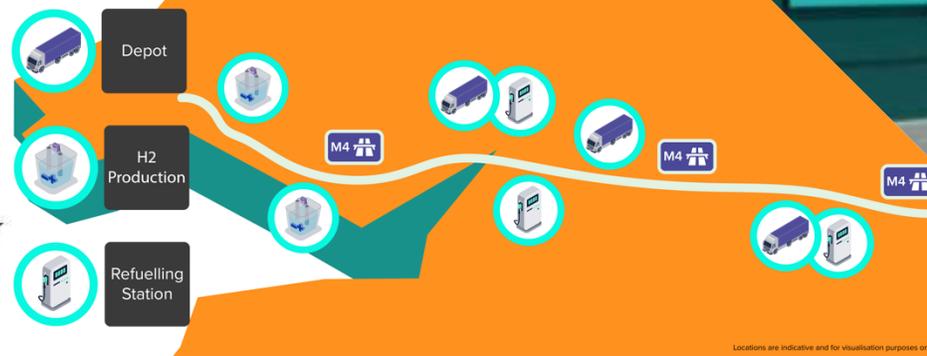
Dynamon - ZEN Freight

- Operator-led 'Zero Emission National Freight'
- Dual BEV and HFCEV element
- £59.2m project, including **£41.4m funding**
- Project live since February 2024
- Gregory Distribution and DFDS joining consortium



HyHAUL - Hydrogen Aggregated UK Logistics

- 30 hydrogen fuel cell vehicles along the M4
- 3+ public refuelling stations
- **£31.8m funding**, project value >£41m
- Project is live since February 2024



30 HFC

What's the latest?

- **Three reports have been published so far.** Projects will publish their findings throughout the real-world demonstrations, and they will all work closely with Ricardo to develop an independent technical evaluation of the demonstrations. Learnings published will include TCO, telematics, infrastructure/vehicle performance, driver/operator perspective amongst others
- Procurement of all infrastructure and vehicles is taking place now until the end of 2026. **Over 100 vehicles are already ordered.**
- Programme wide workshop held in March in Manchester
- In April A.F. Blakemore received the **first two programme-funded vehicles**, as part of their funding within Project Electric Freightway. These two Volvo FM Electric tractor units, coupled to refrigerated trailers powered by HVO are now operating from the company's Bedford Depot, directly replacing roles that were previously performed by diesel-powered trucks.
- In July Renault held a ZEHID partner day involving all 3 battery electric projects discussing the future landscape, launching the new E-Tech T and allowing attendees to experience an eHGV in the real world.



A.F. Blakemore receives the first programme-funded BEVs – April 2024



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Programme wide workshop

March 2024

- IUK held the first programme-wide workshop event in Manchester.
- Three workshops on barriers, challenges and solutions to HGV infrastructure, vehicle operation and grid connection considerations.
- Session on Department for Transport's upcoming Zero Emission HGV and coach infrastructure strategy
- First in a series of open programme events – details of future events coming soon



Key outcomes

- Challenges around differing grid connection approach across areas means early engagement with DNOs
- Collaboration across different heavy vehicle sectors, e.g. bus & coach, including data and infrastructure sharing, is needed
- There is a need for a detailed infrastructure strategy, integrated with planning policy and National Grid.



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Programme wide learning

- The vehicles are real and available!
- The charging technology is coming quickly, with our cohort key to this
- Operators see the need and are keen to be involved
- Grid connections remain a challenge
- Early engagement with DNOs and National Grid is key whether sites are depot or public



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The Tees Valley Hydrogen Transport Hub

- Multimillion pound programme accelerating the adoption of hydrogen solutions within the transport sector.
- Working towards long-term sustainable demand for hydrogen from transport and to de-risk hydrogen's adoption for transport owners and operators.
- Develop first-hand operational experience and share evidence with industry.
- Phase 1 completed in 2022, Phase 2 projects starting now to demonstrate multiple vehicle types and fixed hydrogen refuelling for at least 6 months.

Funded by the Department for Transport & managed by Innovate UK



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Successful Project Summary

Ulemco – Zero Emission airport applications - £2.6m grant

- Builds on Phase 1 programme to productionise HyICE drivetrain for airside applications at both Teesside International Airport and RAF Leeming
- Motive Fuels will redeploy an electrolyser and provide publicly accessible refuelling, Newcastle University will capture and analyse the data.

Exolum – Hydrogen Vehicle Ecosystem - £7m grant

- Utilises Exolums Riverside Terminal just outside Middlesborough for production, compression, loading and refuelling
- 25 HGVs in a range of use cases from Electra and Quantron (in conjunction with Novuna Vehicle Solutions). Teesside University will handle data monitoring and analytics.

Element 2 – TIAL refuelling hub - £2.8m grant

- Station situated on roadside of airport. Accessible by both road going and airside vehicles.
- Ive Yorkshire based FCEV LGVs aimed at supermarket home delivery use cases, purity sampling by Teesside Uni with plans to develop on site purity testing and disseminate across industry



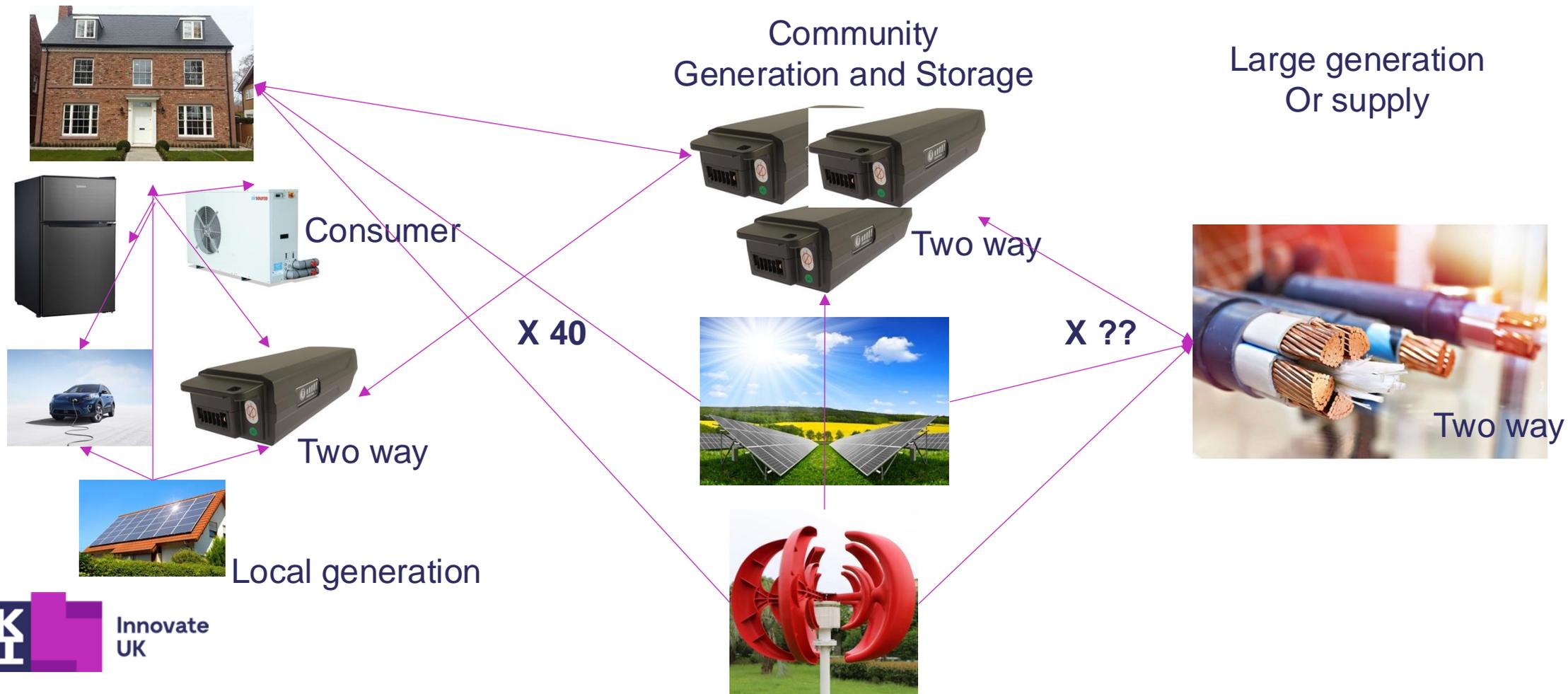
Developing Energy systems

- With new community development and energy constraints, the design of grids and mini grids needs more thought.
- Multiple inputs from different energy sources at different times.
- Multiple energy storage/consumer opportunities.
- Customers wanting seamless supply and opportunity to sell excess energy to others.

Micro Grid Management – 40 homes with cars Etc

- The system would be multi level with:
 - **Home systems** to balance and manage peaks and troughs. Will connect a wide range of household devices in plug-and-play manner, especially high users like heat pumps and car charging.
 - **Community level** management to manage outputs and demands from the home, integrate them into a community-led system. This will balance and optimise community power consumption and local grid management.
 - **Grid level**, enabling communities to feed in to, or reduce draw on, the main grid so as to minimise costs and main grid dependency. It will also manage any local or main grid power outages by balancing available supply and demand across the systems.
- The above is to be delivered against a need to understand consumer needs and wants within the system thus enabling them to exercise an appropriate degree of energy self-control.

Smart Grid



Present systems designed for the consumer

- Building management systems will need to talk to the community management system – Will need to learn the houses habits.
- Community management system will need to learn the habits of the community to understand how to manage available resources including 2 way resources.
- Grid management will take in all communities habit data to map buying and selling and not exceed available supply.

Generation

- Hydrogen, Turbine to generator. Fuel cell.
- SAF and other chemical/Bio fuels - turbine to generator.
- Modular Nuclear.

Project Electric Freightway



Zero Emission National (ZEN) Freight



Questions?

Hydrogen Aggregators



Useful links

- Less innovation support for vehicles at 3.5 or 7.5 Tonne. There are plenty of commercial options and there are sites to help you find the right one. The main challenges are around the infrastructure associated. There is support through the plug in van grant for 3.5 and 7.5 tonne vehicles and you can look at vehicles in the commercial vehicle finder.
- Worth contacting energy saving trust and we can link you to the right person.
- <https://commercialvehiclefinder.cenex.co.uk/>
- <https://thefreightportal.org/about/>
- <https://iuk.ktn-uk.org/transport/low-emission-vehicles/>
- <https://www.gov.uk/government/publications/v2x-innovation-programme-successful-projects>
- Simon.buckley@iuk.ktn-uk.org – happy to have more detailed conversations.