

University of Nottingham
Energy Institute

H₂Cool

Barriers to the adoption of hydrogen technology in distribution transport

Food cold chain partner perspectives

Find out more: energy@nottingham.ac.uk

1. The project

H₂COOL experts

UoN engineers and social scientists



H₂COOL technology

A vehicle dually powered and chilled by solid-state hydrogen with zero carbon emission



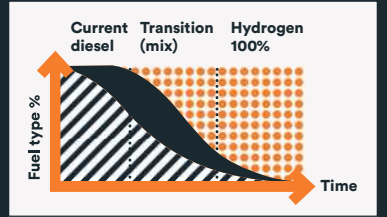
Food cold chain partners

- Fresh and frozen food logistics companies, supermarkets and food manufacturers
- Perspectives from drivers, logistics, transport, fleet, managers and CEOs

2. The transition



- Move away from diesel
- Transition through a mix of technologies (diesel, electric, solar, LNG, CNG, hydrogen)
- Long-term: hydrogen (with other green technologies)



3. Structural challenges

Develop strong, synchronised hydrogen infrastructure



- Green hydrogen production
- Hydrogen refuelling stations
- Hydrogen-fuelled refrigerated vehicles

Changing the existing system

- More hydrogen refuelling stations
- Diversity of hydrogen-fuelled refrigerated vehicles

Support required

- Collaboration within industry (plus R&D and government)
- Fuel credits and funding for hydrogen technologies
- Standards and regulations for hydrogen transportation

Time, scale-up, cost and adoption

- Time: technology and mentality readiness
- Scale up and bring prices down (particularly price of hydrogen per kg)
- Transition not at the expense of the sector, industries or customers
- Positive adoption: novel technologies should fit with the way the industry operates, and not the other way around. Attention should be paid to end-users' needs and motivation

4. Technical challenges



Hydrogen storage capability

- Articulated vehicles: developing self-sufficient trailers from excess cooling, for up to 72 hours
- Hydrogen supply chain: hydrogen transport and on-site storage for companies to have their own fueling station

Refuelling time
10-15 minutes or less



Progressing to at least
500-600 miles



Initial mileage at least
300 miles

5. Key actors and roles

R&D (industry and academia)

- Developing hydrogen infrastructure that fits the industry and the cold chain
- Including industry stakeholders in technological development
- Trials and demonstration of hydrogen-fuelled vehicles

Industry

- Developing and investing into a sustainable strategy for their firm
- Supporting R&D (for example participating in studies and trials)

Government and policymakers

- Providing fuel credits and funding (for R&D and industry to take part in trials)
- Setting up standards and regulations for hydrogen transportation
- Supporting promotion and demonstration of hydrogen-fuelled vehicles



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