



# Hydrogen Corridor 2020

An Innovative Transport Initiative  
in North East Scotland

aka

# HyLand Express Route 1 – HyLANDER I

Endorsed by



# Why Hydrogen?

- Hydrogen is the stuff of the universe
- It won't run out ..... ever
- The seas around us are full of it
- Hydrogen can be produced by electrolysis of water using surplus renewable energy
- In HFCVs, the only emission is clean water
- In H-ICEs, tailpipe emissions are near-zero
- Pound for pound, H<sub>2</sub> has 3 times the energy density of diesel – 143MJ/kg vs 46.4MJ/kg

# Scottish Govt Targets

EU: 20% renewable energy by 2020

UK/Scotland: GHG emissions reduction 80% by 2050

Scotland -

- 20% renewable energy by 2020
- 50% renewable electricity by 2020 (8GW)
- 11% renewable heat by 2020
- 10% green transport fuel by 2020

# HyFuture 2008 report .....

- It is anticipated that the majority of hydrogen generated will be used in the transportation sector which is one of the highest contributors to CO<sub>2</sub> emissions and poor air quality.
- Actions that encourage large-scale installation of renewables and demand for low carbon transport will support the commercialisation of renewable hydrogen.

# HyFuture key points

- transportation sector
  - one of highest contributors to CO<sub>2</sub> emissions
  - poor air quality
- +
- large-scale installation of renewables
- =
- demand for low carbon transport
- =
- commercialisation of renewable hydrogen

# HyLANDER 1

- Aberdeen to Inverness via Peterhead
- Total distance 150 miles each way
- Early mover project to stimulate investment in hydrogen / fuel cell transport
- 3 hydrogen refuelling stations – Aberdeen, Peterhead, Inverness
- Commercial fleet operators will lead transition
- Stagecoach / FirstGroup / Royal Mail
- Integral part of UK HyNet

# UK HyNet

5 active regions with different, local projects and activities:

- Scotland
- NE England
- E & W Midlands
- S Wales
- London





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# HyLANDER 1 partners

- Aberdeenshire Council
- Aberdeen City Council
- Highland Council
- SHFCA
- Stagecoach Bluebird
- FirstGroup
- Royal Mail
- StatOil Hydro
- Air Products
- BOC Linde
- University of St Andrews
- University of B'ham
- FuelCellEurope
- CENEX
- Microcab
- Proton Motor GmbH
- Alexander Dennis
- H2 Logic
- TUV NEL
- Intelligent Energy

# Applications

<b>Application</b>	<b>Headline user</b>	<b>Examples of early actions</b>
Public transport	<b>Stagecoach Group Aberdeenshire Council</b>	Coaches operating on A90 Council vehicles
Commercial vehicles	<b>Royal Mail Group</b>	H-ICE delivery vans FC delivery vans
Road freight	<b>ASCO</b>	Forklifts
Aviation	<b>BAA Scotland</b>	Ground service vehicles & passenger transport
Off-road / leisure	<b>Aberdeenshire Golf resort developments</b>	Golf buggies & on site transport – ground maintenance vehicles and passenger vehicles

# Public transport – City buses

## Main benefits

For passengers:

No emissions

Very low noise level  
internally and externally

Low vibrations

Smooth acceleration, no gear  
shifting

For bus operators:

50% more efficient operation  
than comparable Diesel-  
powered bus

Brake energy recovery

Low-maintenance electric  
drive technology with  
48kW fuel cell



# Commercial vehicles

## Royal Mail H-ICE post vans



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# Commercial Vehicles

## Royal Mail Fuel Cell post van



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# Municipal / Utility vehicles / Leisure



# Versatility ...





# Refuelling – no big deal



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# Refuelling at Birmingham Uni



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# Hydrogen from renewables



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# Hydrogen from renewables

Hydrogen can be produced from any renewable resource, eg. wind, solar, marine, bio-wastes

A message for the renewables industry .....



# The Future is Hydrogen



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# Thank you for listening

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