SMART INFRASTRUCTURE SOLUTIONS
ENABLING INTEGRATED DECARBONISATION
OF THE NORTH WEST

GERARD SHORE
DIRECTOR, COSTAIN GROUP

#h2nw
Smart infrastructure solutions enabling integrated decarbonisation of the North West

Image credit: Newgate Communications
# The changing face of UK infrastructure

## Transport network
- 260,000 miles of road hosting 38 million licensed vehicles of which <0.5% are ULEV
- 8,000 fuel stations, 50,000 petrol/diesel fuel pumps; c1500 EV rapid chargers
- 10,000 miles rail network of which <50% is electrified with 30% UK fleet diesel
- **Decarbonised future?**
  - 1.5 million hydrogen cars in UK by 2030, with over 1000 Hydrogen Refuelling Stations
  - 60% of new cars electric by 2030 – requiring 3 million EV charging points
  - Bimodal trains switching between overhead electrification and fuel cells

## Heat network
- 4,700 miles of high pressure gas pipelines
- 175,000 miles gas distribution network provides 720TWh, 23 million customers
- 85% of domestic heat is gas
- **Decarbonised future?**
  - Hydrogen networks – 100% H2 and blends
  - Heat pumps - wide scale adoption
  - District heating - rollout from 2030 with localised thermal power stations

## Power network
- Electricity mix (500,000 miles lines/cable)
  - 39% Gas
  - 33% Renewables
  - 21% Nuclear
- **Decarbonised future?**
  - Renewables 50% (inc. green hydrogen)
  - Local microgeneration
  - Smart grid technology implementation
  - Vehicle-to-grid systems
The smart infrastructure imperative

Example - smart motorways infrastructure

- Ensure **new assets are digitally enabled** to underpin integrated decarbonisation of the connected system
- Ensure **digital data capture requirements** are considered and addressed during the initial conceptual design
- Establish **digital platforms** for consolidating and leveraging integrated data (e.g. supply & demand)

The challenge: Creating a North West decarbonised economy in which infrastructure assets are digitally connected and optimised on an integrated basis
Connecting our smart infrastructure

Ongoing NW Project – E-Port Smart Energy Master Plan

- The Energy Innovation District is looking at how a local low-carbon smart energy system could be developed in Ellesmere Port.
- The aim is for the smart grid to provide access to cleaner multi-vector energy across power, heating and transport involving local energy trading for businesses and residents.
- Development of a ten year private sector investment programme for smart grid development that could be rolled out across the UK.

Reduce energy costs by at least 20%
Cut carbon emissions
Safeguard and increase competitiveness
Create new jobs
Attract new businesses
Smart infrastructure challenges in the North West decarbonised economy

Developing an integrated clean energy storage system

Optimising hydrogen production, storage & supply to meet demand

Fulfilling customer requirements - 100% & blended hydrogen
To achieve our decarbonisation ambition it’s crucial the North West embraces the opportunities smart infrastructure provides us as we approach this ‘must-win’ challenge on integrated basis.