SMART INFRASTRUCTURE SOLUTIONS ENABLING INTEGRATED DECARBONISATION OF THE NORTH WEST

GERARD SHORE
DIRECTOR, COSTAIN GROUP

#h2nw

DELIVERING THE HYDROGEN ECONOMY | North West

Smart infrastructure solutions enabling integrated decarbonisation of the North West

Image credit: Newgate Communications

The changing face of UK infrastructure

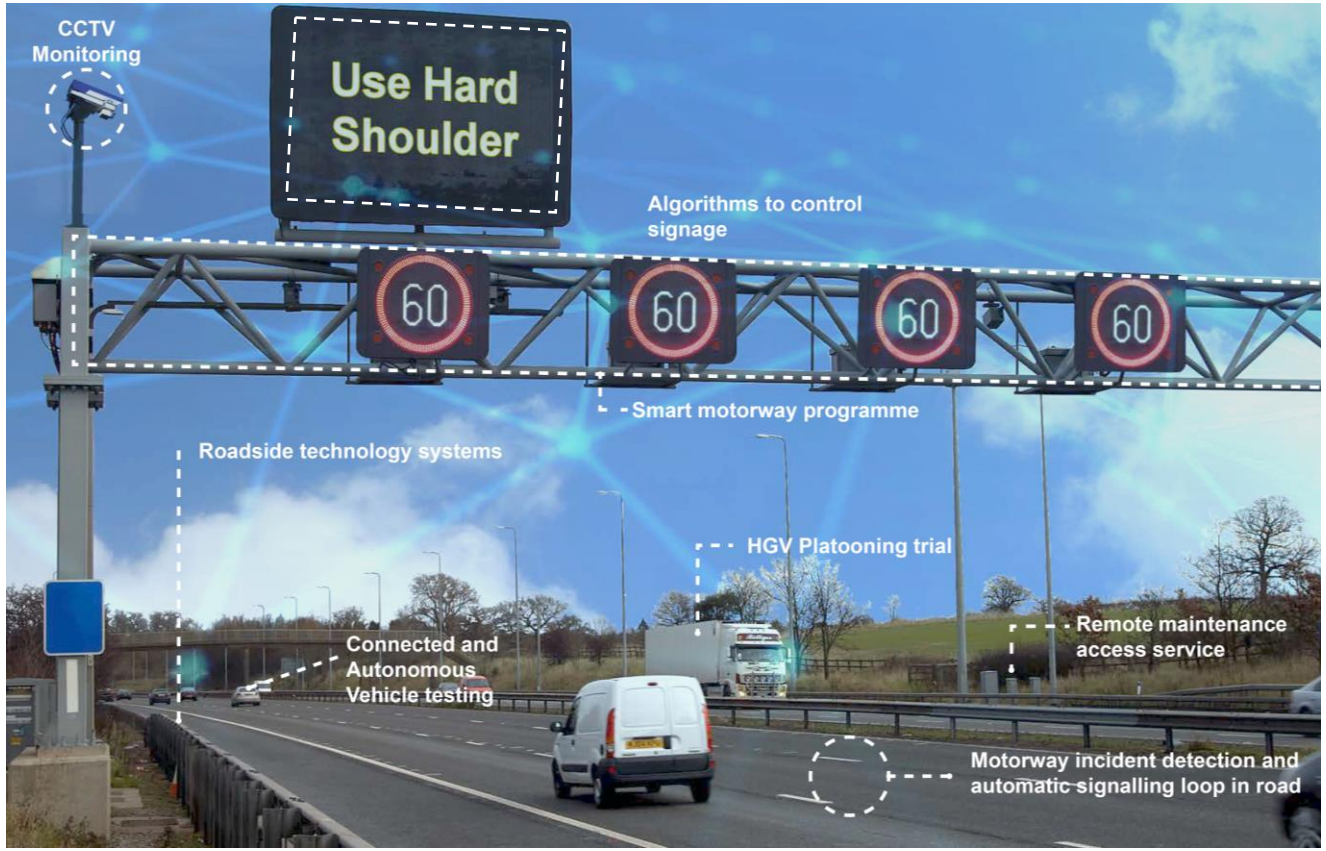
Infrastructure	Current status	Decarbonised future?
Transport network	• 260,000 miles of road hosting 38 million licensed vehicles of which **<0.5% ULEV** • 8000 fuel stations, **50,000 petrol/diesel fuel pumps;** c1500 EV rapid chargers • 10,000 miles rail network of which <50% is electrified with **30% UK fleet diesel**	• **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	• **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
		• **Renewables 50%** (inc. green hydrogen)
		• **Local microgeneration**
		• **Smart grid technology** implementation
		• **Vehicle-to-grid** systems

COSTAIN

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)

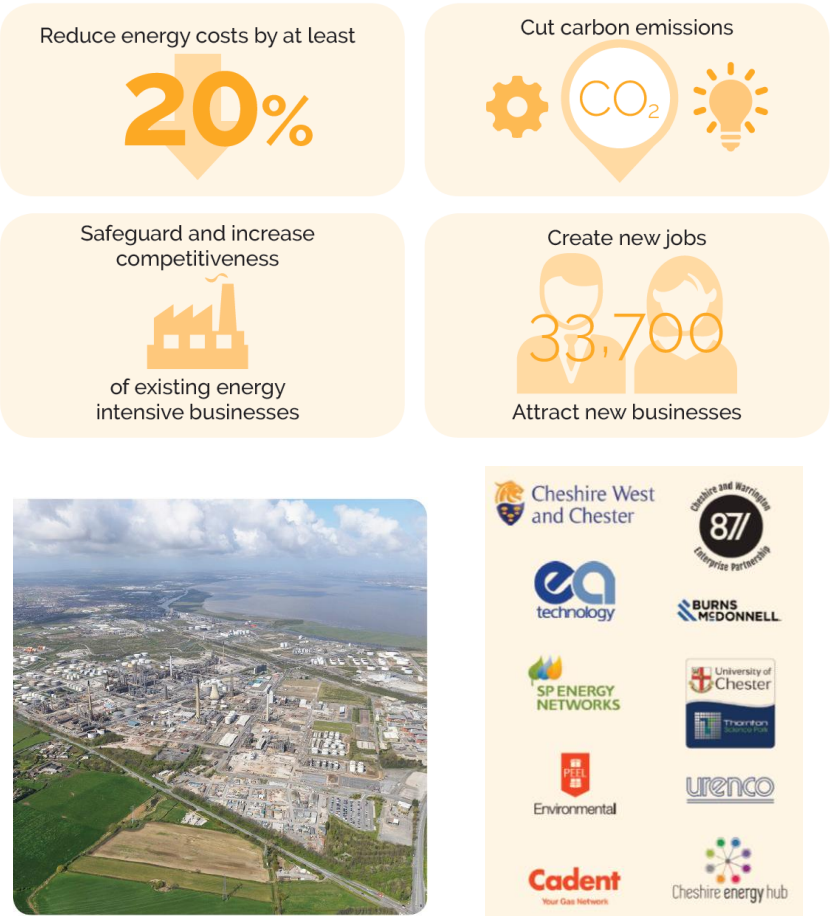
COSTAIN

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**

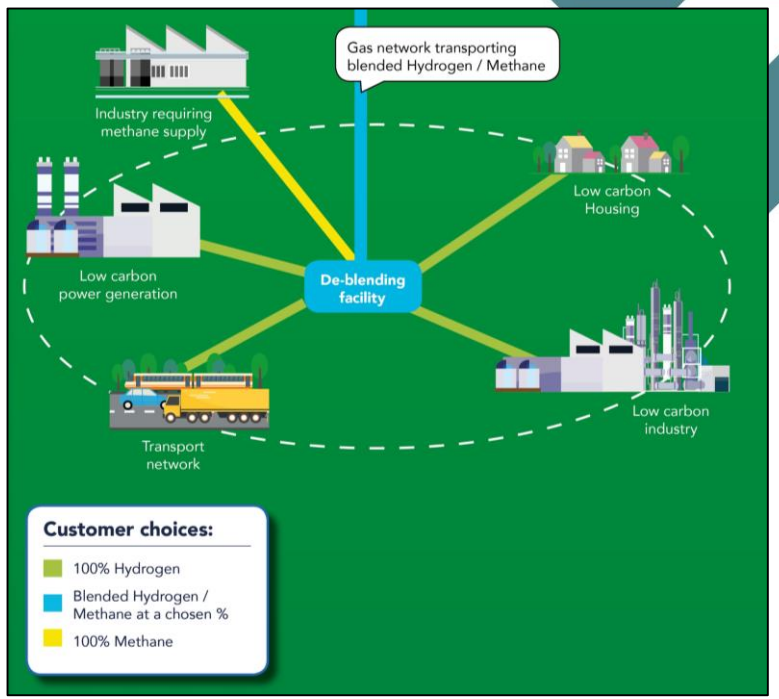


Smart infrastructure challenges in the North West decarbonised economy

Developing an integrated clean energy storage system

Optimising hydrogen production, storage & supply to meet demand

Fulfilling customer requirements - 100% & blended hydrogen



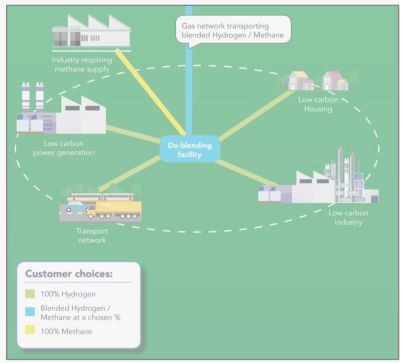
COSTAIN

Smart Infrastructure and North West decarbonisation – summary:

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

COSTAIN