

# TYSELEY ENERGY PARK

## KEY TECHNOLOGIES:

THE SITE AT TYSELEY WILL DRAW TOGETHER A RANGE OF DIFFERENT ENERGY TECHNOLOGIES AND VECTORS. THE SITE WILL BE THE ENERGY AND WASTE NEXUS FOR THE CITY OF BIRMINGHAM, SHOWING HOW NOVEL ENERGY TECHNOLOGIES CAN FORM AN INNOVATIVE INDUSTRIAL ECOLOGY.

### CRYOGENIC 'LIQUID AIR' NETWORK

The University of Birmingham has extensive expertise with clean cold technologies.

Cryogenic energy storage systems use renewables and/or off-peak electricity to liquefy air which involves compression and expansion processes. The cryogenic liquid has a temperature below -190oc, and is stored in a vessel. It is then pumped to a high pressure (150 bar), when electricity is needed, and then vaporised into a gas and superheated, using either or both heat and waste heat, if available. It then goes through an expansion process in a turbine to generate electricity.

### NATURAL GAS NETWORK

- Bio methane gas grid injection
- Filling stations Liquid Natural Gas
- Natural Gas from the Grid is compressed for use in CNG powered vehicles

### HYDROGEN NETWORK



- Thermo Catalytic Reformation plant: produces biodiesel from a range of feedstocks that can be used in Euro IV diesel engines. It also produces green Hydrogen.
- Hydrogen powered buses and taxis filling station
- Hydrogen Electrolyser
- Hydrogen may also be employed in advanced critical materials recycling processes.

### SMART MICROGRID

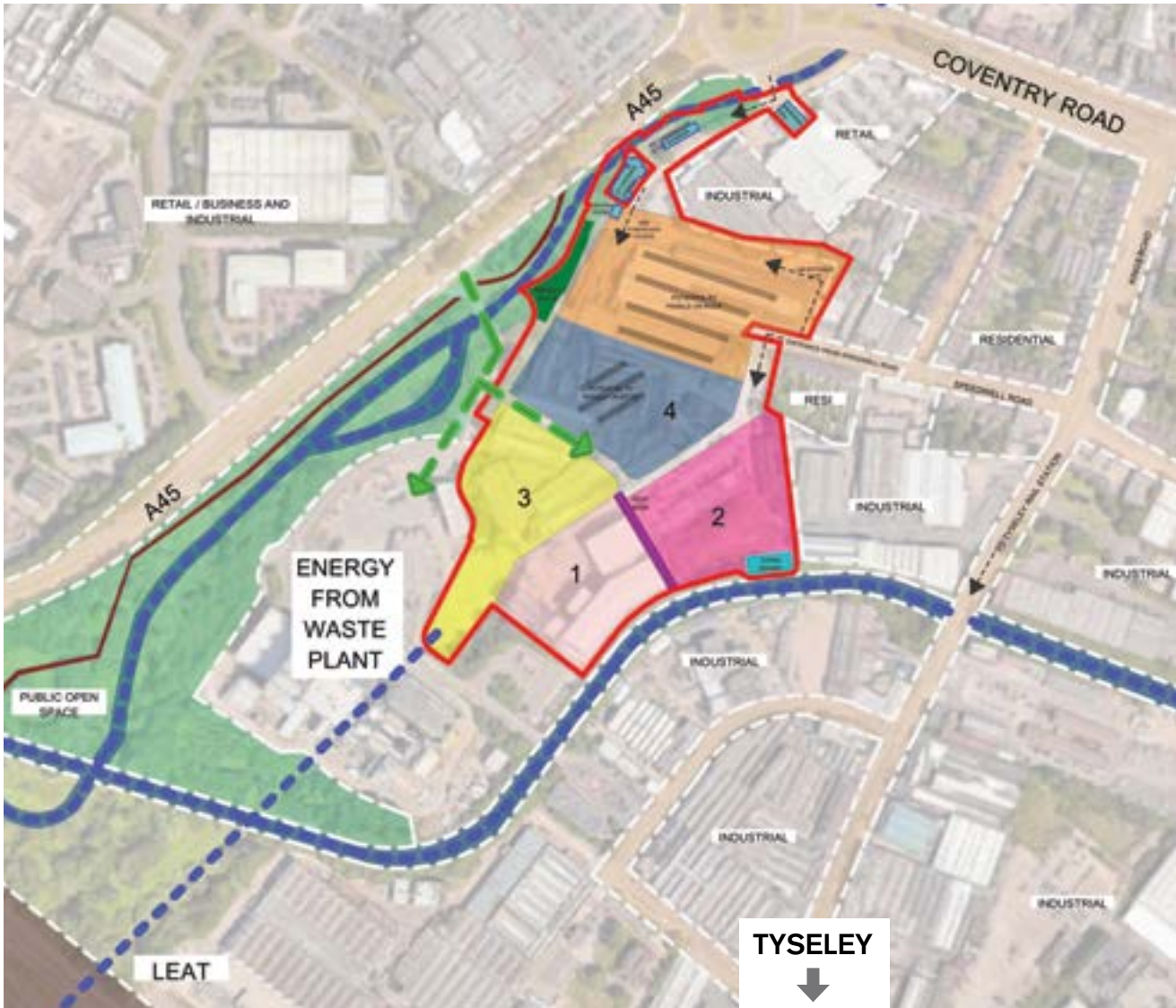


- Import/Export Electricity
- Onsite Wind Power Generation
- Solar Power Microgrid
- Bio Power Plant

### DISTRICT HEATING NETWORK



- Waste is turned into heat and power
- Heat provided to businesses and industry
- Connection with Cryogenic energy storage



### PROJECT PARTNERS:

The project is being developed by Webster & Horsfall and is supported by the Birmingham Energy Institute at the University of Birmingham.

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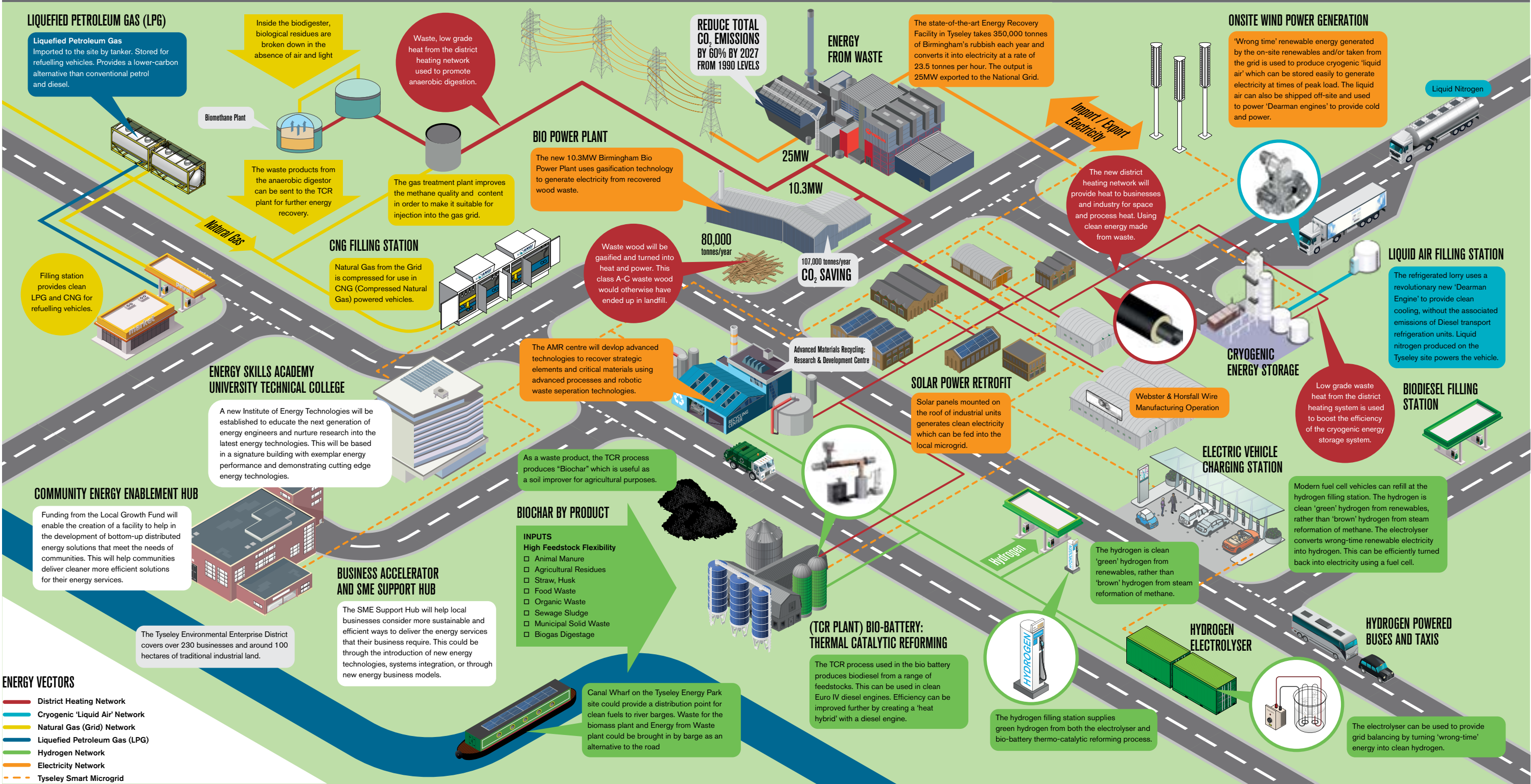
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## TYSELEY ENERGY PARK

The City of Birmingham has ambitious plans to deliver carbon reductions, create a low carbon infrastructure and to modernise how it deals with waste. These priorities are captured in the Carbon Roadmap produced by the City's Green Commission which articulates the ambition via CO<sub>2</sub> Emissions Target and Carbon Budgets.



## TYSELEY ENERGY PARK

### ENERGY INNOVATION ZONE

**THE TYSELEY ENVIRONMENTAL ENTERPRISE DISTRICT WILL BE A CLEAN TECHNOLOGY HUB FOR THE CITY OF BIRMINGHAM. WITH A LONG HISTORY OF INDUSTRY IN THIS AREA, THE REMAINING BUSINESSES SEEK NEW AND INNOVATIVE ENERGY SUPPLIES IN ORDER TO HELP THE REMAINING FIRMS STAY COMPETITIVE. IT IS AGAINST THAT BACKDROP OF TRANSFORMING INDUSTRIAL COMPETITIVENESS THAT THE VISION HAS BEEN CONCEIVED.**

Tyseley Energy Park is one of the sites within the Tyseley Environmental Enterprise District. Established in 1720, site owners Webster and Horsfall Ltd are one of Birmingham's oldest manufacturing companies. The business has been located on the site in Tyseley for 160 years, and are best known as the manufacturer of the wire for the first successful transatlantic telegraph cable in 1866.

The inventions of James Horsfall in 1850 led to the development of dynamic steel springs which made the internal combustion engine possible, and laid the foundations for growth in the automotive industries which the company still supplies today.

Energy is still a key strategic business focus for the company, which supplies wire and wire ropes for the oil, gas and coal industries. The development of Tyseley Energy Park, with its emphasis on alternative low carbon energy fuels, builds on that tradition.

Phase One of Tyseley Energy Park has already seen a £47 million investment into a 10MW<sub>e</sub> waste wood biomass power station, which supplies the development site with electricity. Planning permission has recently been approved for the UK's first low-carbon refuelling station on phase two which is strategically

located between the city centre and Birmingham airport. Tyseley Energy Park provides a logical place to deploy refuelling infrastructure for a range of low carbon fuels. The fuels available support different transport options in the City and will improve of air quality and deliver transformational change, attracting new businesses and supporting the regeneration of the area.

Tyseley Energy Park is the energy-waste nexus for the City of Birmingham. The adjoining energy-from-waste plant has long been a feature of the Tyseley skyline converting 350,000 tonnes of municipal waste into power. The plant currently produces 25MW of electricity with the potential to generate significant heat for distribution in support of the City Council's ambitions for District Heating across the City. The new developments on Tyseley Energy Park will complement the adjoining plant with a range of innovative technologies which can transform other more complex waste streams into energy.

Planning permission has recently been approved for a new thermal catalytic reforming reactor that will convert biomass into renewable energy in the form of heat and power. The installation will involve the heating of biomass in the absence of oxygen (non-combustion) to produce intermediate energy carriers (char, syngas and pyrolysis oil) for use in a stationary CHP engine.

As part of a relentless drive to green industry in the city, the next generation of waste reprocessing technologies will be developed on phase three, using clean energy to power advanced processes to support the City Council's ambitions to become the best City nationally at recycling and recovering energy from waste. Power generated within the site will be from renewable sources including the biomass plant on phase one, solar panels and the UK's first silent revolution wind turbines. This clean energy will be used to support the growth of Webster and Horsfall Ltd manufacturing operation, as well as providing energy at a low price for the various operations planned.

The site will become a crucible for research and learning, with new laboratories, educational facilities and, a research and development centre planned on phase four within a landmark building with exemplar energy performance.

