Doncaster Hydrogen Refuelling Hub

Infrastructure Options

28th June 2022

Agenda

1. Work package detail
2. Site assessment process
3. Scoring matrix
4. Potential locations
5. Refuelling process
6. What a site looks like
7. Site set up
8. key site stakeholders
9. Right solution for the site

1. Work package 3 – scope

- Assessment of potential sites identified in Doncaster
- Undertake an appraisal for each site
- Understand the various refuelling options available. Start to establish relationships with potential suppliers

2. Site assessment process

1.Developing a framework for options appraisal

- Understand the different variants from background research
- Stakeholder attitude, space required, availability for renewable energy
- Formulation of scoring criteria

2.Assessment and site prioritisation

- Assessment of the long list provided by the demand package and suggested council sites
- Formulation of short list (8 sites sited around Doncaster/ Rotherham)

3.Detailed shortlisted sites

- Desktop reviews and site visits
- Examining aspects including key site stakeholder, access routes, site constraints, space, existing infrastructure etc

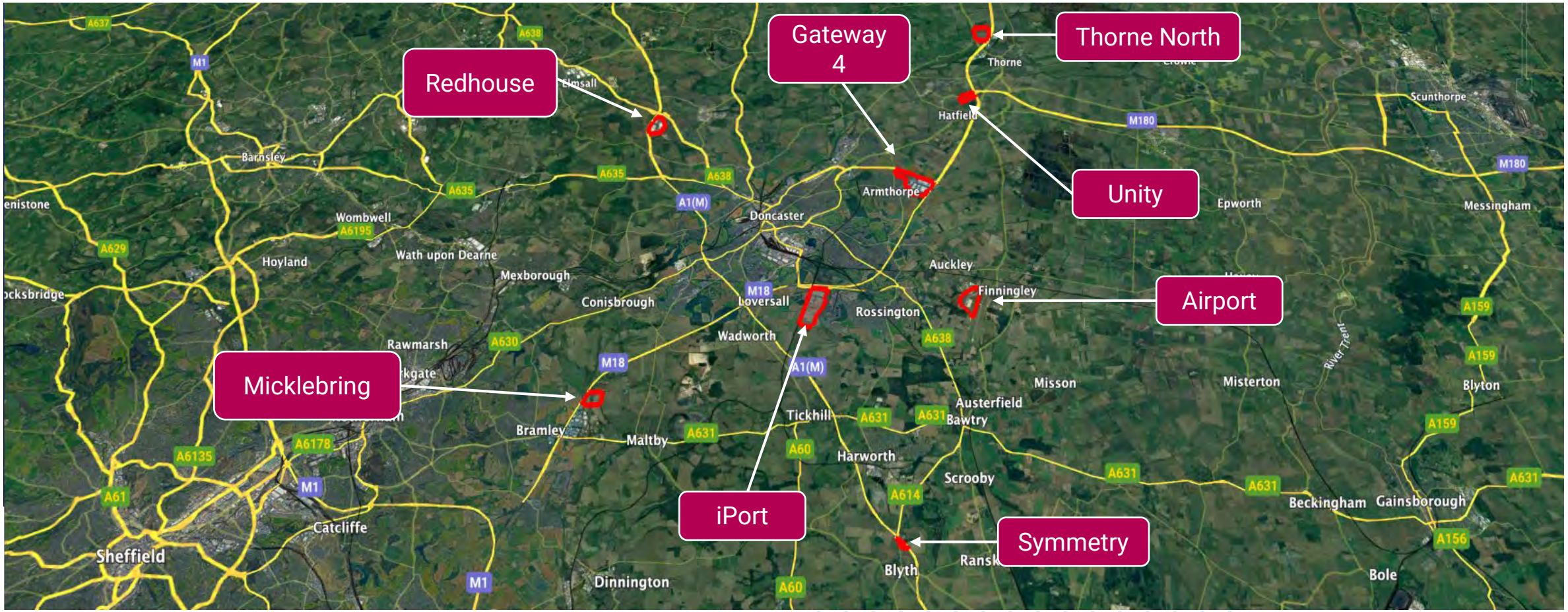
4.Scoring of shortlisted sites

- Scoring of each site to establish if fit for purpose
- Important to note – each site would require different solutions depending of the variables

3. Scoring matrix

Key site aspects	Stakeholder interest at site	Location	Land available at site	Existing land use (e.g. brown field / green field)	Pre-Construction Enabling Works Required?	Opportunities for "Dual Use+"	Refueling Options (H Source)	Scalability	Demand Potential	Source of demand
Percentage weighing	**15%**	**15%**	**20%**	**5%**	**5%**	**10%**	**10%**	**7.5%**	**5%**	**7.5%**
Scoring Description										
0	Not interested	Not close to SRN	No	Green belt	Full enabling works required	No	No options for refuelling	No land available to scale up	Below 250kg	Limited sources of demand
1	Mixed response	B road location	Possibility of land available	Greenfield	Some enabling works required	Limited	Limited options for refuelling	Limited land available to scale up	Approx 250 - 450 kg	Ground fleet
2	Moderately interested	A road location	Yes - space for storage/compression/dispensor	Brownfield	Limited enabling works required	Some	Off-site generation and delivered to the station	Some land available to scale up	Approx 450kg	Ground fleet and buses
3	Positive response	c. 2 miles to motorway	Yes - space for onsite generation	Developed site/existing planning consent	No enabling works required	Yes	Onsite Hydrogen generation (Green)	Land available to scale up	Above 450kg	HGVs, RCVs and additional ground fleets

4. Potential site locations



5. Process – refuelling options

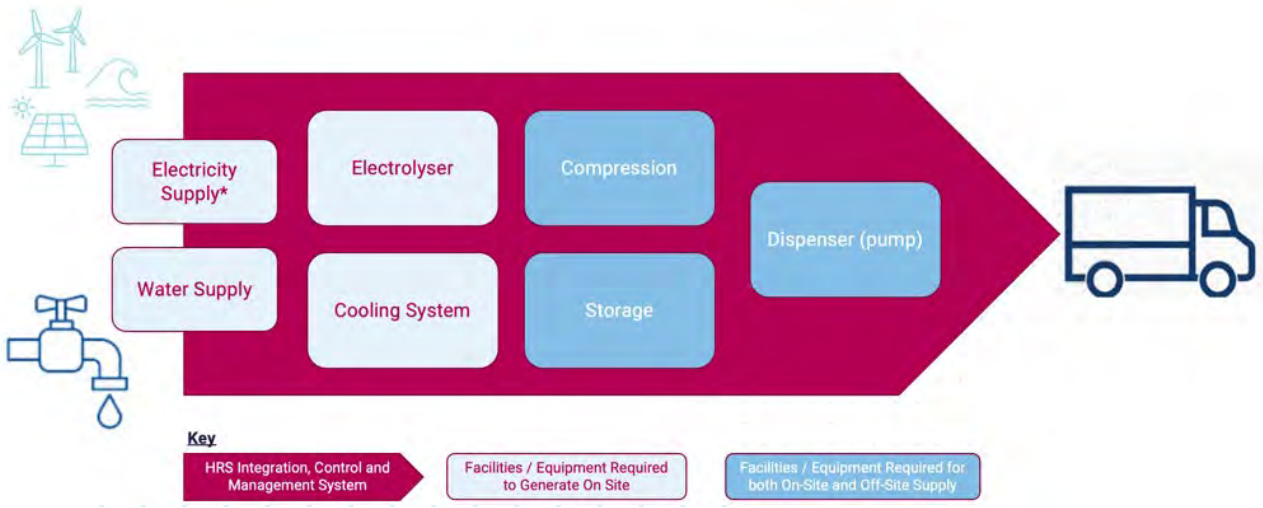
1. Sessions with key hydrogen suppliers
2. Establish planning application process
3. Research potential site layouts and establishment
4. Standards and codes of practice
5. Hydrogen generation options
6. Potential operating models

ITM POWER
Energy Storage | Clean Fuel

BOC
A Member of The Linde Group

Logan Energy
hydrogen technologies

Haskel



6. What does a site look like?

Small site: Kittybrewster, Aberdeen

The site has the capacity to produce 360kg of hydrogen daily. That is enough for the current fleet of 10 x 42-seat buses to travel up to 350km each day, emitting nothing more than clean water produced from the tail pipes.

BOC
A Linde company

ABERDEEN
CITY COUNCIL

6. What does a site look like?

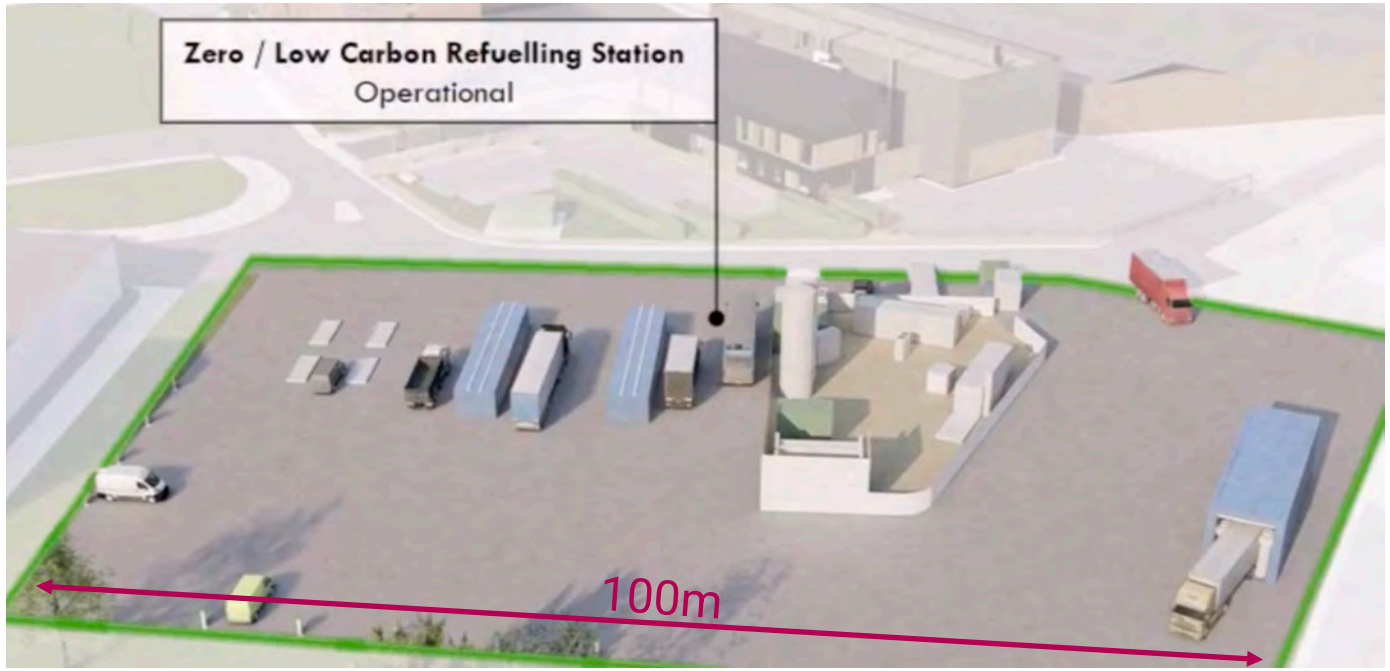
Medium site: Tysley Energy Park (TEP), Birmingham

The HRS refuels 20 hydrogen double decker buses purchased by Birmingham City Council. The TEP refuelling station is part of the Birmingham Transport Plan, supporting the introduction and supply of cleaner fuels to improve air quality across the city.

Webster & Horsfall Group est.1720
Celebrating 300 years of Continuous Innovation

Birmingham City Council

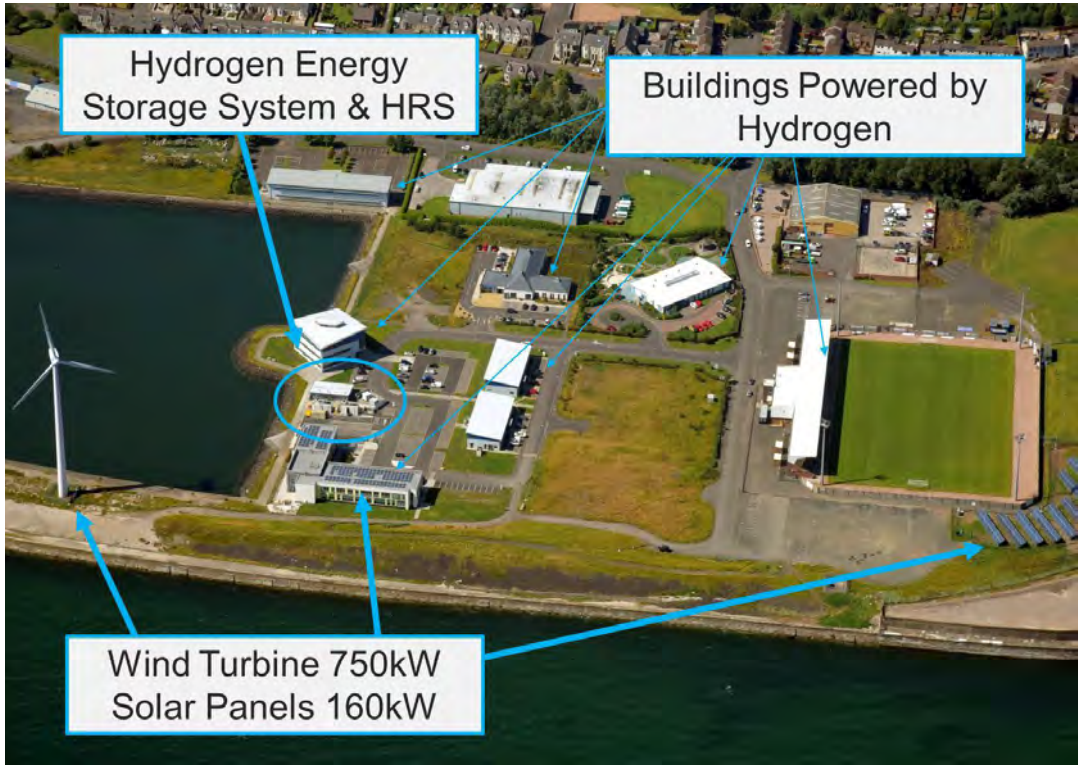
Greater Birmingham & Solihull Local Enterprise Partnership



6. What does a site look like?

Large site: Levenmouth Community Energy Project, Fife

In partnership with Bright Green Hydrogen, Toshiba, Fife Council, and Hydrogenics, the facility at the Levenmouth Community Energy Project in Fife, Scotland, was constructed to demonstrate green hydrogen as a viable medium for energy storage, grid balancing, electricity generation and transport fuel.



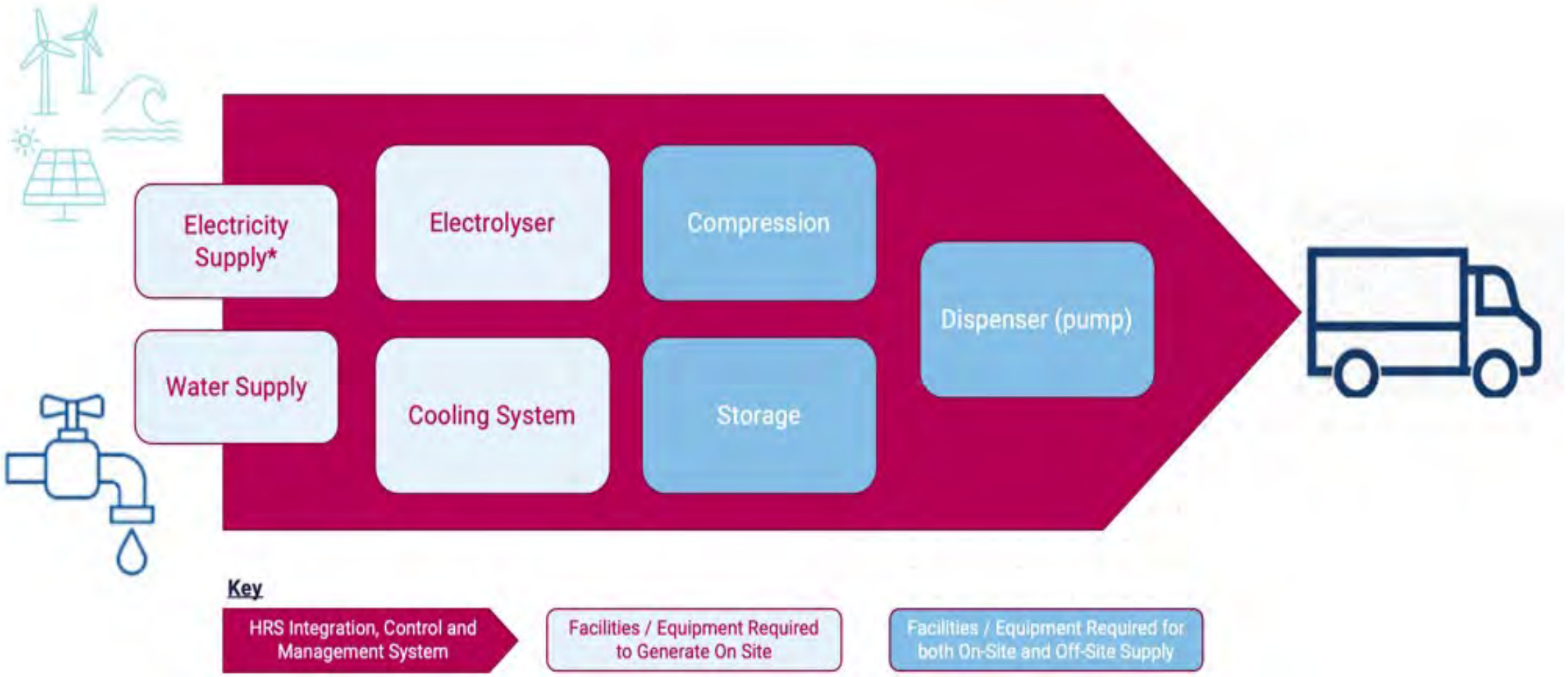
Bright Green Hydrogen

TOSHIBA

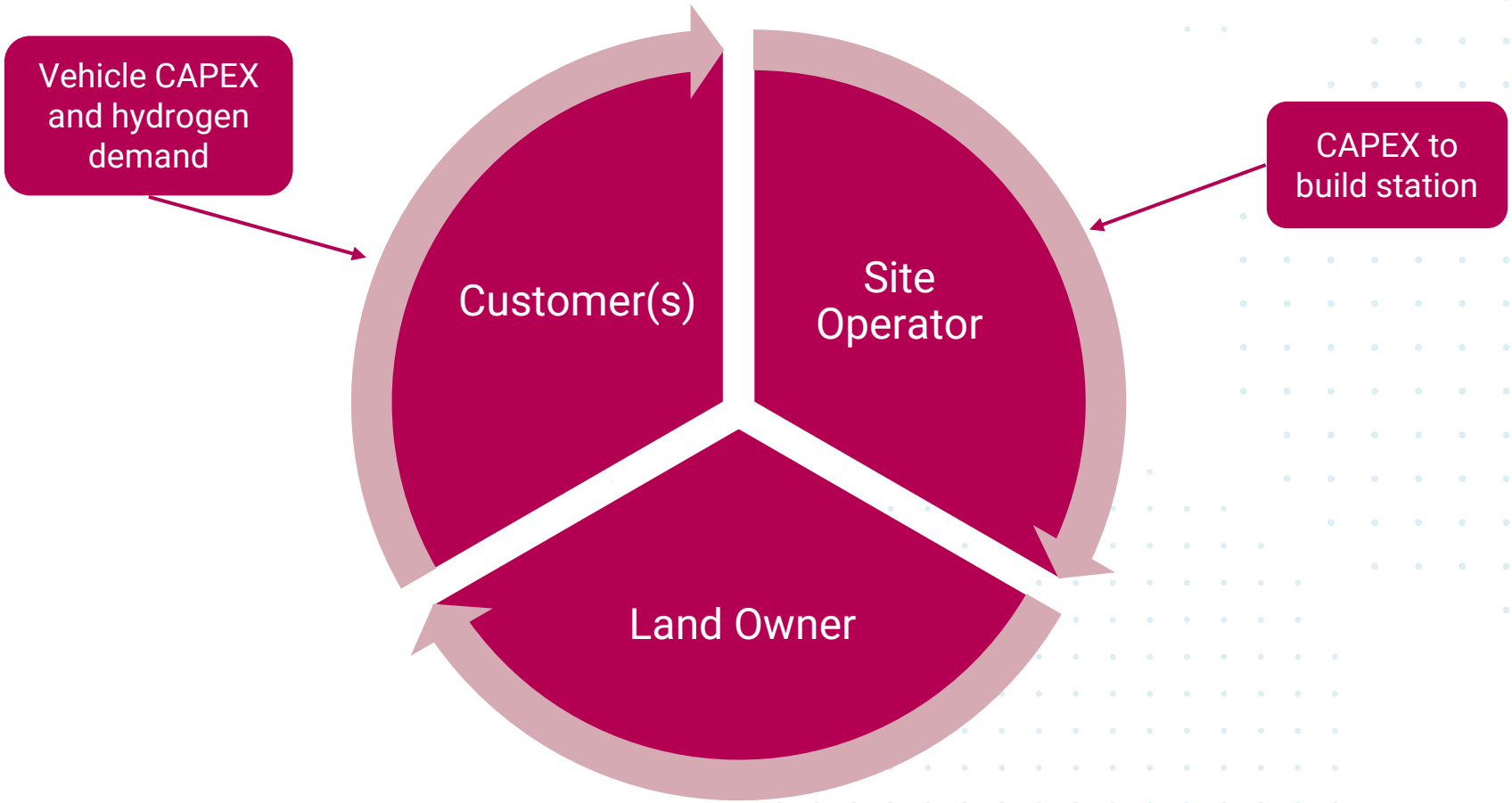
Fife Council

In operation since July 2016
910kW on-site renewable electricity generation
Distribution micro-grid and private wire connection
Energy management system
370kW electrolysis capacity and 100kW fuel cell
Two hydrogen refuelling stations with integrated electrolysis
Fleet of 17 hydrogen vehicles

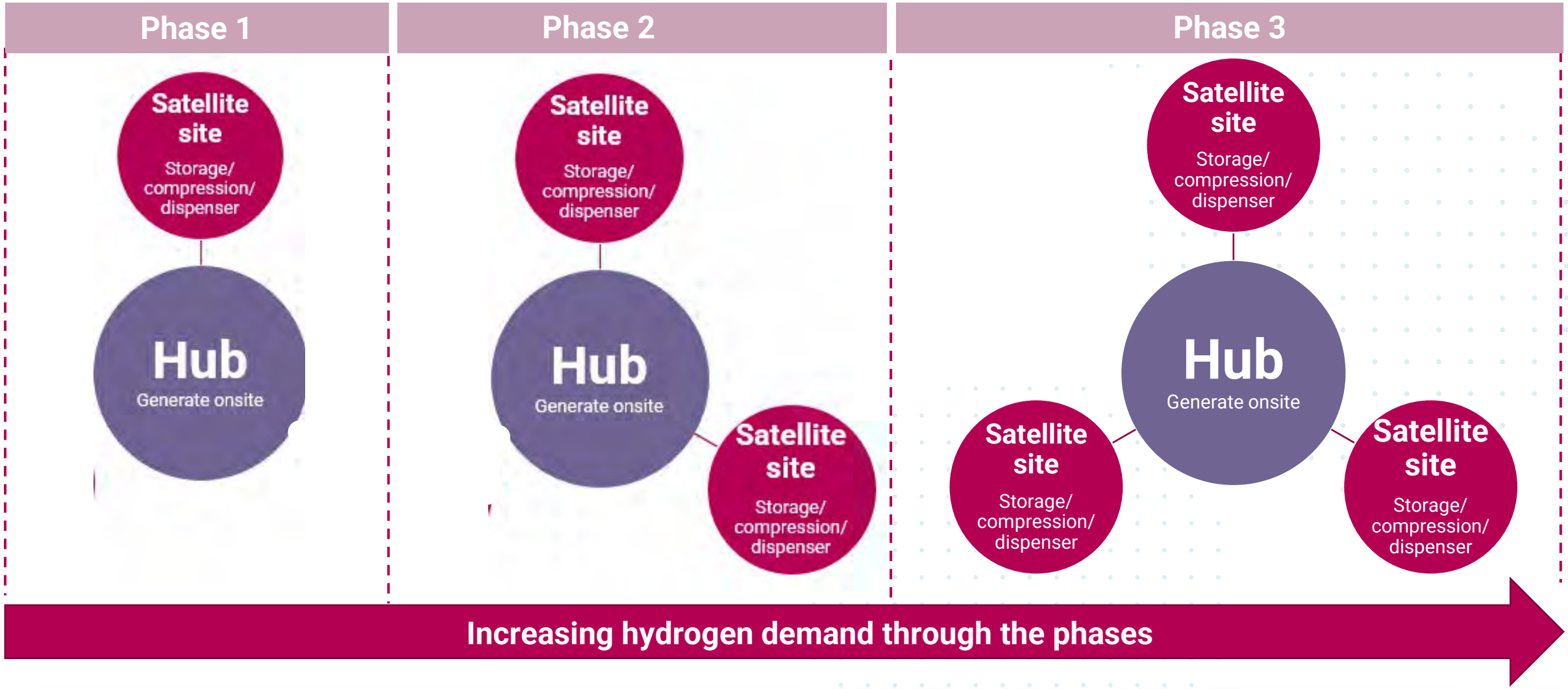
7. Site set up


Electricity Supply*
Water Supply
Electrolyser
Cooling System
Compression
Storage
Dispenser (pump)
Key
HRS Integration, Control and Management System
Facilities / Equipment Required to Generate On Site
Facilities / Equipment Required for both On-Site and Off-Site Supply

8. The key site stakeholders



9. The right solution for the site hypothetically...



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Further details from the report will be available after completion/submission.

Thank you for listening!

Vicky Barnes BSc

Principal Consultant - PMO

Overview

- 16 years' industry experience across the UK's infrastructure sector
- Project management, and bid development expertise throughout renewable energy, construction, highways, housing, environmental risk, waste management and the public sector
- Key skills comprising; strategy development, project management, business analysis, bid management, technical writing, research, training delivery, stakeholder management and contract negotiation

Relevant experience

- Enerveo Ireland | Public Lighting Energy Efficiency Project 1, 2 – Smart cities solutions | Project/Bid Management | Bid Development | Governance | supply chain engagement
- Enerveo Ireland | Dublin City Council - Bid Management | Bid Development | Governance | supply chain engagement
- National Grid – EPC Framework
- Freedom | DNO tenders (NPG/ENW)
- Balfour Beatty | Network Rail - Design Services Framework
- Balfour Beatty | Network Rail - Plain Line Grinding
- Balfour Beatty | Network Rail - Mobile Maintenance Trains
- SSE | HS2 – Old Oak Common Station MEPH
- Balfour Beatty | TFL - Professional Services Framework