Belfast

CLIMATE ACTION

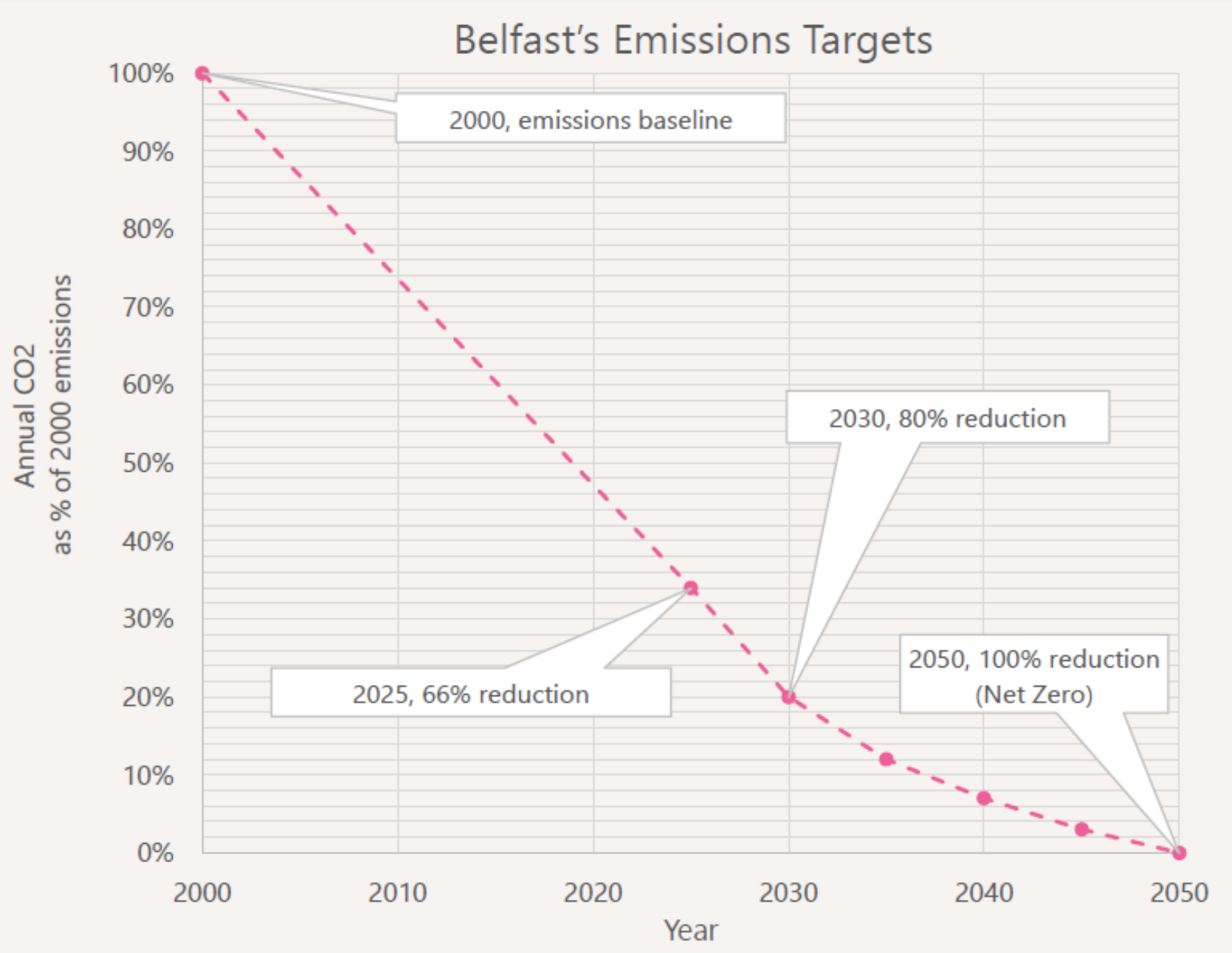
Decarbonising Belfast

Debbie Caldwell

www.belfastcity.gov.uk/climate-change

What is the role of council in supporting the City's transition to an inclusive, net zero-emissions, climate- resilient economy?

1. Using place to foster **collaboration and innovation** to enable a systems approach to decarbonise while also unlocking benefits for local communities
2. **Measuring** the City's climate risks and emissions and understanding where they come from
3. Using the Council **estate** and **procurement** to drive change
4. Creating a **value proposition** for Belfast as a green city and mobilising investment to create green jobs and social co benefits
5. Promoting **behavioural change**


Belfast's Emissions Targets
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Annual CO2
as % of 2000 emissions
2000
2010
2020
2030
2040
2050
Year
2000, emissions baseline
2030, 80% reduction
2025, 66% reduction
2050, 100% reduction
(Net Zero)


A NET-ZERO CARBON ROADMAP FOR BELFAST
Andy Couldson, Andrew Sudmant, Jessica Boyd, Robert Fraser Williamson, John Barry & Amanda Slevin
PCAN
BELFAST CLIMATE COMMISSION
CO2

18%

13%

£389m

Belfast's energy bill from importing fossil fuels

Potential to reduce by

£264m pa by investing

£180m pa through to 2035, with investments paying back in **6 years**

20%

19%

39%

50%

24%

18%

Belfast

LOCAL AREA ENERGY PLAN

Belfast City Council

CATAPULT Energy Systems

March 2024

Belfast

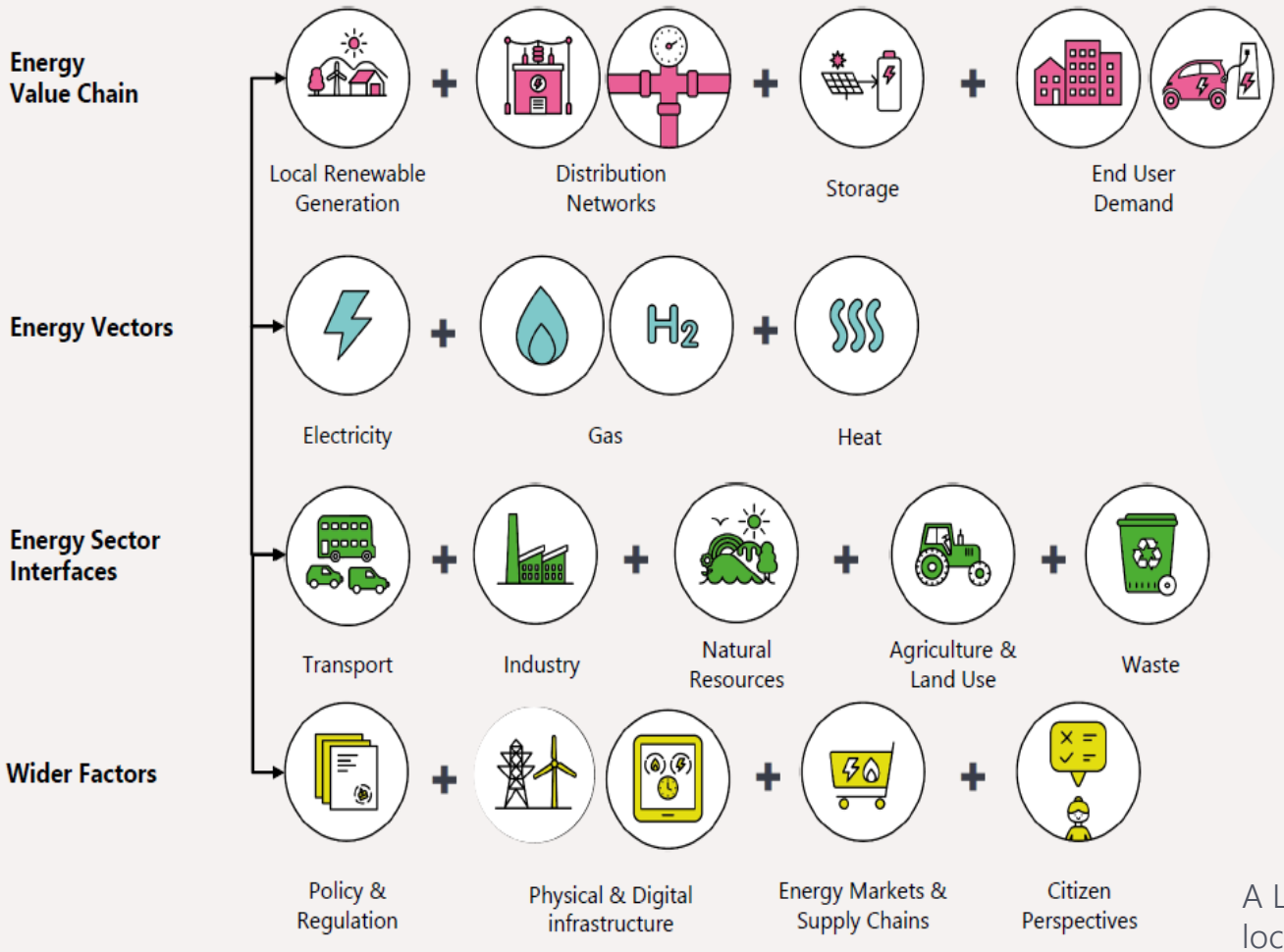
Queen's Island Decarbonisation Plan

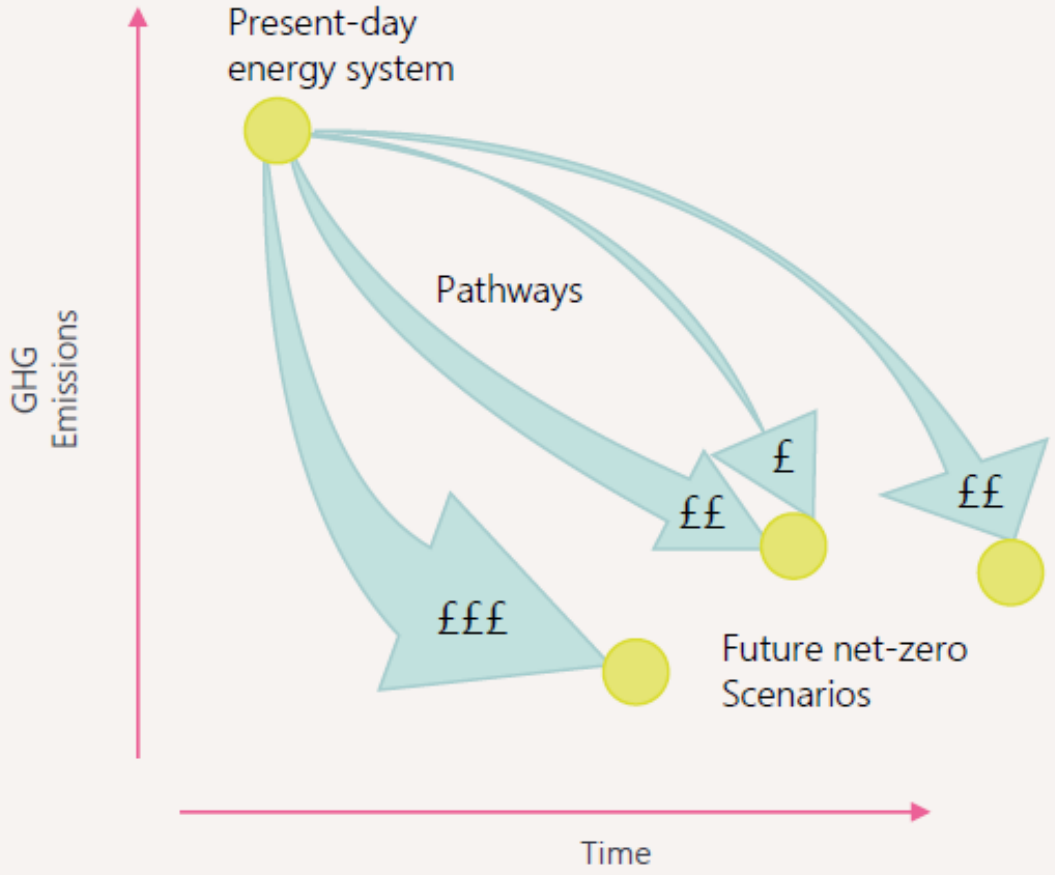
CATAPULT Energy Systems

Belfast City Council

Belfast

Belfast Local Area Energy Plan



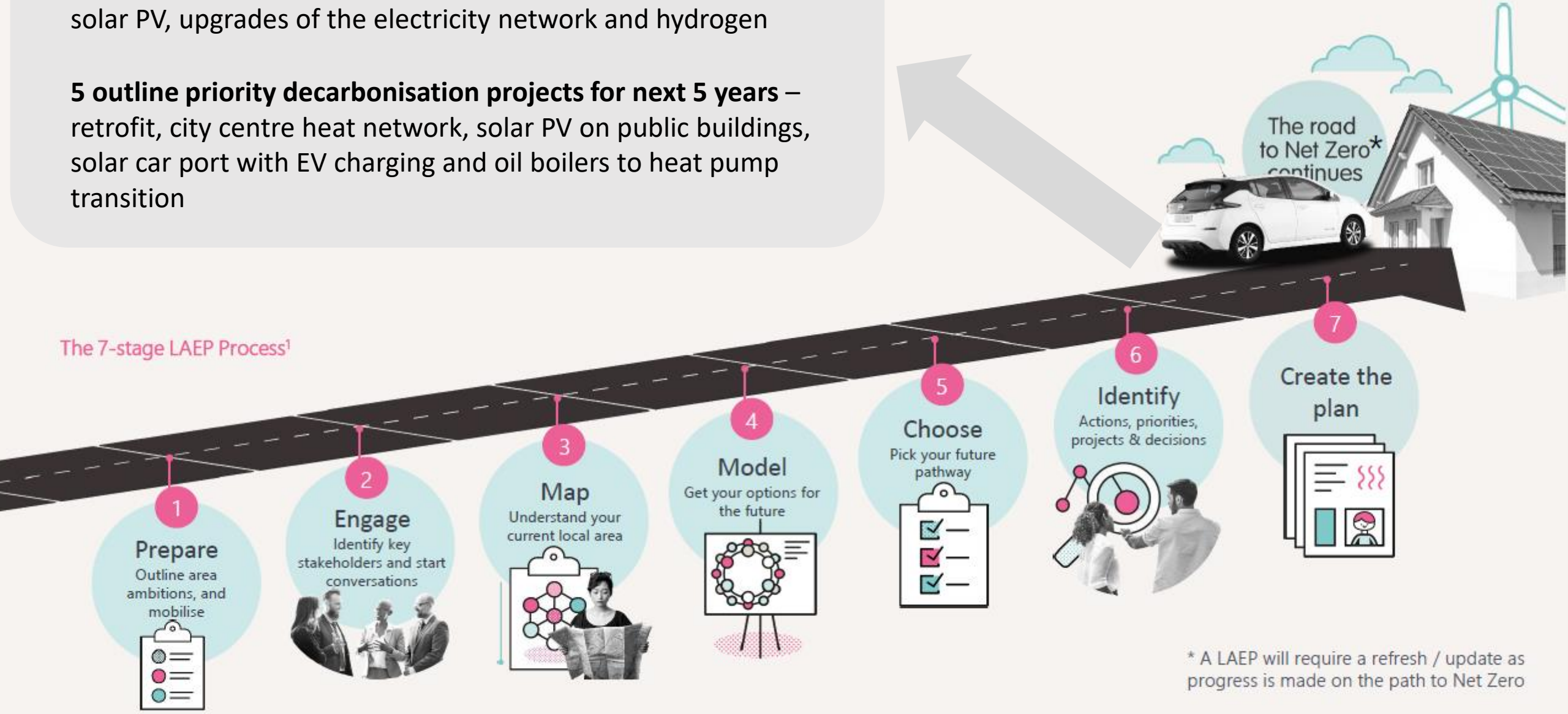


A Local Area Energy Plan (LAEP) is a **whole energy system** approach, led by local government, in collaboration with key stakeholders.

It **identifies the most cost-effective integrated plan** for the local area to contribute to timebound national and local Net Zero targets whilst maximising co-benefits to society.

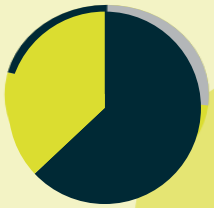
Opportunity areas and focus zones – fabric upgrades, heat networks, heat pumps, biomethane boilers, EV infrastructure, solar PV, upgrades of the electricity network and hydrogen

5 outline priority decarbonisation projects for next 5 years – retrofit, city centre heat network, solar PV on public buildings, solar car port with EV charging and oil boilers to heat pump transition



* A LAEP will require a refresh / update as progress is made on the path to Net Zero

Belfast's Energy System Today



63%

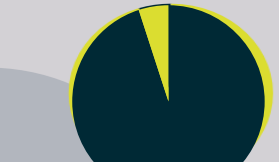
of dwellings EPC rated D – G

BUILDINGS

Currently 35% of of Belfast's existing domestic buildings are EPC rated D with 18% rated E, 8% rated F, and 2% rated G. These require energy efficiency improvements. Belfast must also ensure that 12 million square metres of public, commercial, and industrial floorspace is decarbonised by 2050.

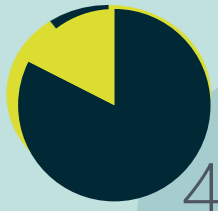
HEATING

66% of buildings currently use gas for heating with 29% using oil. There are small quantities (<5%) of buildings electric heating, solid fuel or biomass heating.



95%

of heating is fossil fuel based



4.5 MW

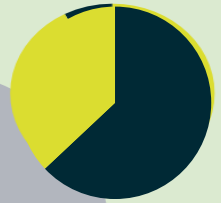
Capacity from existing public EV charging points

VEHICLES

Belfast currently has 170 Electric Vehicle charging points around the city delivering a total charging capacity of nearly 4.5 MW. Belfast's ambition is to deliver 800 charging points by 2027.

ENERGY

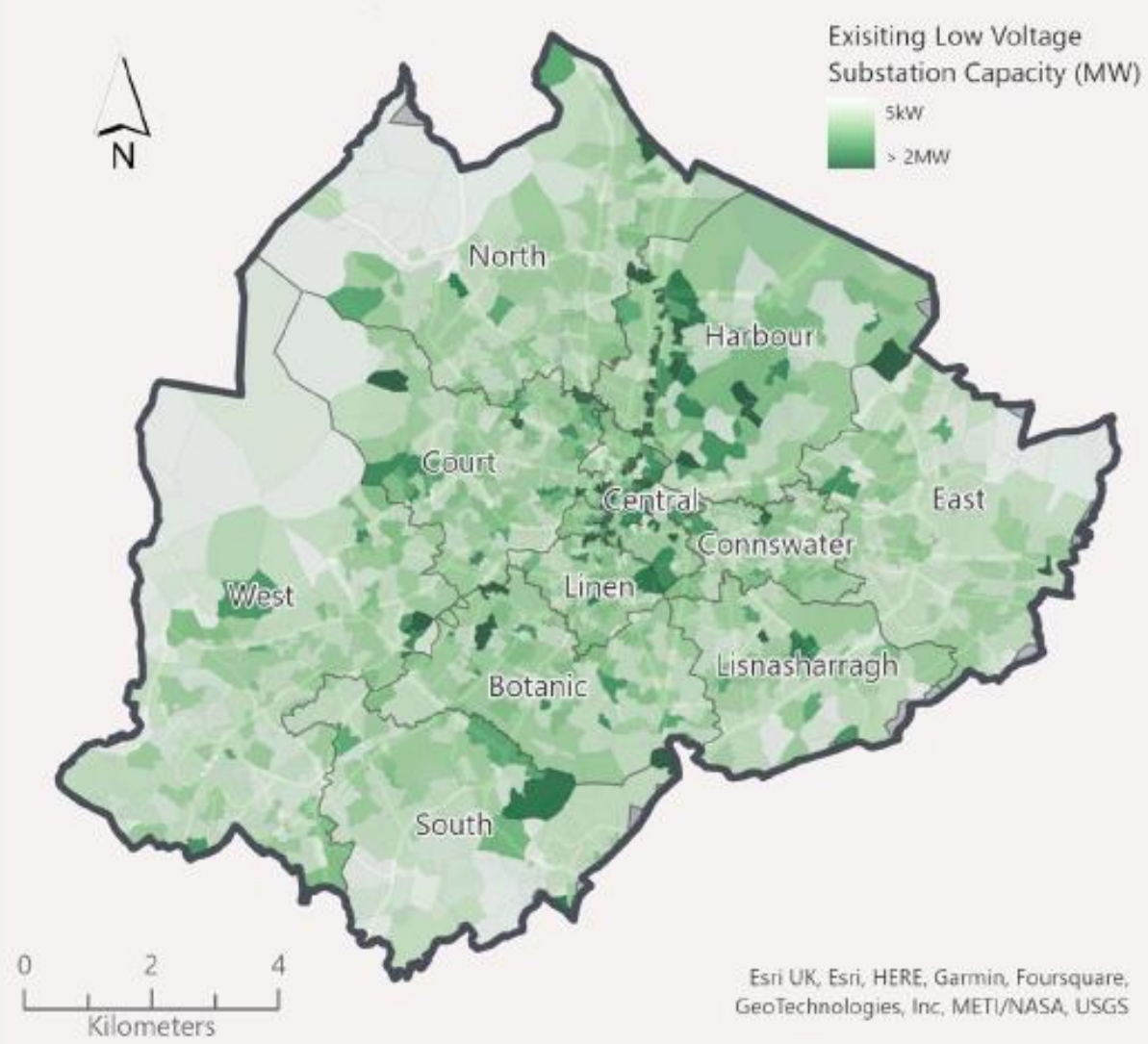
Belfast's metered energy consumption is 63% from gas and 37% from electricity. There are currently 1,311 domestic solar PV installations across Belfast contributing a total of 8.6 MW of renewable electricity to the local supply.



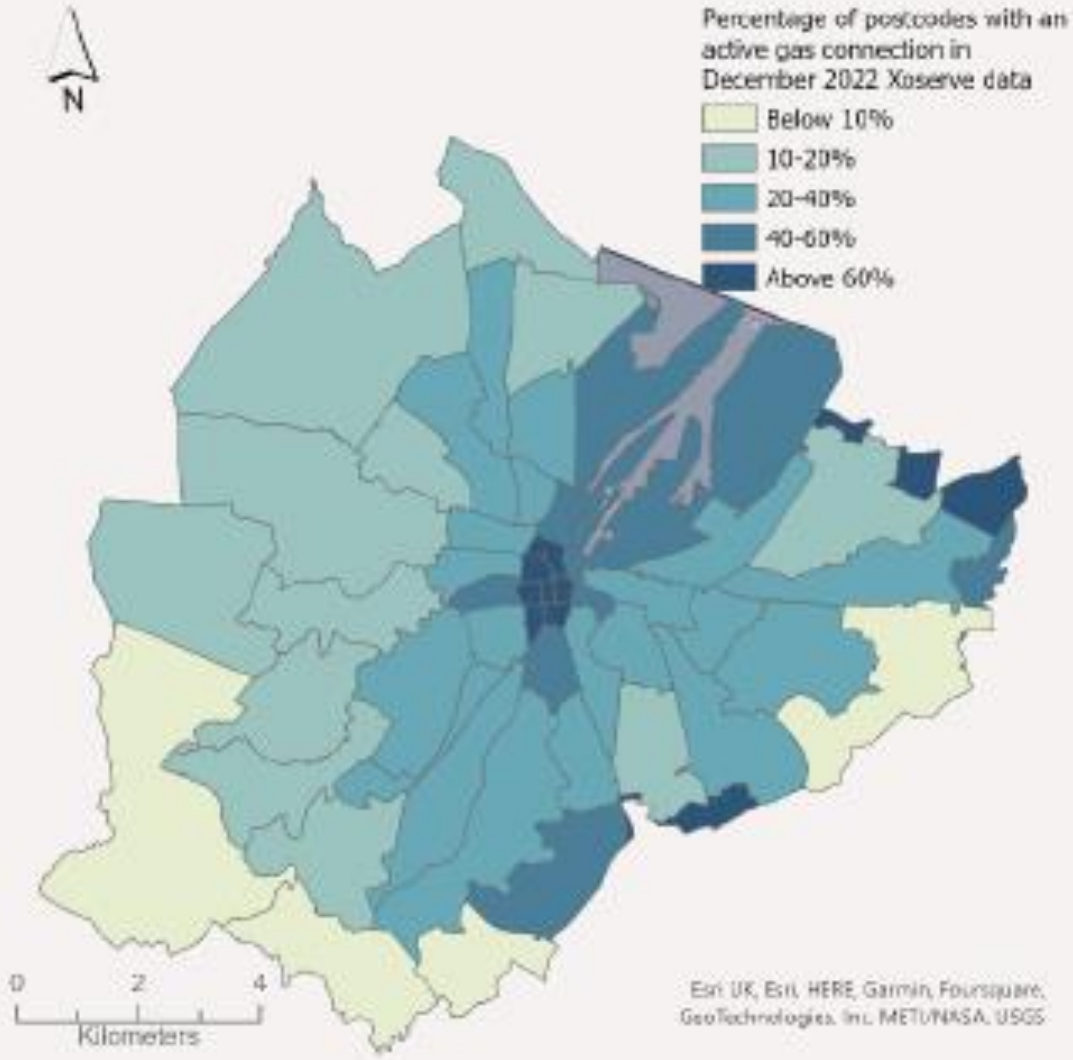
63%

of energy consumed in Belfast is from gas

Low voltage sub-station capacity



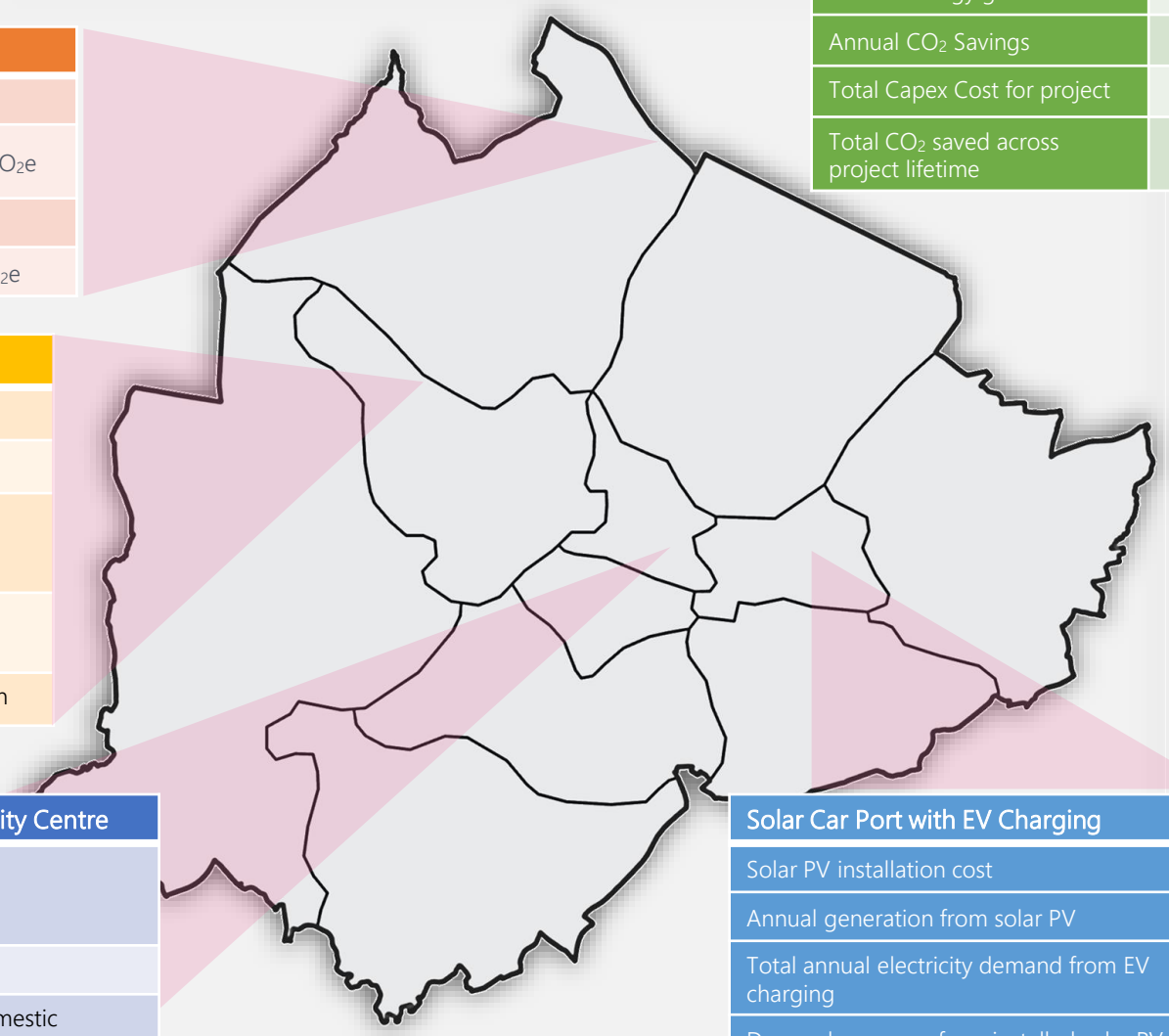
Gas connection



Outline Priority Projects

Oil to Low Carbon Heating Transition	
Number of homes transitioning	500
Annual CO2 Savings (per household)	4,400 $kgCO_2e$
Total Capex Cost for project	£7.0m
Total CO2 saved from project	2.2 $ktCO_2e$

Domestic Retrofit Measures	
Number of Dwellings	Up to 2,000
Capital Investment	£2.7m – £5.6m
Annual bill savings per dwelling	£123 – £520
Annual carbon savings per dwelling	420 – 1,500 $kgCO_2e$
Additional benefit	Fuel poverty reduction



Solar PV on Public Buildings	
Number of buildings	20
Annual energy generated	903 MWh
Annual CO_2 Savings	40 tCO2e
Total Capex Cost for project	£1.0m
Total CO_2 saved across project lifetime	606 tCO_2e

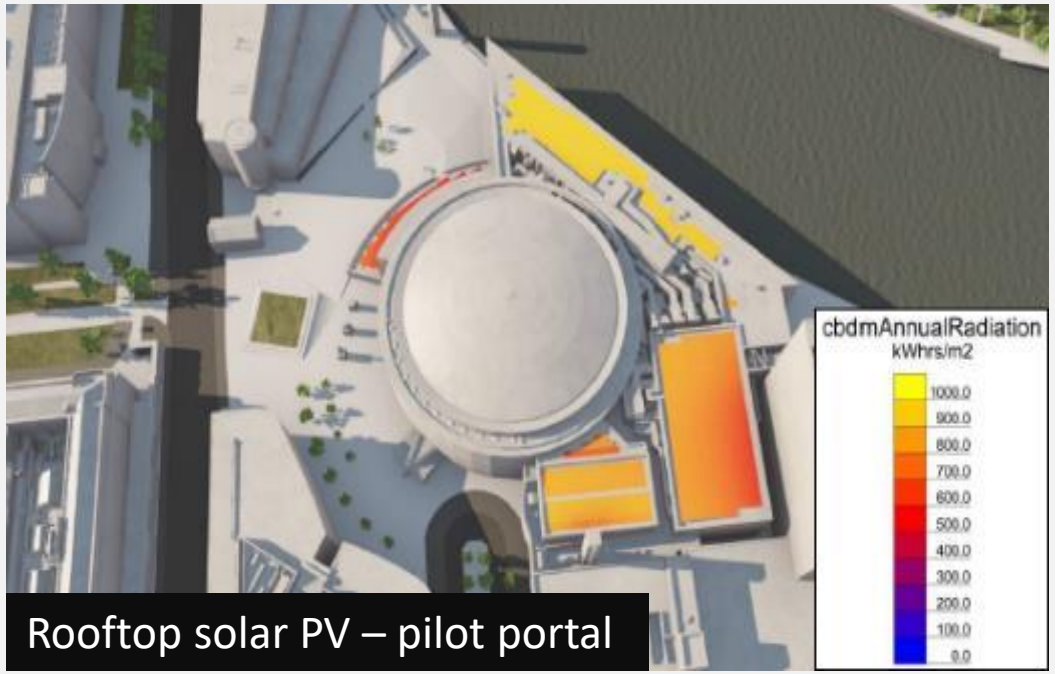
High Temperature District Heat Network in City Centre	
Potential annual energy demand (phase 1: Non-Domestic Buildings only)	2.8 GWh
Capital Investment	£4.2m
Additional benefit	Expansion to domestic properties in phase 2

Solar Car Port with EV Charging	
Solar PV installation cost	£21,100
Annual generation from solar PV	47,800 kWh
Total annual electricity demand from EV charging	3,432 MWh
Demand coverage from installed solar PV	1.4%
Annual CO_2 Savings	2,140 $kgCO_2e$

Priority projects

Retrofit hub

District heat network



Rooftop solar PV – pilot portal

kWh

solar PV may contribute up to 107 GWh of renewable energy in 2030 which is 5% of Belfast's total energy demand in 2030 (2.13 TWh)

734 MW

Domestic Rooftop Solar PV potential by 2050

459 MW

Total Non-Domestic Building Rooftop Solar PV potential by 2050

Loft insulation

Cavity wall insulation

Glazing

Number of retrofit measures applied to properties in the area shown

	Loft Insulation	Cavity Wall Insulation	Single Glazing Window Replacement
Number of homes in area shown (% of all homes in Belfast)	6,615 (3.4%)		
Number of homes in area requiring retrofit measure	2,517	1,419	456
As a % of required measures across Belfast	3.4%	5.4%	6.1%

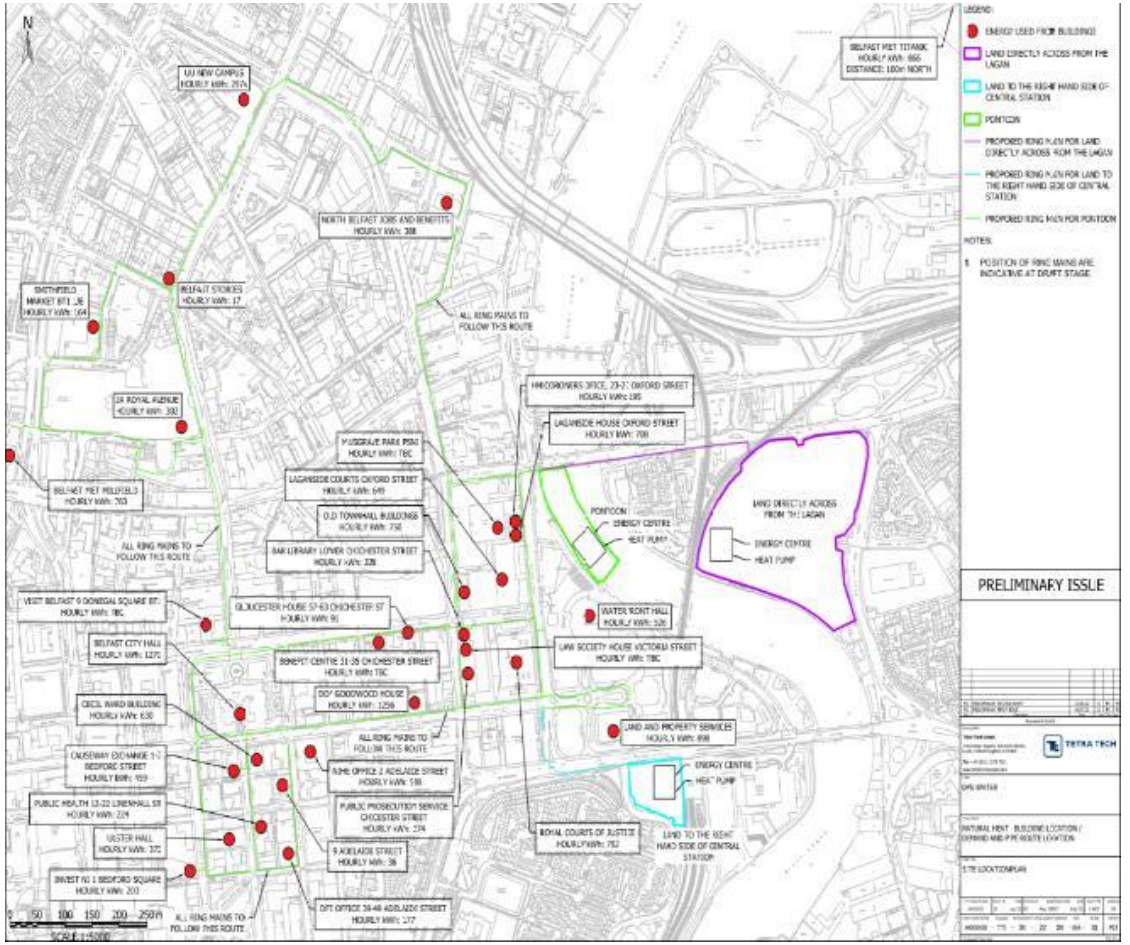
Priority projects – building retrofit

- Use the LAEP to identify potential pilot areas for mixed tenure pathfinder projects, to examine the costs, and potential implementation models

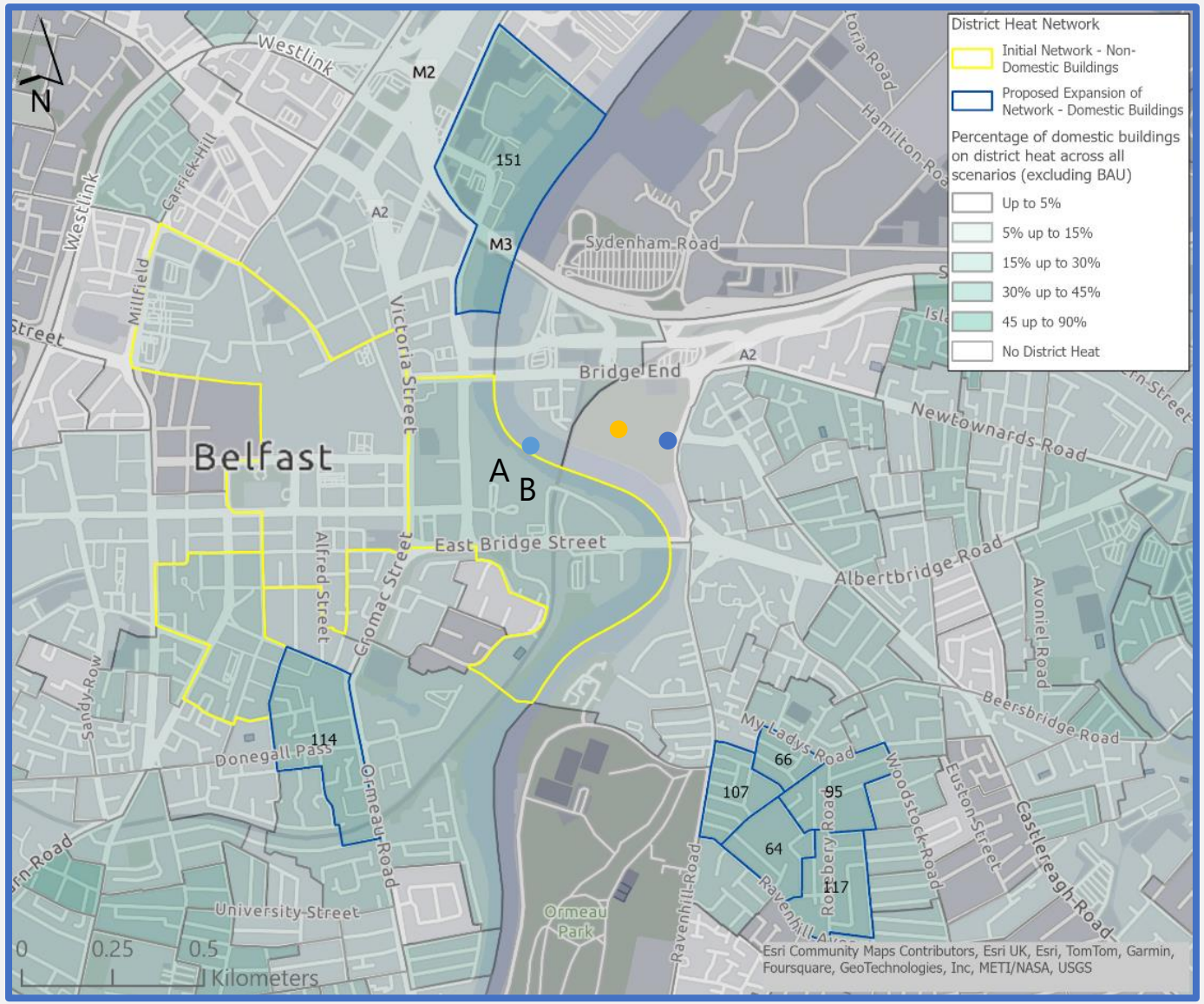
- Adopting a neighbourhood approach will crowd in householders to create a 2 year pipeline of work to increase cost effectiveness

Priority projects – heat network

Using public procurement to drive decarbonisation……



High-Temperature DHN in City Centre

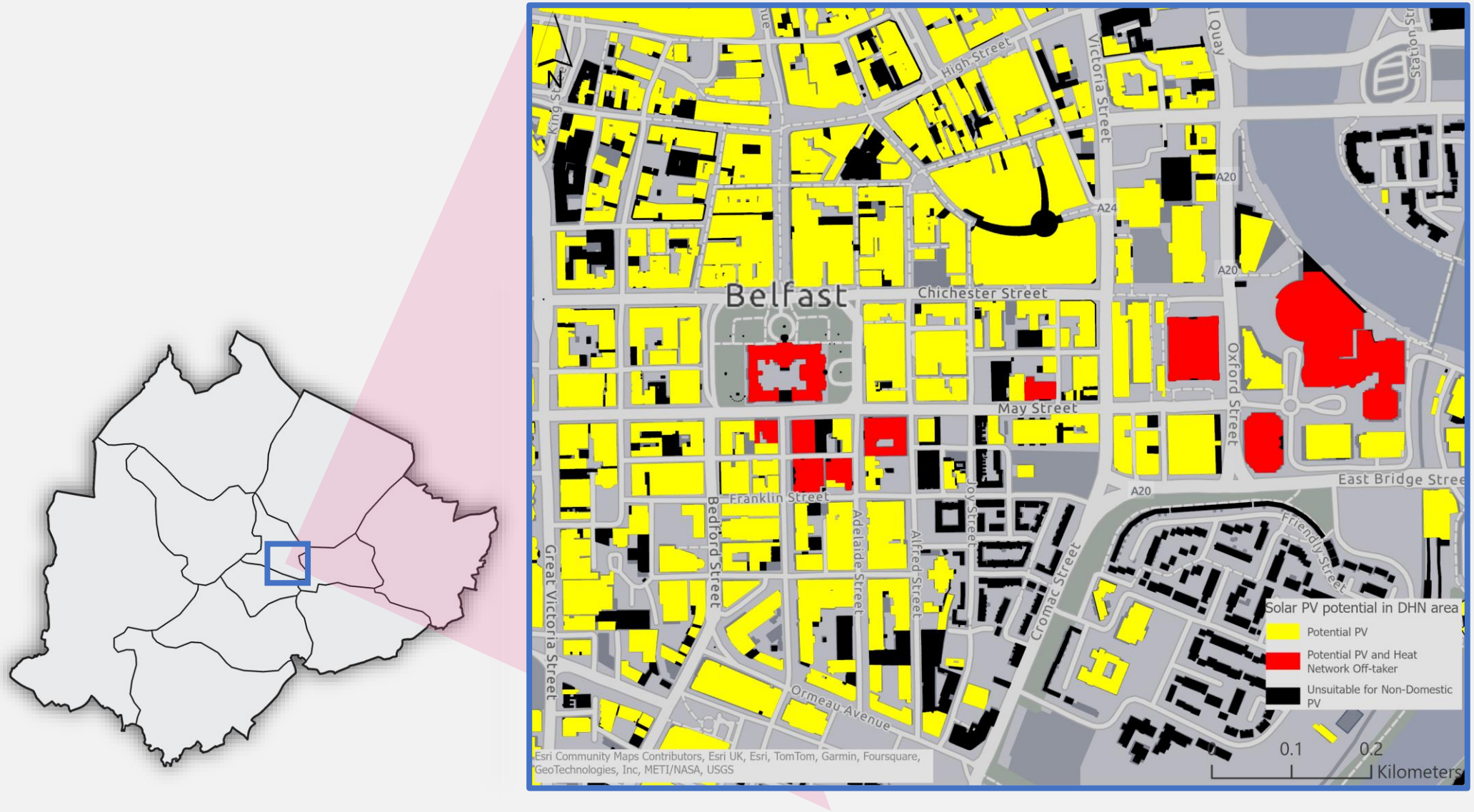


A. Waterfront Hall (annual heat demand 8 GWh)

B. Hilton Hotel, 4 Lanyon Place (annual heat demand 9 GWh)

- Potential river-sourced energy centre
- Potential land-based energy centre
- Potential geothermal boreholes for thermal underground storage

Solar PV potential on Non-Domestic Buildings in central Belfast potential DHN area



Belfast

Queen's Island | Decarbonisation Plan

CATAPULT Energy Systems

Belfast City Council

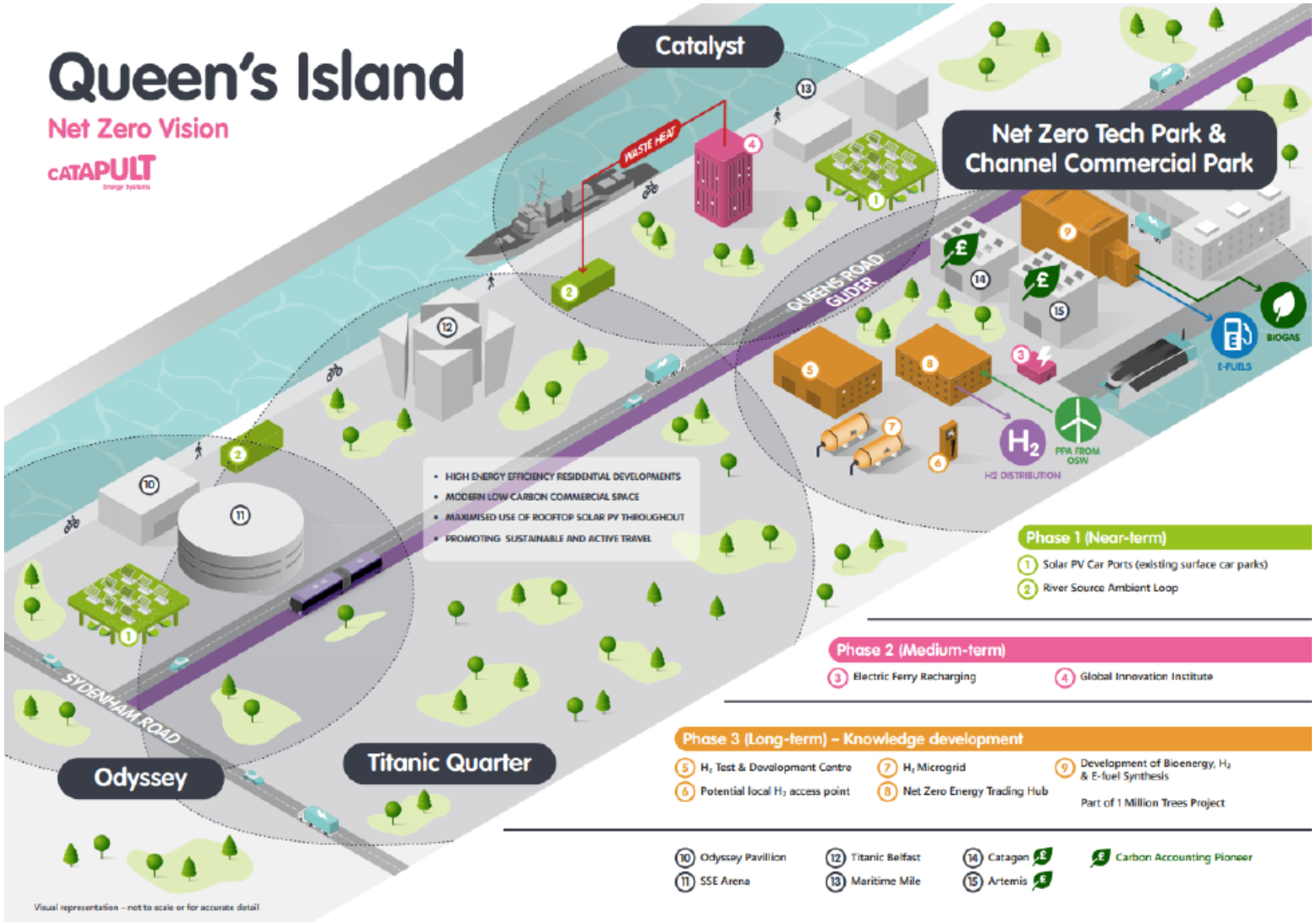
Belfast

01 Citi Gateway Offices
05 Public Record Office of Northern Ireland
06 Belfast Metropolitan College
08 Titanic Belfast
15 Titanic Hotel Belfast

Queen's Island

Net Zero Vision

CATAPULT Energy Systems



Phase 1 (Near-term)

1. Solar PV Car Ports (existing surface car parks)
2. River Source Ambient Loop

Phase 2 (Medium-term)

3. Electric Ferry Recharging
4. Global Innovation Institute

Phase 3 (Long-term) – Knowledge development

5. H_2 Test & Development Centre
6. Potential local H_2 access point
7. H_2 Microgrid
8. Net Zero Energy Trading Hub
9. Development of Bioenergy, H_2 & E-fuel Synthesis

Part of 1 Million Trees Project

10. Odyssey Pavilion
11. SSE Arena
12. Titanic Belfast
13. Maritime Mile
14. Catagen
15. Artemis

Carbon Accounting Pioneer

£15 million

Total net CapEx

Providing:

£2.5 million

Cumulative cost savings to 2050

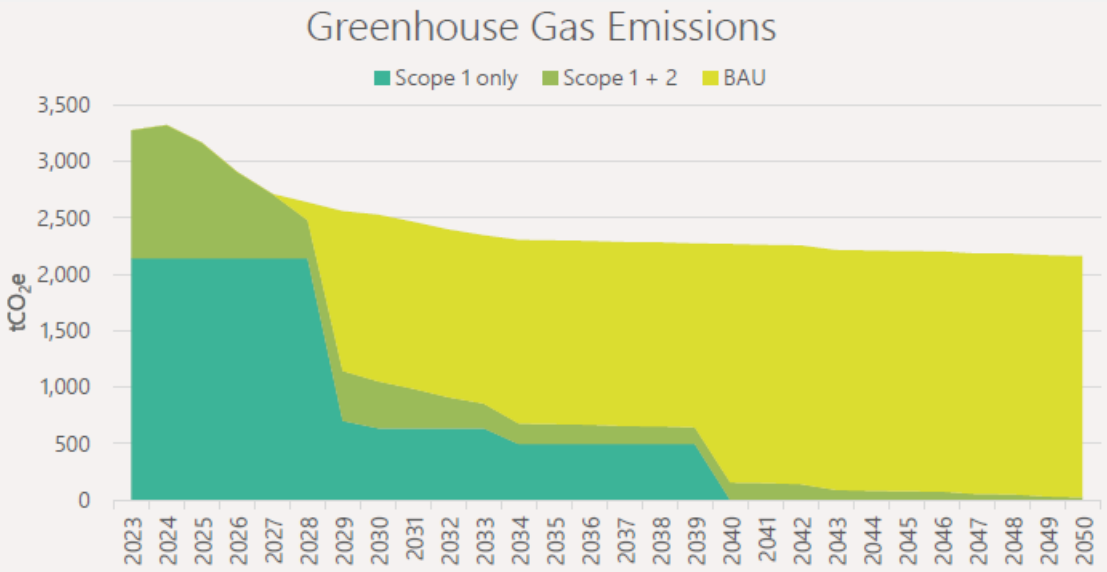
Saving:

2,136 tCO_2e

in 2050 against a business-as-usual pathway

7.3 GWh

energy in 2050 against a business-as-usual pathway



Phase 1* (2027 – 2029)

Start developing ambient loop network and connection of **Belfast Met, Citi** and **Titanic Belfast**

Phase 2 (2033 – 2034)

Connection of **PRONI**

Phase 3 (2039 – 2040)

Connection of **Titanic Hotel** and **Titanic House**

* Solar carports have been phased from 2026-27 alongside Phase 1 heat deployment

Solar car port Odyssey

Heat network

Solar car port Catalyst

Option to extend network to future potential waste heat source (Global Innovation Institute)

Option to extend/replicate ambient loop for existing Catalyst buildings

Option to supply domestic hot water, heating or cooling to future site developments

Support development of Net Zero Technology Park

Next steps

Belfast Net Zero Pathfinder project

Form LAEP delivery group and a data Group

Use the LAEP to build a pipeline of net-zero aligned investments

Develop investible business models

Engage citizens

Measure the decarbonisation and social co-benefits

It can be done