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How to balance cost and carbon

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Some organisations are finding it hard to keep up momentum towards net zero, because of **immediate cost pressures and unpredictability**

But leaders need to recognise that their economic and environmental goals do not have to conflict: **net zero and cost efficiency still work together**.

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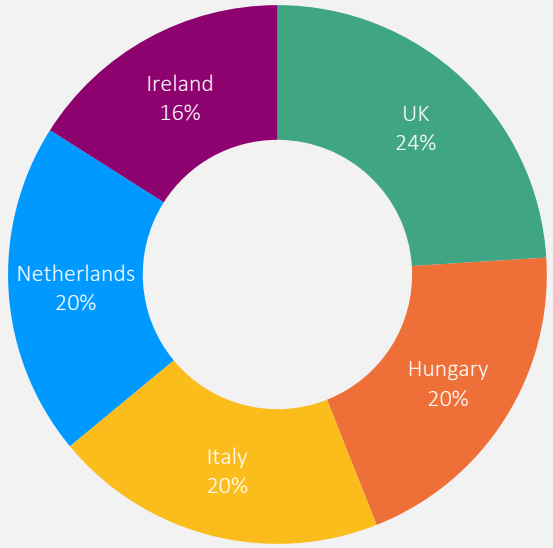
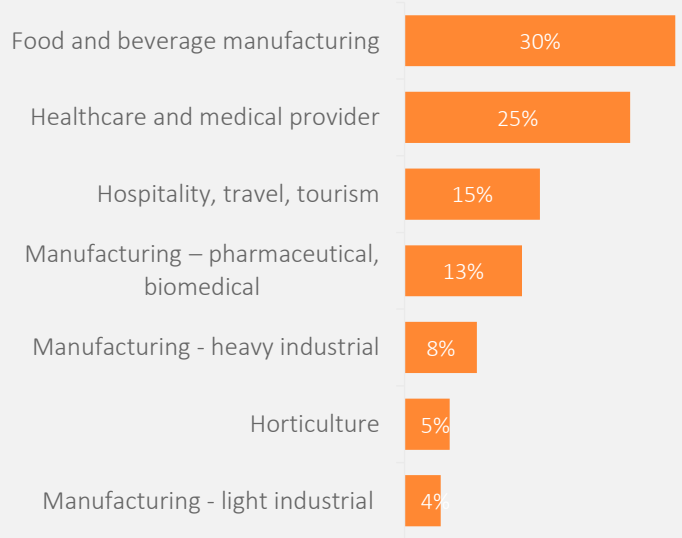
In our fourth year of surveying organisations' energy plans, we explore how to balance their cost and carbon goals

We surveyed 500 executives in December 2022 and January 2023, across the following demographics:





Enhancing the credibility of the research through a range of expert contributors:

John Petre
Supply Chain, Procurement & Technical Director, Executive Leadership Team, Weetabix

Cristina Bifulco
Chief Sustainability Officer, Prysmian

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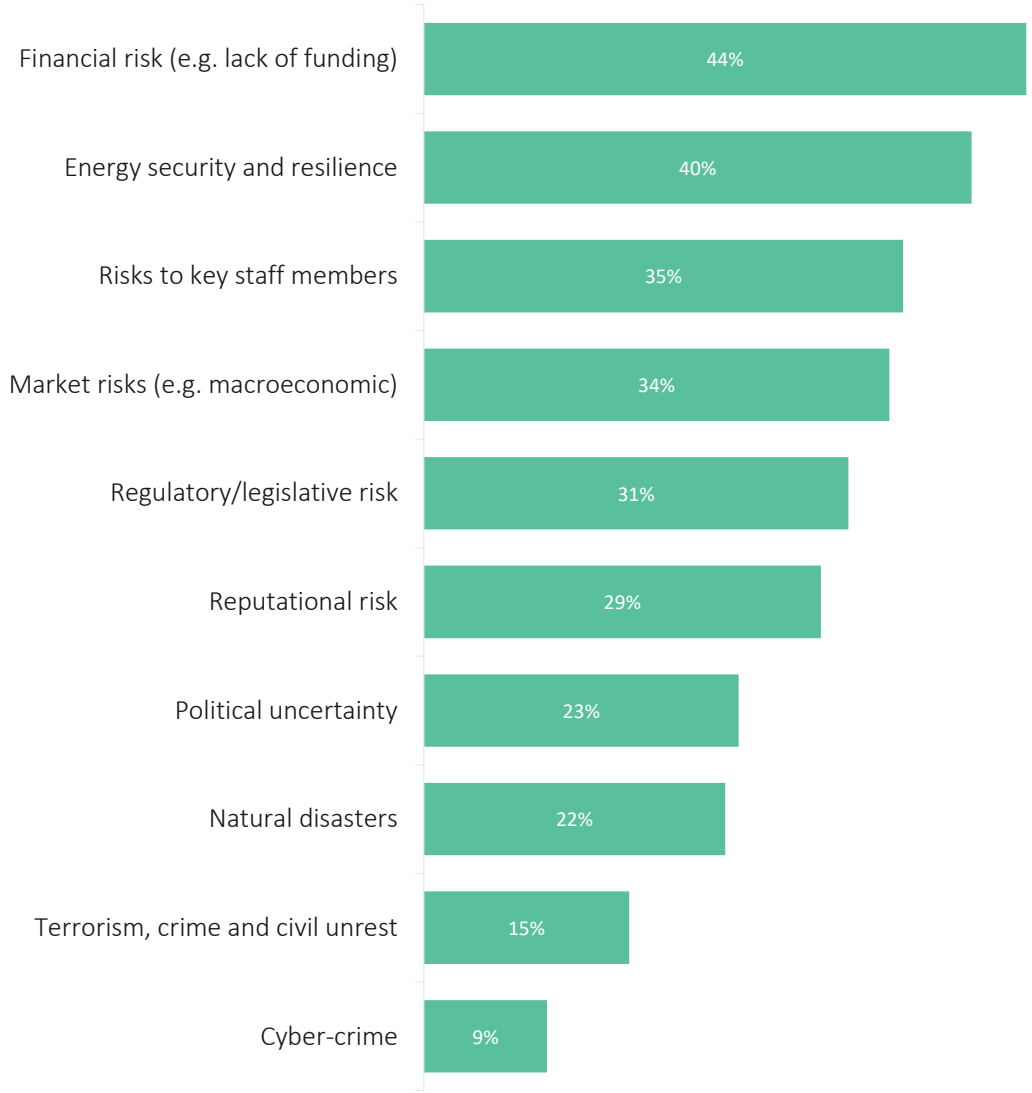
Managing energy costs in a tough environment

- Securing a resilient supply of energy at an affordable price is a concern for the leaders of many organisations.
- For 44% of organisations, financial risk is now the most serious threat they face. For 40%, it's energy security.
- Inevitably, these risks are affecting organisations' priorities: for instance, 46% say that the cost of energy is currently a more pressing issue than sustainability.

Which of the following do you see as substantial risks to your organisation?



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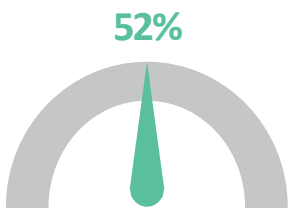
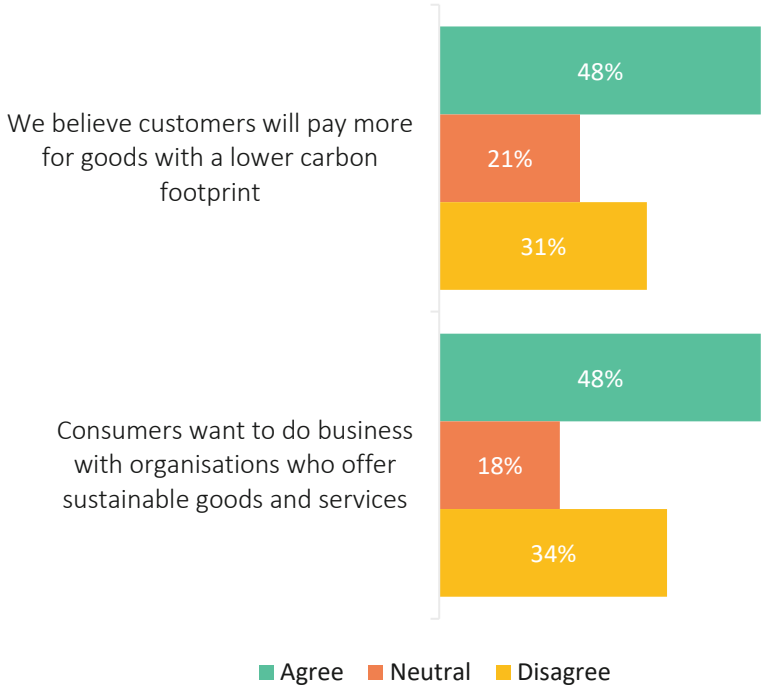
But energy cost reduction is not the enemy of sustainability

- Creating cost efficiency and sustainability are not mutually exclusive objectives. Many of the strategies and tactics organisations will use to reduce costs can also support their decarbonisation efforts.
- Organisations that disregard their sustainability and decarbonisation strategies while they focus on cost will come under mounting pressure from various stakeholder groups, including end-customers and investors.

Meeting stakeholder and customer expectations



of organisations say their investors and shareholders are more in favour of investing in renewable energy than ever before.



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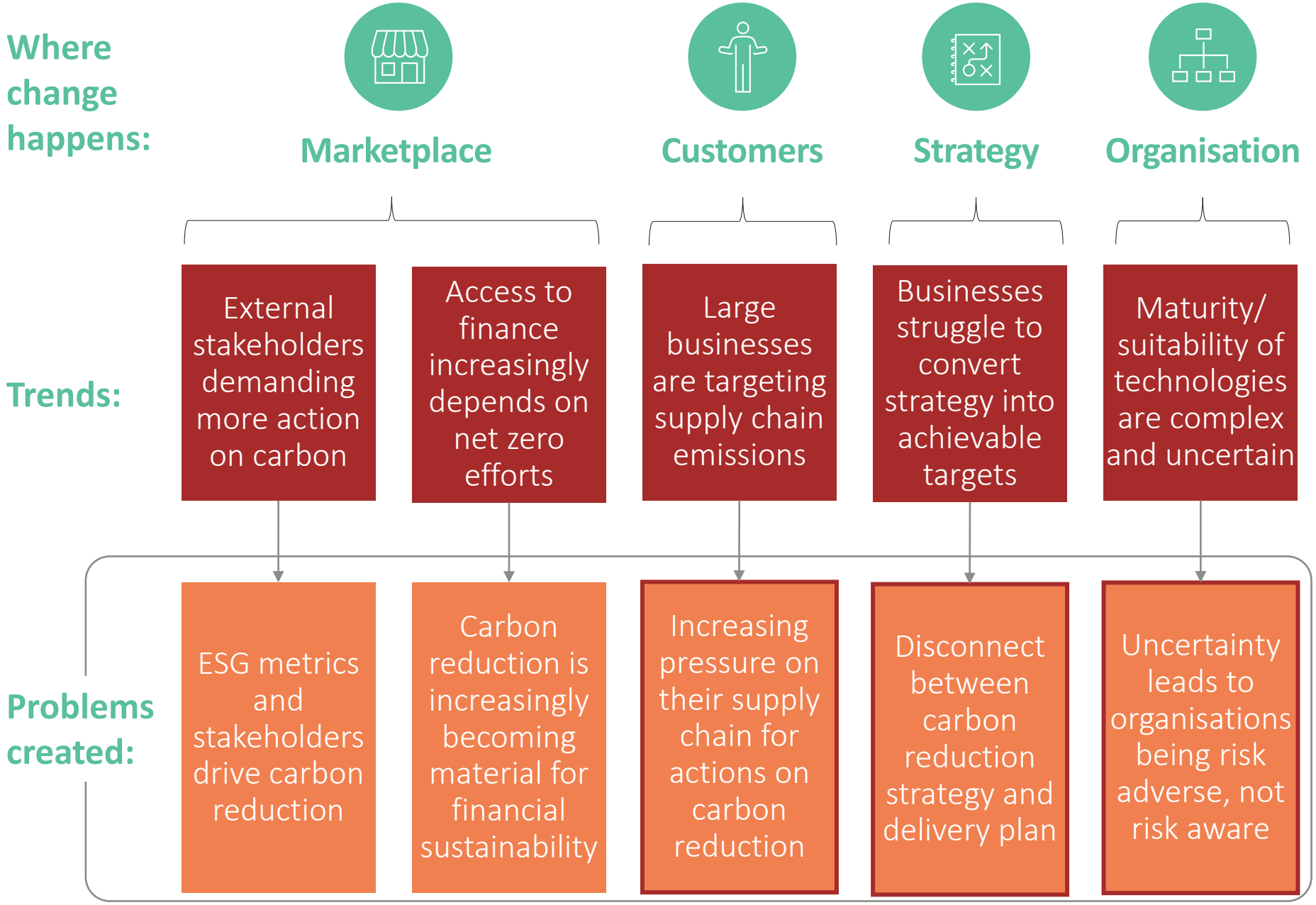
The energy services market is changing

Growing awareness of the net zero challenge is accelerating initiatives taken by organisations



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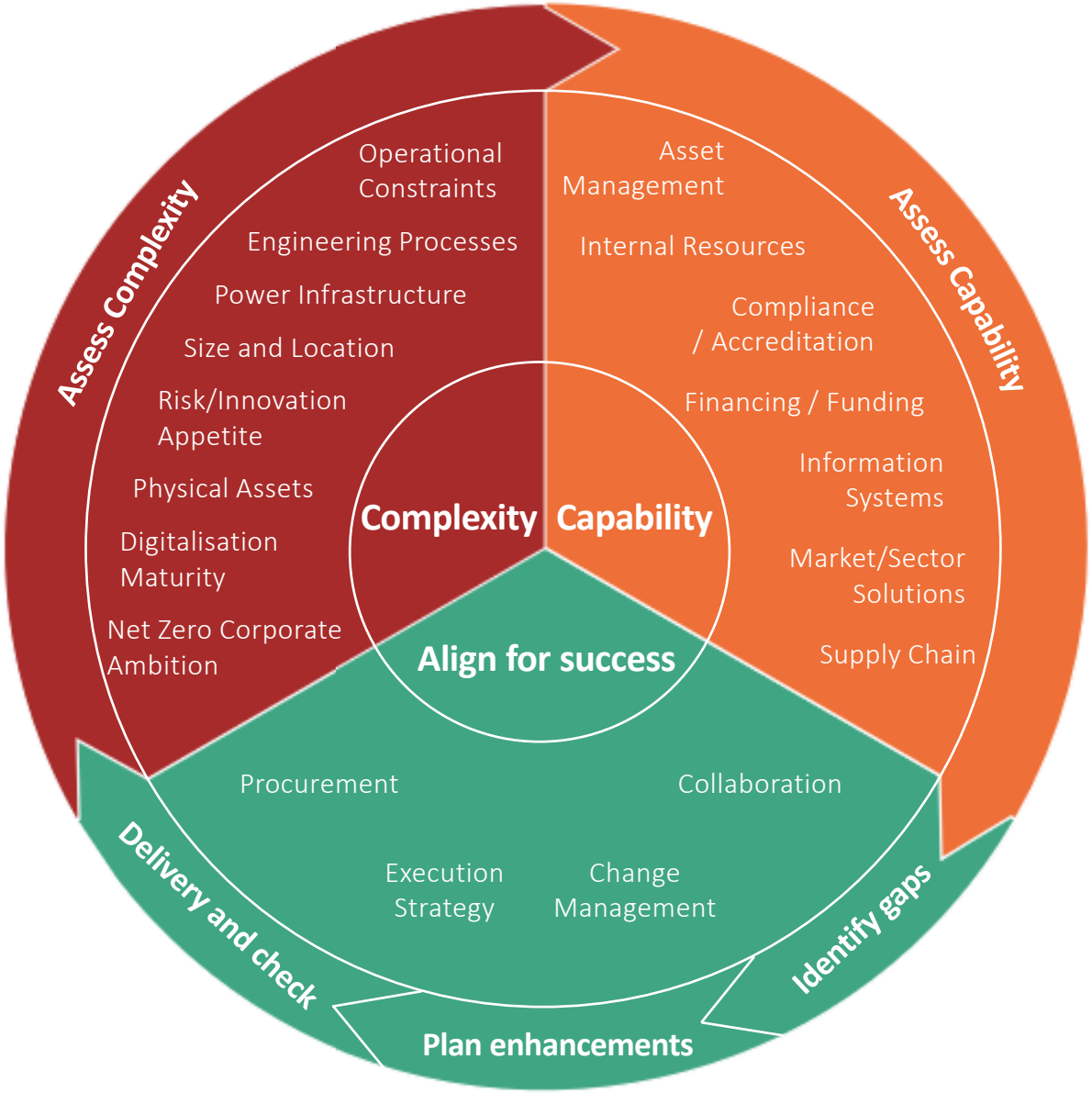
Our net zero delivery framework

A guiding partner to:

- Identify gaps between the organisation complexities and capabilities at every level
- Where and how complexity needs to be managed before moving into delivery
- Existing vs. required level of delivery capability
- Implications of strategic decisions at site level and how to apply best practice and innovations (now and future).



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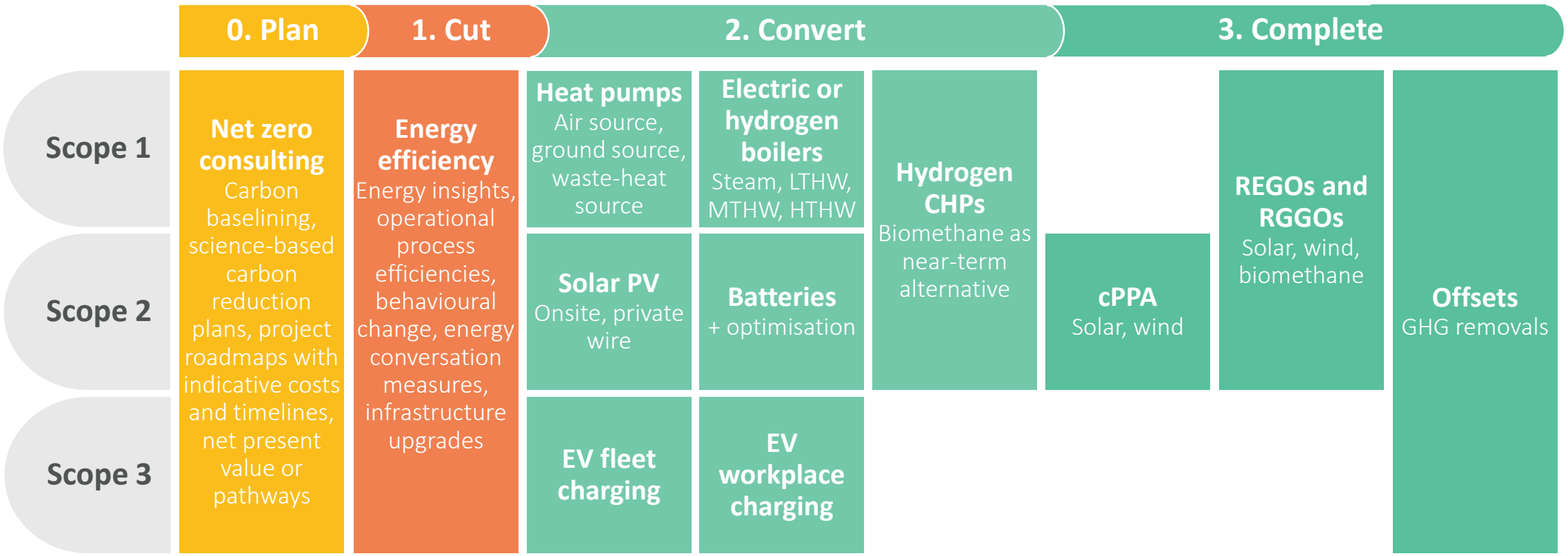
Decarbonisation hierarchy



Complementary solutions
Carbon reporting and cost management benefits

Energy supply options

Flexible asset optimisation

Carbon monitoring and insights

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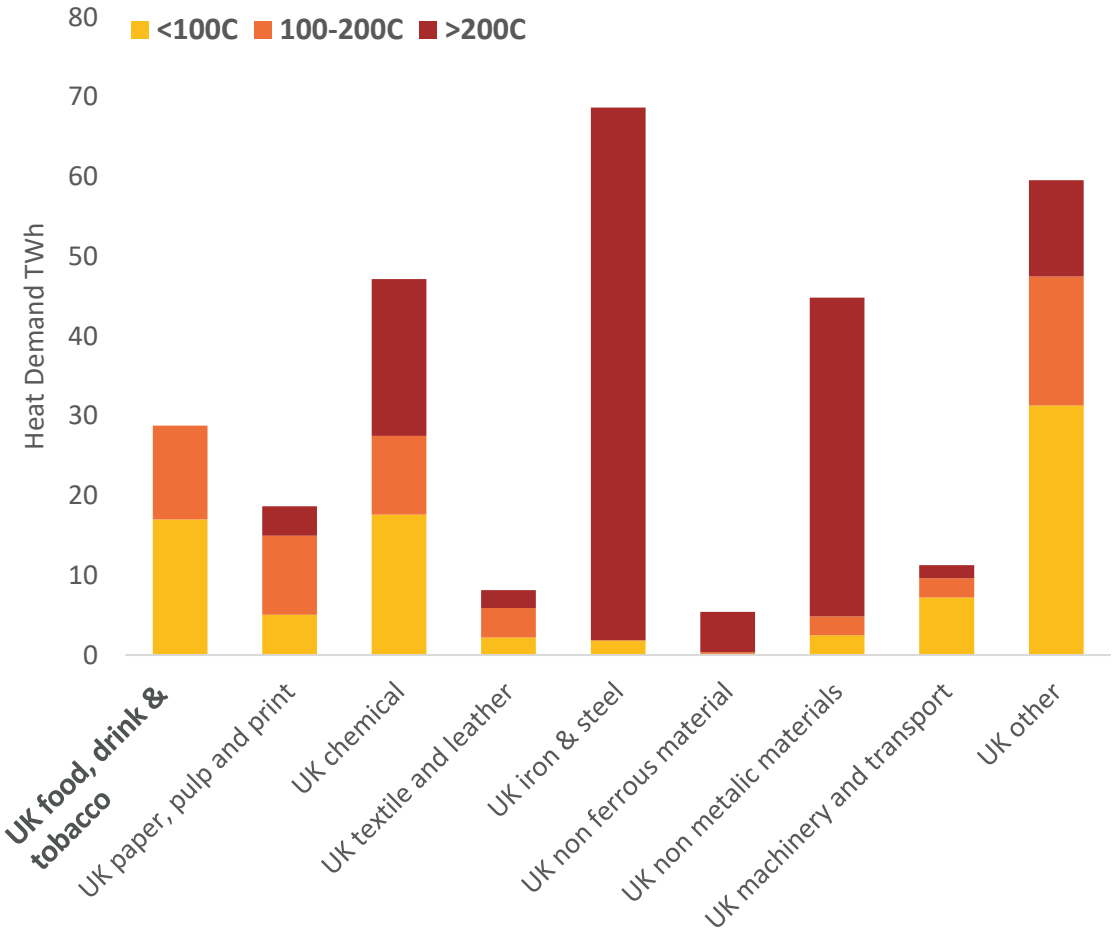
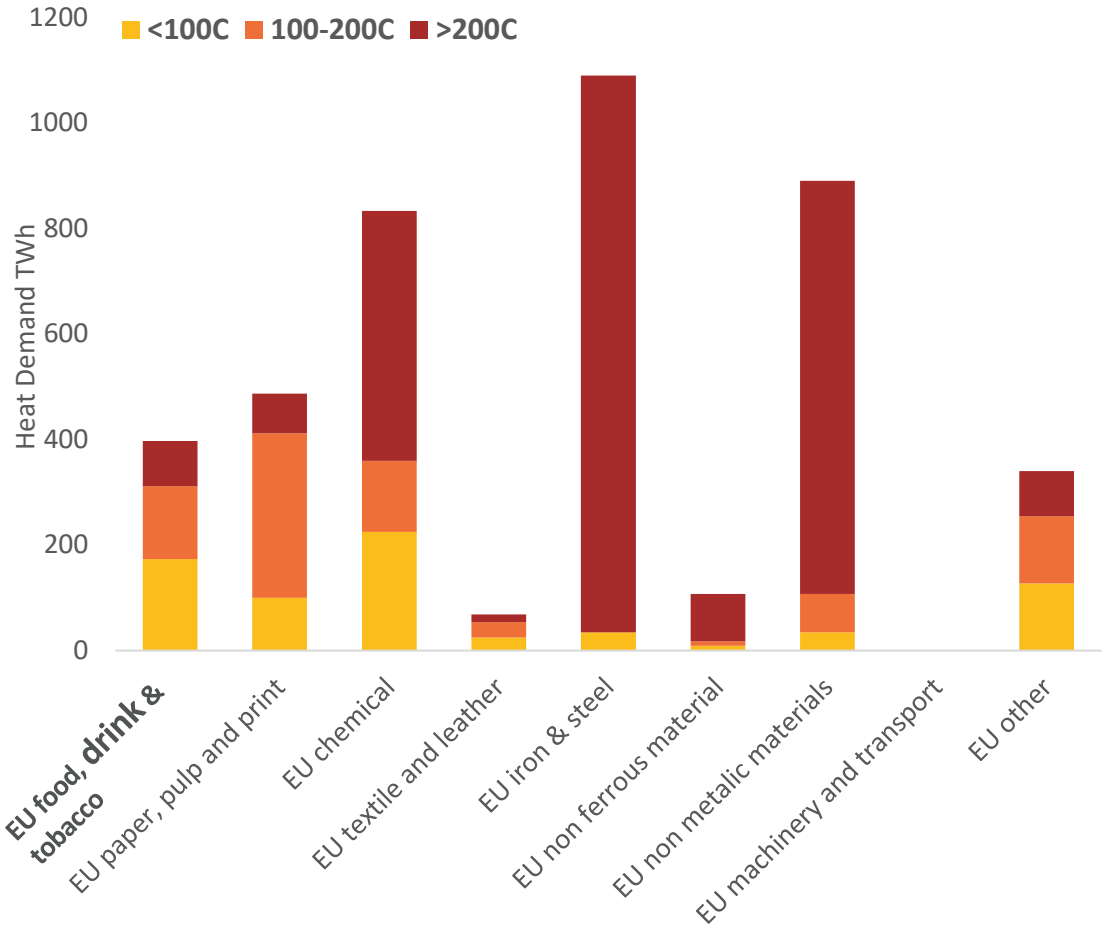
Industrial heat demand

Central Scenario, <200C

UK Potential Industrial Heat Demand by Sector and Temperature Range (2030)



EU Potential Industrial Heat Demand by Sector and Temperature Range (2030)



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ECOP in partnership with Centrica Business Solutions

An innovative high temperature heat pump

- Founded in 2007
- A rotating heat pump providing up to 150°C steam
- A new model providing up to 200°C steam under development

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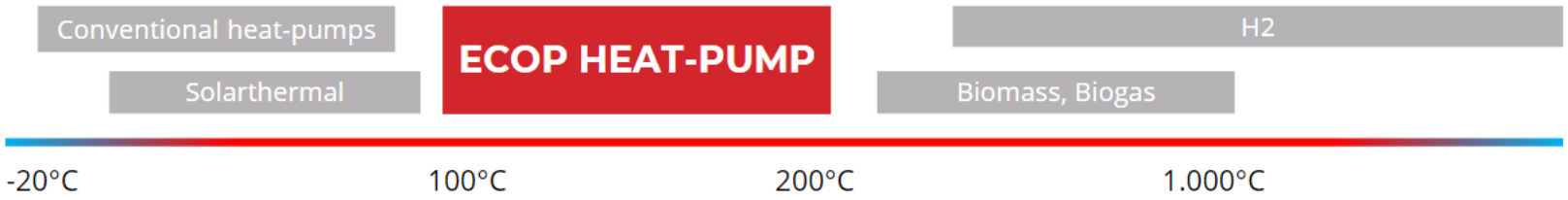
ECOP technology credentials

ROTATION HEAT PUMP	OTHERS
up to 200°C, flexible	up to 90°C, fixed
Eco & climate friendly working gas	Classic cooling medium
High efficiency at all temperature levels	High efficiency at one temperature level



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Industrial and Commercial Market Overview

The I&C fuel switching market will grow

By 2040 there is expected to be **340TWh/year** of fuel consumption across energy intensive industries in the UK.

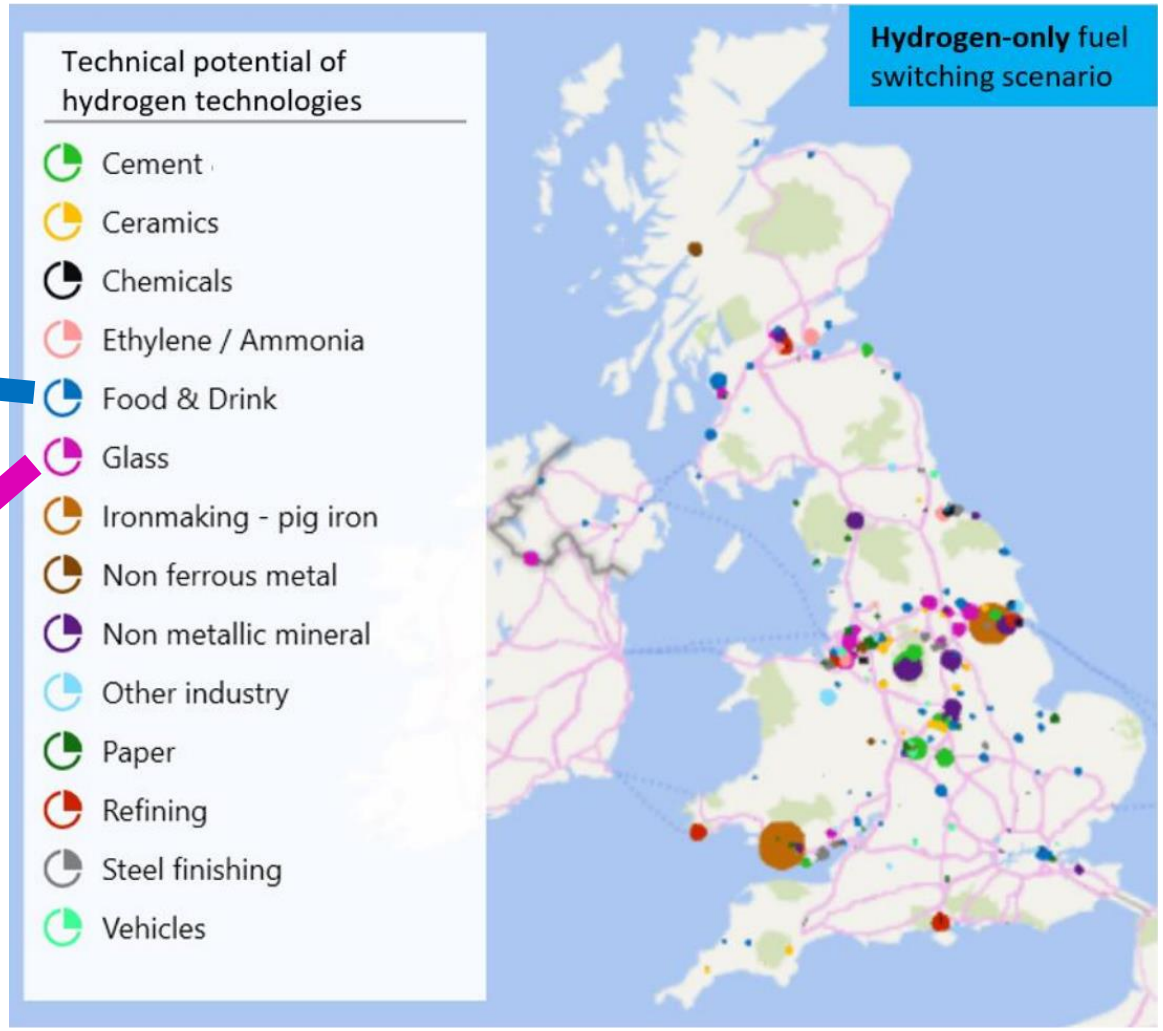
According to Element Energy, **89TWh/year** of this demand has the potential for fuel switching.[1]

Fuel Switching Demand in the Food & Drink Sector:

- **c.1000 sites** across the UK
- **28TWh/year** fuel consumption
- **17%** of UK's manufacturing **GVA**
- **96%** of manufacturing businesses are **SMEs**

Fuel Switching Potential in Glass & Ceramics Sector:

- **Employs** over **30,000** people
- **26TWh/year** fuel consumption
- **Little alternatives** to Fuel Switching
- Large proportion are **SMEs**



[1] Industrial fuel switching market engagement study (publishing.service.gov.uk)

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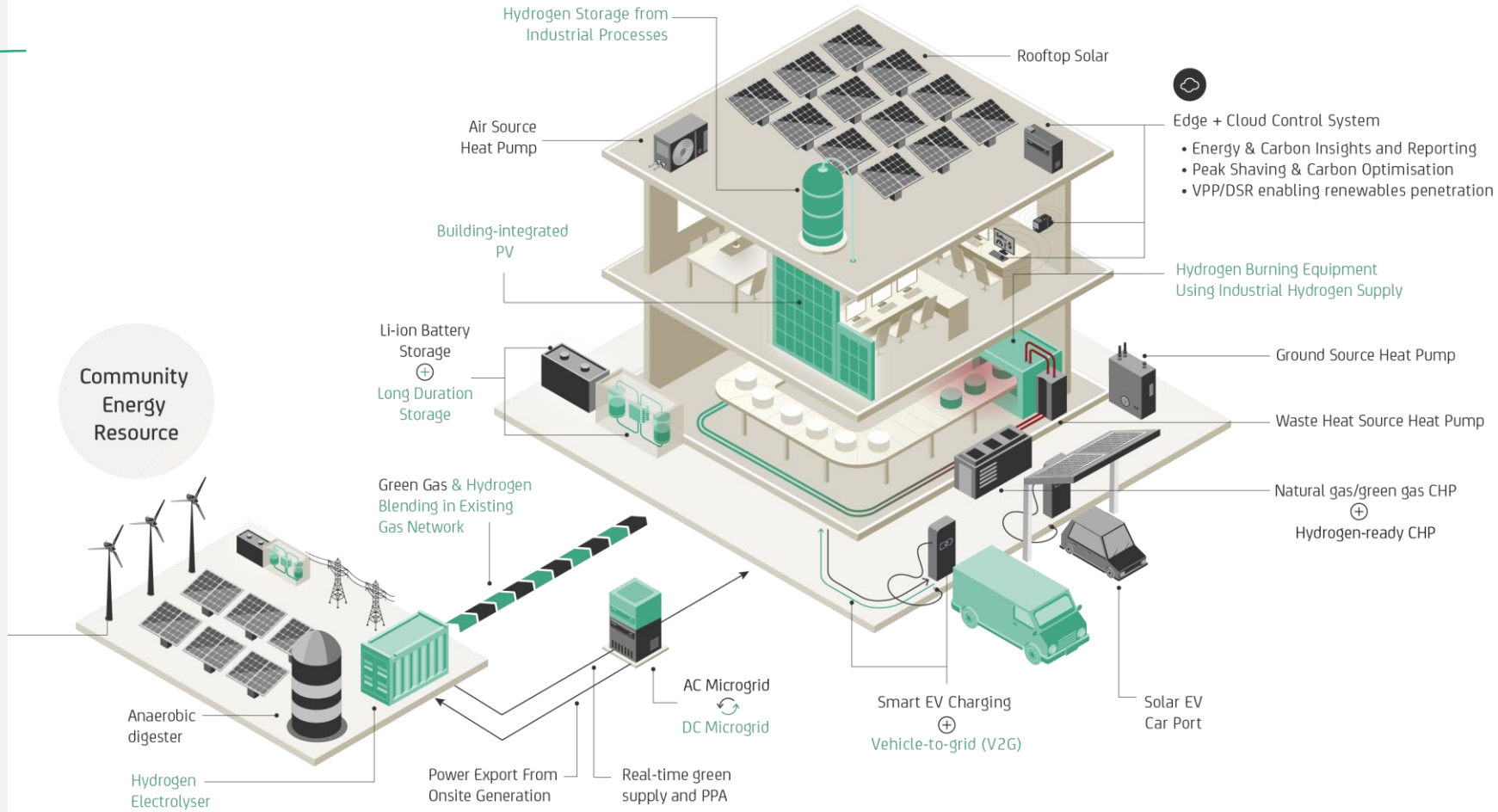
We identify the best technologies and create solutions adapted to your requirements

Our workflow process

- Project scope and objectives
- Site(s) data collection and analysis
- Engineer site(s) survey
- Net zero pathway options design & cost calculation process
- Net zero pathway and target year modelling
- Mid-point evaluation & stakeholders engagement
- Dissemination: Site level workshops
- Global decarbonisation strategy
- Reporting and socialisation/dissemination



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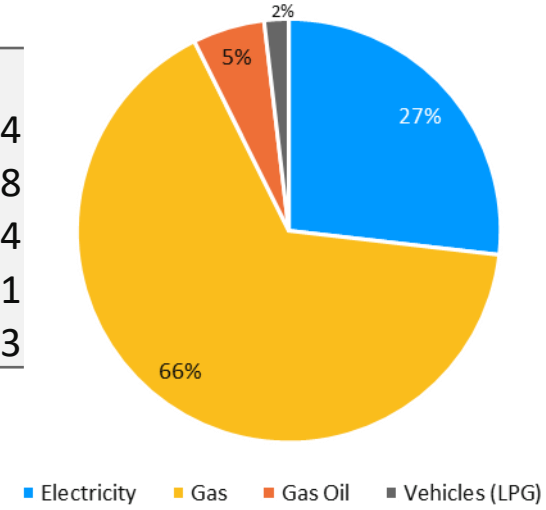
Breakdown of energy and carbon footprint…

In 2022, the site's total energy consumption was 34.7 GWh and the site's emissions were 7,347 tCO2e

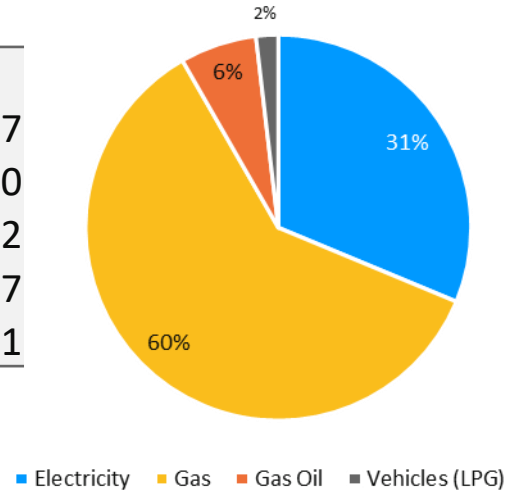
2022 Site Energy Consumption Split By Category

2022 Baseline	kWh
Electricity	9,822,044
Gas	24,199,268
Gas Oil	2,000,964
Vehicles (LPG)	678,931
Total	34,799,243



2022 Site Carbon Emissions Split By Category

2022 Baseline	tCO2e
Electricity	2,497
Gas	4,640
Gas Oil	492
Vehicles (LPG)	187
Total	7,171



Global footprint:

390 GWh
Annual energy consumption

$57M
Annual energy cost

97,500 tCO_2e
Annual scope 1 & 2 carbon emissions

**Figures are for illustrative purposes only*

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We assess various technological pathways for you to reach net zero…

The electrification solution

involves Energy Efficiency, Solar PV, Wind, Heat Pumps and Electric Steam Boilers deployed at site

19,837 MWh imported electricity
(total grid connection of 5MW required)

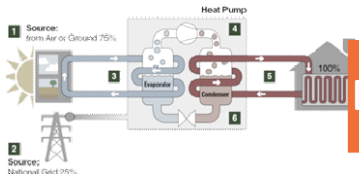
Solar PV: 884 MWh

Solar PV car port: 365 MWh

Electricity consumed on site:
8,826 MWh

(inc 1,022 MWh efficiency savings)

Heat pump:
8,281 MWh



Drier heat: 13,290 MWH (115c)

Electric steam boiler:
6,679 MWh

Ex' and Cond' steam: 6345 MWh (120c)

Heat consumed on site:
19,652 MWh

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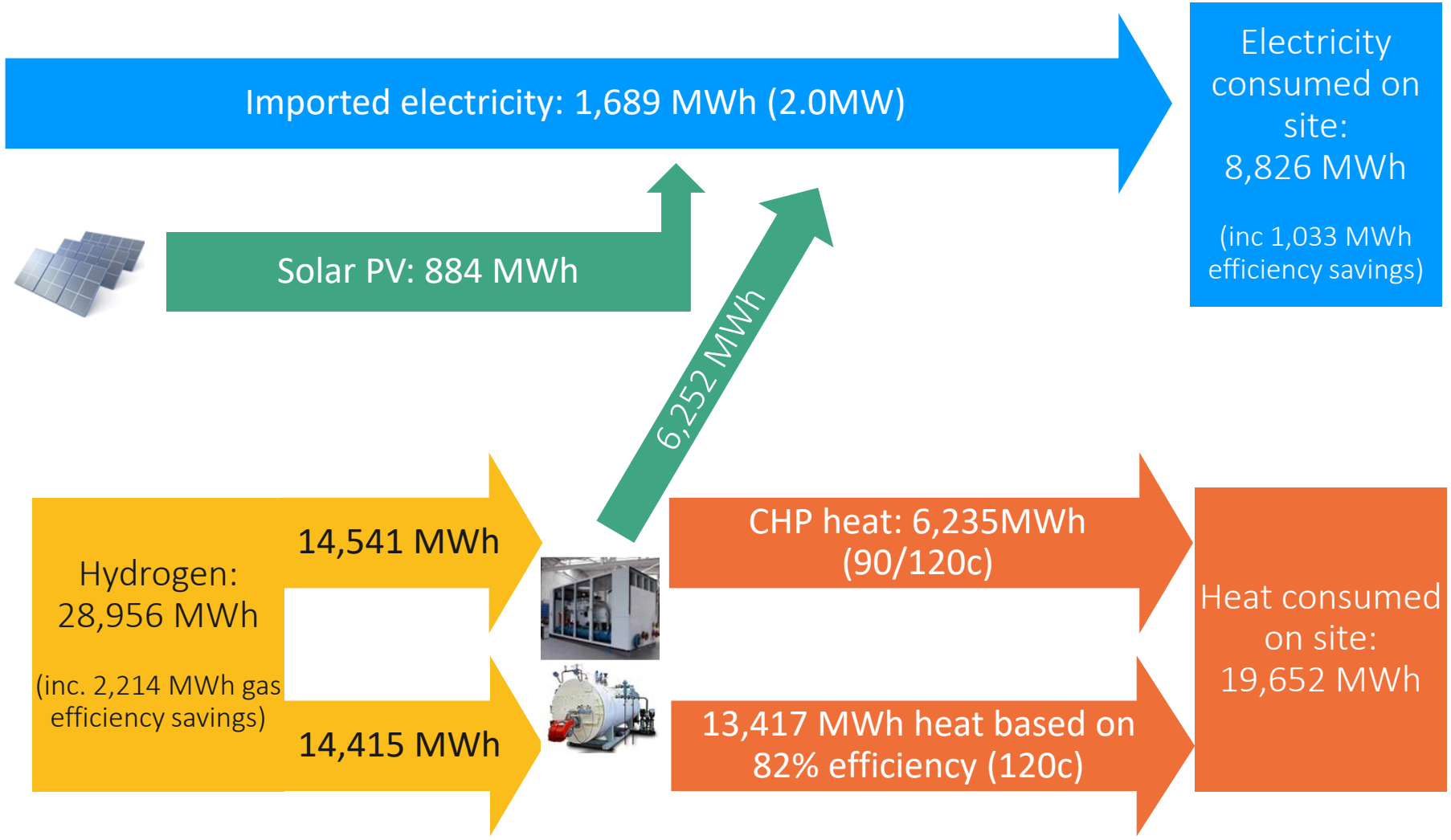
We assess various technological pathways for you to reach net zero…

The Hydrogen solution

involves energy efficiency, Solar PV, hydrogen boilers and hydrogen CHP deployed at site



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We assess the carbon reduction impact of each pathway to net zero…

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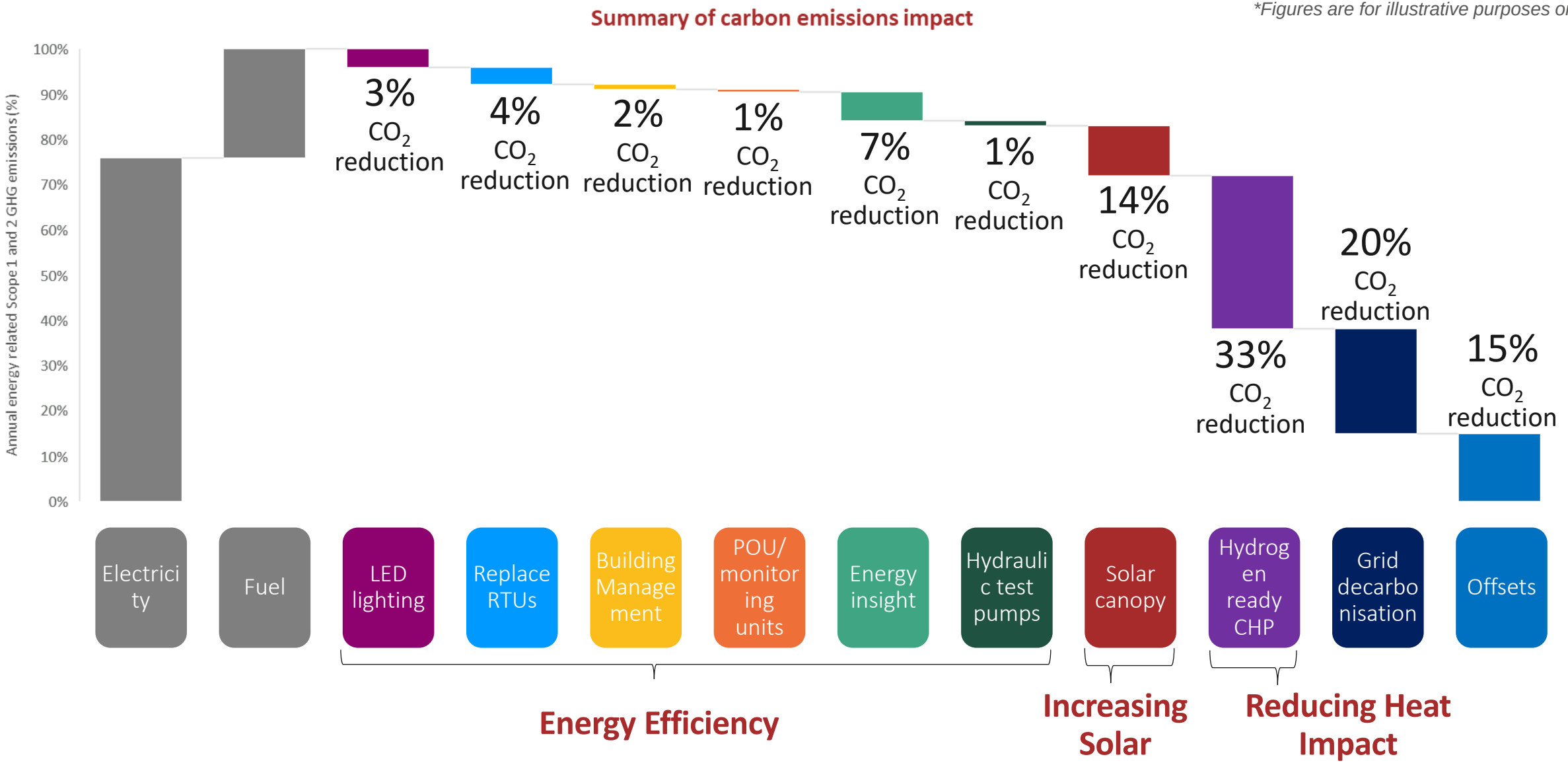

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We assess the costs and paybacks for pathways to net zero…

Electrification Measures

Phase		Technology	Electricity Saving (kWh)	Natural Gas Saving (kWh)	Capex ($)	Pay Back (years)
Cut	1	Energy Conservation Measures	1,025,000		355,000	3
Cut		*Compressed Air*	210,000		150,000	2
Cut		*LED Lighting*	40,000		30,000	2
Cut		*Cooling*	300,000		160,000	4
Cut		*Process Optimisation*	475,000		15,000	0.5
Convert	2	Solar PV 1MWp	900,000		920,000	5
Convert	3	Electric Steam Boiler 1.6MW	(6,680,000)	8,480,000	330,000	
Convert	4	Solar PV Carport 1MWp	800,000		990,000	10
Convert	5	Heat Pump 3.5MWth	(8,300,000)	17,720,000	5,000,000	9
		Total			7,920,000	8.5

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We assess the costs and paybacks for pathways to net zero…

Grid hydrogen measures

Phase		Technology	Electricity Saving (kWh)	Natural Gas Saving (kWh)	Capex ($)	Pay Back (Years)
Cut	1	Energy Conservation Measures	1,025,000	2,050,000	812,000	3
Cut		*Compressed Air*	210,000		150,000	2
Cut		*LED Lighting*	40,000		30,000	2
Cut		*Cooling*	300,000		160,000	4
Cut		*Process Optimisation*	475,000		15,000	0.5
Cut		*Steam Boiler Savings*		2,000,000	450,000	5
Cut		*Pipe Insulation*		50,000	7,000	
Convert	2	Solar PV 1MWp	900,000		920,000	5
Convert	3	Hydrogen-ready Boilers 5.1MW	6,250,000	(5,000,000)	592,000	8
Convert	4	Hydrogen-ready CHP 1.0MWe			1,850,000	7
Total					4,986,000	6.5

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We build a full step by step decarbonisation roadmap and business case to achieve net zero

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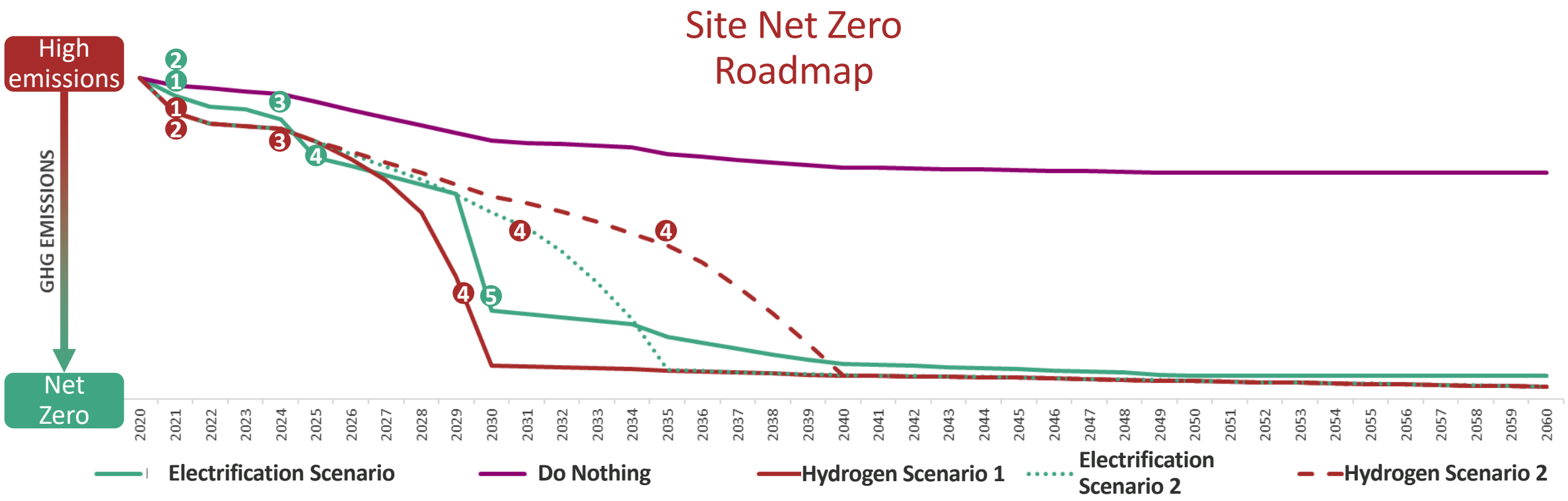

Electrification Pathway Measures

1. ECMs
2. Solar PV
3. Solar PV Carport
4. Electric Steam Boiler
5. Heat Pump

Grid Hydrogen CHP Pathway Measures

1. ECMs
2. Solar PV
3. Hydrogen-ready Boilers
4. Hydrogen-ready CHP

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Key performance indicators

Defined net zero pathway	Electrification pathway, including energy efficiency, solar PV and heat recovery
Net Zero Year	2040
Project costs	$2.6M
Net present value	$3.7
Payback	4 Years

Tangible benefits

- ✓ **20% electricity import** reduction
- ✓ **85% natural gas import** reduction
- ✓ **25% energy cost** reduction
- ✓ **90% carbon emissions** reduction

Intangible benefits

- ✓ Enhanced brand reputation
- ✓ Increase customer loyalty
- ✓ Reduced climate-related risks
- ✓ Reduced regulatory risks

Corporate and sustainability context

Raise awareness internally and externally of the site net zero pathway as a site exemplar

Next steps

- **More granular energy data** to support decision making process and operational efficiency
- **Implement carbon reduction plan**
- **Consider finance options** to accelerate projects implementation and protect capital

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Moy Park

"Our journey to net zero emissions by 2040 is ongoing and this is just one of many investments we are making to reach our sustainability goals. We are collaborating closely with partners to ensure our processes across the business and across the supply chain are more sustainable and bring us closer to our net zero target."

Nompilo Sibanda, General Manager, Moy Park

Challenge

Moy Park's Craigavon facility produces meals and is undergoing an infrastructural refurbishment, aiming to save energy, reduce its carbon output and operate more efficiently.

Solution

A highly efficient combined heat and power (CHP) generator will supply the site with power, hot water and steam, addressing water-supply issues.

Results

Moy Park can expect to save over £400,000 in operating costs, and offset 1,000t CO2, equivalent to taking 350 cars off the road.

£400K

Saved each year

18.3MWh

MWh generated annually

1,000t

CO2 offset annually

Thank you

Learn more about our report **Finding a cost-effective path to net zero:** https://www.centricabusinesssolutions.com/knowledge-centre/reports-and-whitepapers/how-can-organisations-find-cost-effective-path-net-zero

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