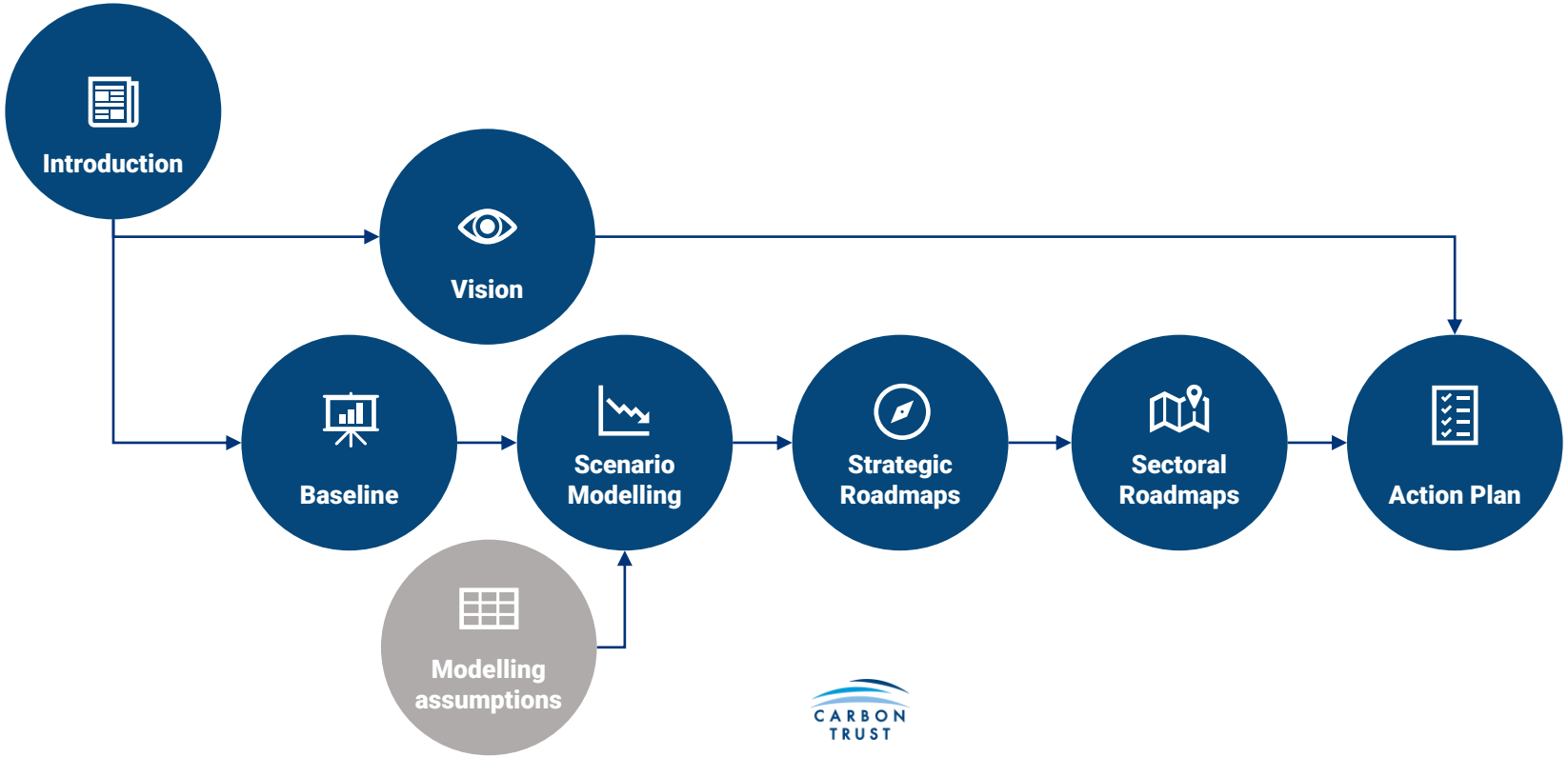
2050 Emissions Reduction Pathways and Action Plan Summary

Hull

01 November 2022

Document guide

This document is interactive. Select the section you want to go to below and return to this page using the home icon



Introduction

Context

- Hull City Council (HCC) has committed to achieving net zero emissions by 2050, in line with national targets. HCC declared a climate emergency in March 2019 and aims to become a leading carbon neutral city in the UK by 2030.
- To support Hull in achieving this vision, the Carbon Trust has worked with key stakeholders to develop ‘net zero pathways’ that set out the required decarbonisation measures and explore proposed actions to reduce emissions to net zero by 2050. These pathways have been broken down into a series of roadmaps outlining periodic milestones to net zero, enabling the development of a detailed action plan to support the council and partners in achieving net zero emissions by 2050.

Hull City Council

Introduction

To meet their Net Zero 2050 target, Hull require an implementable and well-reasoned action plan, based on a thorough understanding of the carbon emissions within the city's boundary and a science-based decarbonisation target.

Project Objectives:

1. Outline, at a high level, the baseline emissions of Hulls key sectors (transport, buildings, industry, power, land-use, land-use change and forestry (LULUCF));
2. Demonstrate 3 potential net zero scenarios for Hull's key sectors, based on future energy scenarios;
3. Provide a roadmap to demonstrate the measures that will be required between now and 2050 to achieve net zero;
4. Provide an action plan that can be used to accelerate action towards net zero.

The Carbon Trust's working definition of Net Zero:

A net zero city or region will set and pursue:

- an ambitious **1.5°C aligned Science Based Target**
- for all emissions **sources covered within the BASIC+** reporting level of the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC).
- Any remaining hard-to-decarbonise emissions can be compensated with **certified greenhouse gas removal (GGR)**.

Vision

Hull's vision and priorities

VISION

In 2050, Hull will have achieved a state of net zero emissions, and will be resilient to the changing climate. The city and its stakeholders across key sectors will have worked collaboratively, forming strong and effective partnerships to accelerate the region's transition towards a low carbon, sustainable and just future.

PRIORITIES

A literature review was undertaken combining key policy and evidence documents with expert interviews and workshop consultation to build a more comprehensive picture of the challenges and opportunities in Hull. This includes available levers, barriers to development and key technologies. This research, and in particular the thoughts and ideas shared by stakeholders, informed the development of five strategic priority areas.

- **Decarbonising transport**
- **Decarbonising residential buildings**
- **Decarbonising industry**
- **Decarbonising electricity and increase renewables**
- **Supporting carbon efficiency in LULUCF**

Hull vision and priorities

Decarbonising transport

- Promote **behaviour change** and encourage people to think differently about how and when to travel.
- Encourage use of **active travel modes** and **create liveable spaces** e.g. create welcoming and safe environments, pedestrianise town centres and promote walking and cycling
- Invest in **public transport infrastructure ,car/journey share and e-bike schemes**, making these an easy and convenient choice for people
- Promote the **electrification of public transport** whilst retaining and improving rail provision.
- Develop **electric vehicle charging infrastructure**, taking an inclusive and joined-up approach to ensure these are located in the right places.

Hull vision and priorities

Decarbonising residential buildings

- Promote **behaviour change** to help people to better understand the carbon impact of home energy consumption
- Progress the **electrification of heating** through installing heat pumps, ensuring they are rolled out alongside necessary efficiency measures
- Support the development of **district heating schemes** where viable, focusing on higher density areas
- Progress **energy efficiency measures** and **retrofitting** in existing housing stock
- Explore innovative **low carbon design opportunities** for new builds. E.g. Passivhaus
- Extend housing **regulations and planning policy** to accelerate decarbonisation measures

Hull vision and priorities

Decarbonising industry

- Ensure **effective collaboration** with industry
- Promote **education** and **tools for monitoring and measurement** to help industry to better understand their carbon impact.
- Maximise the region's position as an industrial cluster exploring opportunities for **industrial scale hydrogen production** and uses across the cluster.
- Maximise opportunity for **heat networks**
- Develop **CCUS technology**

Hull vision and priorities

Decarbonising electricity and increasing renewables

- Maximise **local renewable energy generation opportunities** e.g. tidal and wave power, and solar PV farms
- Encourage the **uptake of building-mounted solar**, using the planning system as a means to ensure renewable energy potential is considered, and support ground-based renewables where appropriate.
- Utilise the industrial cluster to **lead on hydrogen and CCUS** development.

Hull vision and priorities

Supporting carbon efficiency in LULUCF

- Support opportunities for **effective GHG removal** using **nature based solutions**, taking care to ensure tree planting schemes are **ecologically sound and well managed**. Explore opportunities for novel nature based solutions such as seagrass and wetland restoration
- **Work closely with farmers and land owners/managers** to ensure effective collaboration in decision making
- Develop **planning policy** to support environmentally and economically effective land use

Baseline

Methodology

A baseline carbon footprint for Hull was calculated in line with the best-practice GHG Protocol for Cities (GPC), which is consistent with PAS 2070

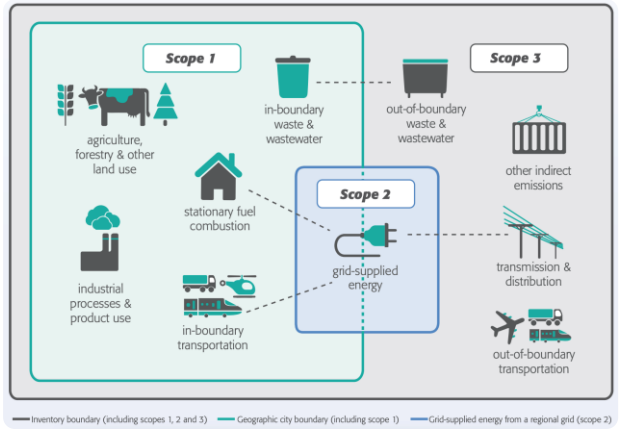
The assessment used publicly available data from sources such as BEIS and National Grid FES. Data sources represent the most recent annual data set, and where there are gaps, reasonable assumptions have been used to deliver a reasonable estimate of values. Material emissions sources across all scopes that are typical for a region are shown in the diagram

The Hull footprint covered Scope 1, 2 and selected Scope 3 emissions, including:

- Transport
- Energy use in residential buildings
- Energy use by industry and in commercial buildings

Secondary assessments explored:

- Renewable energy generation potential
- LULUCF sequestration potential



Each emissions source is reported under the corresponding scope. The scope framework is in place to avoid double-counting and allow for aggregation across different cities, areas or regions.

Scope 1: Emissions from the combustion of gas and other fuels within the regional boundary.

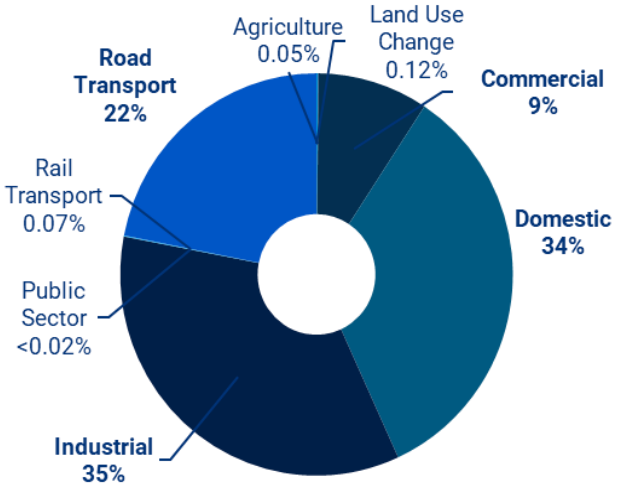
Scope 2: Emissions resulting from the consumption of purchased grid energy (e.g. electricity, heat, steam), generated outside the regional boundary

Scope 3: Emissions from activities that occur outside the city boundary but are generated as a result of activities within the city boundary (e.g. treatment of exported waste, transboundary shipping or freight of goods)

Hull Summary

Hull's baseline emissions in 2018 were **1,109 $ktCO_2e$.** The majority of emissions are due to industrial activity (35%), road transport (22%) and domestic energy consumption (34%)

- Emissions per capita and per unit area were 4.1 $ktCO_2e$/capita (UK: 6.8 ktCO2e/capita) and 14,398 $ktCO_2e/km^2$ (UK: 1,861 $ktCO_2e/km^2$) respectively.
- Total emissions have decreased by 20% since 2014.
- Hull generated 50 MW of renewable electricity in 2018. In the leading the way scenario, by 2050, Hull will see renewable generation capacity increase of 43 MW of solar PV, 5 MW of onshore wind. Offshore wind capacity across the Humber is expected to increase by 7.3 GW based on planned developments



Scenario modelling

Great Britain and Local Distribution Future Energy Scenarios

The decarbonisation were built around the key elements of the GB Future Energy Scenarios[1] and Northern Power Grid's Distribution Future Energy Scenarios[2]

The first two scenarios closely align with the DFES System Transformation and Consumer Transformation scenarios, while the third incorporates elements of Leading the Way and Net Zero Early. We refer to this as the **Leading the Way** scenario.

SCENARIO 1

SYSTEM TRANSFORMATION

- Net Zero by 2050.
- Major shift to hydrogen for heat, I&C and transport (incl. HGVs).
- Relatively low consumer impact and greater systemic change.
- Uptake of ULEVs slow.
- High carbon taxation.
- Key political decisions made in mid-2020s. Effective policy/pricing creates clarity for zero carbon technologies.
- UK misses EU 30% energy efficiency 2030 target.

SCENARIO 2

CONSUMER TRANSFORMATION

- Net Zero by 2050.
- Increased reliance on electrification for heat, I&C and transport (incl. HGVs)
- Relatively high consumer impact/engagement.
- Accelerated uptake of EV vehicles due to consumer demand.
- High carbon taxation.
- Key political decisions made in mid-2020s. Effective policy/pricing creates clarity for zero carbon technologies.
- UK meets EU 30% energy efficiency 2030 target.

SCENARIO 3

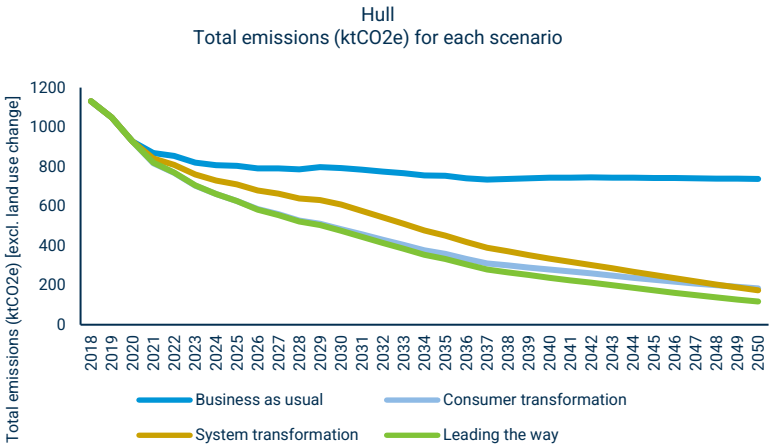
LEADING THE WAY

- Net Zero by 2045.
- See hydrogen uptake and electrification across: supply of heat, transport and I&C mostly electrified with I&C moving towards hydrogen as technology develops.
- More ambitious targets end sale of ICE vehicles.
- Transport sector becomes deeply electrified (inc. HGVs).
- Very high carbon taxation.
- Key political decisions made in mid-2020s. Effective policy/pricing creates clarity for zero carbon technologies.
- Local level targets drive **faster** adoption of low carbon technologies across sectors (e.g. EU target enhanced, ICE vehicle bans made more ambitious)
- Early and bold action from the Gov't is supplemented by intensive investment in low carbon technologies.

Scenario Assessment output

The most ambitious scenario modelled (Leading the Way) results in an overall emissions reduction of over 90% by 2050, leaving residual emissions of 116 $ktCO_2e$ to be offset by greenhouse gas removals to achieve Net Zero.

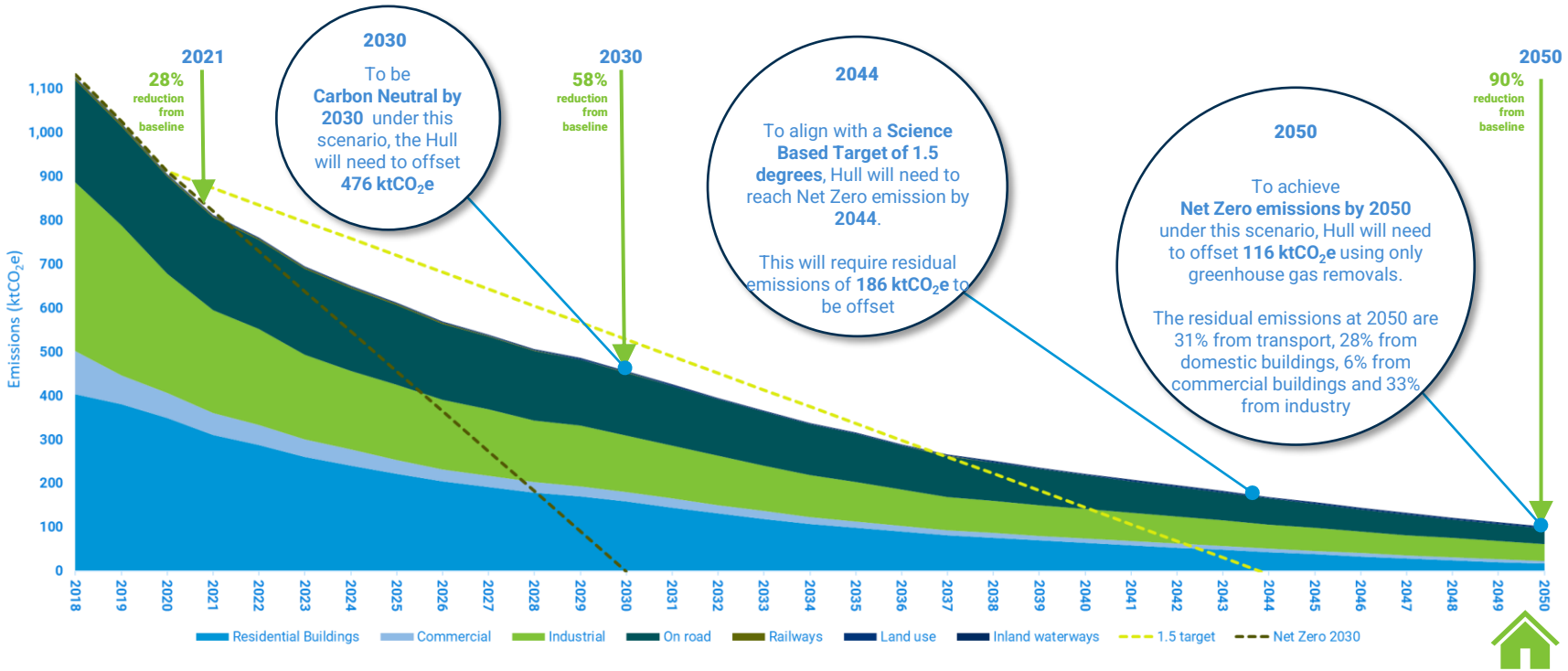
- The three scenario assessments show different decarbonisation trajectories for each of the sectors modelled over the 30 year period to 2050.



Leading the Way	Percentage reduction	90%
	Residual emissions ($ktCO_2e$)	116

Hull – Leading the Way Scenario

The Leading the Way scenario considers a mixture of hydrogen and electrification for heating and assumes significant lifestyle changes



Economic Assessment

An economic assessment of aspects of the Leading the way scenario provided insights into the associated investment costs, jobs and GVA

Economic assessment

Electricity generation

In the territorial region of Hull, there is 59 MW capacity of solar PV and onshore wind installed, that generate approximately 186 GWh of electricity.

The solar and onshore wind renewable generation anticipated will require an investment or £54,044,281 which includes installing 64 MW of solar PV capacity and 2MW of onshore wind capacity.

The increase in renewable capacity will require on average 59 jobs per year and lead to GVA growth of £5,870,357 per year, which equates to 0.1% of current GVA for the production of electricity in the UK.

Technology	Investment (£)	Jobs per year
Onshore wind	1,417,691	1
Solar PV (domestic and large-scale)	52,626,590	1,819

CARBON TRUST

Economic Assessment

An economic assessment of aspects of the Leading the way scenario provided insights into the associated investment costs, jobs and GVA

Economic assessment

Energy efficiency in homes

The leading the way scenario considers that for a net zero future, existing homes will need to meet certain performance standards for these systems to operate efficiently, and to achieve financial benefits. For some homes, energy efficiency will be a key enabler for future heating technologies such as electric heating.

The domestic energy efficiency anticipated in this scenario will require a total investment of **£895,411,292** in energy efficiency measure in homes which would achieve a 746 GWh energy reduction, or a 14% decrease in energy consumption in the domestic sector.

This equates to an average investment of **£7,813 per home**, and an average energy saving of **833 kWh/£1,000 invested.**

Between now and 2040, this investment would lead to **285 jobs per year** and **to GVA growth of £8,724,197 per year,** which is 0.01% of current GVA for construction and manufacturing in the UK.

Energy Efficiency Measure	Total Investment (£)
Solid Wall Insulation - Uninsulated	£211,949,221
Double Glazing - Single glazing	£330,869,676
Underfloor - Solid floor + timber floor	£192,767,300
Cavity Wall Insulation - Uninsulated	£8,631,550
Boiler replacement - Standard boiler	£97,822,815
Loft Insulation - 50-124mm potential	£8,823,273
Loft Insulation - 125-199mm potential	£5,370,638
Loft Insulation - >200mm potential	£18,029,929
LED replacement	£21,146,890

CARBON TRUST

Economic Assessment

An economic assessment of aspects of the Leading the way scenario provided insights into the associated investment costs, jobs and GVA

Economic assessment

Decarbonisation of heat in homes

The leading the way scenario aims to achieve decarbonisation at the fastest pace possible, which means deploying low-carbon heat technologies that are currently available, and phasing in alternatives such as hydrogen heating technologies as they mature.

In this scenario, an additional investment of **£646,214,759** will be required for low-carbon heating technologies relative to business as usual, **£639,363,700** of which is for heat pump installations.

This equates to an average investment of **£5,638 per home.**

The transition to low-carbon heating in this scenario is estimated to require **2,871 jobs per year** and lead to GVA growth of **£6,275,017 per year**, which equates to **0.11%** of current GVA for the manufacture and supply of gas in the UK.

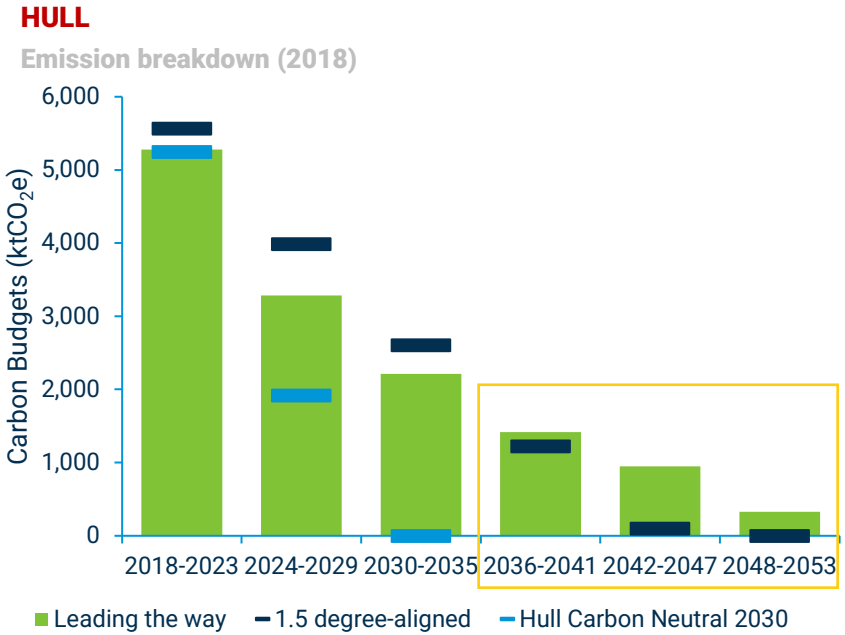
A summary of total investment per low-carbon heat technology is presented below.

Low-carbon heat technology	Total Investment (£)
ASHP	£502,746,613
GSHP	£136,617,087
Bioenergy boilers	£2,782,203
District heating - waste heat	£4,068,856

Carbon Budgets

Carbon Budgets

Pathway from the Leading the way scenario were expressed both as carbon budgets and % reductions from the base year and compared to 1.5-degree trajectories



Strategic Roadmaps

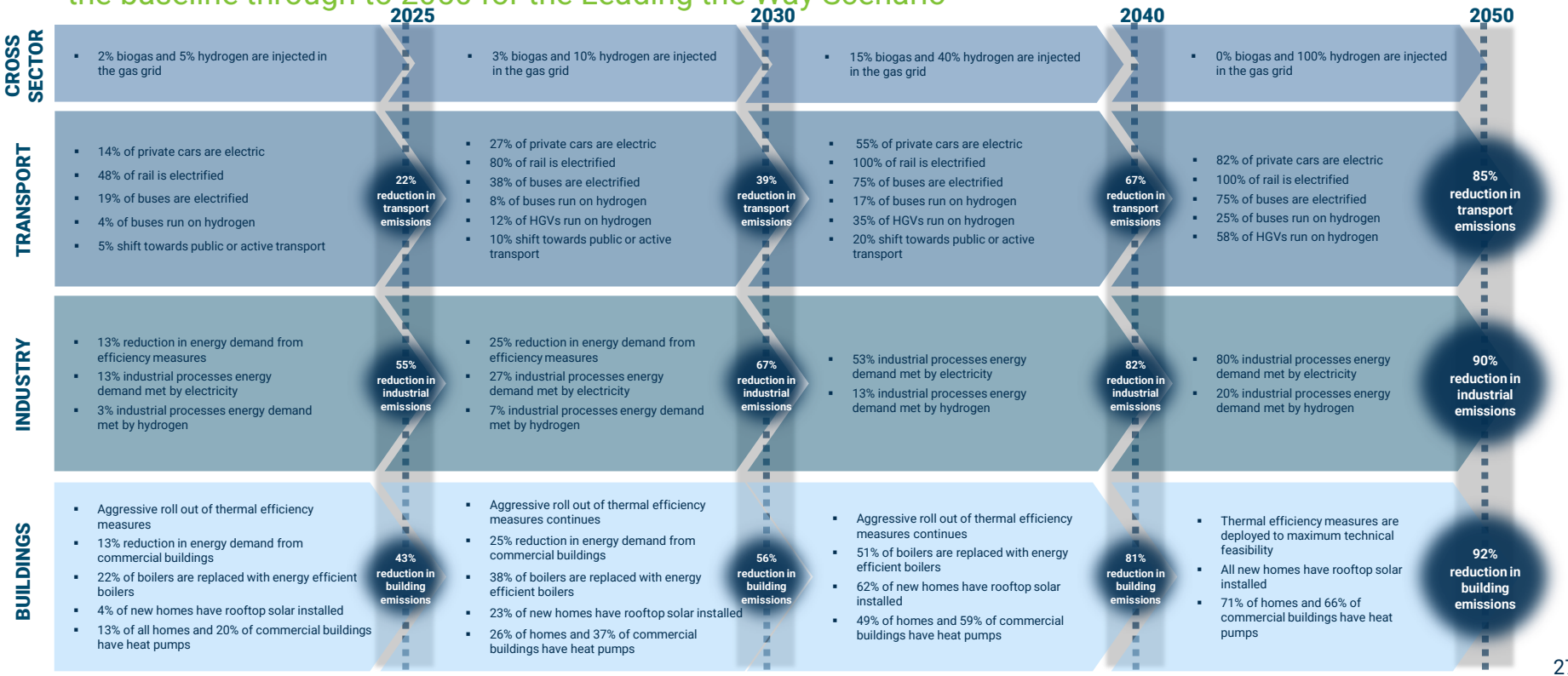
Net Zero Roadmaps

Overview

- The objective of the **strategic roadmap** is to draw together the key requirements of the net-zero transition in summary form to rapidly bring senior decision-makers up to speed.
- The Net Zero Roadmaps have been developed following an assessment of emissions reduction potential across Hull's key sectors, which assessed emission reduction pathways under three future energy scenarios.
- The roadmap provides a detailed view of the measures that will need to be taken if Hull are to achieve the emissions reductions outlined in the most ambitious scenario assessed.
- The targets set out in this roadmap can serve as 'vision-setting' reference points, and their underlying tables the basis for monitoring progress.
- The measures and assumptions noted on the roadmaps have been directly extracted from the emission reduction assessment. The scenarios assessed reflect the latest developments in terms of policy, emission projections and input from local stakeholders.
- The wider contextual information shown has been drawn from national and regional strategic documents (e.g. The Clean Growth Strategy, 10 Point Plan, Strategic Economic Plan) and local authority area plans, programmes and policies. (the Roadmap work predates the publicaion of the Net Zero Strategy and Buildings and Heat Strategy in November 2021)
- The contextual information included has been selected on the grounds that Hull are intrinsically linked to achieving the reduction outlined on the roadmap.
- The roadmaps have sought to avoid proposing specific actions the Local Authorities could take to meet the pathway requirements, with actions collaboratively identified and developed with key stakeholders through the action-planning process.

Hull

The strategic roadmap shows the key targets and associated emissions reductions for each sector from the baseline through to 2050 for the Leading the Way Scenario



*Percentages are presented in terms of energy demand unless stated otherwise. For example, 14% of energy demand from private vehicles will be for electricity by 2025

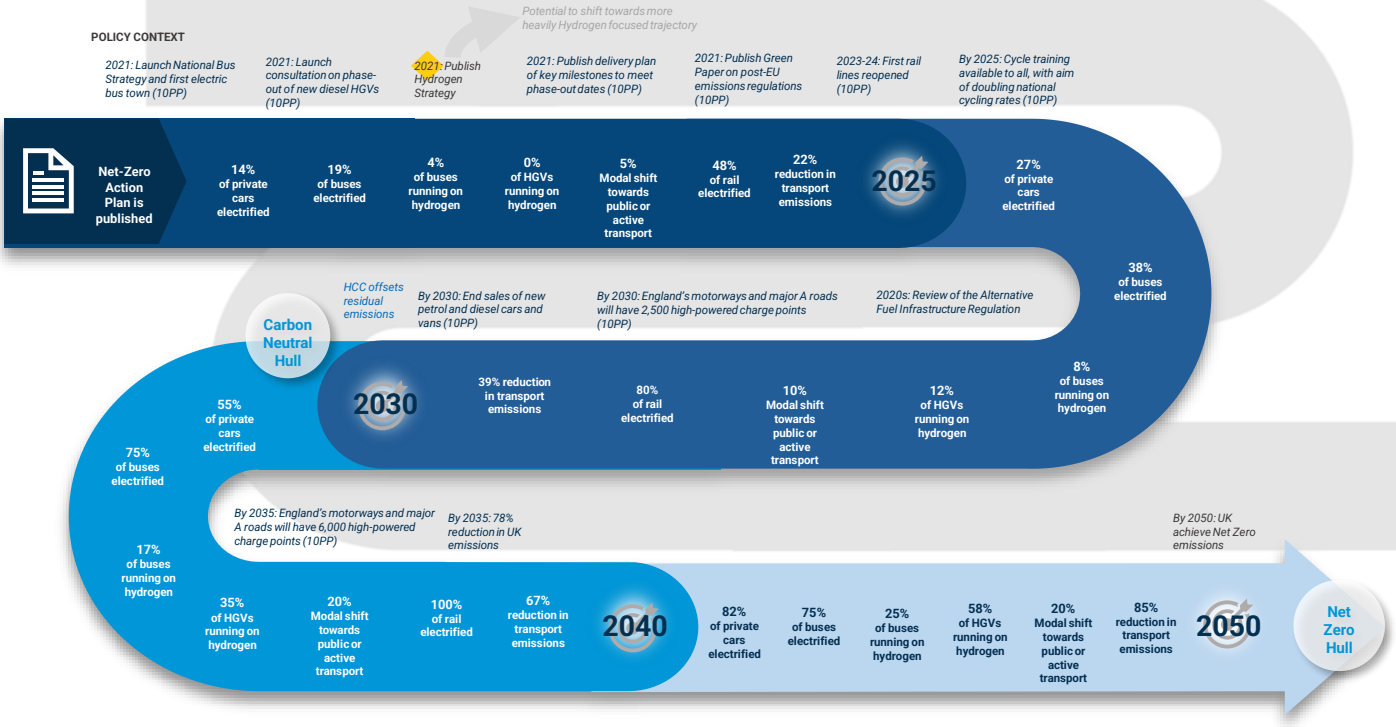
Sectoral Roadmaps

Transport

Sectoral Roadmaps

Transport Roadmap | Hull

The Leading the Way Scenario is presented in the infographic below, with additional scenarios presented in data tables on the following slide.



KEY

Actions
UK Government action
Hull City Council action

Policy sources
10PP = Ten Point Plan
CGS = Clean Growth Strategy
CCC = Climate Change Committee

Key decision with potential to alter roadmap trajectory

Supporting information

- In 2050 it is expected there will be some residual hard-to-decarbonise emissions.
- Residual emissions will be addressed by insetting or high-quality GHG removals, set out in a strategy.
- It is likely that technological developments in the intervening years will reduce the residual emissions gap.
- This roadmap shows only one possible scenario. Key decision points, indicated with yellow diamonds, will influence the remainder of the road map and may change to decarbonisation trajectory.
- Additional scenarios, which lean more towards system transformation (strong hydrogen roll out) and consumer transformation (high electrification) are shown in the following slides

CARBON TRUST

Transport Summary Tables | Hull

	System Transformation					
	2025	2030	2035	2040	2045	2050
% of private cars electrified	10%	21%	31%	41%	52%	62%
Number of private cars electrified	6841	12374	17551	21734	25945	29735
% of buses electrified	15%	30%	45%	59%	74%	89%
Number of buses cars electrified	41	78	116	144	168	188
% buses running on hydrogen	0%	0%	1%	4%	8%	11%
Number of buses running on hydrogen	0	0	2	10	17	23
% HGVs running on hydrogen	0%	12%	23%	35%	46%	58%
Number of HGVs running on hydrogen	0	225	438	605	755	880
LGVs electrified %	1%	2%	4%	5%	6%	7%
LGVs electrified count	108	187	270	376	469	565
% of rail electrified	25%	50%	75%	100%	100%	100%
% shift to active or public transport	0%	2%	3%	4%	5%	5%
Reduction in transport emissions %	18%	32%	44%	58%	68%	77%

	Consumer Transformation					
	2025	2030	2035	2040	2045	2050
% of private cars electrified	10%	19%	29%	39%	48%	58%
Number of private cars electrified	6304	11068	15226	18276	21841	25065
% of buses electrified	15%	30%	45%	59%	74%	89%
Number of buses cars electrified	41	80	120	151	176	197
% buses running on hydrogen	0%	0%	1%	4%	8%	11%
Number of buses running on hydrogen	0	0	2	10	18	24
% HGVs running on hydrogen	0%	9%	18%	25%	29%	30%
Number of HGVs running on hydrogen	0	178	345	430	467	455
LGVs electrified %	1%	3%	4%	5%	7%	8%
LGVs electrified count	115	200	290	400	498	597
% of rail electrified	25%	50%	75%	100%	100%	100%
% shift to active or public transport	1%	3%	6%	8%	10%	10%
Reduction in transport emissions %	21%	37%	50%	63%	70%	76%

	Leading the Way					
	2025	2030	2035	2040	2045	2050
% of private cars electrified	14%	27%	41%	55%	68%	82%
Number of private cars electrified	8030	13328	16995	18398	21873	24943
% of buses electrified	19%	38%	56%	75%	75%	75%
Number of buses cars electrified	53	106	162	208	195	182
% buses running on hydrogen	4%	8%	13%	17%	21%	25%
Number of buses running on hydrogen	12	24	36	46	54	61
% HGVs running on hydrogen	0%	12%	23%	35%	46%	58%
Number of HGVs running on hydrogen	0	225	438	605	755	880
LGVs electrified %	2%	3%	5%	7%	8%	10%
LGVs electrified count	129	227	330	449	555	661
% of rail electrified	48%	80%	97%	100%	100%	100%
% shift to active or public transport	5%	10%	15%	20%	20%	20%
Reduction in transport emissions %	22%	39%	53%	67%	76%	85%

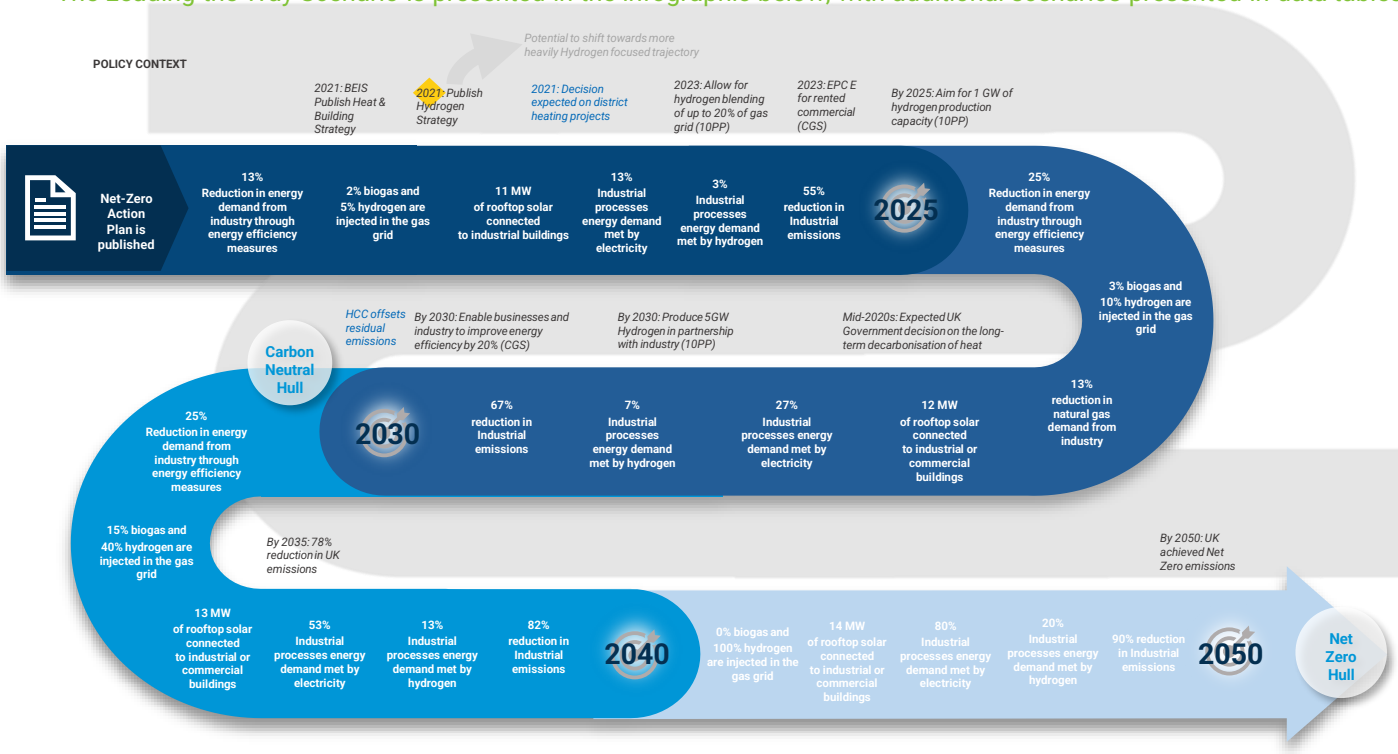
CARBON TRUST

Industry

Sectoral Roadmaps

Industry Roadmap | Hull

The Leading the Way Scenario is presented in the infographic below, with additional scenarios presented in data tables on the following slide.



KEY

Actions
UK Government action
Hull City Council action

Policy sources
10PP = Ten Point Plan
CGS = Clean Growth Strategy
CCC = Climate Change Committee

Key decision with potential to alter roadmap trajectory

Supporting information

- In 2050 it is expected there will be some residual hard-to-decarbonise emissions.
- Residual emissions will be addressed by insetting or high-quality GHG removals, set out in a strategy.
- It is likely that technological developments in the intervening years will reduce the residual emissions gap.
- This roadmap shows only one possible scenario. Key decision points, indicated with yellow diamonds, will influence the remainder of the road map and may change to decarbonisation trajectory.
- Additional scenarios, which lean more towards system transformation (strong hydrogen roll out) and consumer transformation (high electrification) are shown in the following slides

CARBON TRUST

Industry Summary Tables | Hull

	System Transformation					
	2025	2030	2035	2040	2045	2050
Biogas injection in grid mix (%)	2%	3%	9%	15%	8%	0%
Hydrogen injection in grid mix (%)	5%	10%	25%	40%	70%	100%
% reduction in energy demand in Industry	3%	7%	10%	13%	17%	20%
MW of rooftop solar connected to Industrial buildings	11	11	12	12	12	13
% of industrial processes electrified	8%	17%	25%	33%	42%	50%
% of industrial processes switched to Hydrogen	3%	7%	10%	13%	17%	20%
% reduction in industrial emissions	51%	58%	71%	78%	83%	88%

	Consumer Transformation					
	2025	2030	2035	2040	2045	2050
Biogas injection in grid mix (%)	3%	4%	6%	7%	10%	12%
Hydrogen injection in grid mix (%)	0%	0%	0%	0%	0%	0%
% reduction in energy demand in Industry	10%	20%	20%	20%	20%	20%
MW of rooftop solar connected to Industrial buildings	11	11	12	12	12	13
% of industrial processes electrified	13%	27%	40%	53%	67%	80%
% of industrial processes switched to Hydrogen	3%	7%	10%	13%	17%	20%
% reduction in industrial emissions	54%	64%	72%	77%	82%	87%

	Leading the Way					
	2025	2030	2035	2040	2045	2050
Biogas injection in grid mix (%)	2%	3%	9%	15%	8%	0%
Hydrogen injection in grid mix (%)	5%	10%	25%	40%	70%	100%
% reduction in energy demand in Industry	13%	25%	25%	25%	25%	25%
MW of rooftop solar connected to Industrial buildings	11	12	13	13	14	14
% of industrial processes electrified	13%	27%	40%	53%	67%	80%
% of industrial processes switched to Hydrogen	3%	7%	10%	13%	17%	20%
% reduction in industrial emissions	55%	67%	77%	82%	87%	90%

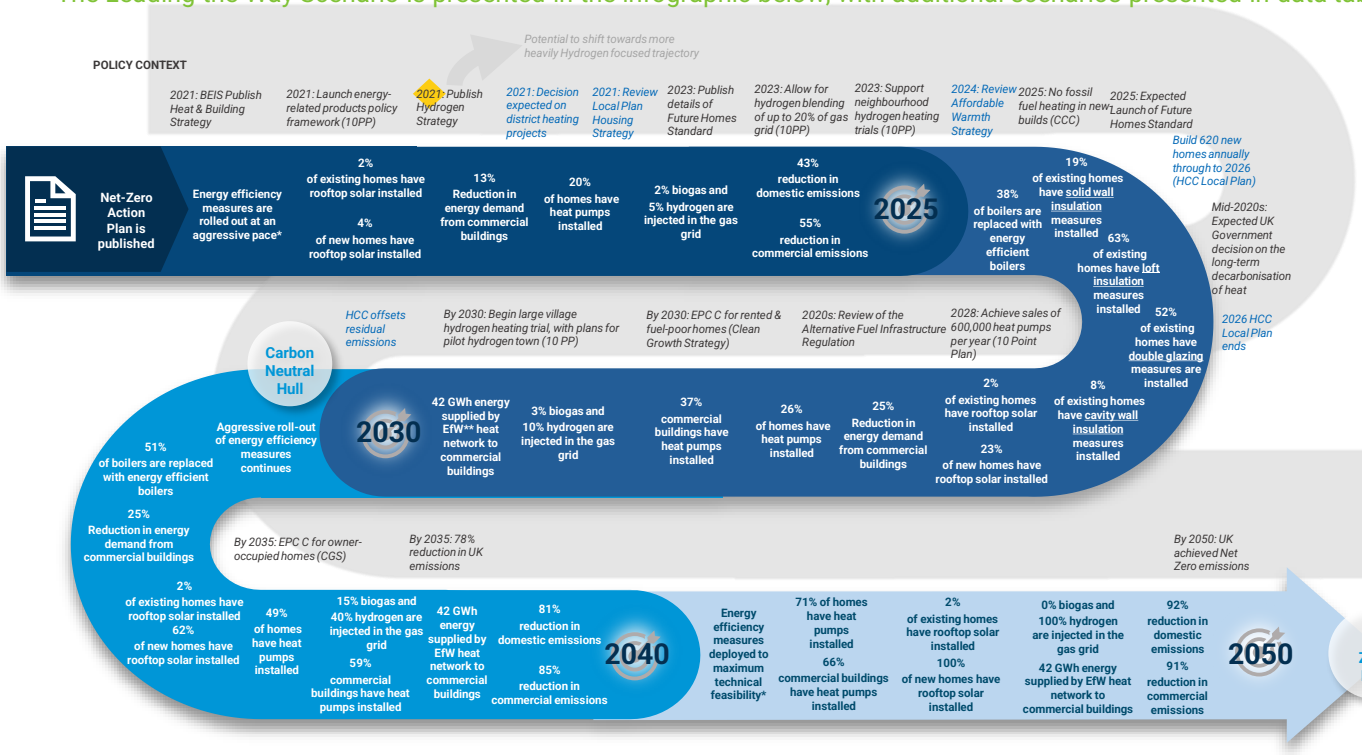
CARBON TRUST

Buildings

Sectoral Roadmap

Buildings Roadmap | Hull

The Leading the Way Scenario is presented in the infographic below, with additional scenarios presented in data tables on the following slide.



KEY

Actions
UK Government action
Hull City Council action

Policy sources
10PP = Ten Point Plan
CGS = Clean Growth Strategy
CCC = Climate Change Committee

Key decision with potential to alter roadmap trajectory

Supporting information

- In 2050 it is expected there will be some residual hard-to-decarbonise emissions.
- Residual emissions will be addressed by insetting or high-quality GHG removals, set out in a strategy.
- It is likely that technological developments in the intervening years will reduce the residual emissions gap.
- This roadmap shows only one possible scenario. Key decision points, indicated with yellow diamonds, will influence the remainder of the road map and may change to decarbonisation trajectory.
- Additional scenarios, which lean more towards system transformation (strong hydrogen roll out) and consumer transformation (high electrification) are shown in the following slides

*See data tables in following slide for breakdown of roll out
**Energy from waste

CARBON TRUST

Buildings Summary Tables | Hull

	System Transformation					
	2025	2030	2035	2040	2045	2050
Biogas injection in grid mix (%)	2%	3%	9%	15%	8%	0%
Hydrogen injection in grid mix (%)	5%	10%	25%	40%	70%	100%
% of existing homes with rooftop solar installed	2%	2%	2%	2%	2%	2%
Number of existing homes with rooftop solar installed	2,292	2,292	2,292	2,292	2,292	2,292
% of new homes with rooftop solar installed	3%	18%	34%	49%	65%	80%
Number of new homes with rooftop solar installed	95	1145	3148	6105	10015	14880
% of homes with heat pumps installed	4%	9%	15%	22%	30%	39%
Number of homes with heat pumps installed	4,348	10,390	18,125	27,554	38,676	51,492
% of homes connected to heat networks	0.2%	0.5%	0.7%	0.9%	1.1%	1.3%
Number of homes connected to heat networks	287	573	860	1,146	1,433	1,719
% of homes with solid wall insulation measures	3%	6%	10%	13%	13%	13%
Number of homes with solid wall insulation measures	3,725	7,449	11,174	14,899	14,899	14,899
% of homes with cavity wall insulation measures	2%	4%	7%	9%	9%	9%
Number of homes with cavity wall insulation measures	2,579	5,157	7,736	10,315	10,315	10,315
% of homes with loft insulation measures	20%	40%	60%	80%	80%	80%
Number of homes with loft insulation measures	22,864	45,728	68,592	91,457	91,457	91,457
% of homes with double glazing measures	16%	33%	49%	66%	66%	66%
Number of homes with double glazing measures	18,781	37,562	56,344	75,125	75,125	75,125
% of homes with LED measures installed	6%	25%	55%	98%	98%	98%
Number of homes with LED measures installed	7,020	28,079	63,177	112,315	112,315	112,315
% of boilers upgraded	12%	24%	36%	48%	48%	48%
Number of boilers upgraded	13,882	27,764	41,645	55,527	55,527	55,527
% Reduction in domestic emissions	31%	40%	57%	70%	78%	86%
% reduction in energy demand in commercial buildings	3%	7%	10%	13%	17%	20%
Heat supplied to commercial buildings by EfW heat network (GW)	26	42	42	42	42	42
% commercial buildings with heat pumps installed	1%	3%	7%	12%	19%	28%
% reduction in commercial emissions	45%	50%	62%	71%	78%	86%

	Consumer Transformation					
	2025	2030	2035	2040	2045	2050
Biogas injection in grid mix (%)	2%	4%	6%	7%	10%	12%
Hydrogen injection in grid mix (%)	0%	0%	0%	0%	0%	0%
% of existing homes with rooftop solar installed	2%	2%	2%	2%	2%	2%
Number of existing homes with rooftop solar installed	2,292	2,292	2,292	2,292	2,292	2,292
% of new homes with rooftop solar installed	4%	23%	42%	62%	81%	100%
Number of new homes with rooftop solar installed	119	1431	3935	7631	12519	18600
% of homes with heat pumps installed	23%	41%	55%	65%	72%	75%
Number of homes with heat pumps installed	26,861	49,643	68,345	82,967	93,509	99,971
% of homes connected to heat networks	0.1%	0.3%	0.4%	0.5%	0.7%	0.8%
Number of homes connected to heat networks	172	344	516	688	860	1,031
% of homes with solid wall insulation measures	9%	15%	18%	19%	19%	19%
Number of homes with solid wall insulation measures	9,777	16,761	20,952	22,348	22,348	22,348
% of homes with cavity wall insulation measures	4%	7%	9%	10%	10%	10%
Number of homes with cavity wall insulation measures	4,763	8,166	10,207	10,888	10,888	10,888
% of homes with loft insulation measures	37%	63%	79%	84%	84%	84%
Number of homes with loft insulation measures	42,118	72,203	90,253	96,270	96,270	96,270
% of homes with double glazing measures	30%	52%	65%	69%	69%	69%
Number of homes with double glazing measures	34,597	59,309	74,136	79,079	79,079	79,079
% of homes with LED measures installed	43%	74%	92%	98%	98%	98%
Number of homes with LED measures installed	49,138	84,237	105,295	112,315	112,315	112,315
% of boilers upgraded	22%	38%	48%	51%	51%	51%
Number of boilers upgraded	25,572	43,837	54,796	58,450	58,450	58,450
% Reduction in domestic emissions	45%	59%	73%	79%	83%	85%
% reduction in energy demand in commercial buildings	10%	20%	20%	20%	20%	20%
Heat supplied to commercial buildings by EfW heat network (GW)	26	42	42	42	42	42
% commercial buildings with heat pumps installed	22%	39%	53%	63%	69%	71%
% reduction in commercial emissions	53%	65%	75%	80%	83%	85%

	Leading the Way					
	2025	2030	2035	2040	2045	2050
Biogas injection in grid mix (%)	2%	3%	9%	15%	8%	0%
Hydrogen injection in grid mix (%)	5%	10%	25%	40%	70%	100%
% of existing homes with rooftop solar installed	2%	2%	2%	2%	2%	2%
Number of existing homes with rooftop solar installed	2,292	2,292	2,292	2,292	2,292	2,292
% of new homes with rooftop solar installed	4%	23%	42%	62%	81%	100%
Number of new homes with rooftop solar installed	119	1,431	3,935	7,631	12,519	18,600
% of homes with heat pumps installed	13%	26%	38%	49%	60%	71%
Number of homes with heat pumps installed	15,697	31,394	47,092	62,789	78,486	94,183
% of homes connected to heat networks	0.1%	0.3%	0.4%	0.5%	0.6%	0.7%
Number of homes connected to heat networks	162	325	487	649	812	974
% of homes with solid wall insulation measures	11%	19%	24%	26%	26%	26%
Number of homes with solid wall insulation measures	13,037	22,348	27,935	29,798	29,798	29,798
% of homes with cavity wall insulation measures	4%	8%	9%	10%	10%	10%
Number of homes with cavity wall insulation measures	5,014	8,596	10,744	11,461	11,461	11,461
% of homes with loft insulation measures	37%	63%	79%	84%	84%	84%
Number of homes with loft insulation measures	42,118	72,203	90,253	96,270	96,270	96,270
% of homes with double glazing measures	30%	52%	65%	69%	69%	69%
Number of homes with double glazing measures	34,597	59,309	74,136	79,079	79,079	79,079
% of homes with LED measures installed	43%	74%	92%	98%	98%	98%
Number of homes with LED measures installed	49,138	84,237	105,295	112,315	112,315	112,315
% of boilers upgraded	22%	38%	48%	51%	51%	51%
Number of boilers upgraded	25,572	43,837	54,796	58,450	58,450	58,450
% Reduction in domestic emissions	43%	56%	72%	81%	87%	92%
% reduction in energy demand in commercial buildings	13%	25%	25%	25%	25%	25%
Heat supplied to commercial buildings by EfW heat network (GW)	26	42	42	42	42	42
% commercial buildings with heat pumps installed	20%	37%	50%	59%	64%	66%
% reduction in commercial emissions	55%	69%	79%	85%	89%	91%

CARBON TRUST

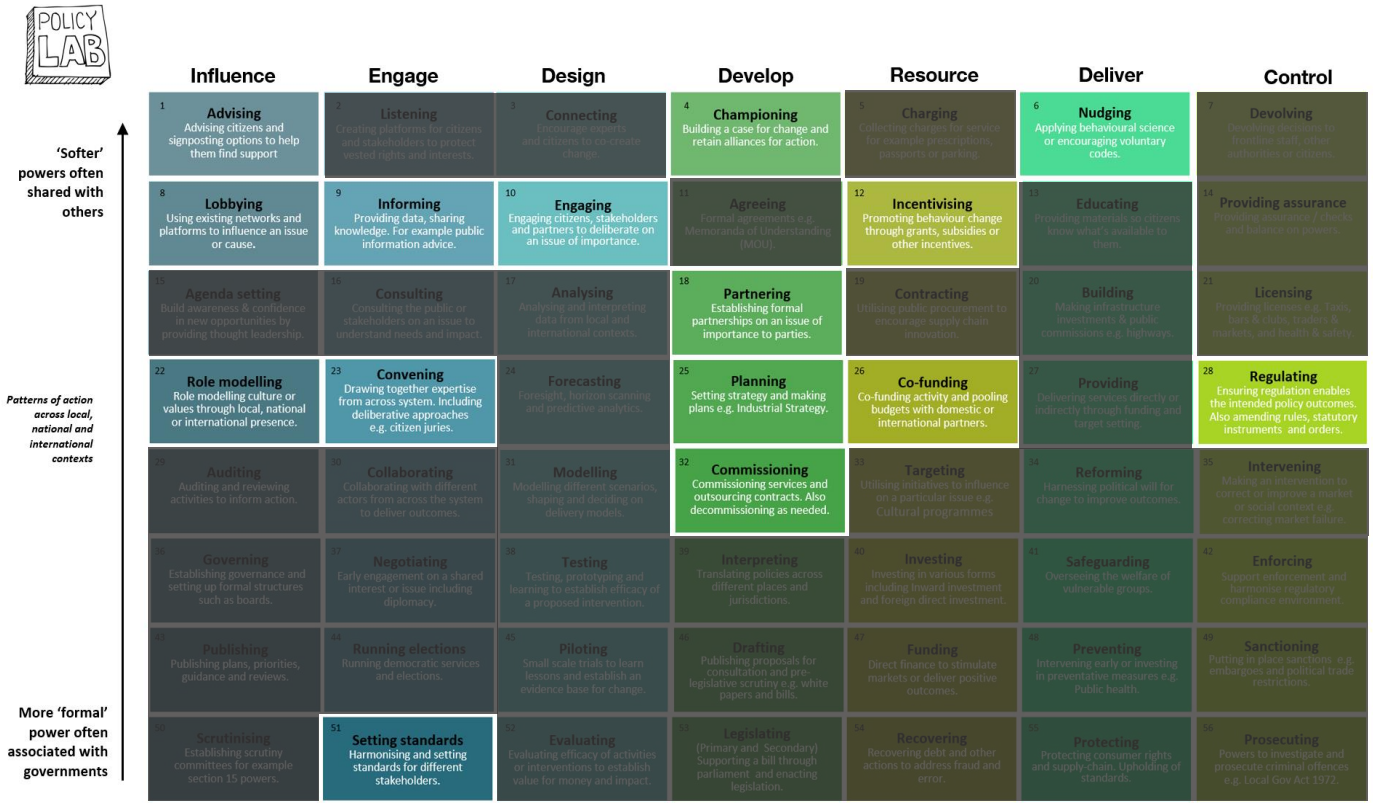
Action Plan

Defining Council roles by sphere of influence

Proposed structure for defining the specific role of the local authority when delivering each action

https://www.theccc.org.uk/wp-content/uploads/2020/12/Local-Authorities-and-the-Sixth-Carbon-Budget.pdf

Action Levers



CARBON TRUST

Action 1. Accelerate and incentivise cross-tenure retrofit for existing homes.

Concept	Residential emissions account for a significant proportion of Hull's total carbon footprint (34% in Hull). Hull should investigate options for developing new or expanding existing programmes to accelerate domestic retrofit in the region. Examples of retrofit programmes are: Better Homes Yorkshire (wyca-final-report.pdf (wordpress.com)
Hull Role/Action Lever Pathway Requirements	Hull has direct control over its owned estate/ social housing and the delivery of retrofit across this estate should take a leading role for this activity. Local authorities can also use planning powers to set standards for existing homes that are either in line with or exceed Government targets. **Hull** • Energy-efficiency measures implemented in all homes where it is technically feasible to do so by 2050. • 71% of residential buildings to have heat pumps by 2050
Related policies & strategies	Hull Housing Strategy Action Plan, Hull Affordable Warmth Strategy, Hull £99 scheme, where householders contribute £99 to cover costs of cavity wall or loft insulation (property owners and private renters only)
Funding Sources	**Public Finance** • Local Authority Delivery scheme (LADS) as part of the £2 billion Green Homes Grant Scheme • Social Housing Decarbonisation Fund administered by BEIS for the implementation of energy efficiency measures in homes. Submission of Wave 1 applications will close on 15th October 2021. • Energy Company Obligation 2018-2022 (ECO3) administered by Ofgem is a scheme where energy companies must provide funding for energy efficiency measures in eligible homes. A Local Authority can also declare homes it deems eligible for funding through the Flexible Eligibility Scheme (ECOFlex). • £150 million Warm Homes Fund (WHF) administered by Affordable Warmth Solutions (AWS) across the UK. Bidding rounds closed end of 2019. • Domestic Renewable Heat Incentive (RHI) has been extended until March 2022 • Heat Network Delivery Unit (HNDU), Heat Network Investment Project (HNIP), Green Heat Network Fund (GHNF) **Private Finance** • Community municipal investments (Abundance Investments) provide a low-cost and longer-term form of borrowing for Local authorities available to retail and therefore community investors and are capable of enabling direct investment by Local Authorities. • Sustainability-linked bonds (Clarion housing arranged by Natwest markets, HSBC and Santander) unlock opportunities for low interest rates and long-term capital to fund retrofit programmes. • Other funding mechanisms (revolving funds, on-bill payments etc.)

Action 1. Accelerate and incentivise cross-tenure retrofit for existing homes **continued**

Implementation Steps	1. **Convene an advisory board to provide the expertise to shape and develop the foundations for the programme.** Include stakeholders such as local authority housing & planning teams, DNOs, community groups and delivery partners.
	2. Establish KPIs, standards and a **housing retrofit delivery plan**. This could include:
	  1. Use of **local area energy planning** to inform the retrofit programme. This would involve building a detailed understanding of current building stock, use behaviours, the feasibility of implementing specific energy efficiency and low carbon heating solutions, and using this to develop a spatially-represented plan. Regional organisations such as DNOs, gas distribution networks and the LEP will be key partners to inform local area energy planning, coordinating activities at the regional and local level can help to minimise disruption and align infrastructure plans to develop a coordinated approach.
	  2. **Set clear targets** for retrofit by ascertaining the standards to be applied across homes. E.g. EnerPhit, Passivhaus standards, The Future Homes Standard (2025) and planned updated to Parts F and L of Building Regulations etc. This is also crucial for informing skills development strategies in the local area.
	  3. Understand the **approach** it will take to retrofit. This involves developing criteria for prioritising different measures such as ownership, funding availability or influence. The council also needs to decide if retrofit will follow a whole-house approach or staged approach to implementing energy efficiency and low-carbon heat measures. This will be dependent on the UK's heat and buildings strategy.
	  4. Establish a **pipeline of projects** to provide proof of concept for scale-up. Projects that are prioritised in the short-term can be used as demonstrators to support business cases for larger projects in the future. Prioritisation can be informed by local area energy plans.
	  5. **Prioritisation** of projects. Based on funding, influence, impact, timeline etc. Projects implemented first could act as a template/case study that provides proof of concept for scaling the programme in the future.
	  6. Implement process for **monitoring progress** to provide evidence of impact and highlight learnings that can be taken forwards into subsequent programmes.
	  7. **Identify potential funding streams.** Hull & East Riding can play a fundamental role in securing funding for retrofit strategies but also supporting retrofit finance mechanisms for tenants in owner-occupier or private rented properties. At the moment, funding for retrofit is limited and the role that local authorities will play is unclear. The councils should lobby Government to provide further clarity and raise concerns about funding shortfalls. Local authorities are in a unique position to leverage existing relationships with social housing providers, landlords etc. to design programmes that are mutually beneficial for all those involved, from tenure type to financial circumstance.
	3. **Convene a cross-sector task group whose purpose is to deliver on specific objectives set-out in the delivery plan.** Consider a partnership that transcends boundaries and encourages a collaborative and coordinated effort towards shared goals. This means involving regional as well as local partners. For example, the partnership could be formed of developers, planners, tenants, Registered Social Landlords, partner organisations to develop a programme that meet the councils' net zero ambition and the commitments set out in their housing Strategy and local plan.
	4. **Develop local skills, capabilities and supply chain to deliver the plan.** Develop an understanding of the current skills base in the local area and its capacity to deliver retrofit. The local authority could form a skills partnership with members from across the supply chain that are responsible for coordinating action. This is directly linked to key action 2.
	5. **Communicate guidance & progress in an easily accessible way.** As a starting point, a communications strategy could focus on prioritised projects delivered in the short-term that provide proof of concept and where knowledge-sharing has the potential to accelerate retrofit on a wider scale. Work with sector partners to produce a holistic, communications strategy that provides clear advice on retrofit and ways to participate in any council-operated programmes, accounting for the specific audience.
	6. **Monitor progress to make sure the scheme delivers on primary objectives.** Local authorities need to integrate monitoring processes into any programmes to measure progress and impacts of designed programmes.

Owners & Champions	HCC, North East and Yorkshire Energy hub (https://www.neyenergyhub.com/), Contractors.
Dependencies & Risks	Skills, supply chain, public acceptance, funding, High dependency on UK Government's heat and buildings strategy, specifically approach to funding heat and energy efficiency measures in homes and what role Local Authorities must play.

Action 2. Create strategic skills partnerships to close low carbon skills gap and support the growing low carbon local economy

Concept	Since its inception in 2010 by HCC, ERYC and Associated British Ports (ABP), The Green Port Hull has had the vision to establish Hull as a world class centre for renewable energy, creating wealth and employment for the region. To ensure the delivery of this vision, HCC and ERYC and other partner organisations set-up The Green Port Growth Programme (GPGP) with support from the Regional Growth Fund (RGF). The programme's aim is to capitalise on the various opportunities that would emerge from the development of Green Port Hull as well as ensuring local supply chains and skill levels can meet the need of the emerging renewable energy sector. A key growth strand of the programme was a focus on employment and skills development. Since its inception in 2010, 1,732 (based on 2018 figures) beneficiaries and 548 business have benefited from this strand's activities. Hull should reflect on the learnings from the GPGP and investigate the delivery of skills programmes for the wider low-carbon sector in the region, building on existing partnerships and regional activities. For example, • **Humber Digital Skills Partnership (DSP) –** helping to increase the digital capability of individuals and organisations in the Humber. • **Hull Growth Hub** – Established by the HEYLEP, the hub provides impartial advice, knowledge, training and other services to help businesses grow in the Hull and East Yorkshire region. A key focus of this activity should include widening the scope of existing skills partnerships to tackle the skills gap to enable the transition to low carbon buildings, bolstering the skills and supply chain required to enable energy efficiency retrofit, the roll out of renewable heat technologies and building-integrated renewables.
Hull Role/Action Lever	Co-ordinating and facilitating
Pathway Requirements	• Hull 71% of homes have heat pumps installed by 2050 • 66% of commercial buildings have heat pumps installed by 2050 • 100% of new homes have solar PV installed
Related policies & strategies	• Hull Carbon Neutral 2030 Strategy – Skills and Training Pathway • Hull's Economic Strategy 2021-2026 - Delivering the strategy • Humber Estuary Plan (owned by the Humber Leadership Board comprised of the 4 Local Authorities and 2 LEPs in the Humber region) • HEY LEP economic strategy
Funding Sources	• Regional Growth Fund • Education and Skills Funding agency (ESFA)

Action 2. Create strategic skills partnerships to close low carbon skills gap and support the growing low carbon local economy **continued**

Implementation Steps	**1. Convene the right stakeholders.** 1. Existing partnerships 1. Industry-led CATCH partnership supports the process, energy and engineering and renewable industries in Yorkshire and Humber facility which is a partnership between University of Hull, Institutes of technology, colleges and training providers 2. Aura is an ESB-led partnership formed of the Universities of Hull, Sheffield and Durham also now with an innovation centre at Humber Bridgehead will focus on working with SMEs to develop skills and knowledge across the low carbon sector. The Humber Skills Energy Campus is being developed as a centre of excellence for energy skills and an online platform to advertise training and courses. 2. New partnerships 1. Explore new partnerships with educational institutions and the supply chain, with a specific focus on the decarbonisation of buildings. **2. Identify current and future skills needs/demands in the region** and use this to develop a skills and training delivery plan that complements Hull's net zero target. The Hull and East Riding LEP is forming a new employment and skills board (ESB) which will be responsible for delivering actions that are agreed by the Skills Advisory Panel (SAP). It published a local skills report in May 2021 and will be used to inform the Employment and Skills Strategy to address the key priorities identified. HCC should work closely with the ESB on actions where councils have been identified as strategic partners. **3. Reflect on learnings from previous experiences.** To boost the local skills supply chain Hull could encourage employers to offer training and employment opportunities by offering financial incentives such as those used for Green Port Hull. This could be: 1. Wage subsidies made available to employers which are equivalent to 20% of total wage costs / £4,000 for beneficiaries taken on over a sustained period. 2. Training subsidies up to 50% of total training cost to upskill existing employees and specific NVQ levels. 3. Provision of upskill support **4. Build internal capabilities.** Ensure that staff within the Council and its companies have the training and skills required to deliver priorities related to the green economy. This could be achieved by participating in carbon literacy training programmes, which were announced in the UK Net Zero Strategy. **5. Develop joint bids for funding to establish identified programmes.**
Owners & Champions	HCC, University of Hull, HEYLEP and Hull Growth Hub, Industrial members, Transport for the North, regional delivery vehicles.
Dependencies & Risks	• High level of uncertainty in relation to national strategy for the decarbonisation of key sectors. • Ensuring a fair skills transition

Action 3. Raise internal awareness of innovative funding mechanisms for low-carbon projects and finance, and secure funding for future projects.

Concept	Create an enabling environment for change by educating officers about innovative funding mechanisms for the delivery of low-carbon projects. One of the objectives set out in The Government's Green Finance Strategy, released in July 2019, sets out clear intentions to "financing green", by accelerating finance for clean and resilient growth and improving access to finance for green investment. The Government has acknowledged that public funding will not be enough to meet the UK's Net Zero goals, and is committed to therefore removing associated market barriers to private finance. The principle of this action is to better equip council officers in legal and finance teams with the knowledge and current approaches being taken across other local authorities to raise sufficient capital to fund carbon reduction projects. There is often a lack of resource and skills to develop a pipeline of projects sufficient to unlock investment opportunities in local areas, but it is recognised that local authorities are the key to guiding potential investors to opportunities that meet local needs as well as national carbon reduction targets, and therefore stand a better chance of being supported by local communities and decision-makers.
Hull Role/Action Lever	Convening, co-ordinating. The council could also play an administrative role for any finance delivery vehicles that are identified.
Pathway Requirements	This action acts is an enabler for the scenarios presented in the roadmaps, focusing specifically on funding mechanisms for carbon reduction projects identified.
Related policies & strategies	• Hull Local Plan 2016-2032 - Deliver economic growth that works for all and create inclusive, resilient and safe communities, actively seek external funding and grants wherever possible to help deliver local programmes and increase funding within the city
Funding Sources	There are numerous sources of funding available for innovation and demonstration projects, including national government grants and competitions, international funding and research grants.

Implementation Steps	1. **Undertake an internal survey to understand the knowledge gaps and existing barriers to financing low-carbon projects.**
	2. **Identify key local partners to contribute expert knowledge and advice on innovative funding mechanisms.** The local authorities could look to educational institutions such as the University of Hull, to provide expert knowledge on the topic, or other organisations taking a leading position in this area.
	3. **Create a dedicated research programme**
	  1. Investigate opportunities for partnerships with third-party investors to access private finance. This involves engaging with potential investors, to understanding their investment criteria and suitability for investment into a range of capital projects. The councils could explore alternative options for securing private sector funding that have already proved successful in other regions. For example, the City LEAP project, led by Bristol City Council, is demonstrating how small projects can be aggregated into one single portfolio to unlock private finance.
	  2. Assess feasibility of establishing an offset fund to raise funds for carbon reduction projects in the council region. Carbon offset funds are well-established mechanisms for raising funds for carbon reduction projects on an area-wide level. Raising awareness of this across the councils and discussing the option of mandating the set-up and administration of this fund in local planning policy would unlock additional funding streams and ensure the councils' decarbonisation targets are accounted for in planning and development. The councils could start by researching where this has worked well. For example, the London Plan requires all major developments to achieve net zero carbon. A minimum of 35% on-site carbon improvement on national building regulations must be met and the shortfall to zero carbon is offset by making a cash-in-lieu contribution into the relevant LPA's carbon offset fund. Carbon offset fund expenditure was £13.8 million with 15 LPAs having begun spending the fund at the end of 2020.
	4. **Develop internal materials/ training guidance to disseminate across internal departments.** Focus on bringing all departments up to date with latest knowledge to make informed decisions about the types of opportunities that could be feasible.

Owners & Champions	Local Authorities, Regional-level bodies, HEYLEP, beneficiaries of information can be other publics sector bodies (e.g. NHS), educational institutions
Action dependencies & risks	• Lack of understanding and experience within the public sector regarding the opportunity for green finance.

Action 4. Explore role of digitalisation in Hull by convening cross-sector partnerships and facilitating demonstrator projects

Concept	• The COVID-19 crisis has proved even more that digital connectivity is a key enabler for society to function effectively and at times more efficiently, with less necessity to travel, remote access to services and communication routes. Out of the growth of information technology and big data, we have seen the concept of "Smart Cities" emerge, where intelligent technologies are applied to address key challenges faced living in urban environments. Digital solutions could help cities adapt to the challenges of climate change, population growth, resource scarcity among others. Digital innovations in the city context come in many different forms, but all work to improve the connectivity between services and people, as well as collecting and sharing data that can contribute to making services easier to access and more efficient. • Local authorities play a critical role in enabling city-based digitalisation decision-makers for city-based services and development. Their extensive network of partners also puts them in a primary position for coordinating large-scale, city-wide programmes where digital solutions could be applied. • Hull City Council (HCC) has already started integrating smart solutions within the city by partnering with Connexin to launch a Smart City platform that provides data from across a number of council services into one platform to drive further insights and efficiencies on day to day activities across the city. This is based on the LoRaWAN network which has the capability of enabling Hull to become one the UK's first programmable cities. HCC was also involved in a pilot programme coordinated by the NEY Energy Hub that deployed the OnGen software to help evaluate the suitability of renewable energy solutions on buildings. Hull should continue to expand its current capabilities across the network through a series of second phase demonstrator projects to provide proof of concept for scaling in the future. **Digital innovations for city services** • Future City Glasgow's smart street lighting demonstrator – part of this project worked on improving energy efficiency and safety throughout the city by collecting real-time data through a digital network. • Manchester CityVerve (ended 2018) cycling safety demonstrator – part of this demonstrator focused on using sensors that adjusted the brightness of bike lights when in high risk situations to make them more visible as well as tracking speed, wait times and other metrics to help inform the council's investment decisions for cycling infrastructure • MK: Smart demonstrators (ended 2017) electricity demand-shifting – Part of the programme focused on engaging with residential solar PV owners to help maximise self-generation and rely less on the grid. The programme also established the "MK: Data Hub", which is a database of information received from open data, infrastructure and sensor networks. The data is being used as a way to develop smart solutions in numerous sectors.
Hull Role/Action Lever	Partnering, Convening, Co-funding
Pathway Requirements	This is an enabling action, which has the potential to facilitate the delivery of carbon reduction actions identified in the emissions reduction pathways.
Related policies & strategies	Hull Economic Strategy 2021-2026

Action 4. Explore role of digitalisation in Hull by convening cross-sector partnerships and facilitating demonstrator projects continued

Funding Sources	• Innovate UK • Net Zero Innovation Programme • Digital Transformation Programme • BEIS Innovative Domestic Demand-Side Response Competition – Projects such as the Energy Local CIC are funded by this and enables communities to offer demand flexibility and to be rewarded for participation.
Implementation Steps	1. **Improve digital accessibility and literacy across the region to enable better access to skills, employment and local services.** Signing up to the Local Digital Declaration gives Local Authorities access to free digital skills training and eligibility to apply for funding for demonstrator projects that meet the objectives of the declaration (What is the Declaration? - Local Digital). 2. **Identify initial list of funding opportunities and request proposals from across the region.** The Humber Estuary Plan outlines a priority to enhance competitiveness for port and manufacturing logistics activity through smart innovation. There is opportunity for digital systems to increase efficiency. For example, steps have been taken to introduce smarter logistics through the Liverpool-Humber Optimisation of Freight Transport (LHOFT) project, led by the University of Hull's Logistics Institute. The system will enable multiple cargo owners to pool volumes to de-risk new sea and rail services through northern ports 3. **Convene key partners to identify priority areas or sectors and potential demonstrator projects.** The local authorities could act as brokers by connecting interested partners to competitive funding solutions, as well as using its influence to attract interest and new partners.
Owners & Champions/ partners?	Local businesses in digital sector, HEYLEP, Distribution network operators (DNOs), Transport for the North, North East & Yorkshire Energy Hub
Dependencies & Risks	• Lack of Government-backed funding for demonstrators or scale-up in the future. • Data privacy and ownership can cause hesitancy or stifle collaboration between partners. • "Digitalising our energy system for net zero: strategy and action plan 2021" – BEIS, UKRI, Ofgem

Action 5. Strengthen engagement and partnership within the industrial cluster to share knowledge and unlock new opportunities

Concept	The Humber Industrial Cluster Plan, owned by the Zero Carbon Humber consortium and funded by the UKRI through the Industrial Decarbonisation challenge, sets out a vision of the cluster being the first low carbon industrial cluster by 2030 and a net zero cluster by 2040.
	
	The cluster is continually attracting investment to make it a leader in industrial decarbonisation. Current deployment projects include:
	• **Partnerships**
	  • Zero Carbon Humber - Consortium of energy and industrial companies and academic institutions working to decarbonise the Humber region with a vision to be a net-zero carbon cluster by 2040.
	  • Northern Endurance Partnership (Net Zero Teesside and Zero Carbon Humber) – Equinor and National Grid working to develop the offshore pipeline and storage infrastructure in the Southern North sea for carbon dioxide captured by Zero Carbon Humber and Net Zero Teesside consortium members.
	• **Projects**
	  • The Saltend Chemicals Park will be home to the first at-scale Hydrogen production plant, having received investment from Equinor for the Hydrogen to Humber (H2H) Saltend project.
	  • Humber Zero (Immingham)
	  • V Net Zero – Offshore carbon storage in the Viking area next to cluster centre in Humber region
	  • Gigastack (In phase 2, supported by BEIS) – Renewable hydrogen demonstrator coordinated by a consortium including Orsted, Phillips 66 and ITM Power,
	Hull City Council, as the governing body of the HEY LEP, plays a key role in developing the strategy, setting priorities and making decisions related to the Humber industrial cluster plan.

Hull Role/Action Lever	Facilitating, collaborating
Pathway Requirements	• 90% reduction in emissions from industry by 2050 • 89% reduction in emissions from industry by 2050
Related policies & strategies	Humber Industrial Cluster Plan, Hull economic strategy 2021-2026, Humber Estuary Plan (Humber Leadership Board, endorsed by HEYLEP and GLLEP)
Funding Sources	Public funds, private sector match-funding
Implementation Steps	1. **Feasibility Assessment.** Hull City Council, on behalf of the HEY LEP (of which it is the governing body) and CATCH have recently gone to tender seeking support for the delivery of Phase 2 Industrial Strategy Challenge Fund (ISCF) decarbonisation of industrial clusters: Cluster Plan project. The aim of phase 2 is to build on previous feasibility assessment work, including assessment of skills and supply chain needs, further scenario modelling, inward investment among other themes. 2. **Continued involvement in cross-regional partnerships.** Hull City and East Riding councils are members of the joint committee known as the Humber Leadership Board which is in place to facilitate cooperation on cross-estuary activities related to clean growth, Freeport, shared assets and attracting inward investment.
Owners & Champions	HEYLEP, private sector, financial institutions, planning authorities,
Dependencies & Risks	• Timing of the development of strategic plans could lead to conflicting priorities or constraints. The councils should make sure that there is a coordinated approach outlined between plans such as local net zero carbon action plans, the Estuary Plan Strategy and the Humber Industrial Cluster Plan being developed. The HICP has been endorsed by the Humber Leadership Board (Jan 2021) as a component of the Humber Estuary Plan.

Action 6. Develop electric vehicle charging infrastructure, taking an inclusive and joined-up approach to ensure these are located in the right places.

Concept	Deploying charging infrastructure is hugely important to the UK phasing out fossil fuel vehicles within its ambitious timeframes. To enable the required roll our of EVs, the Hull region will need to take an inclusive and joined up approach to installing EV charging infrastructure across a strategically selected series of sites (spanning car club locations, light commercial vehicle parking and deprived districts). This should incorporate a cohesive governance structure to enable coordination of EV charging infrastructure with the relevant parties (e.g. local authority, public bodies, public transport operators, DNO). Consideration must be given to: • Ensuring an equitable uptake of EVs, and try to avoid a future where low-income households are penalised for driving the most polluting vehicles. In order to do this, building out EV charging infrastructure for private EVs should not be entirely avoided, but instead focused. • Taking a region wide approach, transcending council boundaries. • Variable charging patterns and V2G opportunities. • Testing local appropriateness of charging solutions.
Hull Role/Action Lever	Planning, regulating, lobbying, convening
Pathway Requirements	Hull 27% by 2030, 82% of private vehicles electrified by 2050.
Related policies & strategies	• Hull Local Plan 2016-2023 • Hull Carbon Neutral Strategy • Department for Transport is due to release its EV Charging Infrastructure Strategy and a guide for local authorities in 2021. • Transport for the North Decarbonisation Strategy June 2021 (draft)
Funding Sources	Funding streams could include: • On-street residential chargepoint scheme (ORCS) provides grant funding for local authorities to install residential charge-points. • £90 million local EV infrastructure Fund (2022) • Charging Infrastructure investment fund • EV Homecharge Scheme • Community Infrastructure Levy (CIL) Fund
Implementation Steps	1. Establish collaborative working group and a governance approach. 2. Assess existing EV infrastructure, charging behaviours, numbers of vehicles. The councils should start by collecting data about electric vehicle use and infrastructure. It also needs to determine forecasts for vehicles in the future. To achieve this, the council could take an engagement-led approach with key stakeholders such as DNOs, sub-regional transport bodies (Transport for the North), private businesses, supply chain members and local communities. It's also important to acknowledge the importance of interoperability in the region, so the local authorities should work together when designing an EV charging infrastructure plan. 3. Lobby national government to clearly define local authorities' role in achieving national charging infrastructure targets, and sufficiently equip them with the resources and funding to deliver. Even though there is grant funding available for Las, this is largely not applied for, which could be due to a number of factors; lack of Government clarity on LA's role in meeting EV charging targets, resourcing constraints or uncertainty around what technologies to invest in. Local authorities are responsible for parking and street-furniture like lamp posts where on-street charging is often installed and they also have an understanding of local needs. These reasons combined mean that HCC should take a more proactive role in managing the roll-out of on-street charging, maximising competition and protecting local residents by develop local plans. LAs should lobby Government to properly equip and incentivise LAs to do this by formally defining their role via a statutory duty. 4. Consider a staged approach to: 1. Short-term – council-owned fleet focus where council has greater influence, public transport service providers. 2. Long-term – regional solutions and tying into regional plans but also needs of commercial/ domestic users. 5. Improve communications to encourage electric vehicle uptake and raise awareness of infrastructure developments. The communications strategy could be part of an overarching communications strategy described in action 8. 6. Use planning policy to mandate vehicle charge points for new developments.
Owners & Champions	Hull, Transport for the North, Public transport providers, DNOs
Dependencies & Risks	Building out EV charging infrastructure requires close co-ordination with the DNO to ensure potential grid constraints are identified early and reinforced or avoided.

Action 7. Prioritise active transport by building on existing local cycling and walking infrastructure plan (LCWIP) for Hull

Concept	Hull already have plans for improving local active transport networks and infrastructure. Hull should work along with internal/external and regional partners, to establish a joined up approach for strengthening and prioritising active transport networks in and around the region to make active transport an easy choice for people. As well as improving road connectivity, attention should be given to: • Increasing secure cycle storage • Bike share schemes • Urban design and planning of new developments (both residential and commercial) • Public perception of cycling - educating the public to understand that cycling can be a mode of transport, not a fitness activity (e.g. Amsterdam) • Leading by example by installing active travel support infrastructure and measures: Quality bike storage, shower facilities, uncapped cycle purchase schemes (Cycle to Work), route planning and an optional cycling road safety lesson.
Hull Role/Action Lever	Coordinating action between Hull and East Riding planners. Engaging with businesses to support them in developing their own active transport infrastructure
Pathway Requirements	By 2030 - 10% Modal shift towards public or active transport in both regions, by 2050 – 20% shift towards public or active transport in both regions
Related policies & strategies	Hull Carbon Neutral strategy, Hull Transport Strategy, Hull Local Plan, Towards an Active Hull, ERY Local Plan, Hull Economic Strategy 2021-2026 commits to "investing in Sustainable Active Travel and travel planning which will help connect people with education, training and employment as well as help deliver improvements in health, congestion and air quality", HCC and ERYC's Sustainable Modes of travel strategy
Funding Sources	Active transport is already a focus area for both Hull. Other funding sources could include: • National Productivity Investment Fund (NPIF) • Local Access Fund (engagement programmes) • £40,000 has been made available through the eCargo Bike Grant Fund for the purchase of ecargo bikes to support businesses switching to a sustainable transport solution. This fund is currently open for applications
Implementation Steps	1. Convene working group between Hull and East Riding transport planners and other cycle/walking support groups e.g. Sustrans. 2. Review and develop respective active travel plans and initiatives 3. Implementing priority activities identified in the action plans. 4. Feed into active travel element of community engagement and comms campaign
Owners & Champions	Hull
Dependencies & Risks	Modal shifts require a wide range of infrastructural, societal and behavioural levers to be pulled, which must all be considered if an effective plan is to be developed.

Action 8. Wider community engagement

Concept	It is recognised that lack of awareness can be limiting to behaviour change within individuals, particularly relating to heat and transport. More can be done to engage with the community on these topics: • Heat pumps - Carefully listening to and addressing the concerns of tenants and leaseholders; • Retrofit - The benefits of retrofit (beyond cost savings), when to retrofit a property, and who can you trust to 'get it right'; • Active travel - Encouraging the switch the active modes, working from home (where possible) and car sharing. Initiatives within the campaign could involve: • Leverage student body to pilot alternative transport ideas on campus and in wider city and region • Leverage businesses and employers position to influence their partners and employees • Use local media campaigns to inform public of climate conditions and projected impact locally (i.e.. What will happen in Hull) • Introduce a "smart city" dashboard, or smart metrics that are directed at residents to educate the public on actual resource use compared to benchmarks and how to reduce it. While there are many opportunities for behaviour change initiatives throughout the organisations described above, behavioural change campaigns are costly and complex and funding is rarely available. Given that behaviour challenges are not unique to this region, rather than attempting to fund a campaign at a local level, Hull could consider a lobbying role, to encourage government to provide further funding to support this activity.
Hull Role/Action Lever	Convening/partnering with key stakeholders from universities, business and other influential organisations Lobbying national government to address and invest in behaviour change at a national level
Pathway Requirements	All consumer behaviour-related measures (e.g. active transport uptake, EV usage, home energy usage, thermal insulation)
Related policies & strategies	Organisational comms campaigns
Funding Sources	This action will require a dedicated budget from councils (and potentially partners). We are not currently aware of any funding sources for communications.
Implementation Steps	1. Identify key organisations to partner on engagement campaign and convene working group dedicated to collaborative cross sector engagement 2. Lobby national Government to provide support and advice for awareness campaigns. 3. Develop community engagement campaign action plan 4. Strategic launch to coincide with launch of other actions
Owners & Champions	Hull and collaborative working group
Dependencies & Risks	• Comms campaigns can be high cost • Communication is complex, and communicating across multiple strands of behaviour change even more so.

Action 9. Convene a carbon removal working group

Concept	There are many current and planned initiatives relating to environmental conservation and restoration within Hull. Many of these have high carbon sequestration potential, however, many are not being considered in terms of this potential. While carbon removal may not be the primary objective of these projects, understanding and supporting the carbon removal angle of these projects will help the region understand and expand the degree to which it can address and 'offset' its residual emissions locally. HCC has an opportunity to convene stakeholders from all these groups to develop a dedicated carbon removal working group to plan, develop and monitor environmental conservation and restoration. Current conservation projects with sequestration potential include: • HEYwoods • Humber Coastal Restoration Project • Sustainable Landscape Project • Meadows Partnership • Other projects delivered by Humber Nature Partnership, Yorkshire Wildlife Trust Definitions and opinions on the nascent topic of carbon removal range widely across the climate community and the public sphere. To effectively assess and plan for carbon sequestration as a means of addressing residual emissions, Hull and partner organisations will have to stay close to emerging policy and guidance from SBTI, the Greenhouse Gas Protocol (Guidance on land based activities and carbon removals to be published in 2022) and other relevant organisations to ensure accounting and reporting frameworks are consistent across all sequestration activities.
Timeframe	Immediate – critical to gain better understanding of current and planned activities to understand the degree to which the region can address residual emissions though local initiatives
Hull Role/Action Lever	Convening a working group with key stakeholders Lobbying for greater policy support and funding for nature based carbon removal
Pathway Requirements	Addressing residual emissions throughout the plan
Funding Sources	
Implementation Steps	1. Convene key stakeholders from councils, local research bodies and conservation groups 2. Document all current and planned restoration activities with sequestration potential 3. Develop framework for measuring, recording and promoting carbon removal initiatives 4. Support the expansion of restoration activities within the region
Owners & Champions	HCC, ERYC, Environment Agency, Yorkshire Wildlife Trust, Humber Nature Partnership, Humber Coastal Restoration Project, HEYwoods, Sustainable Landscape project, Floodplain Meadows partnership,
Dependencies & Risks	• Policy and guidance on accounting for land based carbon removals is not yet standardised. Emerging policy must be monitored.

Action 10. Strengthen requirements for green infrastructure in planning policy

Concept	The importance of green infrastructure (trees, parks and other natural features) has become widely recognised both for its role in carbon sequestration and climate change adaptation. In addition to its role in climate change mitigation and adaptation, green infrastructure has biodiversity and recreational benefits. More can be done in Hull to strengthen green infrastructure networks. There are opportunities with HCC planning teams to engage with and input into the next iteration of the relevant Local Plan policy to explore opportunities to strengthen the requirement for green infrastructure in both residential and commercial developments. Future planning development should be done in collaboration with local environmental and biodiversity groups to ensure plans and initiatives are joined up, appropriate to the local context and ecologically sound. Hackney Local Plan provides a strong example of an urban area which has given strong weight to green infrastructure within the Local Plan
Hull Role/Action Lever	Planning/regulation
Pathway Requirements	Addressing residual emissions throughout the plan
Related policies & strategies	Hull Local Plan Policy 45 - Three new trees of native species and local provenance will be required to be planted for each new dwelling and requirements for tree planting throughout new developments
Funding Sources	This action does not require the input of additional funding beyond existing Council team budgets. Funding for tree planting may be available through various local and national schemes, which should be recognised and promoted
Implementation Steps	1. Congregate Council planning team and other key stakeholders to discuss Local Plan policies, and agree what can and cannot be achieved within the current environment. 2. Based on setting out this limit, planning team could integrate any further possible ambition into new policy, and that which is not currently possible can form the focal points for lobbying efforts with national government.
Owners & Champions	HCC
Dependencies & Risks	Policy and guidance on accounting for land based carbon removals is not yet standardised. Emerging policy must be monitored.

Modelling assumptions

Transport Sector

Assumptions for each scenario were developed from the NpG DFES and NG FES. Discussions were held with relevant stakeholders to ensure all assumptions reflected the local context in the two regions.

	Assumption source	1. System transformation	2. Consumer Transformation	3. Leading the Way/NZ early
ICE/ hybrid vehicles	Assumptions based on NG FES & NpG DFES 2020 and discussions with local stakeholders.	• Sales banned from 2030.	• Sales banned from 2030.	• Sales banned from 2030.
Private/ personal vehicles		• Private vehicles and most vans switch to battery electric technology (BEVs). • Hydrogen fuel cell vehicles (HFCV) commercialised with moderate uptake.	• Majority of road traffic is electrified. • Vans mostly switched to battery electric technology (BEVs).	• High uptake of electric vehicles.
Public transport		• Limited consumer willingness to switch from private transport.	• Increase in demand.	• Increase in demand.
Rail		• Gov't target to eliminate diesel by 2040. • High electrification. • Growth in traffic met by hydrogen.	• Gov't target to eliminate diesel by 2040. • High electrification.	• Gov't target to eliminate diesel by 2040. • High electrification.
Buses		• Hydrogen is favoured over electrification.	• Electrified with Government support.	• High electrification.
HGV		• Nationwide hydrogen refuelling network developed to support hydrogen-powered HGVs.	• Mainly use "green" hydrogen with some electrification.	• "Green" hydrogen available for HGV use.
Rail for freight		• Hydrogen is favoured over electrification.	• High electrification.	• High electrification.

ICE – Internal Combustion Engines, AV – Autonomous Vehicles, ToU Tariff – Time of use tariffs

Industry Sector

Assumptions for each scenario were developed from the NpG DFES and NG FES. Discussions were held with relevant stakeholders to ensure all assumptions reflected the local context in the two regions.

	Assumption source	1. System transformation	2. Consumer Transformation	3. Leading the Way/NZ early
Gas Grid	Based on Northern Gas Network's Net Zero scenario. Consumer transformation was adapted based on anticipated levels of system and behavioural change in that given scenario.	• Assumes NGN's pathway with high proportion of hydrogen injected into the grid.	• No hydrogen injected into the grid, and a maximum for biogas injection in line with National Grid FES 2020	• NGN's pathway with high proportion of hydrogen injected into the grid.
Energy efficiency	Energy efficiency assumptions are based on NG FES 2020, with input from local industry stakeholders.	• Industrial energy efficiency improves by 20% by 2050.	• Industrial energy efficiency improves by 20% by 2030.	• Industrial energy efficiency improves by 25% by 2030.
Industrial processes	Assumptions on fuel switching for industrial processes are based on input from local industry stakeholders and NG FES 2020.	• Industrial customers adapt heat processes to use hydrogen where feasible and a connection is available.	• All credible industrial processes are electrified, or use hydrogen where feasible and a connection is available.	• All credible industrial processes are electrified, or use hydrogen where feasible and a connection is available.
Solar PV	Based on NpG DFES 2020 scenarios.	• Major development of renewable technologies but are geared slightly towards larger, more centralised projects	• High level of development in renewable technologies. Geared slightly towards smaller, more decentralised projects	• Highest levels of renewable/low carbon generation to support hydrogen production from electrolysis. A stronger push to develop new projects.

Building Sector

Assumptions for each scenario were developed primarily from the NpG DFES and NG FES. Discussions were held with relevant stakeholders to ensure all assumptions reflected the local context in the two regions.

	Assumption source	1. System transformation	2. Consumer Transformation	3. Leading the Way/NZ early
Gas Grid	Based on Northern Gas Network's Net Zero scenario. Consumer transformation was adapted based on anticipated levels of system and behavioural change in that given scenario.	• Assumes NGN's pathway with high proportion of hydrogen injected into the grid.	• No hydrogen injected into the grid, and a maximum for biogas injection in line with National Grid FES 2020.	• NGN's pathway with high proportion of hydrogen injected into the grid.
Heating	Based on NpG DFES 2020.	• Decarbonisation of heat is steered towards hydrogen which results in lower uptake of electric heating.	• Decarbonisation of heat is steered towards electric heating sources.	• Hybrid systems, heat mostly electric.
New homes	The efficiency level of homes is based on the assumption that the Future Homes Standard will be a springboard enabling local authorities to set minimum building standards above Part L.	• New homes continue to be connected but are installed with hydrogen-ready boilers. • Off-grid homes switch to biofuels and electric heating.	• No new gas grid connections after 2025. • Off-grid homes switch to biofuels and some hydrogen where feasible. • Solar PV fitted to maximum technical potential.	• No new gas grid connections after 2025. • Off-grid homes heated using a combination of electric, and hydrogen solutions. • Solar PV fitted to maximum technical potential.
Energy Efficiency/ Retrofit	Figures have been calculated by considering a technical potential based on the housing stock and projected deployment rate of each energy efficiency measure in a given year. The level of ambition of the projected deployment is based on the CCC's Sixth Carbon Budget and local stakeholder interviews.	• Less need for retrofit as natural gas boilers replaced by hydrogen-ready boilers or retrofitted with hydrogen burners. • Energy demand remains relatively high as boilers replaced with hydrogen boilers with similar efficiencies.	• The majority of existing homes retrofitted to maximum potential. • Energy demand relatively low, due to increased efficiencies of technologies deployed.	• All existing homes retrofitted to maximum potential. • Energy demand relatively high due to more hybrid heat pumps and hydrogen boilers.