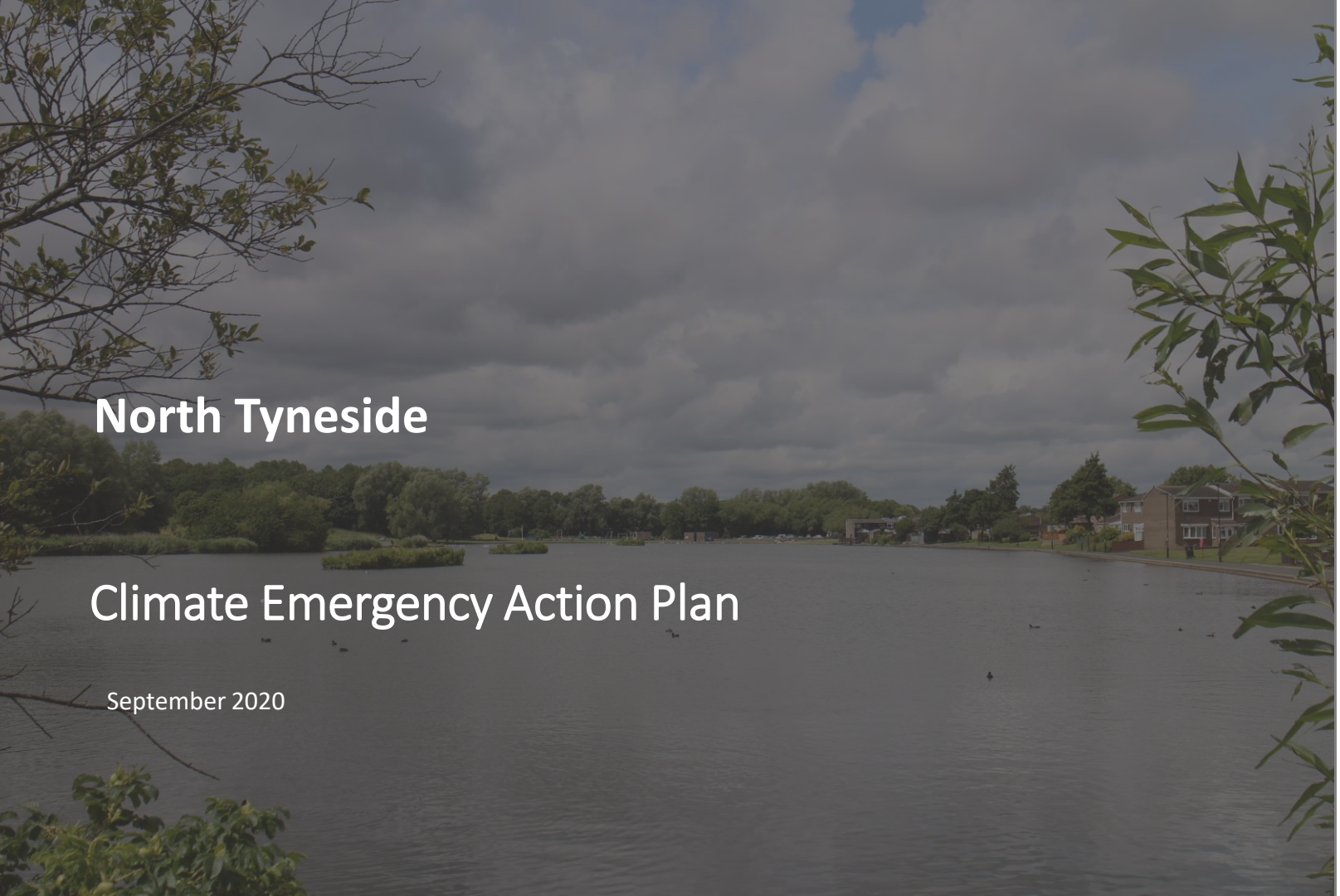

North Tyneside

Climate Emergency Action Plan

September 2020

CARBON TRUST

North Tyneside Council

Context

Growing acknowledgement of the latest science and recommendations from the Committee on Climate Change has resulted in unprecedented recognition of the global climate emergency, and the need to act urgently in order to reduce carbon emissions to limit further global warming and associated environmental impacts. Global initiatives are now focused on limiting warming to well below 2^{o}C, aligning to the pledges outlined in the Paris Agreement. Despite this, warming continues, with the impacts being felt both nationally and internationally. Across the UK, continued warming is projected to make winters warmer and summers hotter and drier. Sea levels will also continue to rise and threaten many coastal communities across the country. Many industrial and farming processes will also be affected by a continuation of rising temperatures, exacerbating impacts that warming will have on communities across the UK.

In 2019, the UK Government set a target of achieving net zero emissions by 2050 and many local authorities across the UK declared a climate emergency. The declaration of a climate emergency recognises firstly the crucial role that local authorities can play in helping to reduce both the causes and impacts of climate change, but it also provides local authorities with the opportunity to develop effective pathways towards reducing their emissions, which if successfully achieved, will help to reduce the climate impacts at both the local and national scale.

North Tyneside Council recognises the significant role it can play in helping to accelerate the national transition towards developing a low carbon economy, and declared a Climate Emergency in 2019. This report was commissioned by the council to help achieve the carbon neutral by 2050 target as set out in the declaration.

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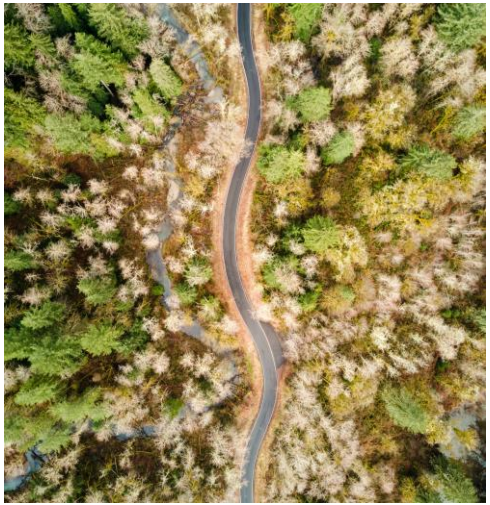
North Tyneside Vision and Priorities

In 2050, the Borough of North Tyneside will be **carbon neutral** and has adapted, and is resilient to a changing climate. The Borough and its stakeholder groups - made up from the commercial and industrial sectors, public sector organisations, the third sector and local community organisations, housing professionals and developers - have, via meaningful transparent dialogue and actions, collectively achieved:

- an **inclusive** transition;
- identified and developed the opportunities of a **low carbon economy** in terms of economic development, including job retention and creation;
- improved the overall **wellbeing** of residents through environmental improvements and education.

By taking a collective, shared responsibility and pragmatic approach we have helped lead the way to a cleaner and stable global climate.



These **priority areas** are central to achieving the North Tyneside Vision:

Improve energy efficiency in our buildings

Decarbonise electricity and increase renewables

Decarbonise heat

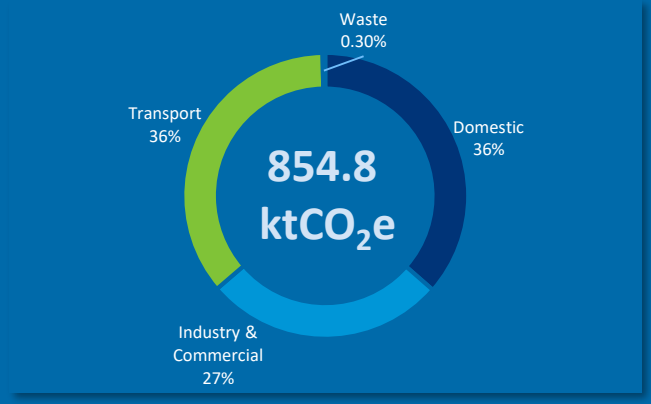
Decarbonise transport

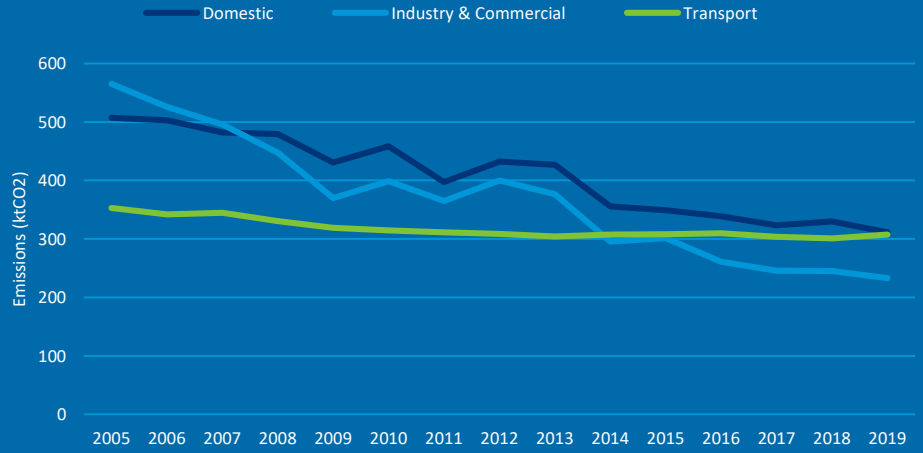
Embed decarbonisation into waste strategy

Carbon footprint overview

North Tyneside's Borough wide footprint for the FY 2018/19 was calculated to be **854.8 $ktCO_2e$.** This is split across four sectors, aligned with the BEIS local and regional emissions dataset[1]:

1. **Domestic** emissions (311.4 $ktCO_2e$)
2. **Transport** emissions (307.7 $ktCO_2e$)
3. **Industry & Commercial** emissions (233.1 $ktCO_2e$)
4. **Waste** emissions (2.6 $ktCO_2e$)



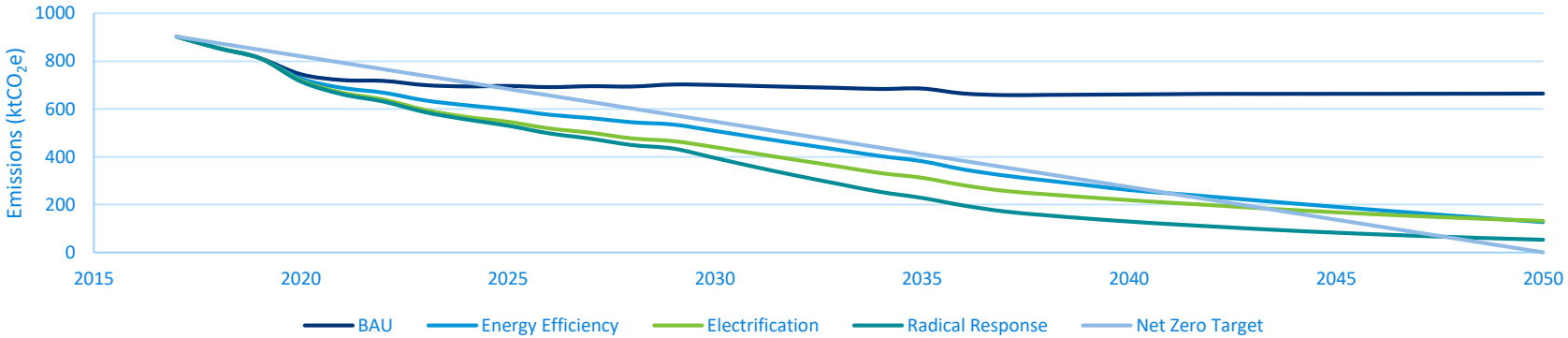


- The footprint covers Scope 1, 2 and selected Scope 3 (waste) emissions.
- Since 2005 North Tyneside has seen strong reductions in industrial & commercial emissions.
- Domestic emissions have followed a similar trajectory, albeit at a slower rate.
- Transport emissions have remained almost constant since 2005, overtaking industry & commercial in 2014.
- Waste emissions constitute a minor portion of the Borough's footprint.

[1] The emission factors used are the UK Government Conversion Factors for greenhouse gas (GHG) reporting, published by the department for Business, Energy and Industrial Strategy (BEIS) for the year 2018 https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2018

Emissions scenarios overview

An emissions scenario analysis was undertaken to help the Borough understand how it may be able to meet its net-zero target. The analysis details the potential measures that could be implemented and what the effect of these would be. Ultimately, the aim of the analysis is to help inform decision making, identify opportunities, present the scale of the challenge, and inspire action.



Four scenarios were produced: 'Business as usual', 'Energy efficiency and alternative fuels', 'High electrification' and 'Radical response'. The scenarios achieve a 26%, 86%, 85% and 94% reduction in emissions respectively from the 2017 baseline to the target year in 2050. This highlights not only the need for a significant effort to be made through carbon reduction projects, but also a need to offset or remove carbon emissions in order to be 'zero carbon' by 2050. The total carbon emissions emitted over the lifetime of the three non-BAU scenarios is less than the total carbon emissions emitted over the lifetime of the net zero target. The cost of implementation for these scenarios ranges from £4,240m to £5,979m over the next 30 years.

Action plan overview

To achieve the emission reduction target of being carbon neutral by 2050, North Tyneside needs to reduce scope 1, 2 and selected scope 3 emissions by approximately 94% by 2050 (compared to a 2017 baseline). The following target themes have been identified across the Borough, and relevant carbon reduction opportunities identified for each. These projects will assist North Tyneside on the pathway towards the goal of being a carbon neutral Borough by 2050.

Energy Efficiency

Improving the energy performance of buildings with a council retrofit programme, a residential energy efficiency retrofit accelerator and promotion of industrial clusters.

Renewables

Undertaking community energy programmes, as well as installing solar PV with energy system integration across domestic and commercial properties

Heat

Roll out of heat electrification in the council and public sector buildings, as well as in domestic properties. Also exploring the potential of heat networks

Education

Training schemes for Solar PV and heat pump technicians, a carbon reduction programme for SMEs, and fostering of community participation.

Transport

Expanding low carbon transport infrastructure such as EV chargers, hydrogen fuelled public transport and cycle lanes

Waste

Reducing waste production within the Borough using awareness raising strategies

Policy

Introducing high ambition housing regulations as well as requiring on-site generation for new commercial buildings

Nature Based Solutions

Implementing habitat restoration projects to promote carbon sequestration

The projects identified in this plan have been shortlisted using an evaluation framework to rank their strategic fit, environmental benefits, deliverability, economic outcomes and value for money. It should be noted that all projects are only at a concept stage based on high level remotely assessed information and benchmarks only. They will require further work to develop detailed delivery plans.

Introduction

In July 2019, North Tyneside Council declared a climate emergency, reflecting its commitment to preserving the environment in North Tyneside. As part of this, the Council established an internal Climate Emergency Board, with the mission to become a **carbon neutral Borough by 2050**. North Tyneside Council commissioned the Carbon Trust to support in the development of a Climate Emergency Action Plan for the Borough of North Tyneside, as part of its climate emergency response.

Achieving this target will require substantial transformation of the energy system and will mean an evolution of the daily technologies that provide our heating, transportation, and power. Transitioning to a modern, place-based decarbonised energy system that is fit for the twenty-first century poses significant challenges, but it also has the potential to bring great benefit, both for the environment and for economic and social wellbeing of our communities.

The North Tyneside Climate Emergency Action Plan is presented in five sections:

Section 1: North Tyneside vision and priorities - presents a vision for North Tyneside, and five strategic priorities areas that are central to achieving the region's decarbonisation goals.

Section 2: Emissions inventory and carbon budgets - a baseline study provides a portrait of the North Tyneside energy landscape today.

Section 3: Emissions pathways to 2050 - evaluates energy system pathways to achieve carbon neutrality by 2040, and the investment required to make those pathways a reality.

Section 4: Action Plan – details a range of prioritised projects, programmes and policies that could be implemented to contribute towards achieving the vision.

Section 5: Governance, monitoring and reporting – considers potential governance, monitoring and reporting arrangements for the North Tyneside Climate Emergency Action Plan.

We would like to thank all of the stakeholders who made valuable contributions to the development of the action plan through their participation in workshops, completing surveys, providing data, and additional communication on the phone and by e-mail. The involvement of the community will continue to be key for the successful delivery and implementation of the actions featured in this report.

Introduction

Impact of the Covid-19 pandemic

This strategy has been finalised in the midst of the COVID-19 pandemic, which is having a profound effect on the lives of millions of people around the world. At the time of writing, the true economic and societal costs of the pandemic for the UK and North Tyneside are not fully clear, but the severity of the impacts on the global economy are forecast by many commentators to exceed that of the 2008 financial crisis. The pandemic is also taking place against the backdrop of the ongoing climate emergency. And whilst the economic damage caused will undoubtedly result in a short-term reduction in greenhouse gas emissions, it is possible that emissions could rebound if climate positive solutions are not included as central elements in our economic stimulus packages.

As we move from the immediate emergency response, we must recognise that our approach to the economic recovery that will follow provides us with a unique opportunity to sustainably rebuild our economy and make greener investments and climate positive decisions that set us on a pathway that aligns with the North Tyneside, UK and international climate targets. In this context, it is essential to acknowledge that our economic recovery and growth plans need to be decoupled from greenhouse gas emissions. We need to recognise the significant economic potential that a green recovery can have to rebuilding a sustainable economy in North Tyneside.

The Committee for Climate Change (CCC) has identified 6 key principles for a resilient recovery from the pandemic, and we must ensure that our strategy is underpinned by these cross-cutting principles to help put North Tyneside in a position to capitalise on opportunities that may arise from the recovery:

- Use climate investments to support economic recovery and jobs
- Lead a shift towards positive, long-term behaviors
- Tackle the wider ‘resilience deficit’ on climate change
- Embed fairness as a core principle
- Ensure the recovery does not lock-in greenhouse gas emissions or increased risk
- Strengthen incentives to reduce emissions when considering tax changes.

Introduction

Impact of the Covid-19 pandemic

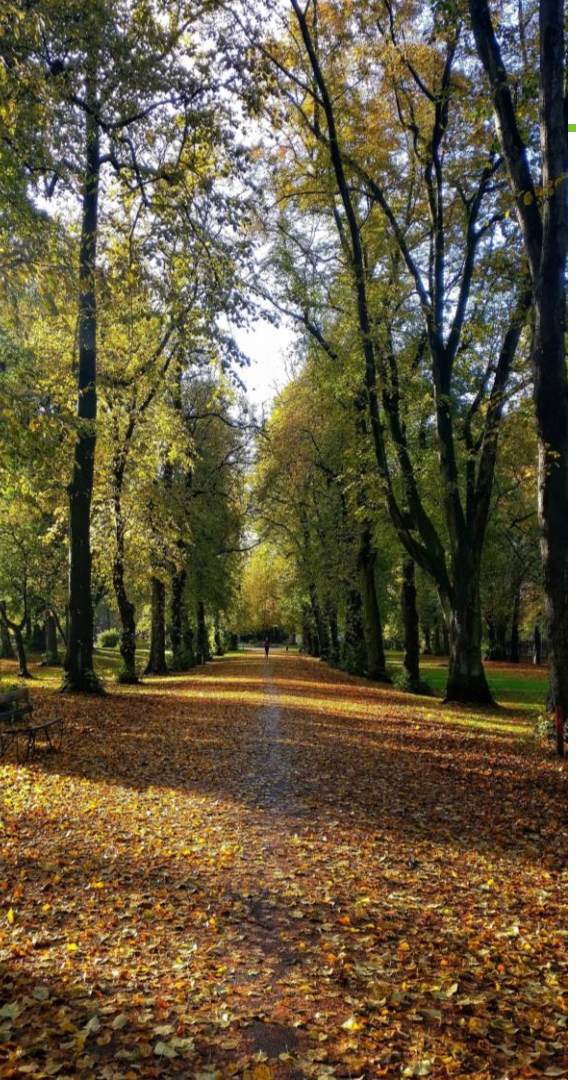
We must also learn from the pandemic, taking the lessons from our response and apply them to the climate emergency. This may include for example: the need for openness and transparency; the importance of good data; the speed with which people can change behaviours and industry re-purpose; the need to support individuals and businesses through economic transition; and the importance of global collaboration.

Other lessons will undoubtedly emerge. But perhaps the biggest lesson from the COVID-19 pandemic is about the the population's capacity and willingness to accept significant lifestyle changes if it is deemed necessary for the good of society. If it teaches us anything it is that we cannot afford to ignore science or expert judgement about the risks faced by our societies, or wait for problems to arrive before taking action. Learning lessons from the response to a global health emergency, and applying this to that of the global climate emergency could pave the way for the accelerated and sustained change that is so critical in solving the problem of climate change.

We must acknowledge the significant uncertainties that exist around how the North Tyneside economy will emerge from the crisis as well as the uncertainties associated with the shape of the future economic growth and decarbonisation trajectories modelled in this strategy. As such, the economic and climate modelling that underpins this action plan will need to be kept under review and updated when, and how, our emergence from the COVID-19 crisis becomes clearer.

In addition, North Tyneside may be able to capitalise on the opportunity to sustain behaviours observed throughout the pandemic that have had a positive effect on reducing emissions, such as the increase in active travel, reduction in travel by private car, increased working from home practices and willingness to invest in domestic property improvements. Directing resources towards infrastructure that will support the embedding of such behaviours into business as usual for communities and businesses has the potential to drive lasting emissions reduction as we recover from the COVID-19 crisis.

However, the fundamental principles of this strategy remain firmly relevant. With its focus on cleaner, fairer economic growth, this climate emergency action plan has the potential to play a significant role in helping North Tyneside to recover and rebuild sustainably. It sets out a pathway for accelerating the shift to a decarbonised energy system in the region and demonstrates the potential for achieving far greater local economic benefits than could be achieved by returning to business as usual.



Section 1: North Tyneside vision & priorities

The vision statement that is presented in this action plan was developed with **stakeholder contributions** through the project's first workshop, survey feedback, and targeted stakeholder conversations.

The vision describes the region's aspiration for how a **future carbon neutral** system will be achieved in North Tyneside, resting on the important role of collaboration.

Five priority areas have been defined that should be at the heart of carbon reduction projects and decisions.

Our Vision for North Tyneside is:

In 2050, the Borough of North Tyneside will be **carbon neutral** and has adapted, and is resilient to a changing climate. The Borough and its stakeholder groups - made up from the commercial and industrial sectors, public sector organisations, the third sector and local community organisations, housing professionals and developers - have, via meaningful transparent dialogue and actions, collectively achieved:

- an **inclusive** transition;
- identified and developed the opportunities of a **low carbon economy** in terms of economic development, including job retention and creation;
- improved the overall **wellbeing** of residents through environmental improvements and education.

By taking a collective, shared responsibility and pragmatic approach we have helped lead the way to a cleaner and stable global climate.

Section 1: North Tyneside vision & 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 North Tyneside. 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.

These **priority areas** are central to achieving the North Tyneside Vision:

Improve energy efficiency in our buildings

Decarbonise electricity and increase renewables

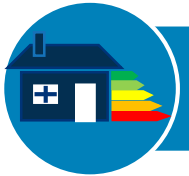
Decarbonise heat

Decarbonise transport

Embed decarbonisation into waste strategy

Section 1: North Tyneside vision & priorities

Understanding the priorities



Improve energy efficiency in our buildings

- Deliver decarbonisation across the region's existing and new building stock, including **retrofitting existing housing stock** and other parts of the built environment with fabric upgrades to improve energy efficiency and deliver cost savings.
- Build **new homes to a zero-carbon standard**, including developments currently within the pipeline, through use of planning powers, whilst futureproofing for connectivity to heat networks.
- Support decarbonisation and **improved energy efficiency in the commercial and industrial sectors**, across equipment, process, lighting and water/space heating.
- Help the population **understand the benefits of decarbonisation** relevant to their households and businesses, such as how improving energy efficiency can deliver cost savings, improved comfort and health.

Section 1: North Tyneside vision & priorities

Understanding the priorities

Decarbonise electricity and increase renewables

- Ensure there is a **mix of generating technologies** across the Borough to provide resilience, flexibility and to support the decarbonisation of the national grid, whilst moving as far towards energy independence as possible.
- 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.
- Pilot **energy storage** projects alongside renewable technologies, to further understand how storage technology could service the Borough's needs.

Section 1: North Tyneside vision & priorities

Understanding the priorities

Decarbonise heat

- Progress the **electrification of heating** through installing heat pumps, ensuring they are rolled out alongside necessary efficiency upgrades.
- Explore the utilisation of **alternative fuels for heat** including bio-methane, solar thermal, and hydrogen, building on north east regional strengths.
- Support the development of **community heating schemes** where sufficiently viable, focusing on higher density areas of the Borough.

Section 1: North Tyneside vision & priorities

Understanding the priorities

Decarbonise transport

- **Investment in public transportation** is essential to providing genuinely attractive alternatives to car transport.
- **Public transport** should be more **affordable and accessible** to encourage a **modal shift** from private transport, in particular **creating a single charging approach** across various providers.
- Encourage use of **active travel** modes, e.g. walking and cycling, by making residents feel safer and able to shift away from car usage.
- Promote the **electrification of public transport** whilst retaining and improving provision, including the decarbonisation of the Tyne & Wear metro and suburban bus services.
- Develop **electric vehicle charging infrastructure**, taking an inclusive and joined-up approach e.g. encouraging location at transport nodes and large business fleet transition as key ‘anchor loads’.
- Lobby for additional bus, train and metro services to **increase semirural accessibility and connectivity**.
- Ensure **metro stations are integrated** with other economic priorities and housing, and other forms of ‘last-mile’ active transport and e-mobility.

Section 1: North Tyneside vision & priorities

Understanding the priorities

Embed decarbonisation into waste strategy

- Link **decarbonisation** in with the existing waste strategy of the Borough, supporting the objective of providing “a clean, green, healthy, attractive, safe and sustainable environment”.
- Support improvement to the **circular use of resources** in the Borough, playing a convening role to bring together potential materials and uses.
- Continue to encourage **reductions** in household waste **generation** and **improvement** to **recycling rates**, building awareness raising around the waste hierarchy.

Section 2: Carbon footprint overview

North Tyneside's carbon footprint in 2019 was 854.8 $ktCO_2e$. This is split across 36% domestic, 36% transport and 27% industry & commercial sectors, with waste emissions only a minor portion (0.3%). The emissions of the Borough since 2005 were also assessed, showing how this proportional split in emissions total has changed over time. The Council's Borough-wide footprint is a crucial step in determining the subsequent carbon reduction pathways, providing insight regarding key 'hotspots' that will need to be targeted to deliver decarbonisation across the Borough.

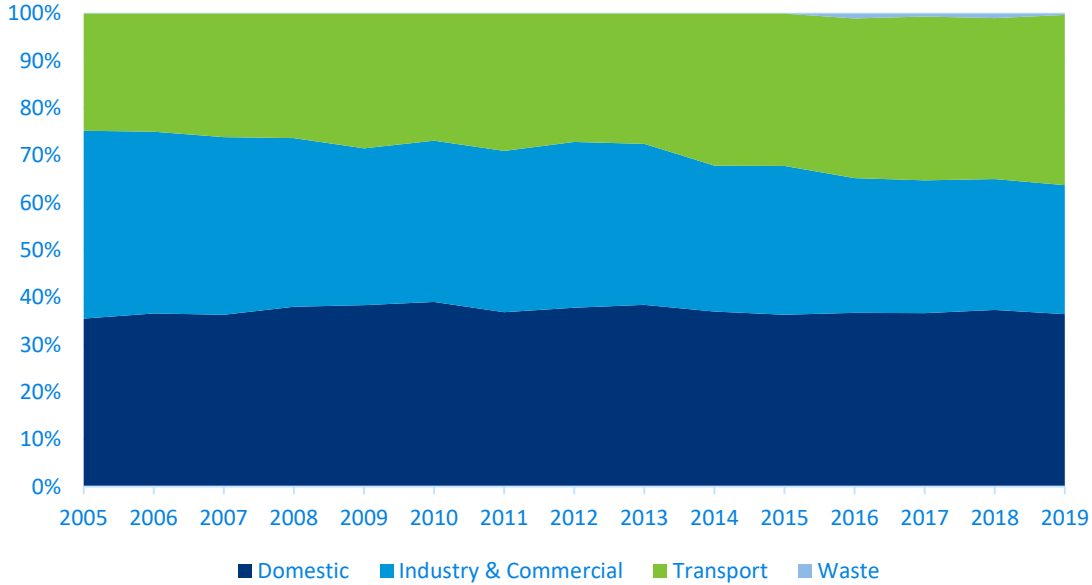


Figure 1: North Tyneside Borough footprint 2005-2019

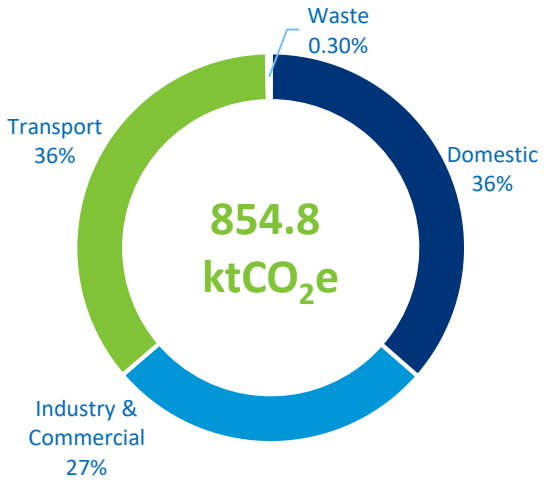


Figure 2: North Tyneside Borough 2019 carbon footprint

Section 2: Carbon footprint methodology

The footprint has been calculated in line with the best-practice GHG Protocol for Cities (GPC), which is consistent with PAS 2070. It has used publicly available data from sources such as BEIS and DfT, along with direct Council data on waste. 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 borough are shown in the diagram below.

North Tyneside's Borough-wide footprint covered Scope 1, 2 and selected Scope 3 emissions, including:

- Energy use in buildings
- Grid electricity
- Road transport across North Tyneside
- Waste generation and management across the Borough (including domestic and commercial)

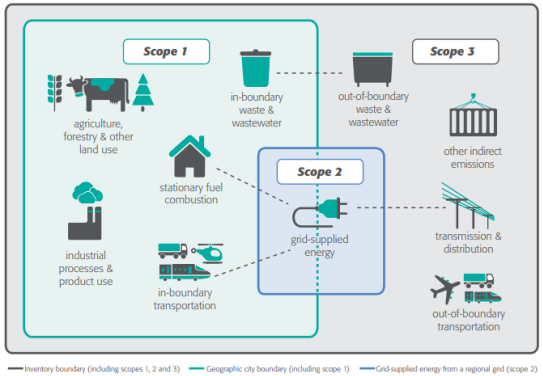


Figure 3: GPC Emission Scopes

Calculation: For most emission sources, cities/regions will need to estimate GHG emissions by multiplying activity data by an emission factor associated with the activity being measured.

- ***Activity data*** is a quantitative measure of a level of activity that results in GHG emissions taking place during a given period of time (e.g., volume of gas used, kilometres driven).
- An ***emission factor*** is a measure of the mass of GHG emissions relative to a unit of activity.

Section 2: North Tyneside Borough-wide footprint

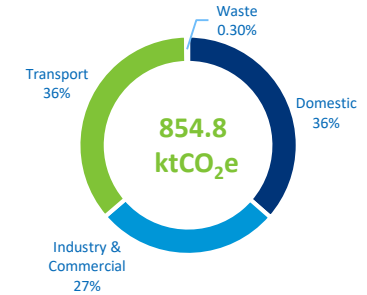


Figure 4: North Tyneside Borough 2019 carbon footprint

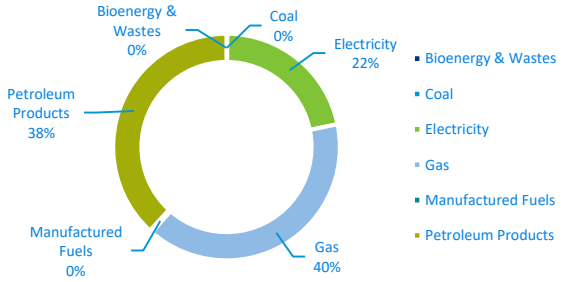


Figure 5: North Tyneside Borough 2019 energy consumption by fuel

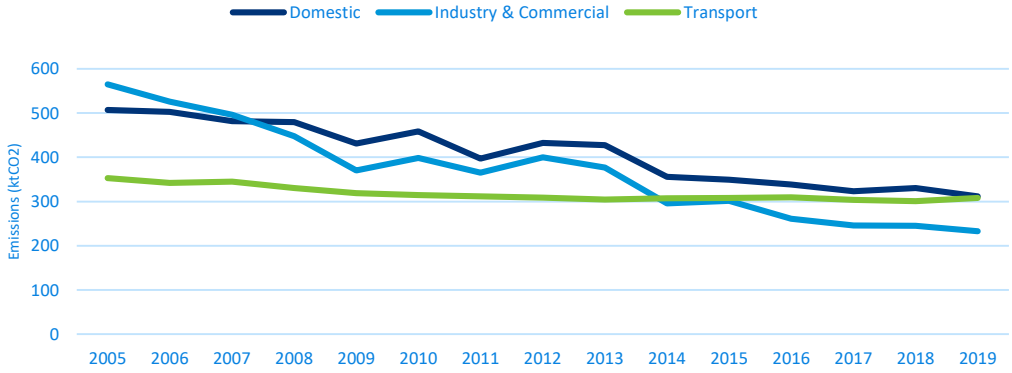


Figure 6: North Tyneside Borough footprint 2005-2019

- Domestic is marginally the highest emitting sector (by 3.8 $ktCO_2e$), very closely followed by transport and then industry & commercial. This is unsurprising given North Tyneside's residential make-up and position on the commuter belt of Newcastle.
- 40% of energy consumption relates to natural gas, followed by 38% in petroleum products used in transport applications.
- There has been a considerable decline in domestic and industry & commercial emissions since 2005. This is in large part due to the decarbonisation of the grid, the intensity of which has fallen by 48% over the past 10 years with the transition away from coal. This is set to continue: falling 55% by 2025, and 82% by 2035.
- Transport emissions have been static, with minimal reduction, compared with the other sectors. This picture is reflected nationally, with transport decarbonisation happening at a stubbornly slower pace compared with domestic and industry & commercial.

Section 2: North Tyneside Borough-wide footprint - Domestic

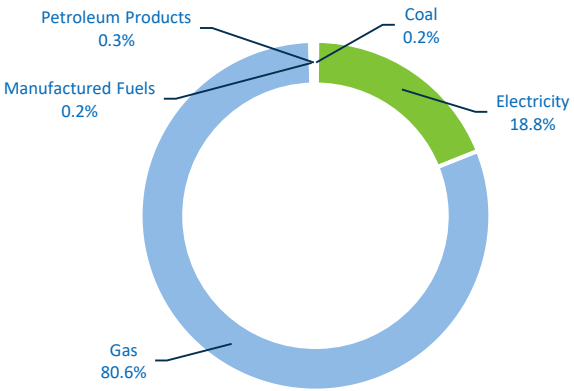


Figure 7: North Tyneside Borough 2019 domestic emissions by fuel

- Domestic emissions are the largest sector contributing towards emissions in the Borough of North Tyneside. Given the semi-urbanised nature of the North Tyneside area, and its existence as a commuter hub, as well as lack of emissions-intensive heavy industry, this trend is not surprising.
- Domestic energy consumption is dominated by space-heating and water-heating demands, this trend is reflected in the breakdown of the emissions by fuel, where natural gas, used as fuel in domestic boilers, is dominant (80.6%). Lighting and appliances are also material to domestic consumption, and these are seen in the electricity (18.8%) figure.
- The three remaining fuel types, manufactured fuels, petroleum products and coal, are not widespread in domestic settings. Old coal and oil boilers are traditionally seen in off-gas grid rural properties, and as such constitute a small proportion of emissions in areas such as North Tyneside, that are well connected to the gas grid.

Section 2: North Tyneside Borough-wide footprint – Domestic EPC Assessment

Alongside the borough-wide carbon footprint, we conducted a complementary piece of analysis examining the trends across North Tyneside's registered domestic Energy Performance Certificates (EPC). This does not capture all approximately 90,000 homes in the council area, however, the 65,798 EPCs are a significant portion, and as such provide insight into the efficiency and potential of the housing stock.

- Mid-terraced and semi-detached properties represent the largest proportion of North Tyneside housing stock, constituting 31% and 38% respectively. However, taking end- and mid-terrace together, terraced housing are the most common. Semi-detached properties are the largest contributor to EPC Band D in the Borough.
- There is high potential for shifting properties from Bands C and D, to Band B, however there are a small number of hard-to-treat inefficient properties that do not have potential above Bands D and G.

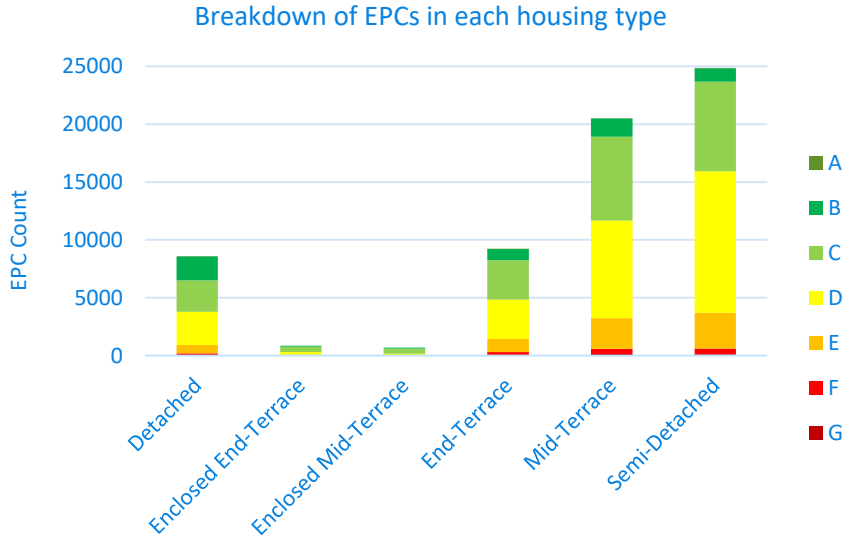


Figure 8: North Tyneside Borough domestic EPCs by housing type

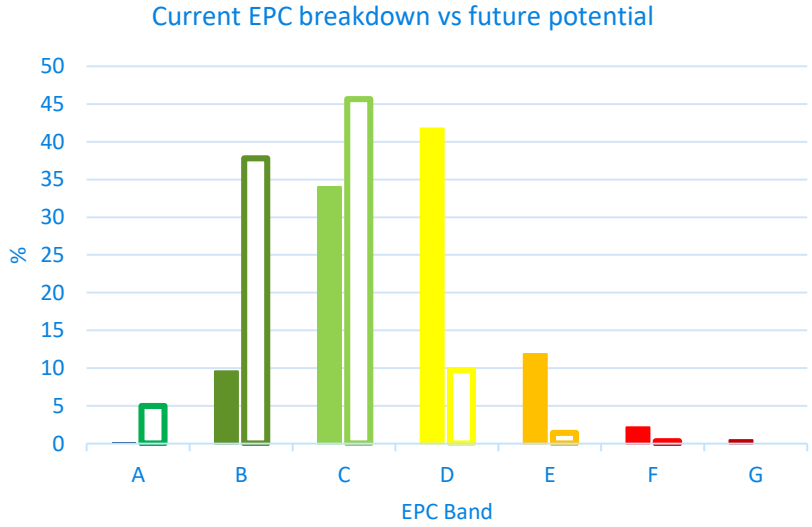


Figure 9: North Tyneside Borough domestic EPCs by band – current vs potential

Section 2: North Tyneside Borough-wide footprint – Industry & Commercial

- The industry & commercial sector constituted 29% of North Tyneside's emission in 2019. Although this sector has seen a positive decline in emissions since 2005, this has stagnated since 2016.
- In order to identify key 'hotspots' for targeted decarbonisation efforts, national emissions data and sectoral employment breakdowns were used to estimate the breakdown of emissions across sectors. We calculated a CO_2/job indicator for each sub-sector (as defined by the Standard Industrial Classification (SIC) codes). This CO_2/job indicator was applied to North Tyneside's 2018 employment data.

Manufacturing (SIC code 'C') is by far the most emissions intensive sub-sector, across both Scope 1 (direct fuel consumption) and 2 (grid-electricity consumption).

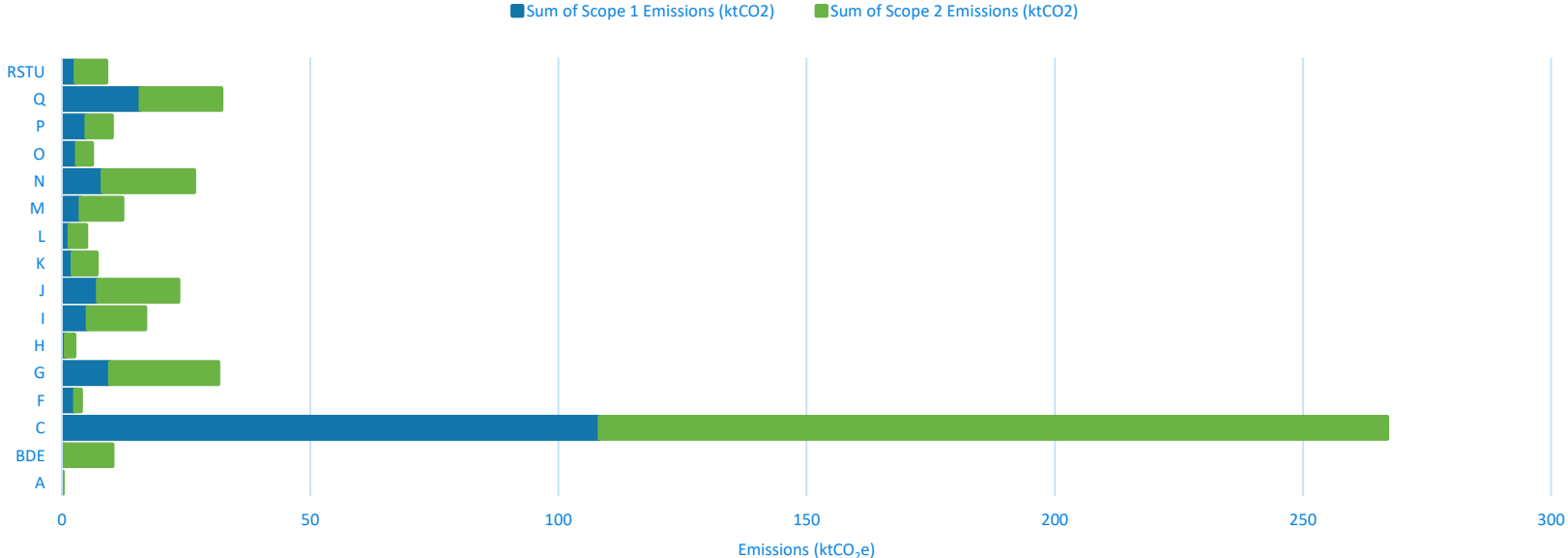


Figure 10: Industry & Commercial emissions by SIC code sub-sector classifications

Section 2: North Tyneside Borough-wide footprint – Industry & Commercial

- The UK government SIC codes provide a further 'Level 2' of sub-sector breakdown. In order to provide a more granular breakdown of key emissions hotspots within the industry & commercial sector, particularly manufacturing, the same approach was used as cited previously, however with more granular CO_2/job indicators for each Level 2 sub-sector, and more granular sub-sector employment data for North Tyneside (2015).
- Of North Tyneside's ten highest emitting Level 2 sub-sectors, 60% sit within the broader manufacturing sub-sector. However, there are also hotspots in construction, retail trade, health services and food and beverage services.
- Within manufacturing emissions, 'chemicals & chemical products' is the largest contributor, followed by basic metals, rubber and plastic products, food products, paper and paper products and other non-metallic mineral products. 'Other' is constituted of 17 further Level 2 sub-sectors.

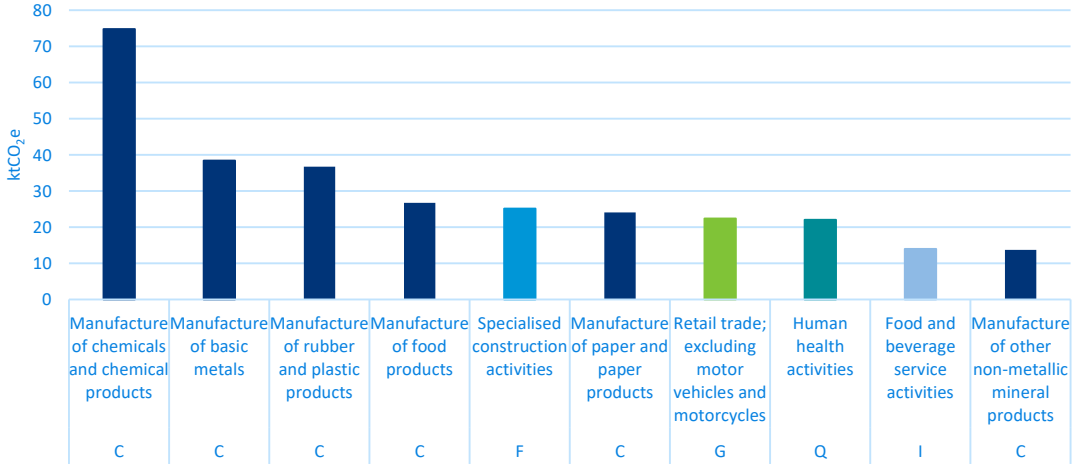


Figure 11: North Tyneside Borough 2019 emissions by top-10 emitting sub-sectors

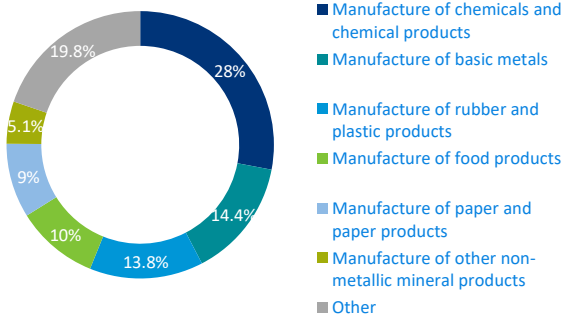


Figure 12: North Tyneside Borough 2019 emissions – breakdown of top-6 emitting manufacturing sub-sectors

Section 2: North Tyneside Borough-wide footprint - Transport

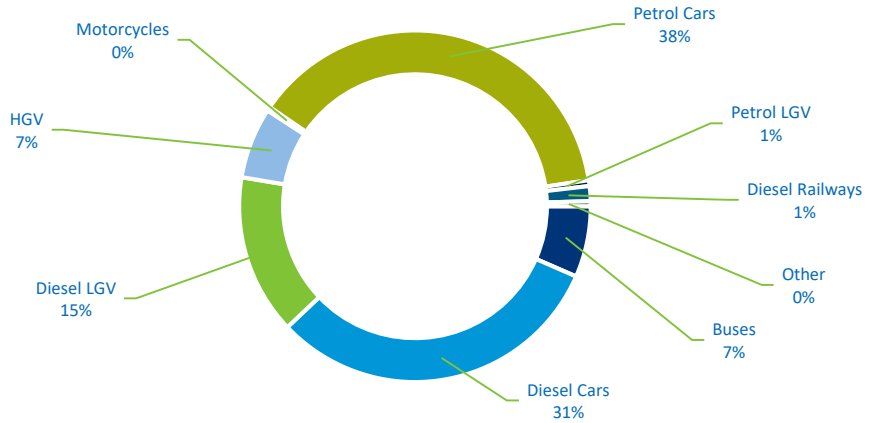


Figure 13: North Tyneside Borough 2019 transport emissions by vehicle type

- Transport emissions constitutes 32% of North Tyneside's emission in 2019. Since 2005 emissions reduction has been limited.
- A full breakdown of both on and off-road transport emissions into vehicle types has been provided by combining the BEIS sub-national road transport fuel consumption dataset (last updated in 2017) with the 'Diesel Railways' dataset from the BEIS local and regional emissions dataset.
- Diesel fuel is responsible for the highest proportion of transport emissions, 61% across LGV, HGV, buses, diesel cars and railways. Petrol fuel is more prevalent than diesel in cars (38%), however much less so across commercial and goods vehicles (1%).
- Transport emissions in North Tyneside are dominated by cars, which combined equal 69% of total transport emissions for 2019. Good vehicles constitute the second largest proportion of the remaining emissions (23%).

Section 2: North Tyneside Borough-wide footprint - Waste

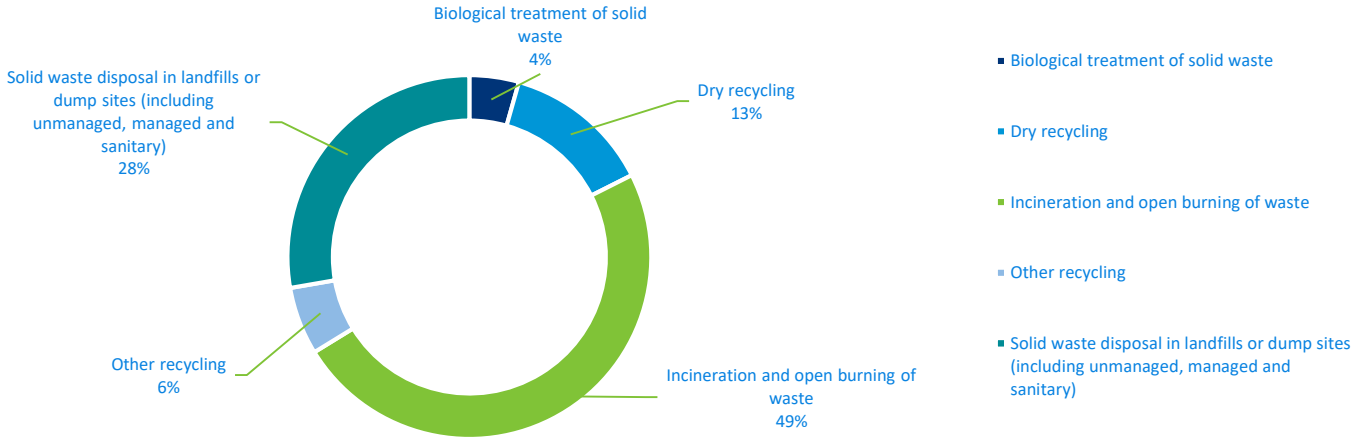


Figure 14: North Tyneside Borough 2019 waste emissions by disposal method

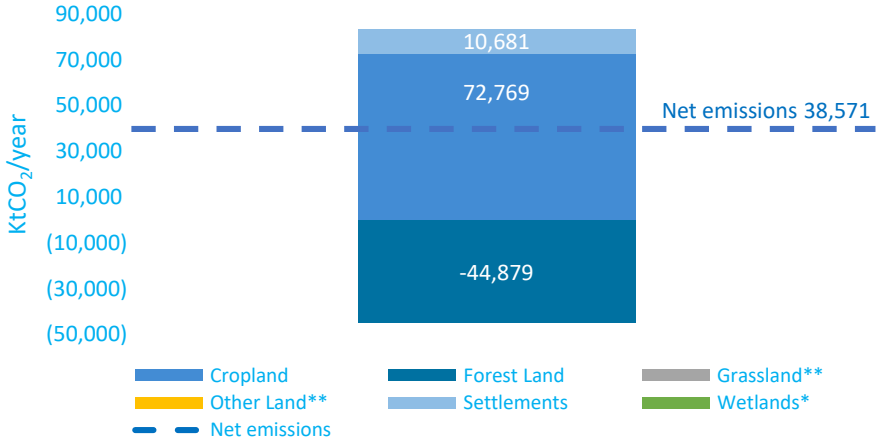
- Waste emissions account for a fraction of North Tyneside Borough's emissions (0.32%). However, it is still a valid exercise to identify the key sources of these emissions, particularly given the Council's influence over this emissions sources.
- Waste emissions have been calculated by gathering quantity data on waste treatment type and multiplying this by the relevant BEIS emission factor.
- The largest emission source by treatment is incineration and open burning of waste, accounting for almost half of all waste emissions (49%). The second largest source is solid waste disposal in landfill (28%). As a total, recycling accounts for 19% of waste emissions.
- Although incineration is the largest emissions source, it is important to note that it remains a preferable treatment solution to landfill, dependent on local air quality considerations, and whether generated heat is captured for productive use. Its existence as the largest emissions source is due to a majority of North Tyneside's waste being treated in this manner (62%). By comparison, landfill only accounts for 1.3% of total waste treatment.

Section 2: Land Use, Land Use Change and Forestry (LULUCF)

We conducted a high-level evaluation of the emissions and sequestration impacts of LULUCF across the Borough. Land-use and land use change emissions and removals were calculated according to the IPCC methodology (AR4 and AR5). The analysis was based on GIS data provided by North Tyneside Council for 2018 and 2019, containing land use categorisations against associated areas. The land use categorisation was then assigned an IPCC defined land-use category (as below). Changes year-on-year were then calculated to produce net emissions as of 2019.

The table on the right presents the key changes in land-use during the reporting period. This demonstrates land was changed on an absolute basis from grassland and other land. The graph on the left then shows the impacts of the changes, with more settlements and cropland leading to net emissions, whereas land-use change to forest land results in net removals. Overall, the graph below shows net emissions of 38,571 $ktCO_2$/year.

In accordance with best practice on reporting on emissions and sequestration impacts of LULUCF, the land use emissions can be reported alongside the scope 1 baseline for North Tyneside, the removals should be reported separately and if North Tyneside Council wants to report the net emissions this should also be separate. The impacts of future LULUCF should be monitored on an annual basis, in line with the forthcoming GHG Protocol Standard and Guidance on accounting for Carbon Removals and Land Use (publication expected by the end of 2021).



IPCC Classification	% Change of ha (2018 – 2019)
Cropland	21%
Forest Land	9%
Grassland	-18%
Other Land	-12%
Settlements	1%
Wetlands	0%

*Set at 0 due to no methane emissions calculated, so assume net change is 0
**No emissions under tier 1 methodology

IPCC Volume 4, 2006
IPPC Volume 4, 2019

Section 2: North Tyneside Borough-wide carbon budget

Starting from North Tyneside's 2019 footprint of 854.8 ktCO2e, we project emissions over the 30 year period from 2020-2050 to determine five-yearly budgets for the Council aligned to either a 1.5°C pathway, a net zero target or the UK's CCC 5-yearly budgets*.

Percentage and ktCO$_2$e reduction against 2017 baseline

	1.5°C Pathway		Net Zero Target		CCC Carbon Budgets	
2018 - 2022	-19%	729	-15%	766	23%	1114
2023 - 2027	-38%	556	-30%	629	-5%	857
2028 - 2032	-58%	382	-45%	493	-18%	737
2033 - 2037	-77%	208	-61%	356	-47%	480
2038 - 2042	-96%	35	-76%	219	-72%	257
2043 - 2047	-100%	0	-91%	82	-91%	86
2048 - 2050	-100%	0	-100%	0	-100%	0

*CCC budgets currently run up to 2032, new budgets will be announced in Sep' 2020 that consider the new UK net zero target and run to 2050.

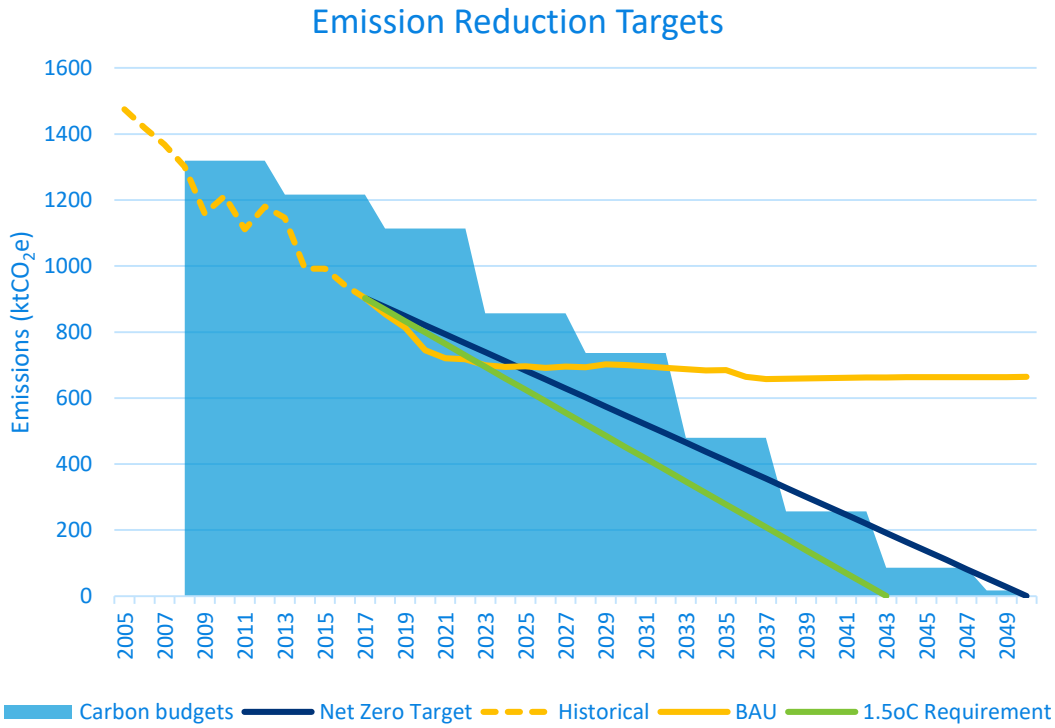


Figure 15: North Tyneside Borough business-as-usual vs carbon budgets

Section 3: North Tyneside emissions pathways to 2050

The baseline tells us where we've come from and where we currently stand, the target tells us where we need to get to; to bridge the gap we have undertaken pathway analysis to examine **how** North Tyneside can transition from the baseline to the target. Through modelling the future energy consumption in the Borough we can begin to paint a picture of how this may be achieved. The modelling that was undertaken specifically examined four different scenarios, these all take unique approaches to try and meet the level of ambition that has been set by the council.

The scenarios do not set out a pre-determined path that must be followed to meet net-zero by 2050, instead they provide a framework to:

- Inform the council of the scale of decarbonisation that must be achieved
- Help in decision making processes
- Identify areas of focus and opportunities
- Inspire radical action

Business as usual

Energy efficiency and alternative fuels

High electrification

Radical response

Section 3: Methodology

The basis of the scenario modelling is a business as usual pathway from which all other scenarios are built. The business as usual pathway stems from the baseline and is then forecast to 2050. The forecast is produced by analysing the UK sectoral energy projections that are produced by BEIS and National Grid, and applying the same trends to regional baseline.

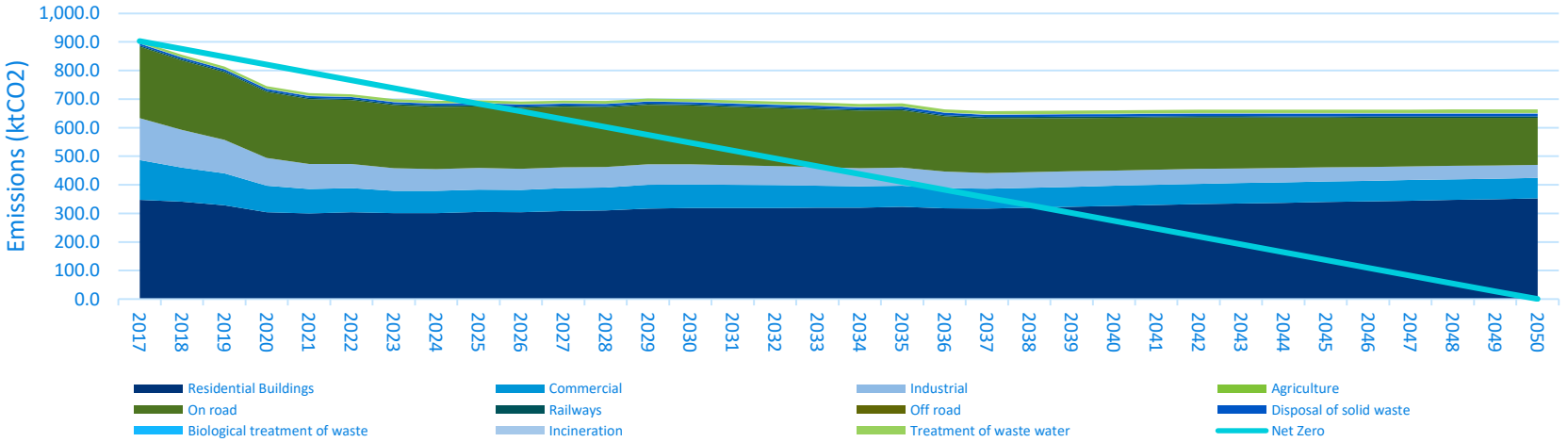
Once the business as usual case has been developed, a bottom up approach is taken to calculate the likely energy change that results from the implementation of various technologies under each scenario. This requires an understanding of the technologies, regional details, sector and fuel breakdowns.

The development of the scenarios, primarily the ‘energy efficiency’, ‘electrification’ and ‘radical’ scenarios, are based on aims and assumed technology deployment as outlined in the UK’s clean growth strategy, National Grid’s future energy scenarios, the Committee on Climate Change’s ‘Net zero technical report’, and other national strategy plans.

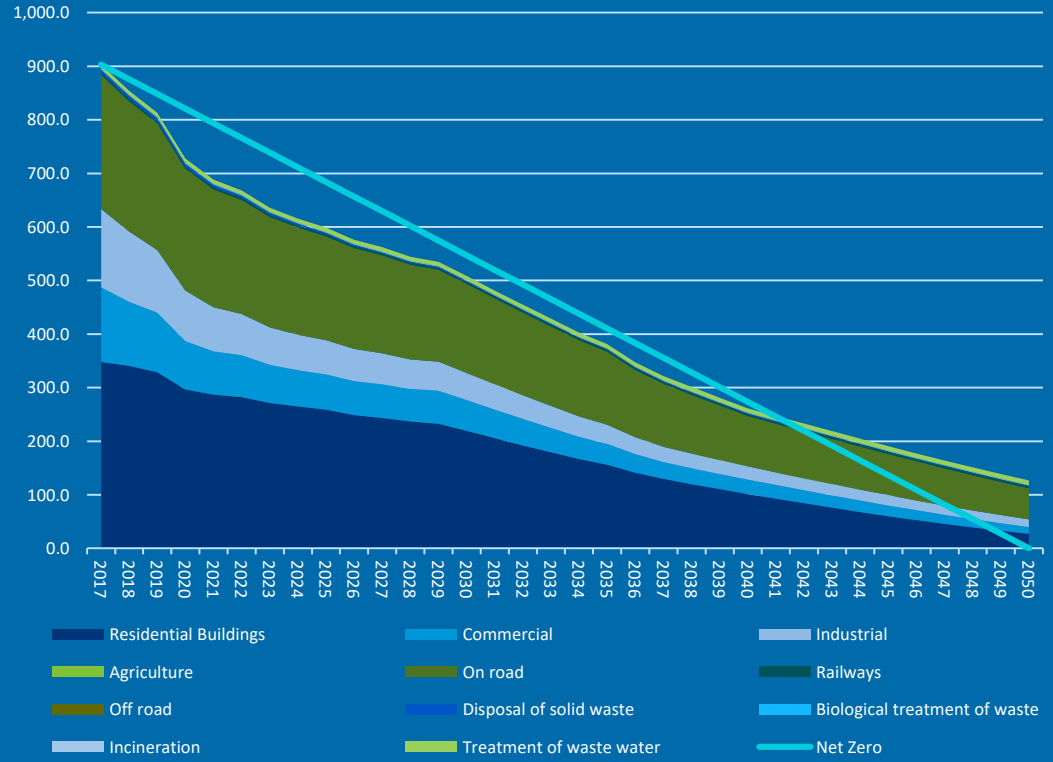
Section 3: North Tyneside BAU to 2050

Under a business as usual (BAU) scenario, where little to no effort is made to reduce emissions aside from existing and already agreed government proposals, it is expected that emissions will reduce by 26% from 2017. This is equivalent to a reduction of 238.8 $ktCO_2e$ to 664.1$ktCO_2e$ being emitted in 2050.

Sizeable reductions are anticipated across the industrial and commercial, and transport sectors – a total reduction of approx. 254$ktCO_2e$ between 2017 and 2050. This is mainly driven by the decarbonisation of electricity, and an overall decrease in mileage driven. Emissions from the residential and waste sectors are expected to increase by a total of approx. 14$ktCO_2e$ – a result of increasing population and therefore homes, this offsets any decarbonisation of the grid.



Section 3: Energy Efficiency and Alternative Fuels



This scenario focusses on a shift to dramatically reduce energy demand through energy efficiency, and then switching fuels to low carbon alternatives, predominantly hydrogen and biogas.

By 2035, levels of active transport and public transport usage will have increased by 10%; waste recycling will stand at 65% with the majority of remaining waste going to EfW. By 2050, it is anticipated that 95% of homes will have adopted all energy efficiency measures available to them; Industry and commerce will have reduced the energy intensity of their operations by 30%; 50% of private vehicles will be electric, and the majority of heavy transport will use hydrogen fuel cells.

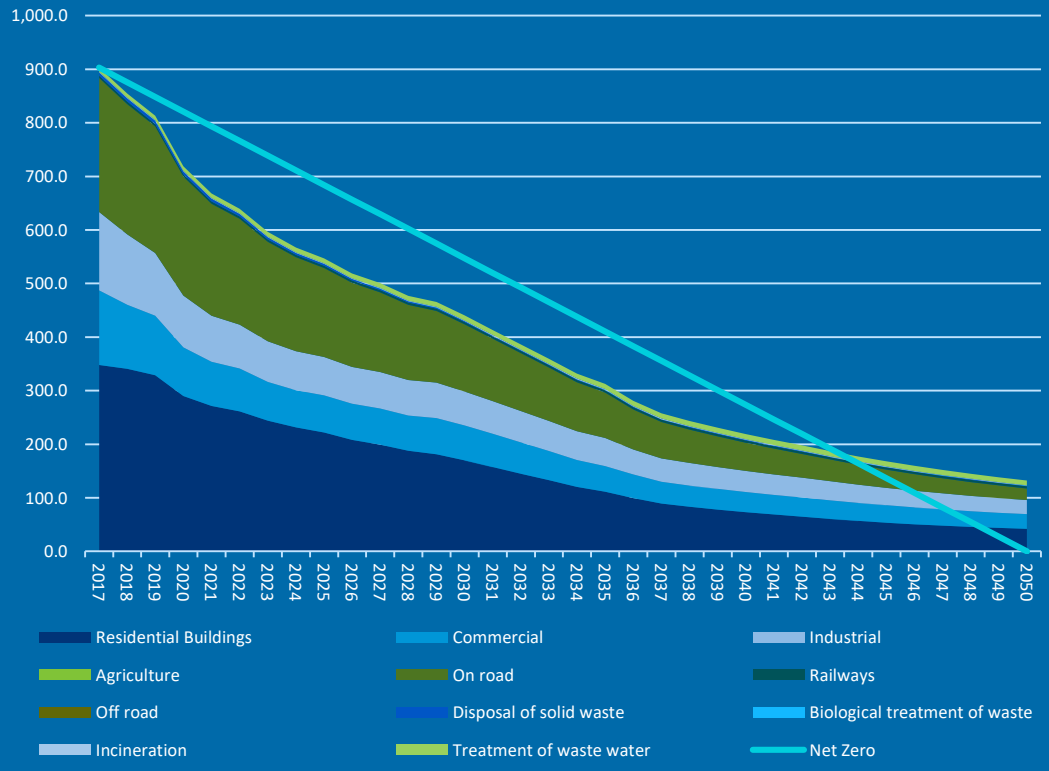
The result is total emissions will decrease by 86% from 2017, such that emissions in 2050 stand at 127ktCO_2e per annum. Due to strong efforts made early on the Borough will be net zero by 2050, for this to remain true the Borough must offset 127ktCO_2e each year or risk becoming a net emitter again by 2055.

Section 3: High Electrification

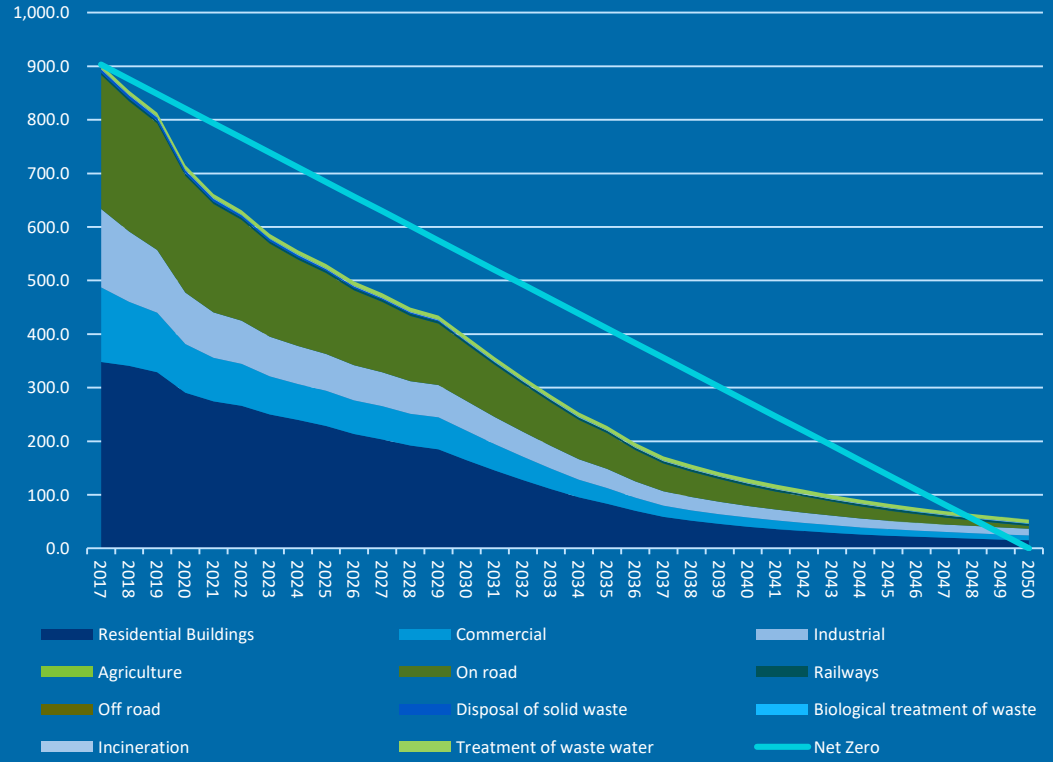
The high electrification scenario prioritises the adoption of electric vehicles and heating above all else, energy efficiency and fuel switching still play an important part though.

By 2035, waste recycling will stand at 65% with the majority of remaining waste going to EfW. By 2040, uptake of public transport and active transport will increase by 5%. By 2050, it is anticipated that almost 3 out of 4 homes will be heated by heat pumps and 90% of homes will have installed solar PV; Industry and commerce will have reduced the energy intensity of their operations by 26%; 95% of private vehicles will be electric, and the majority of heavy transport will be electrified too.

The result is total emissions will decrease by 85% from 2017, such that emissions in 2050 stand at 132ktCO_2e per annum. Early and continued efforts mean the Borough will cumulatively emit less than what is required to meet zero emissions by 2050, however, for this to remain true the Borough must offset 132ktCO_2e each year post 2050 or risk becoming a net emitter again by 2064.



Section 3: Radical Response

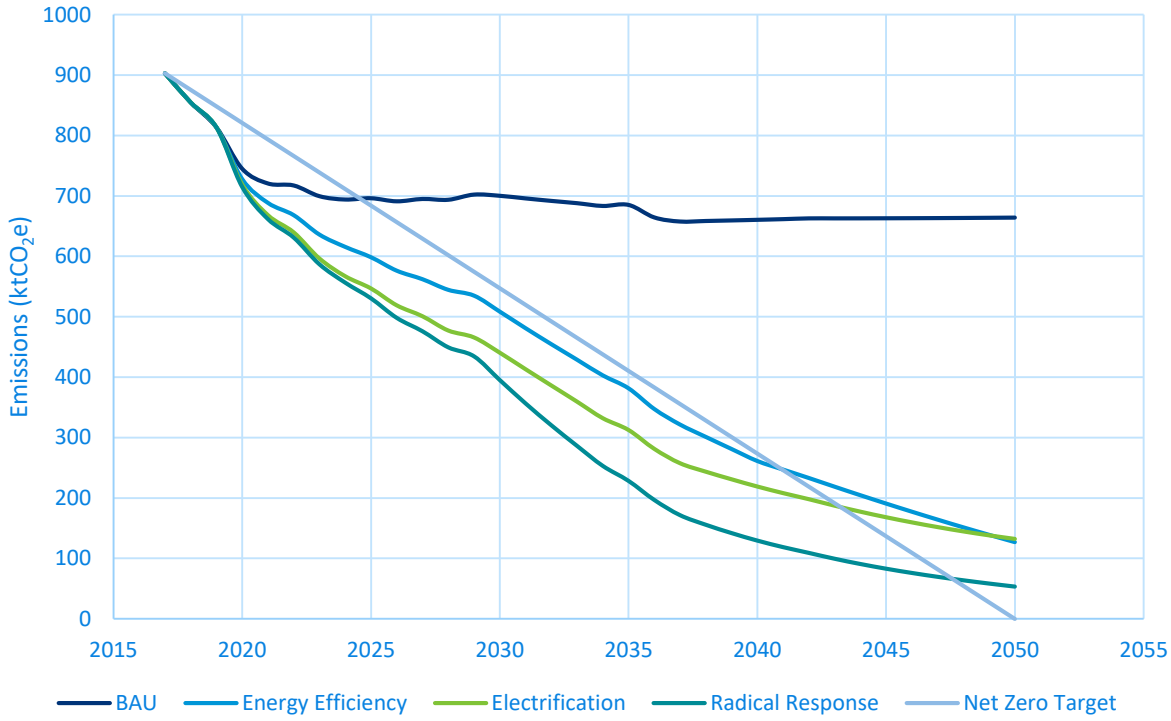


The 'Radical Response' scenario represents an aggressive, proactive, and profound effort to ensure the Borough does everything it can to reduce its emissions as close to net zero by 2050 as possible.

By 2035, waste recycling will stand at 65% with the all of remaining waste going to EfW. By 2040, uptake of public transport and active transport will increase by 20%. By 2050, it is anticipated that all homes will have adopted all energy efficiency measures available to them and have solar PV installed; Industry and commerce will have reduced the energy intensity of their operations by 40%; 100% of private vehicles will be electric, and the majority of heavy transport will be electrified or run on hydrogen fuel cells too. Any remaining gas consumption across all sectors will be switched to hydrogen or biogas.

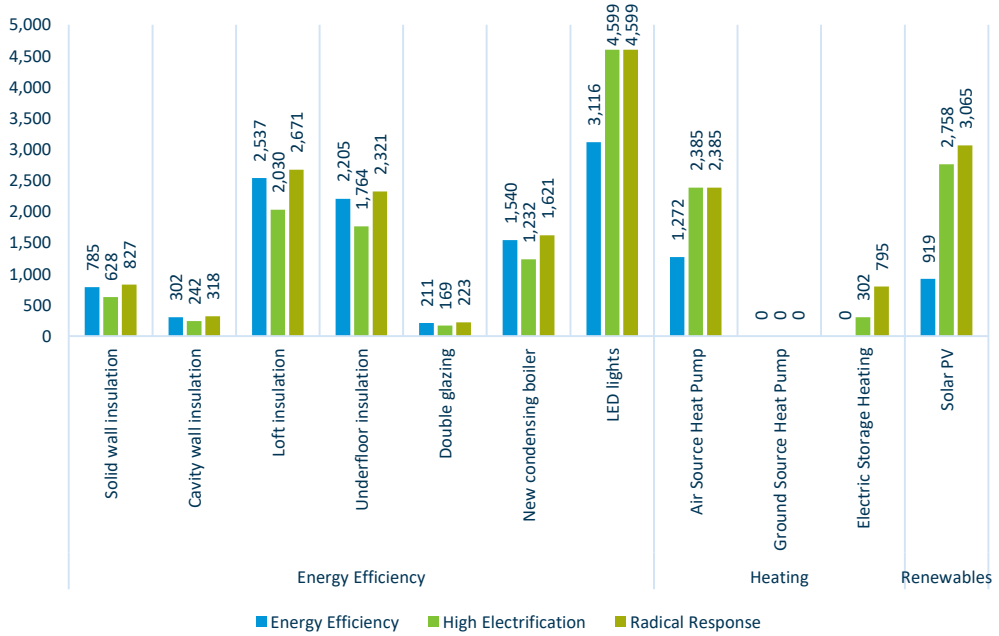
The result is total emissions will decrease by 94% from 2017, such that emissions in 2050 stand at 54ktCO_2e per annum. This shows that even with the strongest efforts there will always likely be some residual emissions that need to be offset.

Section 3: Scenario Comparison



Section 3: Domestic

Annual installations of domestic measure between 2017 and 2050



Within the current housing stock in the North Tyneside Borough there are 97,600 homes, this is expected to increase to 111,760 homes by 2050. For the domestic sector to play its part in the region's decarbonisation, the existing housing stock will need to undergo significant change; new homes should be built to an exceptionally high standard.

Under a business as usual scenario, energy consumption is expected to increase by 49%, and emissions by 1% between 2017 and 2050. Under the energy efficiency, high electrification, and radical response scenarios it is anticipated that emissions in the domestic sector will decrease by 92%, 88%, and 96% respectively over the same time period.

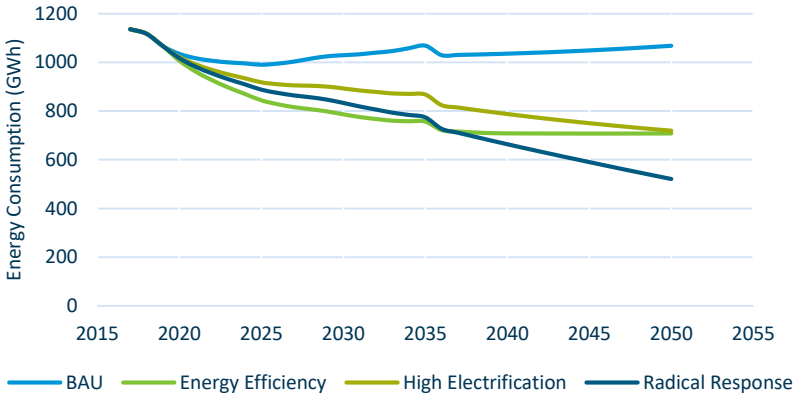
To achieve these results, the graph (left) demonstrates the number of measures that need to be installed **each year** within the existing housing stock. All new houses would need to meet an EPC rating of 'A', be heated electrically, and have building integrated solar PV installed.

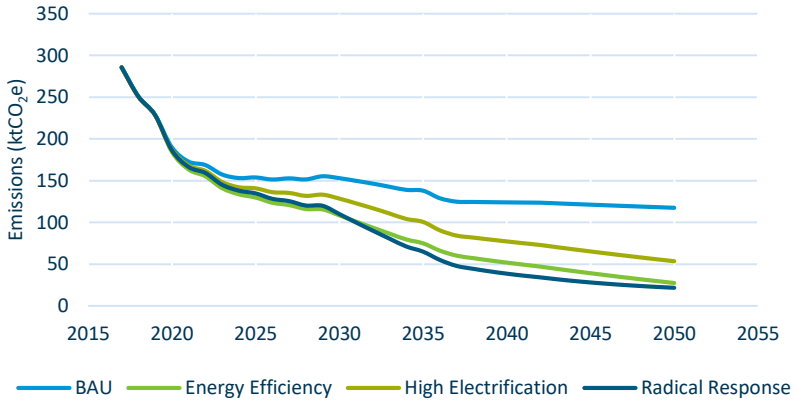
Section 3: Industry and Commercial

Industry and commercial buildings count for a significant proportion of energy consumed in North Tyneside in 2017, under a business as usual case it is expected that energy consumption will drop slightly (6%), while carbon emissions will drop more significantly (59%). The significant drop in emissions is a result of the high electricity usage within I&C which benefits from significant grid decarbonisation.

All scenarios contain a significant level of energy efficiency improvement, generally in line with the clean growth strategy, resulting in a substantial decrease in energy consumed within the sector between 2017 and 2050.

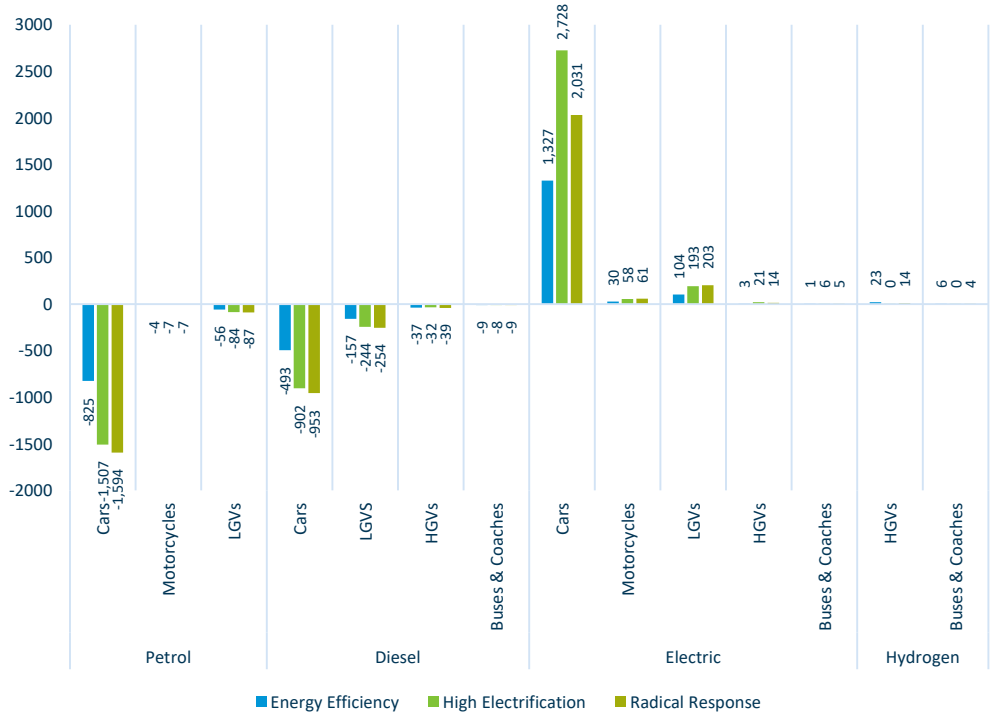
It is expected that the energy efficiency scenario and radical response will yield a greater decrease in emissions (approx. 94%), as this scenario also has a greater level of fuel switching to Hydrogen and Biogas, which are expected to help decarbonise high temperature industrial processes. The high electrification scenario does not benefit from fuel switching to the same extent and struggles to decarbonise some of the harder to reach industries, resulting in a 81% reduction in emissions.





Section 3: Transport

Annual change in vehicle numbers by type between 2017 and 2050



As of 2017, there are 84,066 private vehicles owned in the Borough, by 2050 under a business as usual case, it is anticipated this number will rise to 101,450. As well as the rise it is expected there will be a continual shift back to petrol vehicles from diesel.

The UK has begun its shift already to decarbonise transport and move to an electric vehicle future. However, the scale of the challenge in North Tyneside can be seen in the graph to the left. Electric private vehicles will need to enter the North Tyneside market at a rate of between 1,000-3,000 per year.

This will require significant changes to the transport infrastructure, and an extensive charging network to be built to aid the uptake in electric vehicles.

It is anticipated that vehicle ownership/use of private vehicles will need to decrease across all scenarios. With more people using active transport (cycling, walking, e-scooters) and public transport.

Section 3: Cost of emissions pathways to 2050

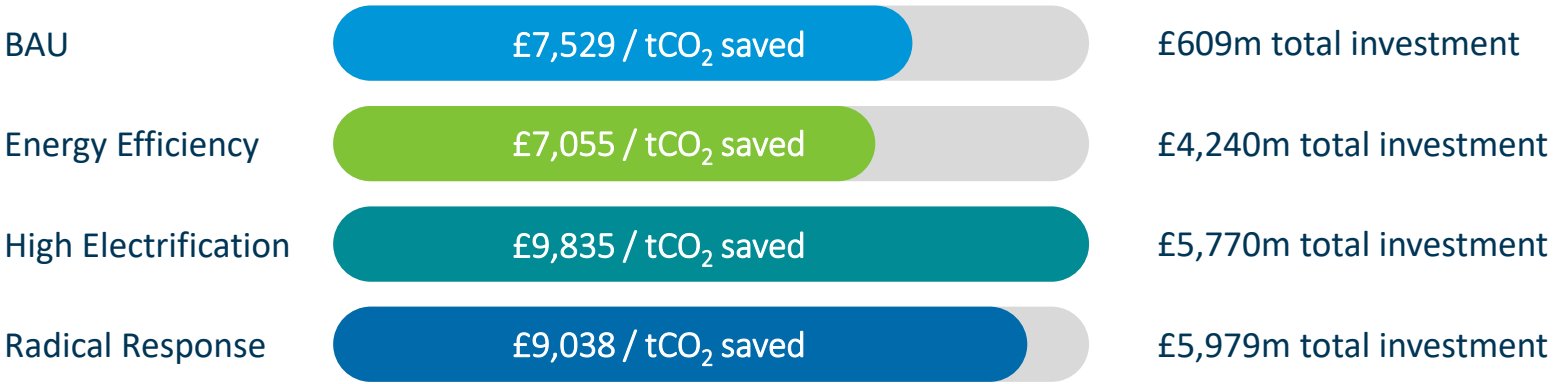
A brief economic assessment has been undertaken to provide an estimate for indicative costs of investment for each scenario, as well as the investment per tonne of carbon saved. The investment examines the cost of implementation of the domestic energy efficiency, heating, and renewable generation measures; on road transport (vehicles only, no infrastructure costs included); and commercial and industrial measures.

The costs provided are indicative only, and do not account for all aspects of the energy transition. They do however indicate an approximate value, and allow for comparison against the other scenarios and the business as usual case.

What is clear from the initial findings is that energy efficiency provides the lowest cost solution to saving carbon; to the extent that it is more cost effective than doing nothing and relying on grid decarbonisation. High electrification, is the most expensive solution to reduce carbon. A radical response scenario has the highest total investment cost, but benefits from energy efficiency too to reduce the cost of investment per tonne of carbon saved.

A further piece of analysis on the economic impacts of each of the scenarios, in jobs and GVA terms, could held provide further insights into the benefits of the low carbon transition. Typically we see much higher jobs and GVA in low carbon pathways compared to the BAU.

Appendix 1 outlines the methodology used to arrive at the cost of the 2050 emissions pathways.



Section 4: Action Plan

In this section of the North Tyneside Climate Emergency Action Plan, we examine the specific projects, programmes and policies that can be implemented to contribute towards a pathway to a carbon neutral Borough by 2050. The plan will not be able to achieve its aims without the support of key public, private and third sector stakeholders in order to translate the vision into reality. Actions taken by North Tyneside will need to be supported by UK policies, funding[2] and action. The action plan contemplates steps that can be taken forward by various public, private and third sector stakeholders across the Borough, including those that can be taken directly by North Tyneside Council.

We define these actions, strategic projects, programmes and policies across each of the **five priority areas**, in addition to identifying actions across the themes of **policy**, **education** and **nature based solutions**. A long list of projects were identified through a series of activities including drawing from the evidence gathered through a literature review, insights from the carbon footprinting and pathway analysis, stakeholder workshops, stakeholder survey and 1-2-1 stakeholder interviews. The project pipeline list is presented in **Appendix 2**.

Projects were subsequently evaluated against a qualitative evaluation framework, against five key criteria: **Strategic Fit**, **Environment Benefits**, **Deliverability**, **Economic Outcomes** and **Value for Money**. Further detail on the five evaluation criteria used to undertake a qualitative evaluation of the project pipeline is provided in **Appendix 3.**

It is important to note that whilst some projects are 'feasible' and can already be described in more detail, the majority are only 'concept' stage and will require significant work to fully scope and agree detailed delivery plans, KPIs, roles and responsibilities etc. In addition, there is a need to consider and agree a governance and project development process; including how this will be funded going forwards.

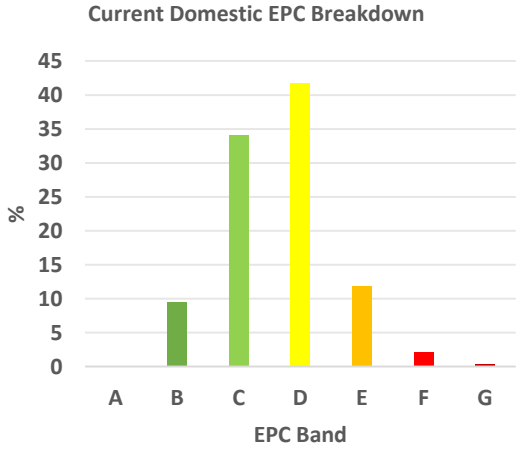
[2] At the time of writing (September 2020), a Carbon Reduction Fund is being proposed by the North of Tyne Combined Authority. This Fund is currently at an early conceptual stage. It will be important to monitor closely the development of the proposed Fund to understand and evaluate its potential to provide support to strategic projects in North Tyneside's Climate Emergency Action Plan.

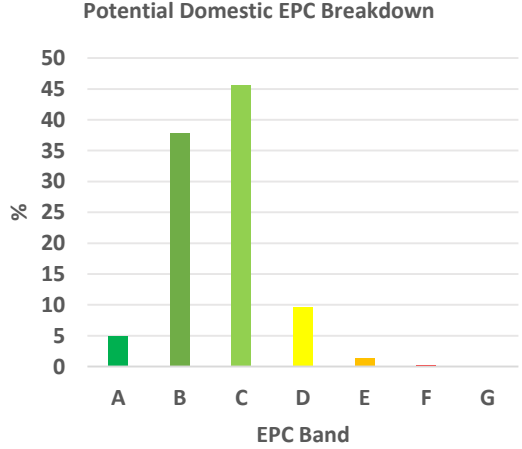
Section 4: Improving energy efficiency in our buildings - overview

Although the UK has made considerable progress in decarbonisation, this has been largely driven by power sector decarbonisation. By comparison, decarbonisation of buildings has been minimal. Domestic emissions (which are dominated by building-related emissions) alone constituted 39% of North Tyneside's carbon footprint in 2019.

With the UK government setting a Net-Zero by 2050 target, the timescales for decarbonisation are tight. Existing buildings are crucial to this, as more than 85% of the building stock that will exist in 2050 has already been built. However, typically buildings only undergo major refurbishment every 20-30 years.

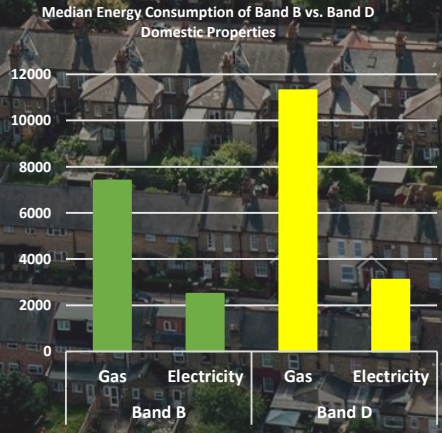
Building energy efficiency retrofit is a tried and tested activity, and can deliver more cost-effective (£/tCO_2e) decarbonisation than new renewable generation. With the announcement of the Green Homes Grants as part of post Covid-19 recovery efforts, it is clear the UK Government also sees energy efficiency as a driver of economic activity. North Tyneside Council has a key role to play as a focal point for activity, facilitating partners, communication opportunities and capturing funding.





Majority of shift is concentrated between Bands D and B

Energy efficiency offers many co-benefits, such as creating jobs, improving thermal comfort, reducing energy bills and improving the overall quality of a property



Section 4: Strategic projects to decarbonise buildings

Project: Council housing stock retrofit programme

Business case	Description
Needs and objectives	North Tyneside operates a significant council housing stock and can lead by example by implementing area-wide high-performance retrofit. This should focus on whole-house multi-measure retrofit and fuel-poor homes.
Business proposals and costs	Large-scale roll out of ambitious whole-house retrofit across North Tyneside's entire council housing stock, starting with fuel-poor homes. The stock will be broken into target groups, which will be addressed on a continuous, rolling basis. Retrofit costs per household vary depending on the building and the target performance, however can broadly be estimated at between £15,000-£60,000 per household for basic to certified whole-house retrofit. **Funding:** As part of the recently announced Green Homes Grant, North Tyneside can apply to the £200m Local Authority Delivery (LAD) Scheme funding, for which the first phase deadline is the 1st September 2020. The minimum grant offered is £500k, and proposals should target low-income households with a combined income of <£30k in EPC Band E, F or G rated homes, likely indicators of fuel poverty. Alternatively, the Council could bid into BEIS's £50m demonstrator project for the decarbonisation of social housing, which is to inform a future Social Housing Decarbonisation Fund.
Benefits realisation	**Co-benefits:** Energy efficiency is labour intensive and creates direct jobs in building assessment and installation, as well as supply chain jobs. The Stern paper on green stimulus (see supporting information) calculated that for every £760K ($1m) investment, 7.7 jobs are created in energy efficiency, but only 2.7 in fossil fuels. It also increases sales and cash flow in the economy, both through purchases up the supply chain, and through households having lower bills and thus improved purchasing ability. Crucially, energy efficiency in fuel poor homes reduce often above-average bills and improve the thermal comfort of the occupier, which can have knock-off health and wellbeing impacts.
Key stakeholders and delivery partners	North Tyneside Council, Tyne & Wear Homes Selected retrofit suppliers, Community Groups
Supporting information	Hepburn, Callagham, Stern, Stiglitz, Zengelis 2020 *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change? https://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-02.pdf*

Section 4: Strategic projects to decarbonise buildings

Project: Residential energy efficiency retrofit accelerator

Business case	Description
Needs and objectives	Most of the 90,000 homes in North Tyneside sit outside the council stock, either as owner-occupied or as traditionally hard-to-reach private rentals. In order to achieve transformational change in the Borough building stock, energy efficiency uptake amongst these residents needs to be accelerated.
Business proposals and costs	This programme will be the focal point for residential energy efficiency in the borough. It will be a 'one-stop-shop' raising awareness, providing information, and being the interface with national schemes. This will require a segmented approach for the two key groups: • **Owner-occupiers:** Raising awareness of the benefits of energy efficiency and guiding and supporting homeowners in accessing the UK Government's Green Homes Grant voucher scheme. This offers £5k to homeowners (up to £10k for low-income) to cover the installation of insulation, heat pumps and other measures via TrustMark accredited suppliers. Particular effort needed to ensure fuel poor homes access the full £10k grant available. • **Private rentals:** It is more difficult to convince landlords to access the Green Homes Grant voucher scheme, as they do not receive the direct benefits of lower energy bills or improved thermal comfort. However, North Tyneside can galvanise this action by setting up a voluntary accreditation scheme for landlords in the Borough. This accreditation will have minimum requirements, such as property EPC ratings, which can be improved using the voucher scheme. Although this will initially mainly draw 'good' landlords, less in need of targeting. As the scheme grows and a critical mass is reached, this will begin to exert pressure on the remainder to join. The Council can increase this pressure by providing additional grants, and referring high-quality tenants to accredited landlords. This approach has been used in Leeds with success. **Funding:** The underlying funding for the measures is from the £2bn Green Homes Grants scheme, however there will likely be a need to apply for additional funding to cover the administrative costs of setting up the broader umbrella, as well as the landlord accreditation scheme. This could be rolled into a broader application to the LAD Scheme funding pot, for which up to 15% of a bid can be used to cover administration or ancillary works. **Required installations:** Solid wall insulation (by 2030 - 14,211; 2040 - 21,811; 2050 - 24,344), Cavity wall insulation (2030 - 5,466; 2040 - 8,389; 2050 - 9,363), Loft insulation (2030 - 45,914; 2040 - 70,466; 2050 - 78,650), New condensing boiler (2030 - 27,876, 2040 - 42,783, 2050 - 47,752).
Benefits realisation	**Carbon reduction & co-benefits:** For a simple package of measures costing £4k, the homeowner pays £1,320 and the government £2,680. The measures save the owner £200 per annum on energy bills, and reduce their carbon footprint by 700 $kgCO_2e$ per year.
Key stakeholders and delivery partners	North Tyneside Council; Retrofit suppliers; Residents / Landlords Associations, Community Groups

Section 4: Strategic projects to decarbonise buildings

Project: Promotion of industrial clusters

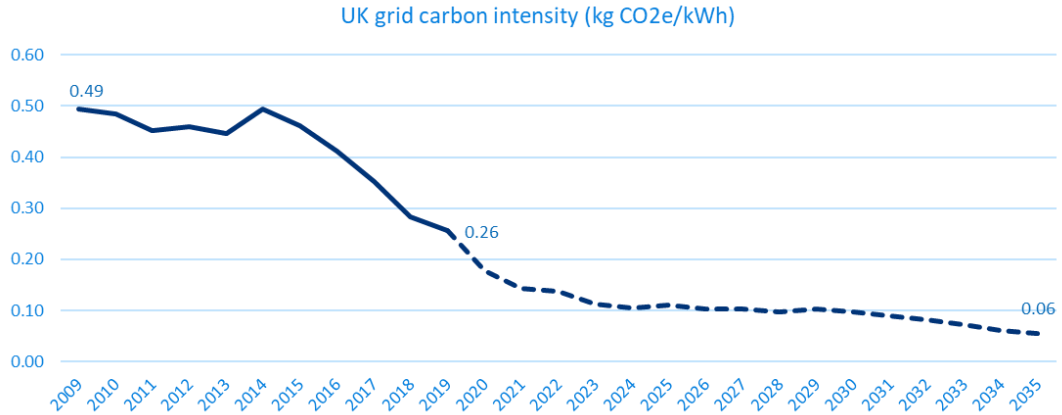
Business case	Description
Needs and objectives	Promote the integration and connection of large industry within the Borough to deliver decarbonisation, energy and cost savings through industrial clustering.
Business proposals and costs	Identify suitable industrial cluster sites (e.g. similar to Quorum park) and promote their development amongst energy intensive industries. Develop a cluster study of high energy intensive industries in the Borough, to identify opportunities for industrial clustering by sector and geography. The Borough has the potential to collaborate with central government (BEIS) in the implementation of 2050 Industrial Decarbonisation and Energy Efficiency Action Plans across a number of sectors. It also has the potential to support partnerships between developers of energy efficiency technology and industrial companies willing to test energy efficiency projects. Costs will vary depending on scale. Funding is needed as well as evaluation of planning permissions.
Benefits realisation	Provide energy intensive industry with the opportunity to grow their businesses whilst decarbonising. Energy is a high and controllable cost for energy intensive industries. Such businesses across the Borough could benefit from collaboration with neighbouring businesses to deliver economies of scale and implement innovative decarbonisation solutions. Industrial clusters facilitate networking and the sharing of common resources and knowledge, whilst also improving business and Borough-wide visibility. Industrial clustering can be used to overcome grid issues, manage heat sources, joint energy purchasing and cost savings, capture efficiencies in waste streams, explore opportunities for carbon capture and usage (CCUS) and identify and unlock innovations in energy efficiency technology.
Key stakeholders and delivery partners	Local energy intensive industries, energy efficiency service providers/ developers of energy efficient technologies, financiers, North Tyneside Council.
Supporting information	• BEIS Industrial decarbonisation and energy efficiency action plans • BEIS Research paper on Industrial clusters in England

Section 4: Decarbonise electricity and increase renewables- overview

Decarbonisation of the power sector is particularly important for North Tyneside to become a carbon neutral Borough by 2050. The electrification of heat and transport means that there will be an increase in demand for electric power which must be met through low carbon electricity generation such as solar or wind energy. North Tyneside has significant potential for renewable energy, particularly with respect to building integrated solar PV.

Decarbonising electricity means reducing the emissions generated per unit of electricity produced, known as carbon intensity (measured in grams of carbon dioxide produced per kilowatt hour of energy generated, gCO_2/KWh). For instance, a natural gas power plant has a carbon intensity of 400 gCO_2/KWh compared to 6 gCO_2/KWh for solar farms [3].

Electricity consumption accounts for 23% of the total emissions of the Borough. Total electricity consumption within the Borough has steadily decreased since 2005; partly due to efficiency improvements in high power appliances, as well as the UK grid carbon intensity decreasing [4] as a consequence of coal power plants being replaced by natural gas and renewable power plants. The graph below shows how the carbon intensity of the UK grid has reduced since 2009 and it's projections through to 2035.



[3] Carbon Intensity from electricity generation modes https://www.eea.europa.eu/data-and-maps/daviz/sds/co2-emission-intensity-from-electricity-generation-2/@@view
[4] BEIS Emission Factors to 2100 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/904215/2019-ghg-conversion-factors-methodology-v01-02.pdf

Beyond decarbonisation targets, renewable energy has many associated benefits such as cleaner air, higher levels of worker safety and fostering green economic growth

North Tyneside has previously partnered with E.On in 2010 to install solar PV on over 1,500 local authority homes with south facing roofs.

The scheme saved tenants ~£132 per property, contributed £72,000/year in revenue stream through the feed-in-tariff, and generates ~3 million KWh/year of electricity

Section 4: Strategic projects to decarbonise electricity

Project: Solar PV – Domestic and commercial with energy systems integration

Business case	Description
Needs and objectives	Decarbonising power is a crucial enabler to the eventual decarbonisation of the transport and heat sectors. Increasing the share of low carbon electricity generation is a key pathway to achieving carbon neutral targets in 2050 for North Tyneside.
Business proposals and costs	A programme to encourage the roll out of solar PV across domestic and commercial properties. Grants or support with initial feasibility assessments could be provided to support investment decisions. The GLA's Solar Action Plan, incorporating programmes such as Solar Together London (collective purchasing scheme) and Community Energy London, provides a good framework for the kinds of interventions that could be taken to encourage the uptake of building integrated solar PV. The programme should examine mechanisms for high energy using consumers to pay for it themselves, focus on the messaging to make it attractive e.g. digitisation, smart tech. Solar PV could be deployed alongside energy storage for smart systems integration.
Benefits realisation	Carbon reduction support: Solar PV will reduce the borough's electricity demand from the grid and thus directly contribute to the 2050 carbon neutral target. Likely to support growth and increased jobs in solar panel manufacture, installation and its supply chain. Furthermore, integrating infrastructure into the grid that can be utilised by a smart energy system will help local District System Operators perform their roles, as well as creating possible new income streams from providing grid balancing services.
Key stakeholders and delivery partners	North Tyneside Council, solar panel manufacturers and supply chains, solar panel technicians/installers, local residents associations
Supporting information	Smart Export Guarantee and Feed in Tarriff information https://energysavingtrust.org.uk/renewable-energy/electricity/solar-panels/smart-export-guarantee-and-feed-tariffs

Section 4: Strategic projects to decarbonise electricity

Project: Community energy programme

Business case	Description
Needs and objectives	Community led energy projects will reduce the borough's energy consumption and emissions and contribute to North Tyneside's 2050 carbon neutral whilst increasing community resilience.
Business proposals and costs	Deliver grassroots community energy projects with local ownership – such as street by street solar, energy efficiency retrofit, or low carbon heating projects. Engage via community centres and community groups for outreach, education in the community. Community centres could also be used to demonstrate low carbon technologies and educate the community. The lockdown period has brought neighbourhoods together, presenting a moment of social and community cohesion that could be capitalised upon to progress a green and democratic energy system. Funding for long term community energy programmes is currently limited, although feasibility grants are available from the Rural Community Energy Fund, and applications can be made via the Energy Hub. This provides funding in two stages: (1) grants of up to £40k for a feasibility study for a renewable energy project, (2) grants of up to £100k for business development and planning of feasible schemes.
Benefits realisation	Community energy has the potential to create real engagement within the local community. Citizens partake as active participants in a process of change, rather than passive consumers. Participants will have a say in how things move forward, share in the benefits, a sense of collective purpose and be more invested with the outcomes.
Key stakeholders and delivery partners	North Tyneside Council, residents of the area, resident or area based groups, cultural and faith based groups, local community groups and community centres, district system operators and power system planners, manufacturers and supply chain of relevant technologies.
Supporting information	List of community energy projects carried out across the UK https://hub.communityenergyengland.org/projects/?project_type=community_energy_project

Section 4: Decarbonise heat - overview

The decarbonisation of heat remains one of the major energy system challenges that we need to address, with heating in buildings and industry contributing approximately 40% of North Tyneside emissions. Deployment of low carbon heat technology in North Tyneside is very low, EPC data suggests that less than 5% of homes have renewable heat installations in North Tyneside.

To facilitate the transition to low carbon heat, we will need highly coordinated planning of infrastructure at the national, regional and local levels, alongside an effective policy and regulatory framework. At a national level, the UK Government is yet to commit to a clear strategy for heat decarbonisation. Key strategic decisions such as the role of electrification versus the use of alternative fuels such as hydrogen, and the potential for geographically distinct approaches, are yet to be made.

But this shouldn't be at the expense of taking action now, in the short term we need to focus on implementing low-regrets options and at-scale demonstrator projects. This will include a focus on improving the efficiency of our building stock, strengthening policy to ensure new buildings are highly efficient and use low carbon heat, rolling out low carbon heat networks in dense areas, greening gas through biomethane injection and hydrogen blending and implementing large scale trials and demonstrators for heat pumps, hybrid heat pumps and hydrogen (particularly with electrolysis). We also need to tackle the skills gap and provide the training needed for the low carbon heat transition.

Beyond decarbonisation, clean heat also has many associated benefits including improvements to health and wellbeing, educational attainment and air quality.

Section 4: Strategic projects to decarbonise heat

Project: Heat pump rollout in Council and wider public sector buildings

Business case	Description
Needs and objectives	The project will demonstrate leadership in heat decarbonisation across the public estate, aiming to catalyse action in the domestic and commercial sectors, and support the strengthening of skills and supply chain.
Business proposals and costs	Rollout of heat pumps in Council and wider public sector buildings across North Tyneside, including social housing and schools. Adopt a One Public Estate policy to ensure that gas boilers are replaced by non-fossil fuel alternative when they reach end of life, alongside implementing an accelerated strategy to install heat pumps and energy efficiency upgrades across the public sector estate within the next **five years**. Utilise a variety of technology types depending on suitability, including ASHPs, WSHPs and hybrids. The project should focus on capturing lessons learnt and case studies to catalyse action across the wider domestic and commercial sectors. **Indicative costs:** Cost of a ASHP for an average household is £9,005 (using 2020 prices). **Funding:** Projects can access support through the Renewable Heat Incentive (RHI), the Domestic RHI is confirmed until March 2022, whilst the non-domestic RHI will close in April 2021. The UK Government is consulting on options for the future support of low carbon heat for homes and businesses, in the form of a Clean Heat Grant. More recently, a series of support programmes were announced as part of Covid-19 recovery, including a £1bn Public Sector Energy Efficiency Fund and the Green Homes Grant Local Authority Delivery Scheme.
Benefits realisation	Carbon reduction estimates of approximately 1.1 tCO_2 per annum per ASHP unit (in 2020). The rollout of heat pumps will also deliver air quality improvements, and could help to boost the local market and supply chain for clean heating alternatives.
Key stakeholders and delivery partners	North Tyneside Council and wider public sector estate partners including Tyne and Wear Homes and Schools.

Section 4: Strategic projects to decarbonise heat

Project: Large scale electric heating rollout

Business case	Description
Needs and objectives	The decarbonisation of heat is a central pillar of the North Tyneside vision, and the electrification of heat is identified as a key part of the solution to achieving this outcome.
Business proposals and costs	Large scale roll out of electrification of heating using heat pumps or electric radiators, targeting 33% of viable homes by 2030, 66% by 2040 and 100% by 2050. This activity will require highly coordinated planning and delivery and likely come associated with the need for grid upgrades to ensure sufficient capacity for the electrification of heat and transport. Whilst the Government is yet to release a clear strategy for heat decarbonisation (including with respect to the potential role for alternative fuels such as hydrogen), progress can still be made in the short term, particularly with respect to large scale trials and demonstrators of heat pumps (e.g. in social housing, clusters of commercial buildings, new build) to ensure preparedness for accelerated implementation in the medium term, and to bolster skills and supply chain. **Indicative costs:** See previous project for further details on indicative costs. **Funding:** In addition to the funding sources listed in the previous project, projects could access innovation funding for trials and demonstrators through sources such as InnovateUK and Ofgem's Network Innovation Allowance.
Benefits realisation	Carbon reduction estimates of approximately 1.1 tCO_2 per annum per ASHP unit and 1.5 tCO_2 per annum per GSHP unit (in 2020). The rollout of heat pumps will also deliver air quality improvements, and could help to boost the local market and supply chain for clean heating alternatives.
Key stakeholders and delivery partners	North Tyneside Council, Northern Powergrid, Northern Gas Networks, Social Housing Providers, Developers, Community Groups, Businesses, Suppliers/Installers, Ofgem (NIA funding)
Supporting information	The FREEDOM project is a £5.2m 'living heat laboratory', a collaboration between PassivSystems, Western Power Distribution and Wales and West Utilities. Hybrid heat pump systems are being trialled alongside smart controls in 75 homes in Bridgend.

Section 4: Strategic projects to decarbonise heat

Project: Heat networks and communal heating using low carbon sources

Business case	Description
Needs and objectives	Heat networks are expected to play a critical role in the decarbonisation of heat and provide a means to introduce the use of low carbon and renewable resources for the provision of heat.
Business proposals and costs	Deploy small scale heat networks and communal heating schemes in areas of high and medium density. Maximise use of waste heat (e.g. from industry) and low carbon technologies (e.g. water/ground source heat pumps), alongside low temperature operation to enable application in less dense areas. The Authority's 2016 Heat Mapping report indicates a range of potential for heat network schemes across North Tyneside. Stakeholders commented that data centres (e.g. in the Cobalt) are a growing sector in North Tyneside, presenting an opportunity for waste heat capture into networks. In addition, there could be potential for water-sourced heat using the River Tyne. Funding: The BEIS Heat Networks Delivery Unit (HNDU) provides grant funding to local authorities to support project development activities. Capital grant and soft loan financing is subsequently available to public and private sector sponsors through the £320m Heat Network Investment Project (HNIP). The Government is currently consulting on a successor programme to HNIP, known as the Green Heat Networks Fund (GHNF), which will be available from 2022 to 2025.
Benefits realisation	Depending on the technology used, heat networks have the potential to dramatically reduce carbon emissions associated with heat. Other benefits include job creation, air quality improvement, fuel poverty reduction and economic growth.
Key stakeholders and delivery partners	North Tyneside Council, BEIS (through HNDU and HNIP programmes), DBOM partners

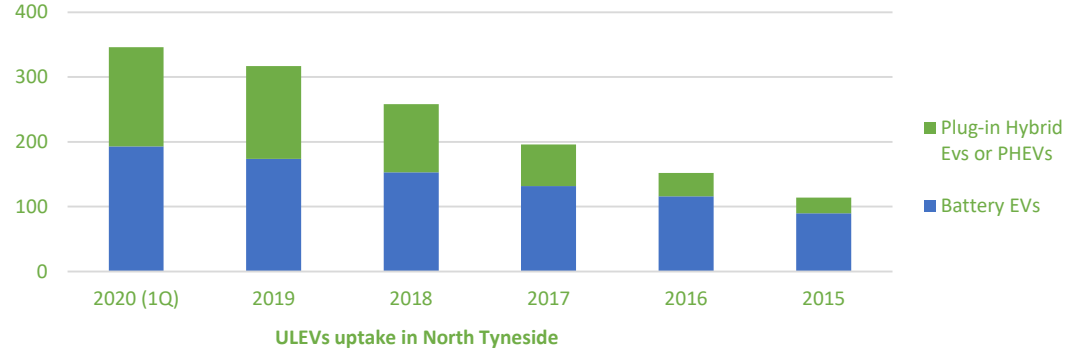
Section 4: Decarbonise transport - overview

Transport has a central role to play in North Tyneside reaching carbon neutral by 2050. The sector is the second largest contributor to the Borough's footprint, accounting for around a third (32%) of the total emissions.

North Tyneside has a high dependence on private cars for transport. Of the total road miles driven in the Borough in 2018, 83% were driven by cars (99% if trunk road traffic is excluded).[5] This suggests that very low road miles are driven by buses comparatively.

Uptake of ultra low emission electric vehicles (ULEVs) have been increasing in North Tyneside in the last few years, however growth is still slow. Approximately 0.3% of vehicles registered in the area are electric, meaning that North Tyneside has below average uptake of EVs compared to Great Britain, where on average 0.9% of vehicles are now electric.[6]

North Tyneside Council has itself been leading the way in the adoption of low carbon vehicles in to its own vehicle fleet. 5% of the Council's vans now are electric, which is well above the national average.[7]

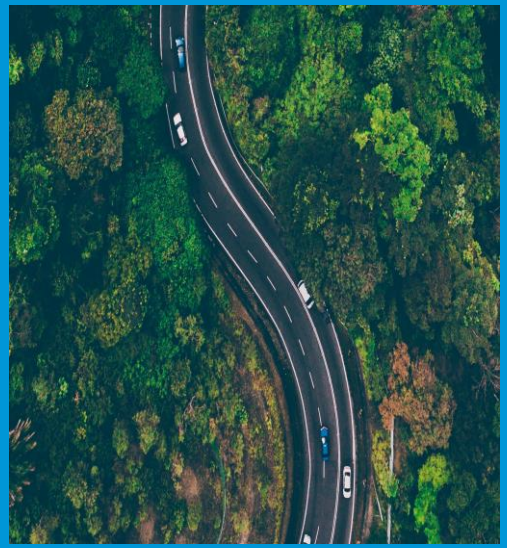


ULEVs uptake in North Tyneside

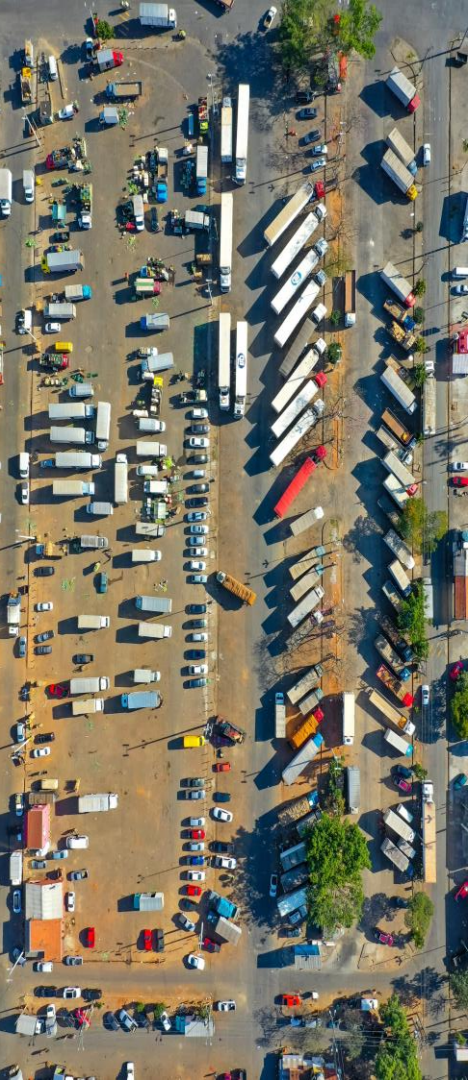
[5] Regen analysis of Motor vehicle traffic by local authority (2018) and Car vehicle traffic by local authority (2018) https://www.gov.uk/government/statistical-data-sets/road-traffic-statistics-tra

[6] Regen analysis of Licenced ultra low emission vehicles by local authority and Licenced vehicles Great Britain and United Kingdom https://www.gov.uk/government/statistical-data-sets/all-vehicles-veh01#ultra-low-emissions-vehicles-ulevs

[7] 10 electric vans out of 200 total vans operated by the Council, as recorded in North Tyneside Metropolitan Borough Council's *Response to the Department of Transport, Transport decarbonisation plan: local authorities.*



Beyond decarbonisation targets, cleaner transport also has many associated benefits such as health improvement, foster green economic growth and build cleaner and safer neighbourhoods.



Section 4: Strategic projects to decarbonise transport

Project: North Tyneside Council fleet decarbonisation

Business case	Description
Needs and objectives	Replacing the Council's existing vehicle fleet with low or zero carbon alternatives, helping to decarbonise road transport in the Borough. Act as a demonstrator to catalyse wider action across the Borough.
Business proposals and costs	Assess the condition of the 370 vehicles in the local authority's fleet and evaluate their replacement for low carbon options over time. The Council's fleet includes horticultural and street cleaning vehicles, cars, vans and trucks. Targets to decarbonise the Council's fleet have already been established. Barriers to low carbon vehicle adoption need to be identified, depending on vehicle type, such as current market availability of electric HGV options for municipal fleet. Plug-in vehicle grants are available for low emission vehicles, as well as zero rate first year Vehicle Excise Duty (car tax) and zero rate for supplementary years in vehicles costing under £40,000.
Benefits realisation	Even though the project impacts a small number of the total vehicles in North Tyneside, decarbonising the Council's fleet will likely act as a demonstrator for the community on the feasibility of adopting low emission vehicles. It gives visibility to the Council's tangible commitment in leading the way towards road transport decarbonisation. Lower emissions from fleet vehicles will also translate in to lower total emissions associated with the Council's operations.
Key stakeholders and delivery partners	Electric vehicle manufacturers/retailers and servicing/maintenance providers, Department of Transport, Council's employees, local community.
Supporting information	Plug-in grant eligibility list https://www.gov.uk/plug-in-car-van-grants

North Tyneside has 39 public EVs charging devices including 2 rapid chargers installed as of October 2019.

This translates into 18 charging devices by 100,000 population, which situates North Tyneside below the average for the Tyne and Wear region (32), and England (22).

DFT (2019) Electric Vehicle Charging Device Statistics https://www.gov.uk/government/statistics/electric-vehicle-charging-device-statistics-october-2019

Section 4: Strategic projects to decarbonise transport

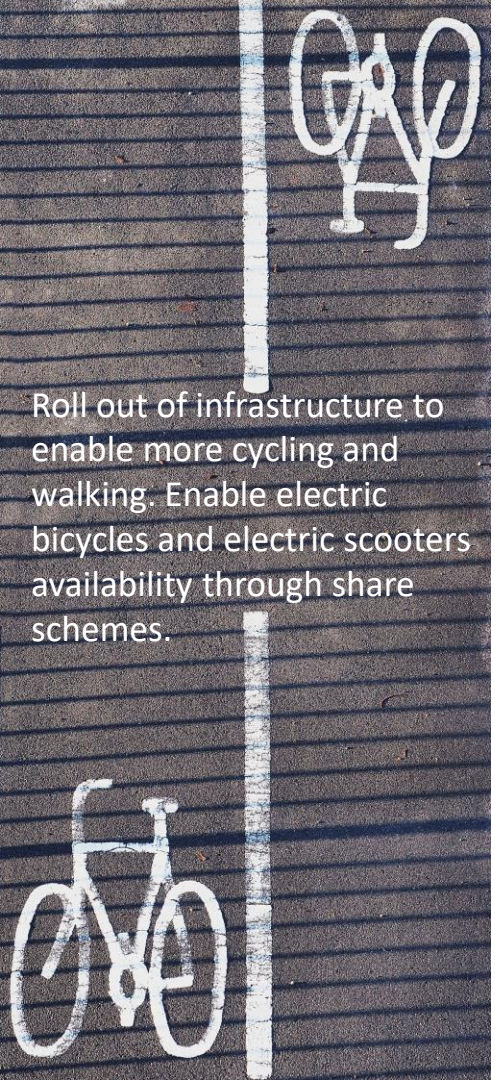
Project: Expansion of EV charging infrastructure

Business case	Description
Needs and objectives	High electrification of vehicles is a key pathway to achieving carbon neutral targets in 2050 for North Tyneside. Moreover, it contributes towards improving energy infrastructure across the region.
Business proposals and costs	Increase EV charging devices across the Borough. Focus would be on rapid chargers and high demand locations such as taxi depots, town centre car parks, train stations, service stations, large supermarkets and high streets. Design strategy: Implementation of software to identify most cost effective charging points – for example the AutoDesign tool developed by Northern Powergrid for the North East, Yorkshire and northern Lincolnshire. Indicative cost of installed non residential EV chargepoints: £1,000 - £1,500 per point. Cost of design tool: free. Grants for residential chargepoints are available. Government funding for local authorities available through the Street residential chargepoint scheme.
Benefits realisation	Carbon reduction: EVs have emissions up to 43% lower than diesel vehicles. Support uptake of EVs in the Borough. Likely to support growth in ULEV industry, increase jobs in infrastructure construction and its supply chain.
Key stakeholders and delivery partners	Northern Powergrid, charging point manufacturers and supply chains, North Tyneside Council, DNOs, ESCOs, large fleet operators, landowners, etc.
Supporting information	Northern Power Grid AutoDesign tool https://www.northernpowergrid.com/news/northern-powergrid-launches-innovative-tool-to-accelerate-ev-uptake#:~:text=Northern%20Powergrid%20has%20launched%20a,EV%20charging%20point%20connections%20locations.

Section 4: Strategic projects to decarbonise transport

Project: Hydrogen fuelled public transport

Business case	Description
Needs and objectives	Replacing fossil fuel buses with cleaner alternatives decarbonises public transport.
Business proposals and costs	Deployment of hydrogen fuelled buses alongside a hydrogen refuelling station. Indicative costs of hydrogen fuelled bus expected to be equivalent to diesel powered option. Intervention best placed to occur in the short to medium term due to technology availability. Following the initial transport and infrastructure development, this project could seek to generate hydrogen via electrolysis using wind turbines or solar farms.
Benefits realisation	**Air quality improvements:** No toxic tailpipe emissions. Hydrogen vehicles release water and vapour to the atmosphere. **Greenhouse gases emission reduction:** Each bus reduces approximately 95 tonnes of carbon per year, equivalent to removing 35 cars off the road yearly. Potential to fully decarbonise public transport when hydrogen is generated from renewables. Noise reduction - fuel cell electric buses are quiet. Specialised jobs creation in hydrogen sector.
Key stakeholders and delivery partners	Suppliers of hydrogen fuel cell buses such as Wrightbus, Arcola Energy and the Optare Group, Passenger Transport Executive (Nexus), Joint Transport Committee of the North East Combined Authority and the North of Tyne Combined Authority.
Supporting information	Wrightbus announced plans to introduce 3,000 hydrogen buses in the UK market by 2024, aiming to convert 10% of UK bus fleet https://www.thebusinessdesk.com/westmidlands/news/2040223-jcb-heir-plans-to-introduce-400-hydrogen-buses-to-Birmingham



Section 4: Strategic projects to decarbonise transport

Project: Cycling and walking infrastructure, including e-bikes

Business case	Description
Needs and objectives	Walking and cycling (including electric cycling) is a substitution for local motorised travel and thereby reduce energy use and carbon emissions from transport.
Business proposals and costs	Building cycling lane infrastructure. Closing roads and widening pavements. Prioritise east to west travel within the borough, and refer to the Department for Transport funded Cycle Tool. Promote electric bicycles and electric scooters availability through share schemes. Indicative costs of cycling lanes: £1-1.5 million per km. **Considerations:** To minimise traffic disruption, construction of physically segregated space for cyclists has to be restricted to off-peak periods or overnight, adding costs. Maintenance cost likely to be higher in 'light segregation' (not completely separated from traffic). Availability of parallel off-road alignments where trackway can easily be provided reduces costs.
Benefits realisation	Walking or cycling could realistically substitute for 41% of short car trips (3 miles), saving nearly 5% of CO2e emissions from car travel. Average economic benefit-to-cost ratio of investing in cycling & walking schemes are thought to be about 13:1. It will likely increase job opportunities in the cycling industry and local shops as well as construction supply chain. More long term outcomes relate to health improvement and lower work disruption.
Key stakeholders and delivery partners	Likely to be the same as previous similar projects: department of transport, commercial associations, cycling groups, civil society organisations, e-bikes and electric scooter manufacturers and rental, etc.
Supporting information	• Typical costs of cycling interventions https://www.gov.uk/government/publications/cycle-city-ambition-typical-costs-of-cycling-interventions-and-interim-analysis • Assessing the potential for carbon emissions savings from replacing short car trips with walking and cycling using a mixed GPS-travel diary approach https://doi.org/10.1016/j.tra.2018.08.022

Section 4: Strategic projects to decarbonise transport

Project: Cross council coordination of public transport infrastructure

Business case	Description
Needs and objectives	A unified vision and well-coordinated implementation of transport policy and provision with neighbouring districts will enhance the effectiveness of transport initiatives.
Business proposals and costs	Coordination across multiple local authorities and transport operators for the provision of appropriate area-wide transport infrastructure and public transport services. Collaboration between planning and transport regulatory and delivery bodies, better coordination between different modes of travel (e.g. bus timetables). Identification of transport capacity opportunities and constraints. No additional costs or risks identified.
Benefits realisation	We are unable to calculate potential carbon savings from policy coordination. However this will be a useful advancement in planning the infrastructure required to optimise public transport and help reduce emissions in the transport sector. Policy coordination is likely to unlock private sector initiatives and accelerate applications for new developments. Better transport coordinated across a wider area supports greater social equity by ensuring that individuals access jobs, services, and leisure opportunities without the need for privately owned cars.
Key stakeholders and delivery partners	Combined Authority, local councils, Highways England, Nexus, civil society organisations, etc.
Supporting information	Chartered Institution of Highways & Transportation (CIHT) - Better planning, better transport, better places https://www.ciht.org.uk/media/10218/ciht-better-planning-a4_updated_linked_.pdf

The North East Transport Plan produced by the North East Joint Transport Committee, brings together four members from the North East Combined authority and three members from the North of Tyne Combined Authority.

https://northeastca.gov.uk/decision-making/the-north-east-joint-transport-committee/

Section 4: Embed decarbonisation into waste strategy - overview

Although waste constitutes only a small portion of North Tyneside's 2019 footprint, waste projects provide co-benefits by supporting objectives such as improving the general cleanliness and quality of life of the borough. The Council has already agreed a '10 Year Plan for Waste', plotting drivers and actions to 2030 (see below).

Some of these actions are being driven by central government requirements, such as local authorities to introduce separate weekly collections of food waste by 2023, and to collect a standard range of materials for recycling as a minimum by 2023. With these key pledges in place, the Council's role is two-fold: to accelerate the delivery of these collection and recycling services, and to raise awareness amongst residents of why and how to recycle properly. This also relates to clearly communicating the importance of the waste hierarchy (see right), which helps reduce the size of the waste problem as a whole.

DRIVERS	50% of household waste to be reused or recycled. Ban on plastic stirrers, buds and straws. Market demand for better quality recyclables	Introduction of new legislation in response to the Resources and Waste Strategy		Implementation of new legislation - Food waste, - Plastic tax, - Deposit return schemes, - Extended producer responsibility.	Revision of the Resources and Waste Strategy	55% recycling rate for municipal solid waste (MSW)	Response to the implications arising from the revision of the Resources and Waste Strategy			EU Target of 60% of household waste to be reused or recycled	2050: Eliminate avoidable waste of all kinds.
YEAR	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
ACTIONS	Investigate food waste options	Extend or re-procure materials recycling contract arrangements	Extend our residual waste contract arrangements. Commence HWRC improvement programme	Commence separate food waste collections to meet legislative requirement. Renew waste awareness and initiatives campaign contract arrangements	Commence options appraisal for waste treatment	Complete options appraisal for waste treatment	Approval of future waste treatment arrangement	Renew Waste awareness and initiatives campaign contract arrangements	Work with businesses, schools and residents to improve recycling rates	Develop new Waste Strategy for the Borough	Launch new Waste Strategy	<10% of waste to landfill & 65% recycling for 2035

SHORT, MEDIUM & LONG TERM GOALS OF SINGLE USE PLASTICS ACTION PLAN 2018 - 2030

Source: Energy Saving Trust

Section 4: Strategic waste projects

Project: Awareness raising campaign to improve recycling rates

Business case	Description
Needs and objectives	As North Tyneside introduces more segmented residential recycling collections, and a separate food waste collection, there is a need to prime the residents so the progress of these changes are fully realised.
Business proposals and costs	It is important that the Council suitably raises awareness and provides information on recycling, to minimise any issues relating to an introduction of more complex recycling segmentation. The communication should instil a sense of common purpose and communicate the benefits of change. As a further incentive to drive behaviour change, the Council could consider putting in place a strict limit on the number of black bags collected per household. This has been successful in Bristol, and forces households into more careful segmentation of recycling on an ongoing basis during the week. **Funding:** As this project is focused on communication and marketing, with some costs relating to advertising and materials, the funding required should be relatively small.
Benefits realisation	**Carbon reduction:** The carbon reduction potential of recycling is relatively low in proportional terms when assessed at the borough-wide scale, however reducing the quantity of waste sent to landfill is high impact per kilogram of waste, due to high emissions intensity associated. **Co-benefits:** Contributing towards North Tyneside being a cleaner, greener borough. Improvements in recycling can also contribute to positive impacts of biodiversity, as less plastic enters local habitats.
Key stakeholders and delivery partners	North Tyneside Council, Waste delivery partner

Section 4: Policy - overview

Beyond projects, North Tyneside also has a number of policy levers it can pull to drive climate action and progress toward the borough's decarbonisation target. Policy interventions are often broader than their specific project counterparts, driving and influencing wide-spread behaviour change.

Policy interventions can also look to change fundamental external factors on the ground that influence the delivery of projects, such as regulations. As a planning authority, North Tyneside holds the authority to shape planning regulations to achieve desired outcomes. This theme will examine in further detail at two specific interventions around planning regulations and how North Tyneside can effectively leverage them to drive energy efficiency and renewable generation.

However, beyond these two interventions a range of policies have been considered:

Priority / Theme Area	Segment	Description
Energy Efficiency	Commercial	Incentivising SMEs by providing a short business rates holiday for confirmed installation of energy efficiency measures
Energy Efficiency	Domestic	Linking fiscal incentives to change in property EPC Band rating
Generation	Commercial / Industrial	Establish offshore wind Energy Innovation Zone (EIZ) for component manufacturing and service provision
Transport	EV Infrastructure	Require employers over a certain size to install charge-points
Transport	General Infrastructure	Require new developments and re-developed sites to take a cycling and walking-first approach, in line with the "15 minute city" approach
Community Engagement	-	Encourage companies to consider remote working as a permanent element of their business

Section 4: Strategic policy projects

Project: Region-wide higher-ambition housing regulations

Business case	Description
Needs and objectives	New homes currently being constructed to Part L standards are not 2030-proof, and will require costly retrofit before 2030. In order to reduce the size of building stock requiring retrofit, North Tyneside should work cross-regionally to set higher minimum energy efficiency standards.
Business proposals and costs	It is recognised that current Part L building standards, and those likely to flow from the Future Homes Standard, are delivering housing that adds to the future energy efficiency retrofit burden. However, due to strong opposition from developers, taking action to raise the minimum permitted standards will require co-ordination at the North of Tyne scale. By agreeing and enacting higher-efficiency requirements across the region, developers will struggle to make arguments of moving their developments elsewhere, and will be more likely to comply. The August 2020 'Planning For The Future' White Paper states, "Local Planning Authorities, as well as central Government, should be accountable for the actions that they are taking, and ***the consultation response will look to clarify the role that they can play in setting energy efficiency standards for new build developments***." **Funding:** As this project only involves the research, development and confirmation of new regulations, it will not require significant funding, and would likely be funding through the Council's revenue budget.
Benefits realisation	**Carbon reduction:** Building new homes to a low carbon standard is among the most cost-effective methods to reduce emissions, although it is limited by the number of new homes being built per year. **Co-benefits:** Higher efficiency homes use less energy, and consequently have lower operating costs. Residents are also likely to benefit from improved thermal comfort and general fabric quality.
Key stakeholders and delivery partners	North Tyneside Council, Newcastle City Council, Northumberland County Council, North of Tyne Combined Authority, Private Developers.

Section 4: Strategic policy projects

Project: On-site generation requirement for new commercial sites

Business case	Description
Needs and objectives	Commercial buildings are a significant opportunity for low carbon energy generation in North Tyneside, which lacks the open spaces for more traditional ground-mounted arrays.
Business proposals and costs	Working in co-ordination at the North of Tyne level, the authorities could set a requirement of new commercial developments that they must consider on-site renewable generation (e.g. roof mounted solar PV or ground-source heat pumps) as well as the productive use of any waste heat generated, for example from a data centre, as part of their planning application. On-site renewables must be given first refusal, with a clear and robust justification supporting why they may have not been taken further. It is crucial this action is taken at the regional-scale, presenting a united front to potential commercial developers. **Funding:** As this project only involves the research, development and confirmation of new regulations, it will not require significant funding, and would likely be funding through the Council's revenue budget..
Benefits realisation	**Carbon reduction:** Commercial properties, such as warehouses, have large flat roof spaces which can accommodate substantial renewable generation equipment. **Co-benefits:** On-site generation and the productive capturing of waste-heat can provide positive revenue flows for the business site owner, and reduce the energy bills of the occupier.
Key stakeholders and delivery partners	North Tyneside Council, Newcastle City Council, Northumberland County Council, North of Tyne Combined Authority, Private Developers.

Section 4: Education - overview

Education, awareness raising and training play an important role in the transition to a low carbon economy. All areas of the economy will need to play their part in the transition to net zero, and this required the right level of education, information, skills and training.

Reaching a more sustainable and energy efficient economy is possible while fostering employment growth. To achieve this, it is essential that climate and energy policies include measures to support green skills development. This is fundamental to ensuring that skill gaps will not impair future sustainable developments.

Integrating considerations on employment needs and associated skills to the Climate Emergency action plan for 2050 will allow North Tyneside Council to:

- Promote greater awareness on the dependence of low carbon development on the availability of a skilled workforce.
- Determine changes in labour demand and skills requirements in sectors of strategic importance.
- Establish a productive dialogue with relevant social partners to design training mechanisms relevant to workers and employers.

Stakeholders pointed towards the need of education and training during the workshop discussions. The tables following describe two project ideas (i) for upskilling in energy efficiency and (ii) training focused on SMEs.

Section 4: Strategic projects in Education

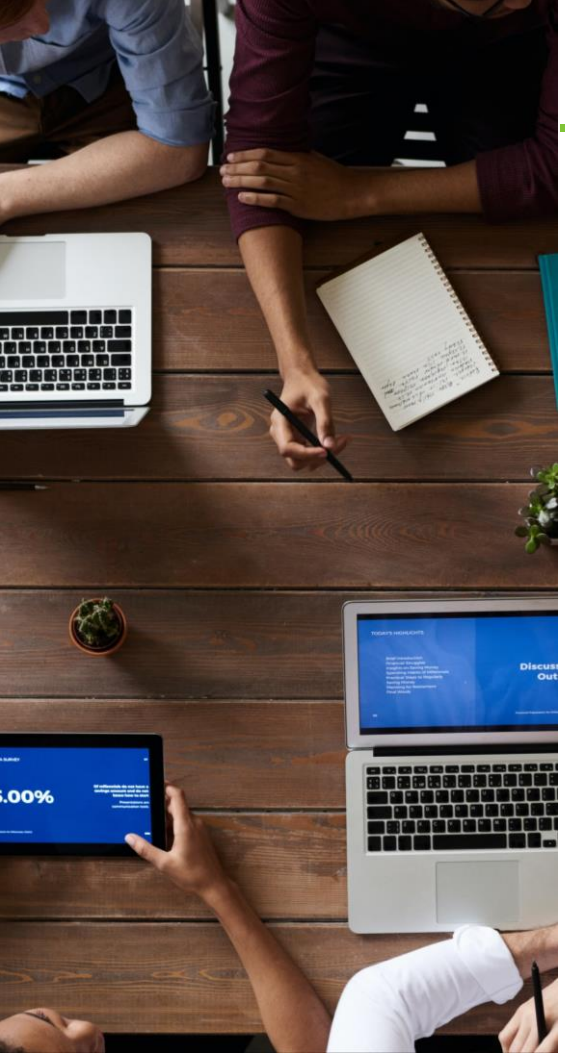
Project: Training scheme for solar PV and heat pumps

Business case	Description
Needs and objectives	Training electricians and heating and plumbing engineers in solar photovoltaic systems and heating energy efficiency.
Business proposals and costs	Provide the necessary skills for the design, installation, testing, commissioning, handover, servicing and fault finding of solar photovoltaic systems and heat pumps. Costs will depend on the level of outreach.
Benefits realisation	Ensuring local electricians and heating and plumbing engineers have the required skills to support North Tyneside's transition to a low carbon economy. We are unable to calculate potential carbon savings from the training scheme. However a more aware workforce is likely to promote retrofitting and energy efficiency solutions amongst their client base, impacting carbon reduction in the borough's commercial and residential buildings. Likely to impact employment growth in low carbon sectors.
Key stakeholders and delivery partners	Local electricians, local heating and plumbing engineers, training providers, colleges
Supporting information	Examples of syllabus • Solar PV https://www.niceic.com/contractor/training-courses/renewables-courses/solar-photovoltaic-(pv) • Heat pumps https://www.niceic.com/contractor/training-courses/renewables-courses/heat-pumps

Section 4: Strategic projects in Education

Project: SME carbon reduction programme

Business case	Description
Needs and objectives	Implementing resource efficiency training and advisory programmes for SMEs to increase decarbonisation across industry.
Business proposals and costs	Establish a resource efficiency programme for SMEs that includes: - the provision of training and resources - energy audits to identify resource efficiency opportunities in energy, water and waste - capital grant funding towards the cost of implementation of resource efficiency projects There are many examples of this type of programme having been delivered across the UK, such as the Green Business Fund and the Leeds City Region Resource Efficiency Fund. Many local authority-led programmes have been funded through ERDF. Innovations could include expanding the focus of the programme to provide more digitalised support (i.e. increasing the impact of the programme) and the incorporation of advice on circular economy initiatives.
Benefits realisation	The potential carbon savings from this programme will depend on the level of outreach and the influence obtained amongst local SMEs. However, upskilling local industry in carbon efficiency will provide useful support in implementing low carbon initiatives in the borough. Moreover, it will but also consolidate communications channels with a knowledgeable private sector. Likely to impact low carbon related employment.
Key stakeholders and delivery partners	North Tyneside Council, Local SMEs, their supply chains, commercial and industrial sector associations
Supporting information	Free resources through the Green Business Fund https://www.carbontrust.com/our-projects/green-business-fund



Section 4: Strategic projects in Education

Project: Promotion of community led action

Business case	Description
Needs and objectives	Proactive approach to empower the community and invigorate existing groups to lead decarbonisation action on a local level.
Business proposals and costs	Support the development of neighbourhood planning groups. Promote awareness across the community on local group efforts to build bottom-up initiatives for decarbonisation on different sectors of the economy and society. Innovative financial schemes and support tools need to be identified.
Benefits realisation	Community led action can deliver climate initiatives from society groups with understanding of local priorities and problems, tapping into local knowledge, expertise and capacity. The local community share climate action responsibilities and turns its participants into advocates for decarbonisation, building strong partnerships with other communities and local government. The Council has the potential to become one of several partners to local community groups helping to develop policy and build evidence.
Key stakeholders and delivery partners	Various community groups and organisations, neighbourhood representatives, volunteers.
Supporting information	• Neighbourhood planning in a climate emergency https://www.cse.org.uk/downloads/reports-and-publications/policy/planning/renewables/neighbourhood-planning-in-a-climate-emergency-feb-2020.pdf • Climate Active Neighbourhoods https://www.nweurope.eu/media/1782/can_project_newsletter_1.pdf

Section 4: Nature based solutions - overview

Nature based solutions are actions that work jointly with nature to solve coupled environmental, social and economic challenges. They also have the potential to build resilience in the face of future climate change and offer carbon offsetting opportunities – further supporting North Tyneside's ambition of carbon neutrality by 2050.

These actions involve a new focus on traditional conservation approaches and environment management initiatives, relating the benefits that nature can offer to human well being. Social awareness of these interlinkages has been increased by the Covid-19 pandemic.

In the survey conducted to gather project ideas from stakeholders, some pointed out nature based solutions to support North Tyneside's action plan. The richness of the borough coastline was highlighted as a potential source of initiatives in this respect. More information on this topic can be found at https://www.naturebasedsolutionsinitiative.org/

It should be noted that guidance on how to account for carbon removals within GHG reporting is currently limited[8]. The GHG Protocol will be releasing a new standard and guidance on carbon removals and land use by the end of 2021[9]. It is recommended that North Tyneside Council awaits the release of this guidance before finalising any offsetting strategy associated with the Climate Emergency Action Plan.

Image source: IUCN

[8] For example https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/218573/110727-woodland-reporting-guidance.pdf

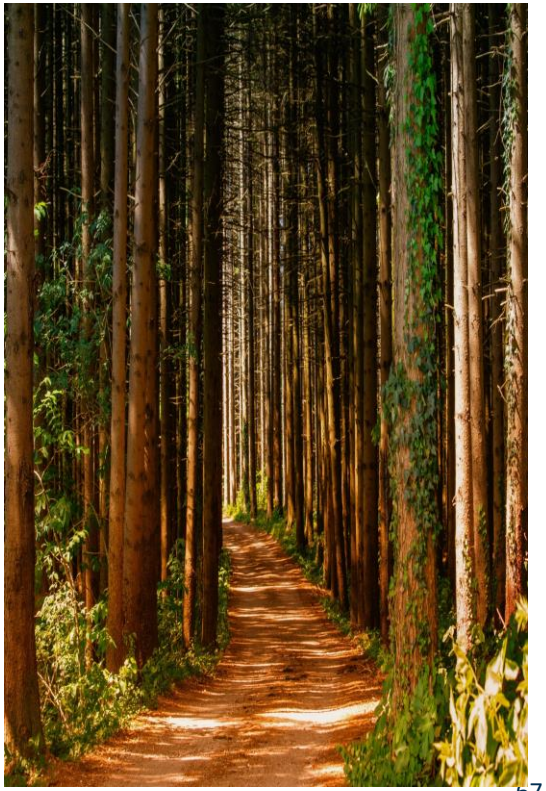
[9] See https://ghgprotocol.org/sites/default/files/GHG%20Protocol%20-%20Carbon%20Removals%20and%20Land%20Sector%20Initiative%20-%20Overview.pdf

Benefits	Challenges
• Focus on resilience and long-term sustainability	• Can be more costly than technological interventions, and can require vast spaces
• Opportunity for inclusive and integrated approaches	• Time lag between the occurrence of costs and the visibility of benefits
• Often "locally-grown" solutions	• Range of definitions – operational barriers
• Multiple social and environmental benefits at once, enhanced social and natural capital	• Valuation and funding – private investment needs to complement public and philanthropic funding

Section 4: Strategic project in nature based solutions

Project: Proposed North East England Community Forest

Business case	Description
Needs and objectives	Community forest plantation in the English North East area to promote carbon sequestration and carbon offsetting opportunities.
Business proposals and costs	A bid to the *Trees for Climate* fund, in conjunction with other north-east England local authorities, for tree planting funding from the national Nature for Climate Fund. *Trees for Climate* grants are anticipated to cover 100% of costs, including establishment and planting. The programme is expected to be run by England's Community Forests.
Benefits realisation	The majority of carbon is captured in forest soils (75% vs 25% in tree biomass). In England, forest soils have a carbon stock of approximately 650 tonnes CO_2e per hectare, offering carbon offsetting opportunities. Forest management and public policy can strongly influence the sequestration process (such as action to manage deforestation sustainably). The project aligns with the UK Government's manifesto commitment to increase tree planting across the UK to 30,000 hectares per year by 2025. Other non carbon benefits include adaptation to climate change by reducing risk of flooding, provision of shelter for wildlife (biodiversity), reduce soil erosion and help to cool down urban areas.
Key stakeholders and delivery partners	North-east England local authorities, Trees for Climate, Nature for Climate fund, England's Community Forests Trust, local communities.
Supporting information	• FAO's Global Forest Resources Assessment 2020, UK Report http://www.fao.org/3/cb0082en/cb0082en.pdf • Nature for Climate, Tree planting guide https://nature4climate.org/news/tree-planting-a-users-guide-for-comparing-tree-for-tree/



Section 5: Governance

The North Tyneside Climate Action Plan will not be achievable without coordinated action from a diverse range of stakeholders. Good governance should ensure decarbonisation is embedded into strategies, plans and economic activity. It should incorporate cross-sector representation, with dedicated roles and responsibilities and clear decision making and approvals processes.

North Tyneside Council have established an internal Climate Emergency Board to advise on the Council's mission to reduce the Borough's carbon footprint. As part of it's commitment, the council has pledged to include a separate budget in the 2020/21 Investment Plan dedicated to projects addressing the climate emergency. In addition, the Council has taken steps to ensure young people have a voice in the development, delivery and review of key environmental actions, through the Youth Council and Cabinet.

Additionally, the North Tyneside Strategic Partnership is made up of the Authority, Third Sector and other Public Service bodies, working in partnership to improve the quality of life for people living and working in North Tyneside. This partnership offers a potential vehicle through which coordinated delivery could be achieved. Stakeholders have suggested a range of potential initiatives that the Council could explore to enhance the governance in association with the North Tyneside Climate Emergency Action Plan:

- **Sector specific working groups:** Launching a series of sector specific working groups to take on responsibility for delivering various aspects of the climate emergency response across North Tyneside (e.g. housing, transport, industry). Working groups could report to the North Tyneside Climate Emergency Board and provide sector specific recommendations/updates etc. Working groups could be used to share learnings, form partnerships, and pilot activities. If local networks already exist they could be built upon.
- **Climate emergency review committee:** a committee to assess all council policies, decisions and services to determine their impact on the environment and progress towards a carbon-neutral Borough. Reports to the Cabinet and full Council. A comparable level of transparency could be achieved through the use of Public Meetings. This external group could focus on reviewing the wider activities associated with decarbonisation of the Borough.
- **Citizens assemblies:** Citizens Assemblies on Climate Change are used to engage the public in the debate on solutions to the climate emergency. Citizens Assemblies have been adopted by local authorities such as Oxford City and Camden Borough Council.

Section 5: Monitoring and Evaluation

Once the North Tyneside Climate Action Plan and it's associated carbon budgets are adopted, measuring progress is a critical part of implementation.

Monitoring occurs during the strategy timeframe and is key in that it helps to understand if the strategy is on track, understand where impacts will or will not be realised, identify what changes are needed to ensure success and capture lessons learnt. We recommend that monitoring activities are undertaken at least on an annual basis, but potentially more frequently to coincide with Climate Emergency Board meetings.

Evaluation on the other hand happens after the strategy timeframe. It is important to evaluate the strategy to determine whether the objective has been met, the impacts realised, and learning for the future identified. More in-depth evaluation activities could be implemented on a five-yearly basis to coincide with the carbon budget timeframes.

North Tyneside Council should consider how progress against the carbon budgets will be monitored. For example, this could include an annual assessment of the carbon emissions across the Borough, using updated BEIS subnational data, compared against the baseline year. The use of relative metrics, such as the Carbon Emissions Per Capita, Carbon Intensity (e.g. tonnes CO2/GWh consumed) or the ratio of GVA to carbon emissions, will allow the Council to account for changes in population or economic output and provide a benchmark to allow a like-for-like comparison with other regions or against the UK's national progress.

There should also be as aspect of monitoring progress in the implementation of projects identified in the action plan. It is recommended that the Council and other key stakeholders that will bring these projects forward monitor their success based on outcomes sought and on a set of Key Performance Indicators (KPIs). It is recommended that the Council and key partners discuss the implications of various approaches to monitoring progress of the action plan projects to reach a fit-for-purpose solution that does not place unmanageable additional burden on Council and is easy to understand and implement.

Section 5: Monitoring and Evaluation

Below we have outlined a set of principles that should govern the monitoring of individual projects within the action plan:

What are you monitoring?
For each of the projects and initiatives in this Action Plan, it will be important to monitor the activities that have been undertaken to advance those proposed projects, the policies that have been put in place and their effectiveness, the outputs and the costs. The Council and other delivery stakeholders should also assess whether corrective actions are needed at the point of monitoring.

How are you monitoring it?
One needs to have sufficient clarity around who is being monitored, and how. Delivery staff, end consumers, and all other affected stakeholders can be the object of the monitoring activity. The Council and delivery partners can decide to monitor the action plan's progress during Board meeting cycles or at specific pre-defined milestones.

How do you respond to monitoring findings?
If the monitoring indicates that the action plan is not on track it is important to address the following questions:

- How far off is it?
- Is it only in certain areas or all areas?
- What action is needed to correct it?
- Who can implement it?
- How quickly can it be corrected?
- How can unintended impacts be mitigated or reduced going forward?

Appendix 1: Scenario Cost Methodology

The methodology used to calculate the costs of emissions reduction pathways to 2050 creates high-level, indicative costs. The total cumulative cost is the sum of the discounted cost of each year for each main area.

$$Total\ Cost = \sum_{2020}^{2050} Discounted(Transport + Domestic\ Energy\ Eff. + Domestic\ Heating + Industrial\ \&\ Commerical + Fuel\ Generation)$$

For 'transport', 'domestic energy efficiency' and 'domestic heating', the cost was simply found by multiplying the expected number of units based from the scenario by the capital cost of the unit.

For 'industrial and commercial' and 'fuel generation' the cost is found by first finding the number of jobs created. This is done by multiplying the number of low carbon sector jobs supplied per GWh[10] of fuel consumed by the change in energy consumption expected from the scenario analysis. Using ONS data on the GVA per job in each sector it's then possible to use the number of jobs from the previous step to find the GVA created and thus the investment required.

It should be noted that there will likely be numerous costs that aren't included within this methodology, such as electric transport charging infrastructure, building of EfW and recycling plants, etc.

[10]Rutovitz and Atherton, 2009. As quoted in Cambridge Econometrics, 2015, *Assessing the Employment and Social Impact of Energy Efficiency.*

Appendix 2: Project pipeline

This section contains the long list of projects that were identified through stakeholder engagement, desk based research and a review of the relevant evidence base (e.g. pathway analysis). The stakeholders engaged throughout the project included representatives from the commercial and industrial sectors, public sector organisations, the third sector and local community organisations, housing professionals and developers.

Ideas for projects were submitted through an online survey, shared in discussion groups during a engagement workshop and received by email. Stakeholders received guidelines to encapsulate their ideas. Follow up calls were arranged with a smaller number of stakeholders to gain further insight into some of the projects details.

Extract: stakeholder survey – project ideas guideline

Part 3 - Share your Project Ideas

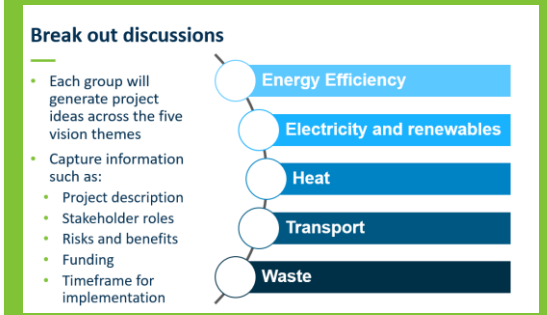
Call for Project Ideas
In this section, please provide your transformational project ideas that you believe could accelerate the route to a carbon neutral economy and society, and improve or transform buildings' energy efficiency, electricity, heating, transport and waste strategies in North Tyneside. These ideas are ideally at the large-scale. Alternatively, feel free to use this space to share examples of projects implemented in other geographies that you think are interesting or innovative and could be relevant for North Tyneside. Please note - these project ideas may inform the Delivery Plan.

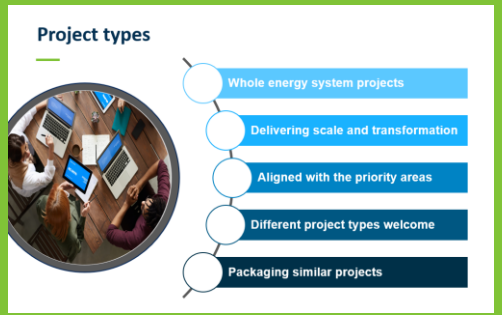
Try to provide as much information as possible about your idea. We have laid out some questions as guidelines. We do recognise that many project ideas will be concepts and that it won't be possible to answer all of the questions.

Idea 1: Please briefly explain your project idea below.

Guideline questions:
1) Project Title
2) Brief description
3) Objectives and rationale: What does your project hope to achieve/overcome/improve?
4) What are the proposed outcomes?
5) Have you thought of a proposed location for the project?
6) What might the project cost look like?
7) Do you have any similar examples of where this has been implemented?

Extract: Engagement workshop slides – break out discussions guideline





The project ideas went through a process of screening and evaluation from which strategic projects (those which had a higher potential of contributing to carbon reduction efforts) were selected, further developed and incorporated into the action plan in Section 4.

Appendix 2: Project pipeline

Project Name	Project Type	Description
Nature Based Education Centres	Education	Mini forests to be used as an outdoor laboratory for schools so children can learn about the environment and eco-systems, and become environmentally responsible citizens and develop the skills and attitudes needed to address the climate emergency. Cost: starter pack from Woodland Trust £60 each. Supported by council employee to look after the forests and a teacher. 2 salaries £100K pa.
Energy Efficiency community education programme	Education	Raise awareness across the community Inform and explain how people can change behaviours/habits and make the right decisions which will make a difference to emissions (and save them money/deliver other co-benefits, e.g. in health and wellbeing). In partnership with Green Branch of the WEA
EE and Energy management in high school curriculums	Education	Schools in North Tyneside are a real mixed bag – split across PFI, trusts, academies, religious schools. o There is high participation in the 'green flag' scheme. o It's easy slipping in efficiency and energy management lessons into the junior/first and middle school curriculums, as there's much more flexibility, but at the high school level, there is much less flexibility and freedom
Training scheme for Solar PV and heat pumps installers/retrofitting	Education	Training the workforce to ensure better Solar PV and retrofit energy efficiency measures
Promoting sustainable diets	Education	Workshop to explore possibilities within council to integrate more urban agriculture for local food production, promoting healthier diets and managing food waste strategies.
Personal carbon footprint plans	Education	Providing tools for individual employees to use to visualise where most of their individual emissions contributions come from. Will help to manage and reduce their individual footprints.
Develop and deliver a communications strategy for engagement with residents	Education	Focus on what action residents and landlords can take to decarbonise their homes and on selling the wide range of benefits beyond addressing the climate emergency – e.g. links with health and wellbeing, economic, wider environmental benefits. Community and voluntary sector could support local authority with grassroots outreach and engagement activities with residents, they network throughout the community and are trusted partners within the borough. Could deliver outreach through community centres and door to door knocking.
Setting up sector specific networks to coordinate action	Education	Organising a series of sector specific working groups to take on responsibility for delivering various aspects of the climate emergency response across North Tyneside. Working groups reporting to the North Tyneside Climate Emergency Board and providing recommendations /updates etc. Use groups to share learning, form partnerships, pilot activities, agree on roles and responsibilities. If local networks already exist they could be built upon.

Appendix 2: Project pipeline

Project Name	Project Type	Description
SME carbon reduction programme	Education	Training employees on how to decarbonise their operations, to drive investment in low carbon measure and changed behaviours. Could include a specific focus on SMEs, that tend not to have that capability in-house
Council housing stock retrofit programme	Energy Efficiency	Insulation and retrofitting of existing local authority-owned housing stock using a continuous process. Requires a commitment to human resources and capital funding over multi mayoral/council terms to be effective. Will cover both simple measures, such as solar adhesive films on the windows, as well as complex multi-measure retrofit.
Integrate 'energy efficiency first' approach into fuel poverty policy & programmes	Energy Efficiency	Fuel poverty policy should be pivoted to focus on efficiency and renewable solutions. One of the three priority areas for the Combined Authority is fuel poverty. There are 95,000 homes in North Tyneside, the previous Warm Homes Scheme addressed (although only partially) 30,000 homes. This was mainly the council stock, which is of an average/good quality. It is current practice that retrofit programmes start with fuel poor homes first, as this is where the most co-benefits are, however it needs to be cemented that fuel poverty solutions used are always low carbon.
EE retrofit in homes - implementation and information	Energy Efficiency	A broad ranging retrofit programme providing a 'one stop shop' for energy efficiency. Covering both awareness raising, information and implementation across various measures and levels of ambition.
Energy efficiency incentives for SMEs	Energy Efficiency	Programme will provide information and incentive to encourage SMEs to install energy efficiency measures. SMEs are leasing their property, potentially on short-term contracts. Bigger organisations can employ someone to focus on the issue and chase it up, but smaller organisations often have many competing priorities for their attention. Will cover both simple measures, such as solar adhesive films on the windows, as well as complex multi-measure retrofit.
Smart appliance upgrades in businesses	Energy Efficiency	Support the upgrading of large electrical appliances to more energy efficient 'smart' appliances which consume less energy, are cheaper to run and can contribute to demand-side response.
Retrofitting private rental properties	Energy Efficiency	Programme targeted at getting landlords to take action to decarbonise homes across North Tyneside through fabric efficiency (e.g. insulation) and low carbon heating. This could include an element of policy 'stick' wherein a minimum EPC efficiency standard for privately rented properties is required for a landlord to be licenced. Previous Warm Homes Initiative had issues with private sector and stakeholder engagement. An alternative approach to incentivising this could be linking council tax to the level of energy efficiency improvements, ensuring that the beneficiaries of the improvements (those living in the property and paying council tax) and the ones paying for them. At the same time, the landlord benefits from improved property quality and associated rent uplift.
LED lighting	Energy Efficiency	Ensuring that all council buildings and sites have had lightbulbs upgraded to energy efficient LEDs.

Appendix 2: Project pipeline

Project Name	Project Type	Description
Alternative fuels for industrial processes	Energy Efficiency	Promoting energy efficiency and developing alternative fuels/ running pilot trials for technologies such as hydrogen heaters using green hydrogen derived from electrolysers powered by offshore wind. Biomass/waste materials can also aid decarbonisation of high temperature industrial heating processes
Electrical sub-metering for high-consumption sites	Energy Efficiency	Project supporting the gathering of accurate insights on baseloads and target site-specific reductions in energy consumption of particular high-consumption sites. Involves the installation of either MID (Measuring Instruments Directive) approved or any meter capable of producing an output, such as pulse or Modbus that can measure energy usage after it reaches the primary utility meter. Sub-metering offers the ability to monitor energy usage for individual tenants, departments, pieces of equipment or other loads to account for their actual energy usage. The Benefits of Sub-metering are: - Accurate energy monitoring, real-time or day plus one energy consumption; - Granular in-depth review of facility energy data; - Better informed to make decisions that can help optimize energy performance; - Ability to record actual energy usage (no estimates); - Comparison of usage across similar facilities over time; - Ability to identify and eliminate wasted energy; - Early access to maintenance issues for repair before critical equipment fails. ***Costs:*** Not specific, the saving can be re-invested in increased monitoring capacity. As part of the government's RE:FIT scheme, it would pay for itself in just over 10 years. - Multiple providers can do this, including SSE Energy Solutions - Providers such as SSE may offer upfront funding as part of a package of services which would be agreed under contract
Water-sourced heat from the River Tyne (and from mine water)	Heat	Water-sourced heat proposals being developed in nearby areas, including for South Tyneside Council in Jarrow, also using the River Tyne. Also Durham University (River Wear). Recommend further investigation into what is happening with the South Tyneside proposed scheme, to identify any possible synergies with that project, and whether a similar project could be developed in North Tyneside.
District heating	Heat	Identifying potential sites within NT that could utilise district heating systems to mitigate heating emissions
Ensuring all new boilers are hydrogen compatible	Heat	New boilers that are installed must be capable of being upgraded to hydrogen boilers in the event of a hydrogen switchover, with a target of all boilers in the region being hydrogen compatible by 2040

Appendix 2: Project pipeline

Project Name	Project Type	Description
Large-scale electric heating rollout	Heat	Rolling out the electrification of heating using heat pumps or electric radiators, targeting 33% of viable homes by 2030, 66% by 2040 and 100% by 2050
Forestation to offset emissions	Nature-based Solutions	Tree planting scheme developed through accredited processes. Identify suitable places, involve the community to give ownership. Something like the successful Great North Forest project of the 1990s which was delivered by Ground work trust Durham or examples in Forestcarbon.co.uk. Funding: grants, local funding, public conscription or crowd funding.
Intertidal habitat restoration on North Tyneside Coast featuring saltmarsh carbon capture	Nature-based Solutions	Restoration of saltmarsh. A 18/19 Habitat Restoration feasibility study of the Tyne Estuary identified habitat restoration sites which would create fringing saltmarsh habitat - area to be confirmed as there are a number of potential sites which have been identified.
Climate Emergency Review Committee	Policy	A new committee to assess all council policies, decisions and services to determine their impact on the environment and progress towards a carbon-neutral borough. Reports to the Cabinet and full Council. Cost: salary and associated costs £50K
Participating democracy programs	Policy	Inviting the public to participate in a decarbonising exercise within the boundaries of North Tyneside and recognising that the people as Citizens and/ or Stakeholders have much to contribute
Divestment from fossil fuels	Policy	Sustainability criteria attached to pension fund investments
Solar carports	Renewable energy	They are doing one at Killingworth, but they are 40-50% more expensive due to the need for steel structuring and lighting
Hydrogen-fuelled public transport	Transport	Buses and HGV/LGV
Region-wide higher ambition building regulations	Policy	North Tyneside work with wider North of Tyne region to set higher ambition building standards for new developments, this will include requirements to integrate renewable energy, such as solar pv, ground source heat pumps etc., where appropriate.
Waste heat capture from data centers	Heat	Data centres (e.g. in the Cobalt) are a growing sector in the borough. Such sites are high consumers of electricity and generators of heat. This heat be captured and utilised in nearby buildings which have heat demand.

Appendix 2: Project pipeline

Project Name	Project Type	Description
Hydrogen reformers for low Carbon Commercial Vehicles	Transport	Retro fitment of Hydrogen Reformer units to commercial vehicles. Suitable for North Tyneside transport department or a local bus/truck fleet operators premises. The individual units cost circa £3,500 plus annual support circa £500. System description: retrofit which has been proven to not only reduce vehicle emissions but also to improve fuel efficiency. By means of electrolysis, the system reforms deionised water back to the fundamental elements of H2/O2 but with a difference, due to the electrode configuration and applied voltage a secondary element of water vapour is also generated. Water cools combustion to reduce emissions of NOx whereas the H2/O2 improves combustion efficiency of the primary fuel to reduce particulate matter and carbon monoxide. This combined effect has the result of a dramatic improvement in fuel efficiency with substantial emissions reduction. Developed locally by David Harvey of NuNrg Reformers Limited - more information provided in brochures (sharepoint)
Low traffic neighbourhoods	Transport	Low traffic in residential neighbourhoods. Link neighbourhoods with high quality walking and cycling routes. Cost: £2 million although cost savings could be achieved by implementing multiple locations at the same time. Success story: Ghent's (Belgium) traffic circulation plan (city wide LTNs). Motor vehicles used to make up 55% of trips – that number has now fallen to 27%.
Cycling and walking infrastructure	Transport	Roll out of infrastructure to enable more cycling and walking. Capitalise on the willingness of people to cycle as a result of covid (175% increase compared to before). Closing roads and widening pavements, providing good access to cycle lanes etc. East to west travel within the borough is really difficult with existing transport infrastructure. Some cycling networks in the region are poor and unsafe, road surfaces not good for bikes – need investment. Encourage modal shift prioritising active travel and multimodal including public transport. Cost: £3 million per annum over 10 years, £30 million in total
Energy systems integration + solar PV	Renewable energy	Integrate solar PV generated by households and high street premises into the grid. Cost: £6,000 to £10,000 per household (less with a bulk buying scheme)
Biomethane Project	Renewable energy	Application of AD to treat liquid chemical plant wastes. Use AD on our pharmaceutical site to decarbonise the waste streams and produce biomethane for supply to Northern Gas Network. Existing aerobic effluent treatment plant which treats site waste and some commercial wastes from local companies. By enhancing the existing ETP with an anaerobic treatment stage, can convert the organic content of the waste to biomethane for use as a green fuel. Cost: £8.5M (planning application submitted). Plant planned to have capacity to treat waste for local industry.
Harness wave / tidal energy	Renewable energy	Not well researched / high level suggestion

Appendix 2: Project pipeline

Project Name	Project Type	Description
Community energy	Renewable energy	Deliver grassroots community energy projects with local ownership – street by street solar/EE/heating projects. Covid has brought lots of neighbourhoods together, worth capitalising on this opportunity. Have developed an engagement strategy and can support groups in getting systems onto the local network
Solar PV rooftop scheme across domestic and commercial sites	Renewable energy	Programme to roll out solar PV across domestic properties. Provide grants for the initial feasibility assessment. This then provides households/businesses with the intel (showing a strong business case) that gives them the confidence to make the investment decision. Examples: Sheffield Solar rooftop scheme. Need to look at mechanisms for high energy using consumers to pay for it themselves, focussed on the messaging to make it attractive e.g. digitisation, smart tech
Varied vehicle size for council fleet/leased vehicles	Transport	Size of vehicles used within the council should be as small as possible to minimise emissions, tailored to the specific use and demand. Ideally, vehicles should also be low emission
Ecodriving training programme	Transport	Ecodriving is a driving style that reduces fuel bills, cuts carbon emissions and lowers accident rates. The techniques taught such as route optimisation are straightforward and an effective way to see immediate results, Ecodriving training delivers average fuel savings of 15% on the day of training and up to 6% in the long-term for fleets.
Drop-in biofuels	Transport	Exploring the potential for using drop in biofuels within the NT fleet
Anaerobic digestor for food waste to produce blended compost for local SMEs	Waste	With more and more people growing their own vegetables they need more compost which can be supplied by moving the existing garden waste recycling facility into the borough and establishing an anaerobic digestor for food waste initially within the Borough and then as a bigger operation covering food waste from all 3 North of Tyne Authorities with the aim of producing a blended compost for all allotment holders and other vegetable growing SME's. Example: anaerobic digestion facility at Stanley in County Durham (some local business send waste there but it has limited capacity).
Packaging control	Waste	Packaging is too excessive, but fears that a response to Covid-19 will actually be to increase (plastic) packaging (at least in the short-term) as an infection control measure.
Paper waste reduction	Waste	Try to incentivise less paper waste being produced by reducing the number of printers available to use within council buildings, and keeping any archives in an electronic format rather than keeping hard copies
Food waste collection for biogas	Waste	Food waste to be collected by local councils to be used for the synthesis of new biogas and biofuels, and to prevent waste to landfill

Appendix 2: Project pipeline

Project Name	Project Type	Description
Expansion of EV charging infrastructure	Transport	Council signed agreement as part of North of Tyne Combined Authority to trial on-street residential charges. Initiative to be expanded
Cross-council coordination of public transport infrastructure	Transport	Coordination across multiple local authorities and other stakeholders for provision of appropriate area-wide transport infrastructure and public transport services. Problem to sove: NTC is part of the North of Tyne Combined Authority, but this doesn't coordinate well enough with South of Tyne or other neighbouring districts to establish a unified vision and well-coordinated implementation of transport policy and provision. Some positive opportunity from the forthcoming North East Transport Plan, produced by the North East Joint Transport Committee, bringing together the two Combined Authorities (N & S of Tyne), Durham and Northumberland County Councils. Will target to remove a specified quantity of cars from the roads in the region by a set date (currently all TBC). This Plan should be out to consultation now, but has been delayed due to Covid-19. Does there need to be a North East City Region Mayoral Authority?
Tool to design EV charging points	Transport	EV Charging Points – Nothern PowerGrid an in-house tool 'AutoDesign' which help figure out how many EVs to put in each location. North Tyneside currently doesn't have a strategy around EVs.
Public transport interlinking	Transport	Create a single-ticketed area and interlink different service providers through aligned timetables and routes.
Cargo Bikes	Transport	Replicate E-cargo bike project in London and Z-move in Newcastle, which are using cargo-bikes to replace white vans
E-bikes and scooters	Transport	Improving electric bicycle/e-scooter availability
Heat pumps in council buildings - initiative to replace end-of-life gas boilers with clean alternative	Heat	The Council council could adopt a policy for its own buildings (demonstrating leadership to others / stimulating market demand and supply chain) that whenever gas boilers reach the end of their natural operating life they must be replaced by an alternative non-fossil fuel technology, e.g. heat pumps.

Appendix 3: Evaluation framework

Overarching evaluation framework

Strategic Fit
How well aligned is the project to local strategic priorities?

Environmental Benefits
Does the project deliver environmental benefits, including emissions reduction and air quality improvement?

Deliverability
Is the project realistic and deliverable within the timeframes?

Economic outcomes
Will the project improve job opportunities and drive economic growth?

Value for money
Does the project deliver value for money?

Appendix 3: Evaluation framework

Strategic Fit

Is the project aligned with strategic sectors for North Tyneside?

How well aligned is the project to local strategic priorities?

How well does the project align to regional priorities and outcomes as outlined by the North of Tyne CA and North East LEP, and the UK as a whole?

How well does the project meet or build upon aims/aspirations of the relevant North Tyneside strategies and plans? e.g. Our North Tyneside Plan, Local Plan, Low Carbon Plan (this Action Plan will succeed the current Low Carbon Plan), Housing Strategy, Transport Strategy, Waste Strategy

Will the project develop innovation in the region?

Does the project deliver social benefits? (e.g. health improvement, social awareness, community engagement, etc.)

Does the project contribute towards improving energy infrastructure across the region?

Appendix 3: Evaluation framework

Environmental benefits

Does the project significantly contribute to making North Tyneside a leader in decarbonisation?

Does the project deliver climate change mitigation through absolute carbon reduction or the reduction of emissions intensity to facilitate sustainable growth?

Does the project support the restoration of natural habitats?

Does the project have potential to deliver scalable environmental benefits? (e.g. demonstrator projects easily replicated, and with rapid take up)

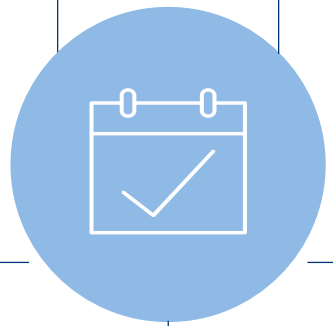
Does the project help to deliver improvements to air quality levels?

Appendix 3: Evaluation framework

Deliverability

Has the project secured, or identified a reliable source to secure the necessary planning permissions and consents ?

Has the project secured or identified a reliable route to secure a sufficient funding package to enable it to reach financial close?



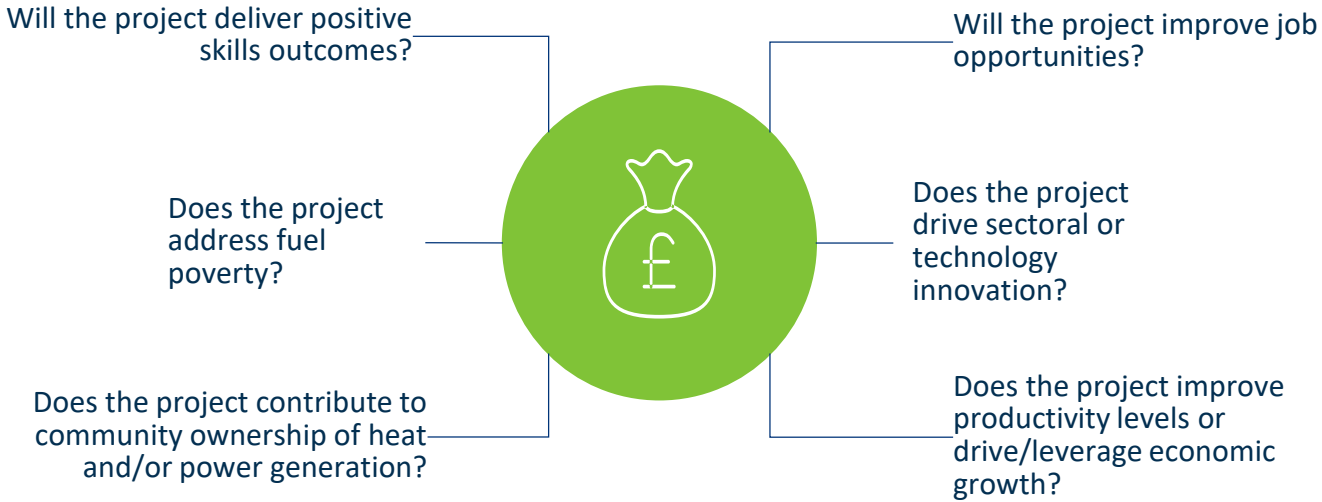
Is the project realistic and deliverable within the timeframes?

Is the project politically acceptable? Is the project likely to be acceptable to the public and other key stakeholders?

Have the risks been mitigated ?

Appendix 3: Evaluation framework

Economic outcomes



Appendix 3: Evaluation framework

Value for money

Does the project include financial business case metrics (Capex, NPV, IRR %, simple payback)?

Does the project achieve a low cost per tonne of carbon mitigated?

Does the project achieve a competitive Levelised Cost of Energy (LCOE) – at present value of total life cycle cost?

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