

Creating a world fit for the future





Leicester Carbon Neutral Roadmap Summary

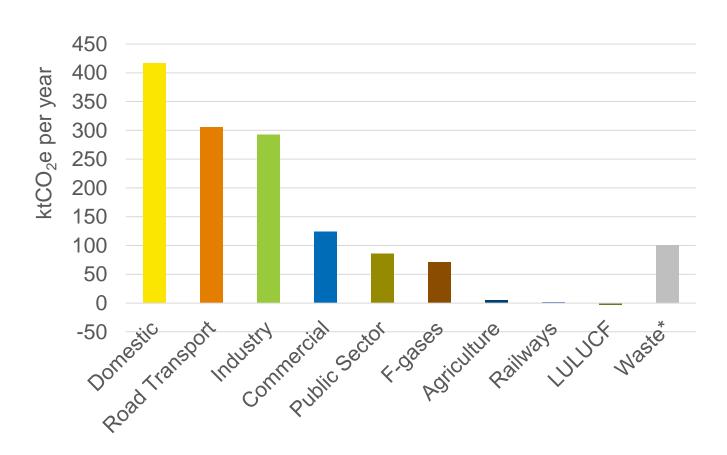
Produced on behalf of Leicester City Council

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Current sources of greenhouse gas (GHG) emissions in Leicester



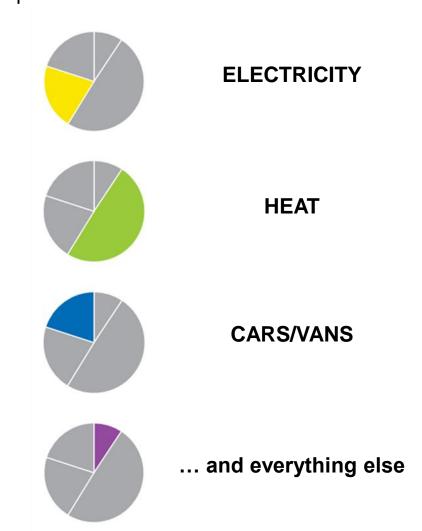
GHG emissions in Leicester (2019)



^{*} Waste is reported for information but not within the scope of the Roadmap

Note that LULUCF stands for 'Land Use, Land Use Change and Forestry'

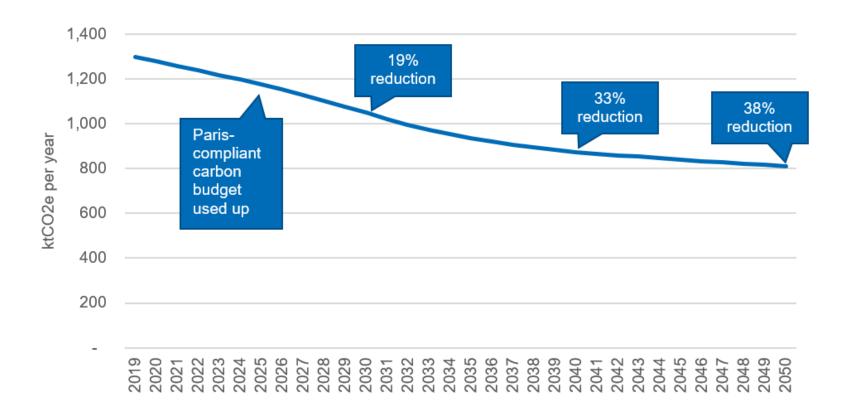
Looking at this data another way, the major priorities are...



The 'Business-As-Usual' (BAU) scenario for Leicester



GHG scenario modelling has been used to evaluate the impacts on Leicester's emissions of changes that are considered most likely to occur between now and 2050, if **no further action is taken**. This is the BAU scenario.



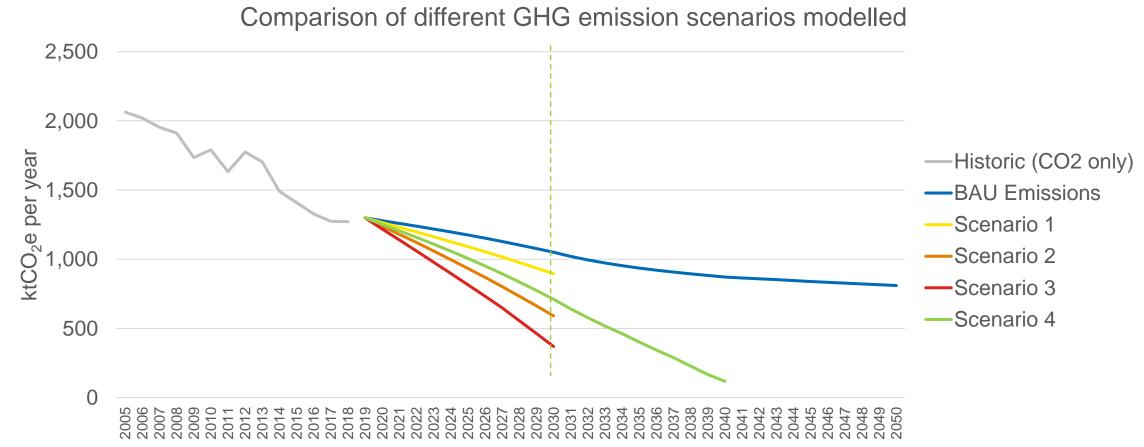
In this scenario, the **2030 ambition is not met** – in fact, according to the CCC, the UK as a whole does not have sufficient policies in place to reach net zero by 2050.

Raising the level of ambition



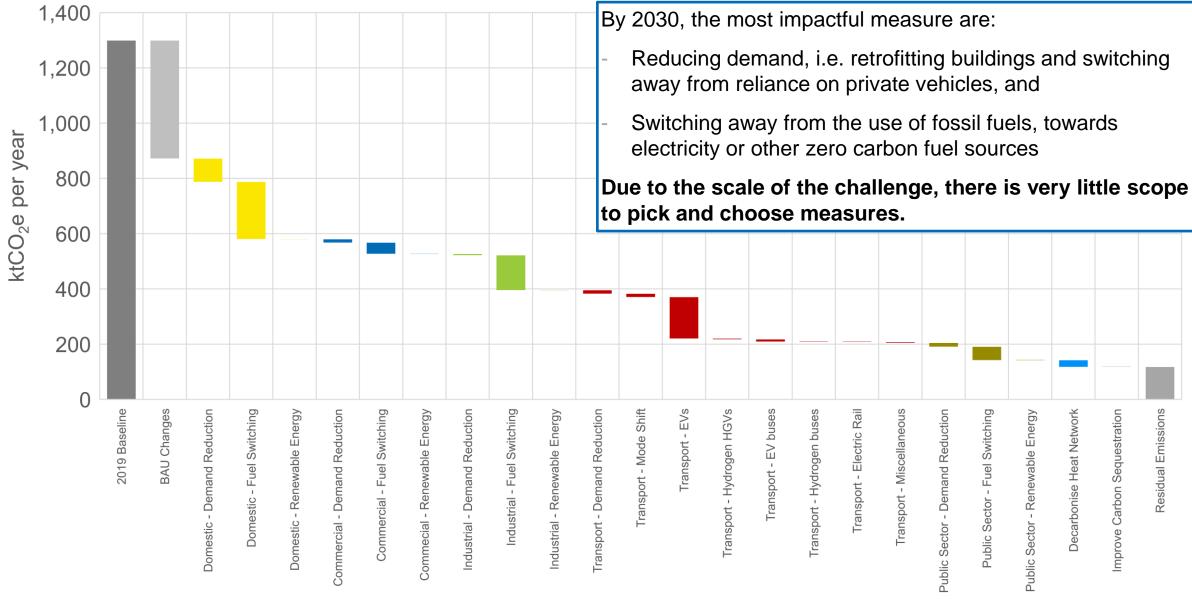
Four additional scenarios were modelled for Leicester representing higher levels of ambition than the BAU

- Scenario 3, which gets closest to net zero by 2030, does so by prioritising:
 - (1) demand reduction
 - (2) electrification
- These are the core themes of Leicester's strategic pathway to reach carbon neutrality



Impacts of mitigation measures in Scenario 3 for Leicester





In practical terms, Leicester aligning with the most ambitious scenario would involve...





Approx. **12,000**

heat pumps

installed per year Current total: <1000



50% of journeys to be

walking or cycling

(or more use of public transport)



Up to 100%
electric cars, vans, and buses
Current total: <1%



Minimum **65,000**

buildings to undergo energy efficiency

retrofits



3x increase

in use of public transport (or higher rates of walking and cycling)



Approx. **6,000**

solar panel

installations each year Current total: 4,600

... and no further increase in energy demand or GHG emissions from any source

Leicester's Buildings (1)



Priorities for:

Zero carbon buildings

Reduced energy demand

Energy efficiency on its own will not reduce GHG emissions to zero, but will make it much easier to achieve.
Retrofitting is a crucial prerequisite for heat decarbonisation, from both a cost and practicality standpoint.

Decarbonised heat supply

The biggest challenge in buildings is to decarbonise the heating supply. This will require a massive scale effort to switch from fossil fuels to low carbon heating systems. Heat pumps will be the primary measure for doing this.

Decarbonised electricity

Leicester's constrained area means that it is not practical for the city to produce all its own electricity, but uptake of local renewable energy generation (e.g. rooftop solar) should still be promoted.

Together, these measures reduce emissions by up to 35% in Scenario 3

Leicester's Transport (1)



Priorities for:

Zero carbon transport

Reducing travel demand

To reduce the need for new infrastructure, it will be crucial to maximise opportunities to avoid journeys altogether, and shift remaining journeys towards walking, cycling and public transport.

Zero emission fleet

The biggest GHG reduction in transport comes from switching to EVs. The shift will be primarily market-led, but will not be complete by 2030. Realistically, the focus will be on facilitating and incentivising uptake.

More efficient freight

For technological reasons, zero emission HGVs are not likely to be widely in use by 2030, so the focus needs to be on demand reduction, journey consolidation, engine efficiency, and driver training.

Together, these measures reduce emissions by up to 16% in Scenario 3

Leicester's Energy (1)



Priorities for:

Zero carbon energy system

Improved electricity grid

and transport could more than double electricity use. Existing grid infrastructure cannot accommodate this additional demand, so will need to be upgraded.

Increased renewables

There is relatively limited scope for renewables within the City boundary, but across the country, both large- and small-scale renewable capacity will need to increase radically, and LCC can support this.

Decarbonised heat network

The heat network will need to stop using natural gas as fuel. This does not have a big impact overall, but it is important to reduce emissions wherever possible so that offsetting is a last resort.

The impacts of these measures are not assessed separately, but contribute towards carbon savings from BAU changes (19% in Scenario 3) and fuel switching (32% in Scenario 3).

Sources of Leicester's residual emissions



Even under the most ambitious scenario, 29% of today's annual emissions will remain by 2030.

The figure on the right shows some examples, and indicates how these can realistically be reduced.

In order to achieve net zero emissions by 2030, some form of carbon offsetting measures would inevitably be required.

HGVs



- Reduce demand where possible
- Potential solutions could include hydrogen, electrification or sustainable biofuels

Industrial heat



- Work with businesses to understand the energy end uses and possible technological alternatives
 - Promote R&D and pilot projects

F-gases



- Future regulations to encourage refrigerants with lower GWPs
- Demand reduction and technology breakthroughs

Rail



 Collaborative push for rail electrification in Leicester and surrounding lines

Options for addressing residual emissions



Key options:

- 1. Measures within Leicester: tree planting and other nature based solutions (but scope is limited)
- Measures outside Leicester:
 - a. Nature-based solutions, directly undertaken by LCC with partners
 - b. Large scale renewables, directly undertaken by LCC with partners outside the city or
 - c. Purchasing carbon offsets.

Examples of nature-based solutions include:



Protecting existing carbon sinks (e.g. greenfield sites), while also protecting ecosystems, natural habitats and biodiversity



Implementing best practices on Council-owned land (e.g. parks) and working with other local landowners and communities to do the same



Increasing tree cover where possible and ensuring that it is sustainably managed in the long term



Releasing Council-owned agricultural land for alternative uses (e.g. woodland or rewilding projects)



Working with Government and engaging with stakeholders



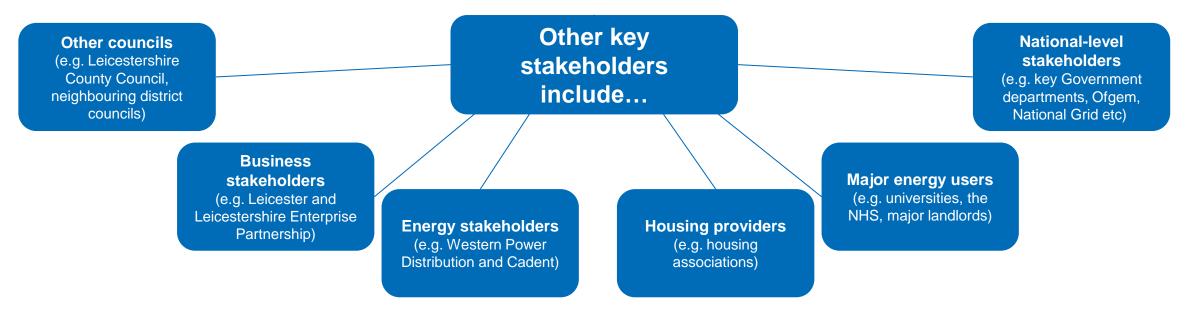
Considering the scale of ambition, and the scale of costs involved, it is clear that LCC cannot achieve net zero alone, and will need support from the Government. Some of the most important requests will be to...

Ensure that national-level programmes and funding are sustained and stable

- Remove barriers to those pursuing further levels of ambition
- Re-allocate funding away from projects that increase emissions

Provide additional funding to support new climate mitigation activities

- Promote jobs and (re) training opportunities in low carbon sectors
- Help to ensure that there are robust supply chains to deliver the measures



Key strategic decisions for Leicester

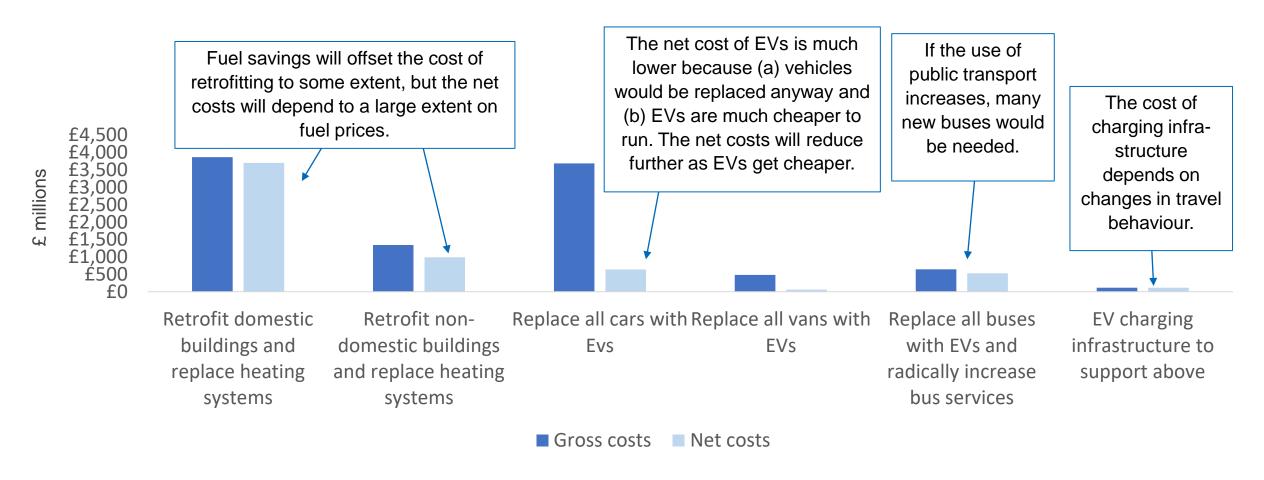


Topic	Description
Approach to offsetting	Decide whether to put effort and resources towards offsetting the residual emissions, or whether to focus on emissions reductions within the City itself (which would almost certainly make reaching net zero by 2030 impossible).
Decarbonisation of heat network	Decide what the role of district heating will be in the route to carbon neutrality, and whether it is worth expanding, given that it is unlikely that the heat network can decarbonise by 2030.
Local vs. large-scale renewables	If there are limited resources available to deliver or promote renewable energy projects, decide whether to focus resources on renewables within Leicester or outside of the City. Onshore wind and large-scale PV are the cheapest options, although they have a larger impact on the landscape.
Role of hydrogen	Decide to what extent the city wishes to invest in continuing to upgrade the gas grid, given that it will be necessary to phase out fossil fuels. This is subject to a decision first being made on the role of hydrogen, which could potentially utilise the existing gas grid. The Government has announced that they will decide on the role of hydrogen to heat buildings in/around 2026, so it may be necessary to wait until the national picture is clearer.
Gas grid upgrades (subject to decision on hydrogen)	

Potential investment costs for Leicester



Examples of 'big ticket' items include:



Remember: the costs of action are much less than the costs of inaction!

Conclusion



Whilst there are a huge number of actions that will need to be taken to transition to carbon neutrality, they can be simplified into four main areas:



Start
mainstreaming
carbon neutrality
considerations
into all activity



Accelerate activities to reduce emissions immediately



<u>Plan</u> for larger emissions reductions longer-term



<u>Increase visibility</u> of action on carbon neutrality to enhance support and buy-in