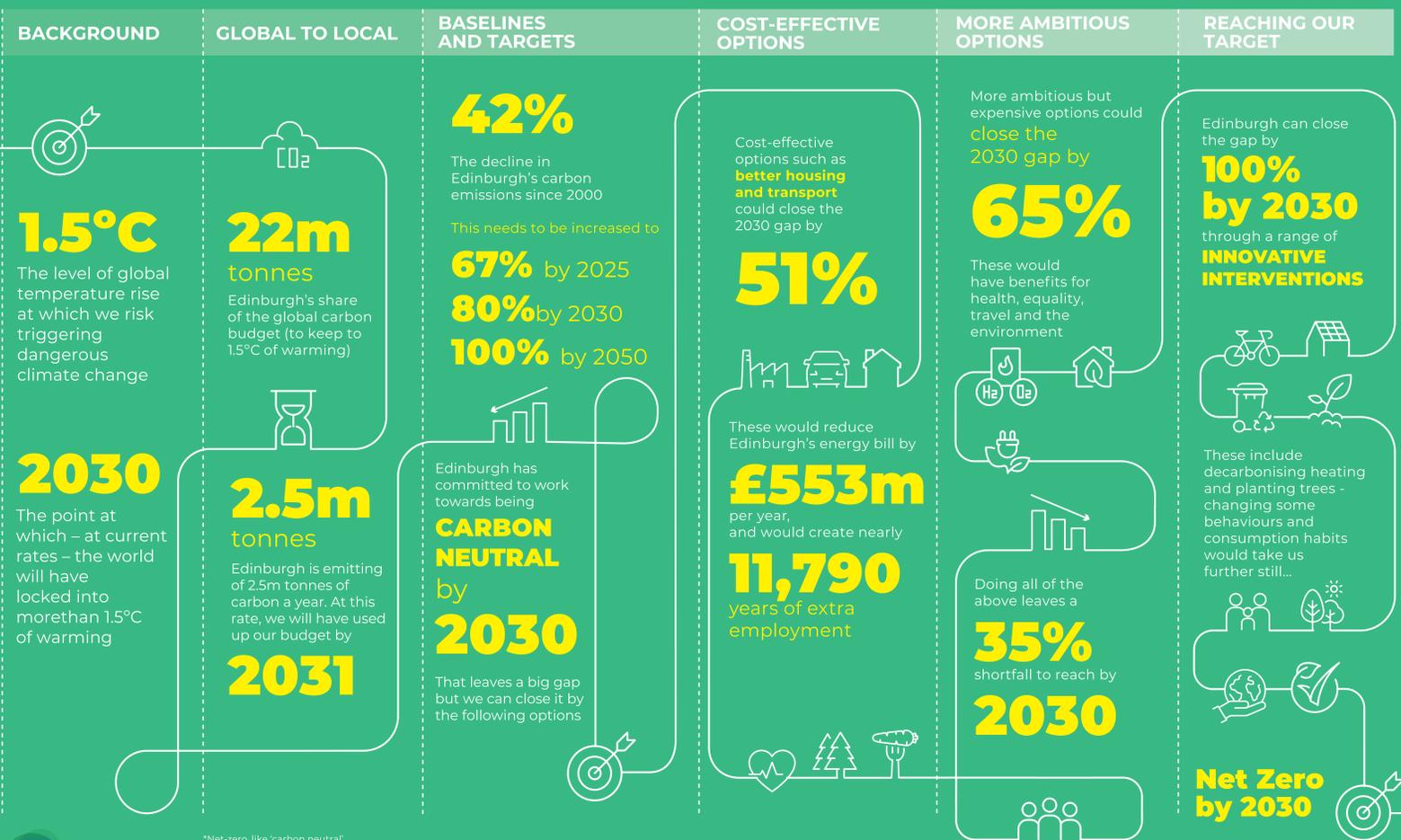


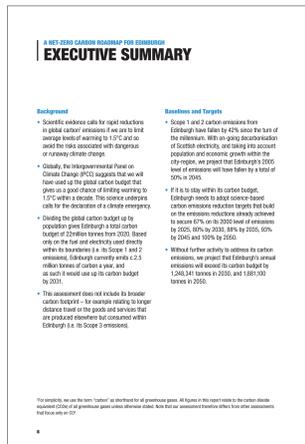
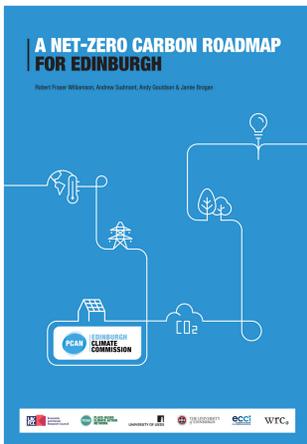
The roadmap to net zero

This diagram, taken from the Net-Zero Carbon Roadmap report shows the journey we all have to make if we are to reach net-zero.



PCAN PLACE-BASED CLIMATE ACTION NETWORK

*Net-zero, like 'carbon neutral', refers to achieving an overall balance between emissions produced and emissions taken out of the atmosphere, with any residual emissions removed through carbon sinks.



The Net-Zero Carbon Roadmap for Edinburgh report.

When will Edinburgh achieve net-zero carbon?

The City of Edinburgh Council has pledged to achieve net-zero carbon for energy and short-distance travel by 2030, which is extremely ambitious, but similar to the targets set by Glasgow, London and some other UK councils.

The Scottish Government has set a world-leading net-zero carbon target of 2045 and the UK Government is aiming for 2050, but these later target dates are being criticised for being too slow.

To reduce carbon emissions of the entire city of Edinburgh is a huge task, requiring every sector of society to play a part.

The City of Edinburgh Council is following a 'Roadmap' prepared by the Edinburgh Climate Change Institute (ECCI) and the University of Leeds that sets out the potential for carbon savings and a timetable for implementation, in order to reach net-zero carbon by 2030. The full report is online.

The panel on the left is a summary diagram of the pathway to net-zero carbon. It shows key headlines and milestones, each of which is backed up by more information in the full report. Towards the end it identifies where more innovation is needed, such as decarbonising heating, which is referred to in the SpACE case studies.

How much will it cost to decarbonise Edinburgh?

To achieve the levels of carbon reduction from the built environment indicated in the roadmap will require high levels of investment every year, until 2030 and beyond. This is expected to come from individual property-owners, local and national government, financial institutions and companies. But it is envisaged there will also be huge returns from lower energy costs, the creation of thousands of jobs and a healthier, more sustainable lifestyle.

The analysis carried out by ECCI for the roadmap suggests that more than half the city's carbon emissions target can be delivered for around £3.5bn and that that this will pay off within 8 years. Financing net-zero carbon is among the biggest challenges in the years leading to 2030.

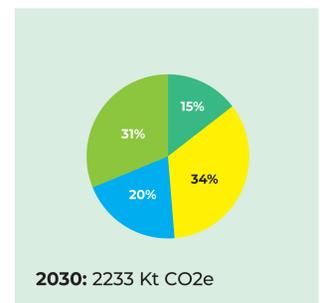
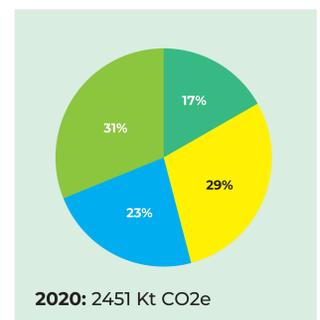
What is 'renewable' energy?

Renewable energy comes from natural processes that are constantly renewed, such as solar, hydro, wind or wave power. Although there are carbon emissions from the construction of renewables, once they are completed the energy is carbon free and some, like wind turbines, are constantly available regardless of demand. Energy consumption is at its greatest during the day, so it's efficient to shift some of that demand to night-time, such as charging batteries for cars or computer equipment.

Scotland already has extensive wind and hydro power, and these will increase over the coming years. It might seem that Scotland is already close to meeting its own needs from renewables, but after the switch from gas to electric heating, demand will increase far beyond the current capacity for renewables.

If renewable energy can be increased at the same time as overall demand for energy is reduced by making buildings and transport more efficient, there will be a time in the near future when our needs can be met by carbon-free energy. This combination of renewable energy and demand reduction is the only way we will reach net-zero carbon.

- Industry
- Domestic
- Public & commercial
- Transport



Edinburgh's 2020 and projected 2030 emissions by sector

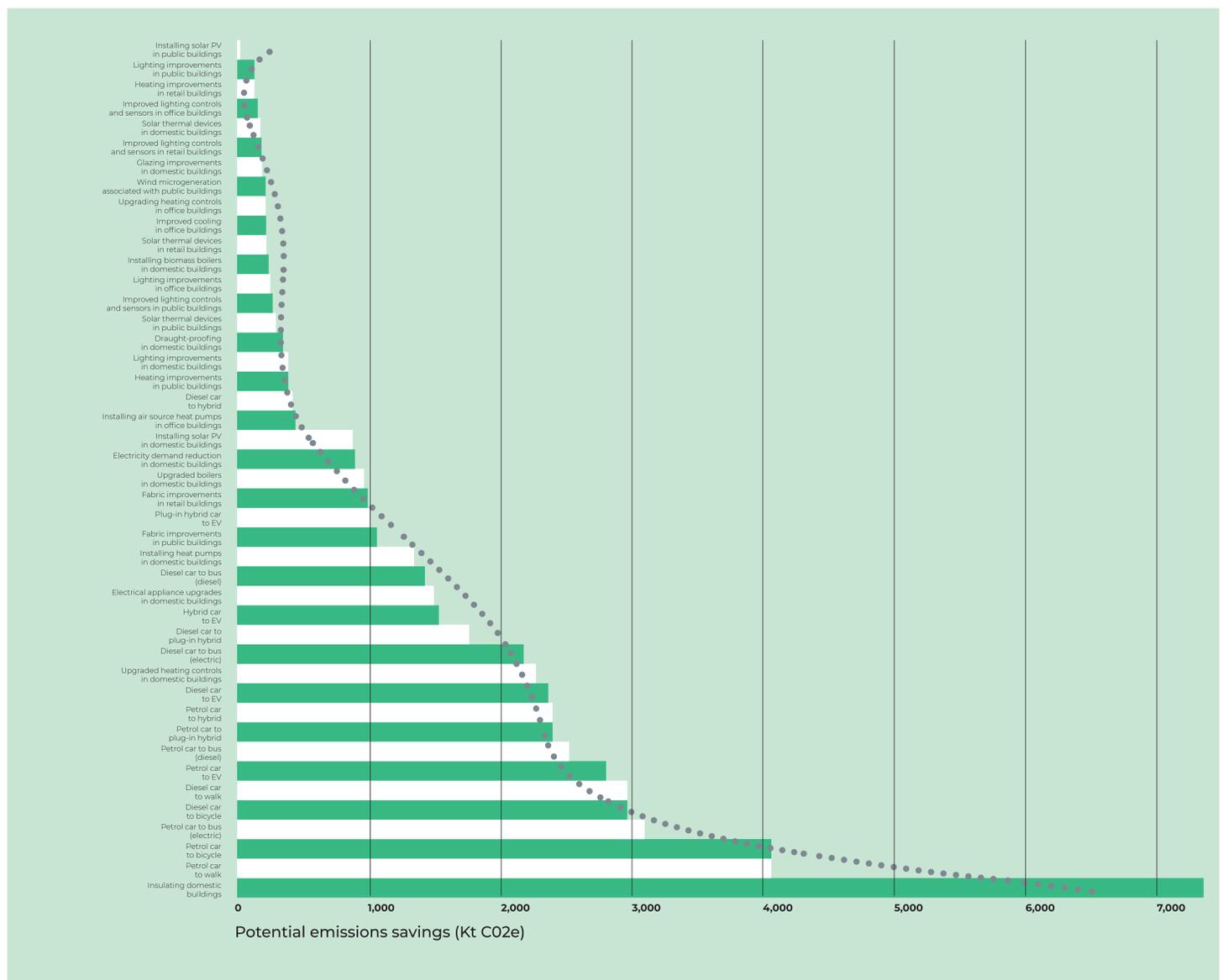
These pie charts show just how big a proportion of carbon emissions comes from the built environment – almost 50% from domestic and public/commercial buildings alone – and how far these emissions need to shrink by 2030.

How Edinburgh can reduce emissions using different measures

To illustrate how every area of life is affected, this chart lists a wide range of areas where emissions can be reduced to meet the 2030 target.

Out of 44 items, 28 relate to buildings and by far the largest reduction can be achieved by insulating our homes.

Crucially, this includes the city's existing buildings, not just new developments, which is why the SpACE case studies examine both.





Bruntsfield Links.
© Jon Barnes.

5 principles for low-carbon techniques in larger buildings

- 01** Simple, adaptable structures for long life and loose fit, designed to be dismantled or converted later.
- 02** Use of low carbon materials, such as locally sourced cladding systems, insulation, masonry and timber.
- 03** Avoiding petroleum-based products such as plastics in internal assemblies and carpets.
- 04** Using 'passive' design. This means natural ventilation where possible, good insulation, control over solar gain and designing for ease of maintenance.
- 05** Feedback on the completed building should be used in the design of future projects.

Why do we need to change our existing buildings?

Although there is a lot of construction currently happening in Edinburgh, 85% of the buildings that will exist in 2050 have already been built, so it is vital that we upgrade our existing buildings if we are to reduce carbon emissions.

Recent studies have also shown that, although new buildings can be relatively efficient to run, their actual construction emits far more carbon than their entire lifetime in operation. We should avoid constructing new buildings wherever there is an alternative as we now know that upgrading existing buildings is far more important to overall carbon reduction targets than previously thought.

In Edinburgh this has additional significance, as there are so many heritage properties that can't accommodate radical change, so carbon reduction will be uneven across the many different types of buildings.

Converting and upgrading existing buildings is set to become the most significant part of the design and construction industry, requiring new skills and creating many jobs.

Techniques for upgrading existing buildings are described later in the exhibition and in the case studies. The panel on the right describes design principles for larger buildings like offices, to ensure they don't need to be demolished at the end of their initial use.

Top-down meets bottom-up approach to energy

This diagram shows that, if buildings can become more efficient and the amount of renewable energy can be increased, it would be possible for supply and demand to balance by around 2030.

