There are options available now in every sector that can at least halve emissions by 2030.
Energy

- **major transitions** are required to limit global warming
- reduction in fossil fuel use and use of carbon capture and storage
- low- or **no-carbon** energy systems
- widespread **electrification** and improved energy **efficiency**
- **alternative fuels**: e.g. hydrogen and sustainable biofuels
Transport

- reducing demand and low-carbon technologies are key to reducing emissions
- electric vehicles: greatest potential
- battery technology: advances could assist electric rail, trucks
- aviation and shipping: alternative fuels (low-emission hydrogen and biofuels) needed
- Overall, substantial potential but depends on decarbonising the power sector.
In some cases, costs for renewables have fallen below those of fossil fuels.
Electricity systems in some countries and regions are already predominantly powered by renewables.
Buildings

- buildings: possible to reach net zero emissions in 2050
- action in this decade is critical to fully capture this potential
- involves retrofitting existing buildings and effective mitigation techniques in new buildings
- zero energy and zero-carbon buildings exist in new builds and retrofits

[Pelargoniums for Europe/Unsplash, City of St Pete CC BY-ND 2.0, Victor/Unsplash, ETekwini Municipality, Arne Müseler/arne-mueseler.com, CC BY-SA 3.0 de]
Industry

- using materials more *efficiently, reusing, recycling, minimising waste*; currently *under-used* in policies and practice
- *basic materials*: low- to zero-greenhouse gas production processes at *pilot to near-commercial* stage
- achieving *net zero* is challenging

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Cities and urban areas

- sustainable production and consumption of goods and services
- electrification (low-emission energy)
- enhancing carbon uptake and storage (e.g. green spaces, ponds, trees)

There are options for existing, rapidly growing and new cities.
Demand and services

- potential to **significantly bring down** global emissions by 2050
- walking and cycling, electrified transport, reducing air travel, and adapting houses make large contributions
- **lifestyle changes** require **systemic changes** across all of society
- **some** people require additional capacity, energy and resources for human wellbeing

[Bosch, Unsplash/Yoav Aziz, Adam Bartoszewicz, Victor Hernandez]
Technology and Innovation

- investment and policies **push forward low emissions** technological **innovation**

- **effective decision making** requires assessing potential benefits, barriers and risks

- **some options** are technically **viable**, rapidly becoming **cost-effective**, and have relatively **high public support**. Other options face barriers

Adoption of low-emission technologies is slower in most developing countries, particularly the least developed ones.
Policies, regulatory and economic instruments

- Regulatory and economic instruments have already proven effective in reducing emissions.
- Policy packages and economy-wide packages are able to achieve systemic change.
- Ambitious and effective mitigation requires coordination across government and society.

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Increased evidence of climate action

Some countries have achieved a steady decrease in emissions consistent with limiting warming to 2°C.

Zero emissions targets have been adopted by at least 826 cities and 103 regions.
"The evidence is clear: The time for action is now"