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Limiting Global Warming: Urban Systems

All types of cities – whether established, rapidly growing, or emerging, can contribute to mitigating climate change through sustainable production and consumption, changes in demand, electrification, and improving urban carbon uptake and storage.

CURRENT EMISSIONS

Emissions from urban areas are driven by population size, income, and the state of urbanisation and urban form

FUTURE OF CITIES

- With no urban mitigation efforts, urban emissions could more than double from 2020 levels.
- Aggressive but not immediate urban mitigation policies could limit global warming to 2°C.
- Aggressive and immediate mitigation policies could limit global warming below 1.5°C by the end of the century.

WHAT CAN BE DONE

How cities and towns are designed, constructed, managed, and powered will lock-in behaviour, lifestyles, and future urban emissions. Urban land areas could triple between 2015 and 2050, with significant implications for future carbon lock-in.

Established cities

Emissions can be reduced by 23-26% by 2050 and offer public health benefits. Options include:

- Improved land use and rezoning, e.g. through spatial planning for compact and resource-efficient cities
- Breaking out of lock-in – e.g. by replacing, improving or retrofitting buildings.
- Electrifying the grid – and employing low emissions public transport.

Rapidly growing cities

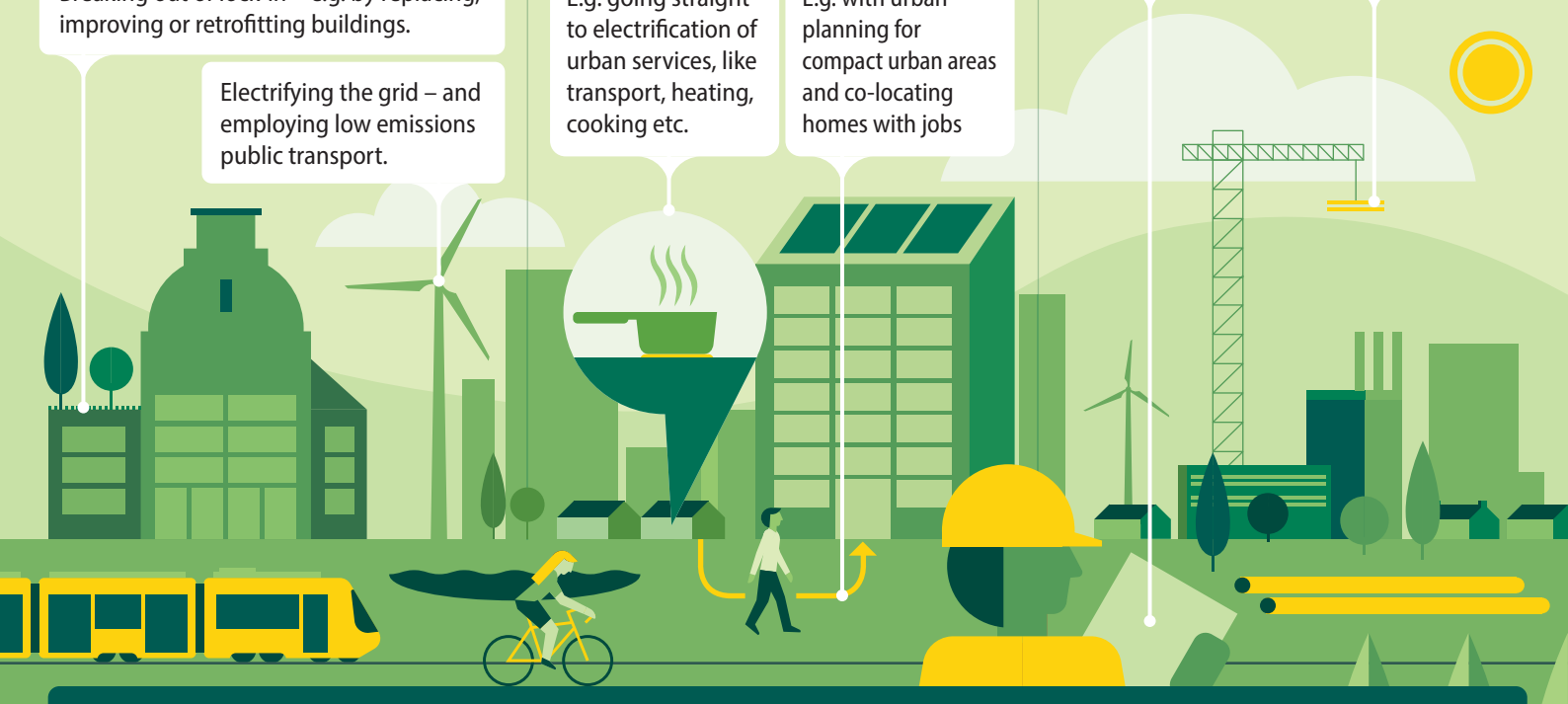
Designing human-centered streets and infrastructure layout is essential for lowering urban demand for energy and achieving low- or net-zero carbon.

- Employing low-emissions materials and reducing embodied emissions.
- E.g. going straight to electrification of urban services, like transport, heating, cooking etc.
- E.g. with urban planning for compact urban areas and co-locating homes with jobs

New cities

These yet-to-be-built cities have tremendous opportunity for low emission design and construction. Achieving this provides benefits for health and economic development.

- Smaller-scale, walkable cities
- Reducing materials demand and use



Urban green and blue infrastructure (in all cities): Urban forests, street trees, green roofs and other permeable surfaces can directly mitigate climate change by sequestering and storing carbon. They can also indirectly help by creating a cooling effect which reduces demand for energy and water.

OTHER BENEFITS

Green and blue infrastructure can help in reducing the urban heat island (UHI) effect and heat stress, reducing stormwater runoff, improving air quality, and improving the mental and physical health of people living in cities.

Measures that promote walkable urban areas combined with electrification and renewable energy can create health benefits from cleaner air and more physical activity.

MAKING IT HAPPEN

BEYOND CITY BOUNDARIES

Beyond city boundaries:
Cities can only achieve net zero emissions if emissions are reduced both within and outside of their administrative boundaries through supply chains (e.g. importing vehicles and building materials).

PARTNERSHIPS & COOPERATION

Addressing emissions beyond administrative boundaries depends on cooperation with national and subnational governments, industry, and civil society.

Putting in place infrastructure to mitigate climate change is often beyond the capacity of local budgets and jurisdictions.

INVESTING IN CITIES

Partnerships, e.g. between cities, institutions, regional governments, transnational networks etc. play a pivotal role in mobilising global climate finance. Current investment in urban areas is only 10% of the climate finance required for low-carbon urban development.

LINKAGES TO OTHER SECTORS

The implementation of packages of multiple city-scale mitigation strategies can have cascading effects across sectors and reduce GHG emissions both within and outside of a city's administrative boundaries.

Consumer behaviour & Transport

Changes in urban form (e.g. density, connectivity, and accessibility) in combination with programmes that encourage changes in consumer behaviour (e.g. transport pricing) could reduce transport related emissions in developed countries and slow growth in emissions in developing countries.

Land and Agriculture

Expansion of Urban areas is likely to take place on agricultural lands and forests, with implications for the loss of carbon stocks and sequestration.

To read full AR6 Working Group III report, please visit www.ipcc.ch/report/ar6/wg3

INTERGOVERNMENTAL PANEL ON ipcc climate change

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