

SUSTAINABLE URBAN MOBILITY

Lesson 2: Sustainable Urban Mobility

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Sustainable Transportation within the Framework of Green Deal - SPHERE

Call: ERASMUS-EDU-2023-CBHE-STRAND-2

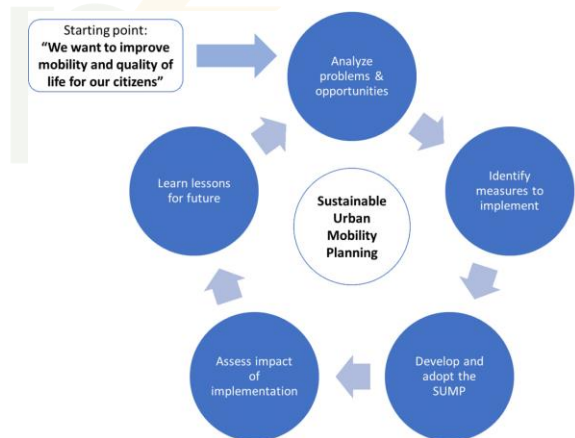
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Agenda:

- Issues, initiatives and planning
- Non-renewable energy sources
- Mobility, greenhouse gases and climate change

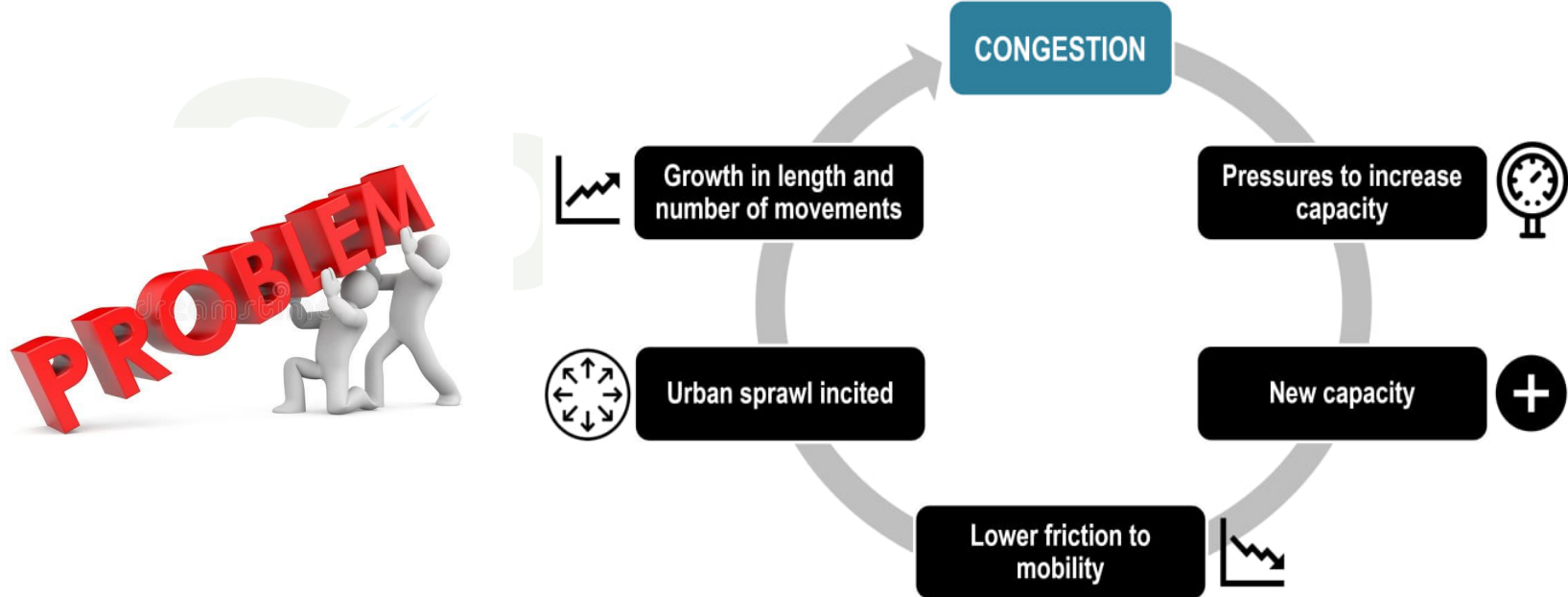
Issues, initiatives and planning

Urban mobility systems face many challenges, including traffic congestion, air pollution, road safety concerns, inefficient public transport, and increasing private car ownership. These issues negatively affect the quality of life, economic productivity, and environmental sustainability. To address these challenges, cities are implementing various initiatives such as improving public transport services, developing cycling and pedestrian infrastructure, promoting shared mobility, encouraging the use of electric vehicles, and deploying Intelligent Transport Systems (ITS). Effective urban mobility planning integrates transport, land use, environmental protection, and social needs to create safe, accessible, efficient, and sustainable cities for present and future generations.



Issues, initiatives and planning

Sustainable urban mobility faces interconnected challenges including excessive car dependency, inadequate public transit, and poor infrastructure for active transport like cycling and walking. These issues exacerbate traffic congestion, air pollution, and climate change. Additionally, cities frequently struggle with policy gaps, technocratic planning disconnected from lived experiences, and a lack of funding for sustainable infrastructure.



Issues, initiatives and planning

Sustainable urban mobility initiatives aim to reduce greenhouse gas emissions, alleviate traffic congestion, and improve civic well-being through public transit, active transportation, and smart city technologies. These frameworks prioritize pedestrian access, electric vehicles, and efficient freight to foster livable, human-centric environments.



Taking Initiative

#Be The First

1. Public Transport Improvement
2. Active Mobility Promotion
3. Clean and Electric Mobility
4. Intelligent Transport Systems (ITS)
5. Demand Management Policies
6. Land-Use and Transport Integration
7. Safety and Sustainability Policies



Issues, initiatives and planning

Sustainable Urban Mobility Planning (SUMP) shifts focus from simply moving cars to prioritizing accessibility, quality of life, and low-carbon transit. It integrates land-use with multi-modal transport strategies—such as walking, cycling, and mass transit—to ensure equitable, safe, and efficient travel.

PLANNING



Climate Mitigation in transport – Avoid, Shift, Improve



Avoid



Shift



Improve

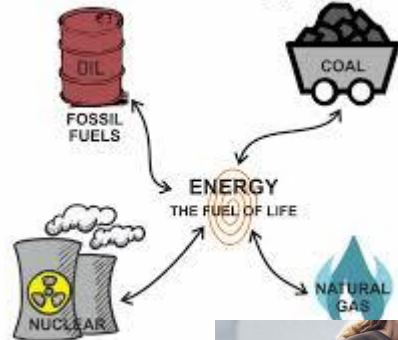


Issues, initiatives and planning



Non-renewable energy sources

Non-renewable energy sources



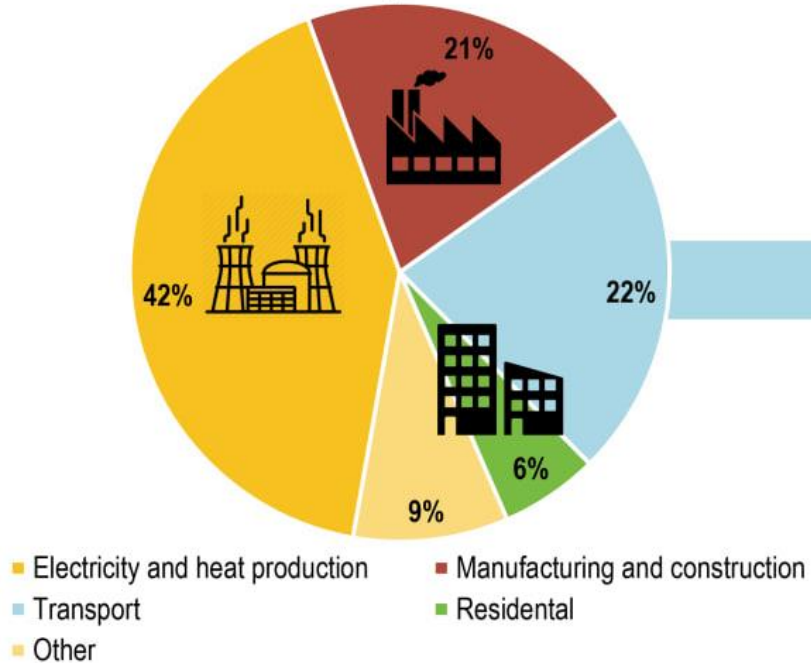
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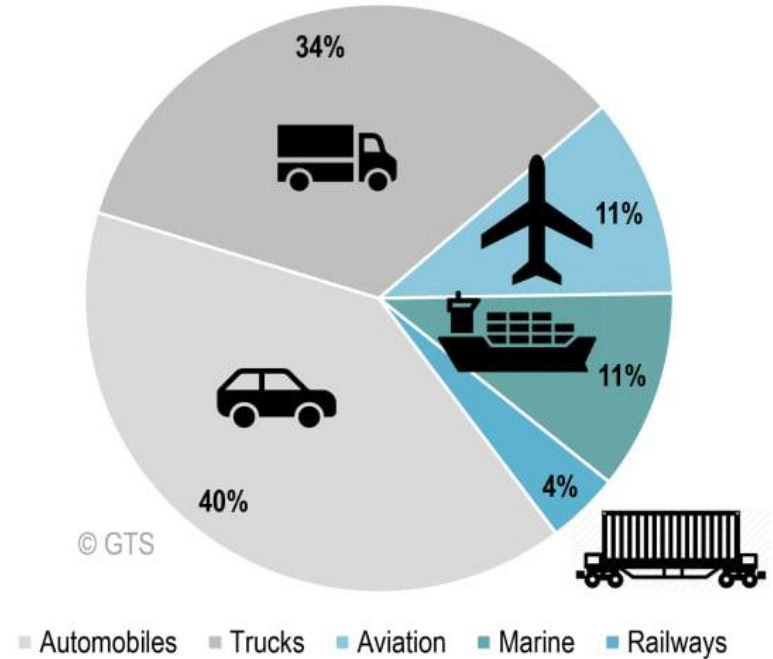
Non-renewable energy sources such as coal, oil, and natural gas have played a fundamental role in the development of modern transport systems. They have enabled large-scale mobility, industrial growth, and economic development for many decades. However, in the context of sustainable urban mobility, understanding their importance is critical because the transport sector is still highly dependent on fossil fuels. This dependence leads to significant environmental problems, including greenhouse gas emissions, air pollution, and climate change. Therefore, studying non-renewable energy sources helps identify the limitations of current transport systems and highlights the urgent need for a transition toward cleaner and renewable energy solutions.

Non-renewable energy sources

CO2 Emissions by Economic Sector

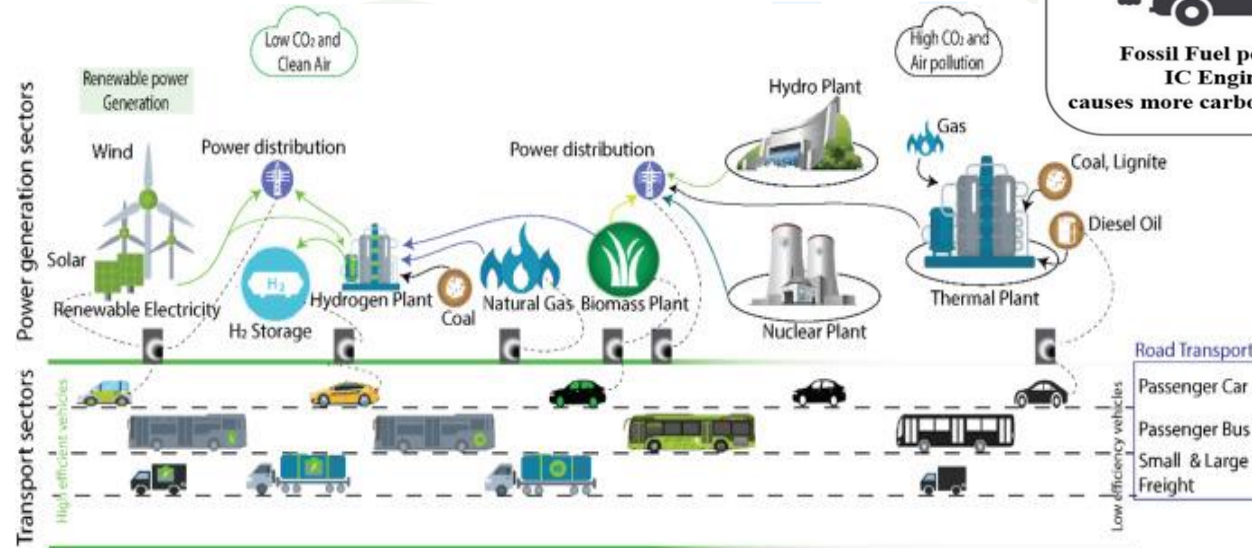
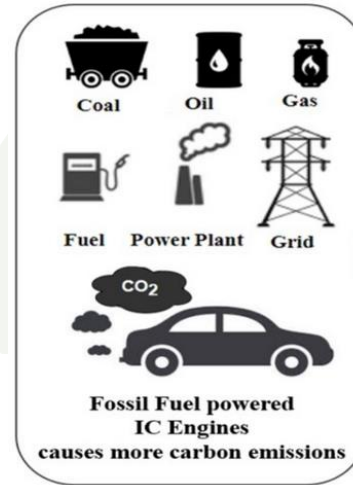


CO2 Emissions by the Transport Sector



Non-renewable energy sources

Transitioning to renewable and clean transport requires a three-step framework: **Avoiding** unnecessary motorized trips, **Shifting** to low-carbon modes (like public transport and cycling), and **Improving** vehicle technology by directly electrifying fleets with zero-emission, renewable-powered motors



Mobility, greenhouse gases and climate change

The purpose of this study was to investigate how individual sociodemographic traits influence travel mode choices among urban residents in Klang Valley, Malaysia. The study collected data from 415 participants regarding their daily short trips. It discovered that men, individuals with lower education levels, students, and those without private vehicles tended to prefer active transportation like walking or cycling, whereas women, highly educated individuals, and vehicle owners were more inclined to drive.

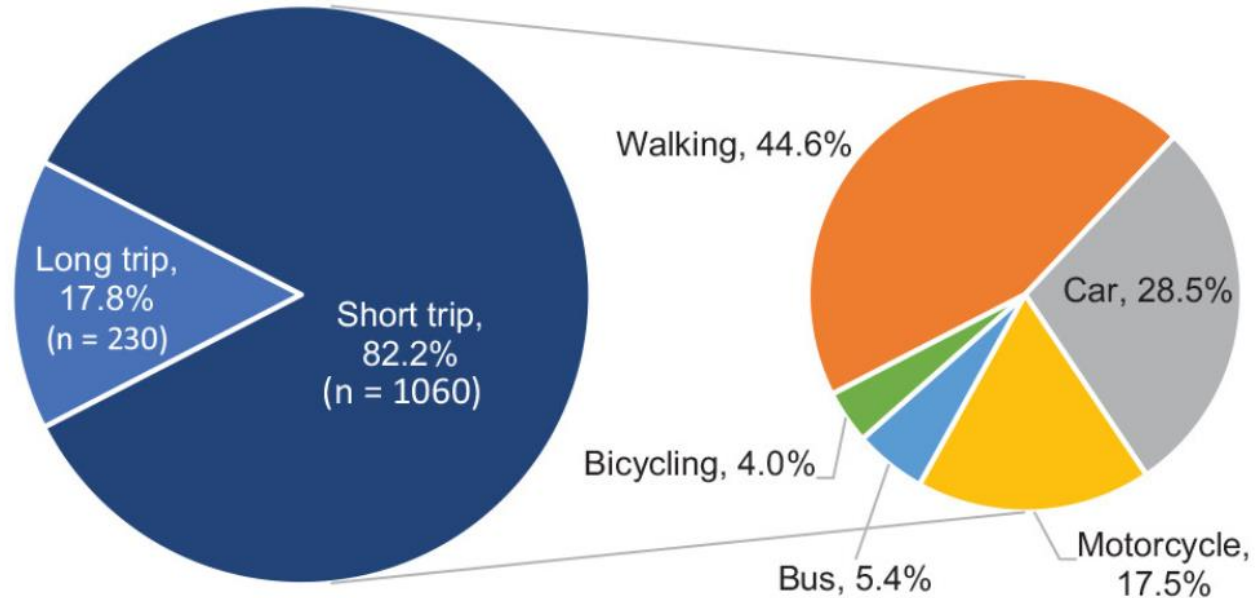


Figure 3. Distribution of urban travel mode share of short trips ($n = 1,290$).

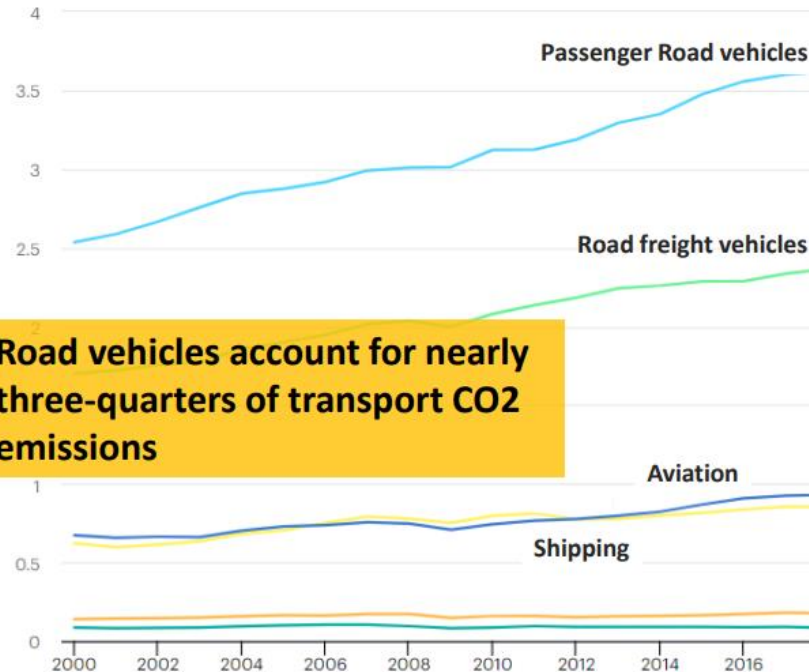
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Mobility, greenhouse gases and climate change

Transportation is a primary driver of global climate change, accounting for nearly 14% to almost 30% of global greenhouse gas (GHG) emissions depending on the region. With road vehicles like passenger cars and heavy-duty trucks responsible for the vast majority of these emissions

Transport is the fastest growing contributor to GHG emissions

Transport sector CO₂ emissions by mode in Gt, IEA 2018



Road vehicles account for nearly three-quarters of transport CO₂ emissions



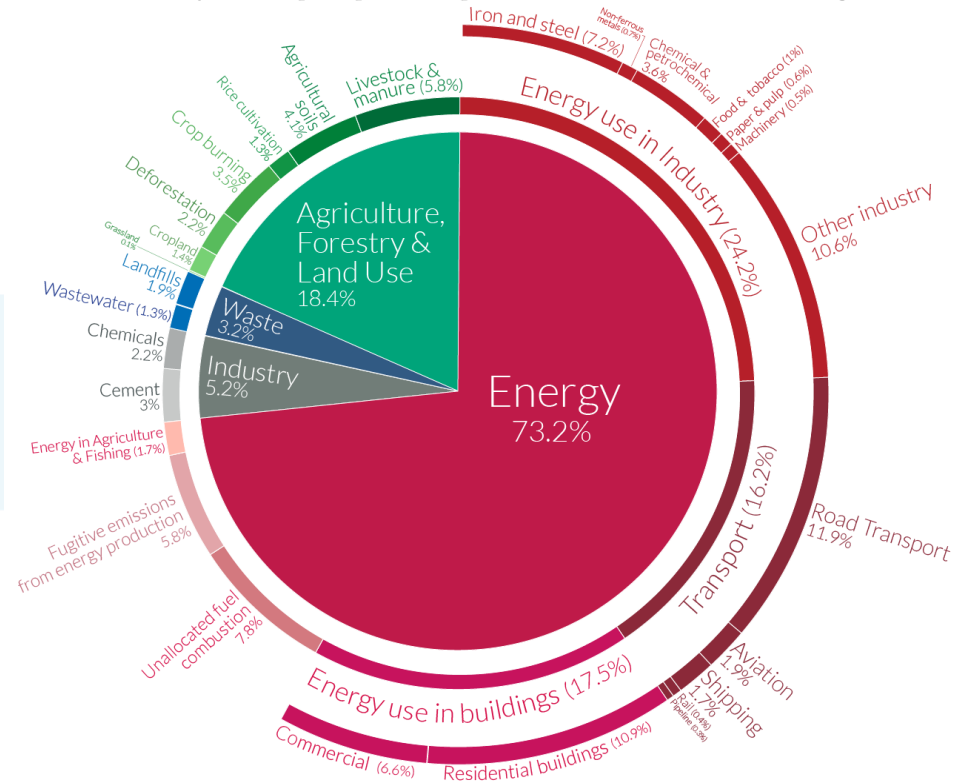
Mobility, greenhouse gases and climate change

Urban mobility drives climate change in cities primarily through the burning of fossil fuels in internal combustion engines, making transportation the fastest-growing source of urban greenhouse gas (GHG) emissions. According to the Intergovernmental Panel on Climate Change (IPCC), urban transport alone accounts for approximately 8% of global CO₂ emissions and consumes 40% of all transport-related energy.

Global greenhouse gas emissions by sector

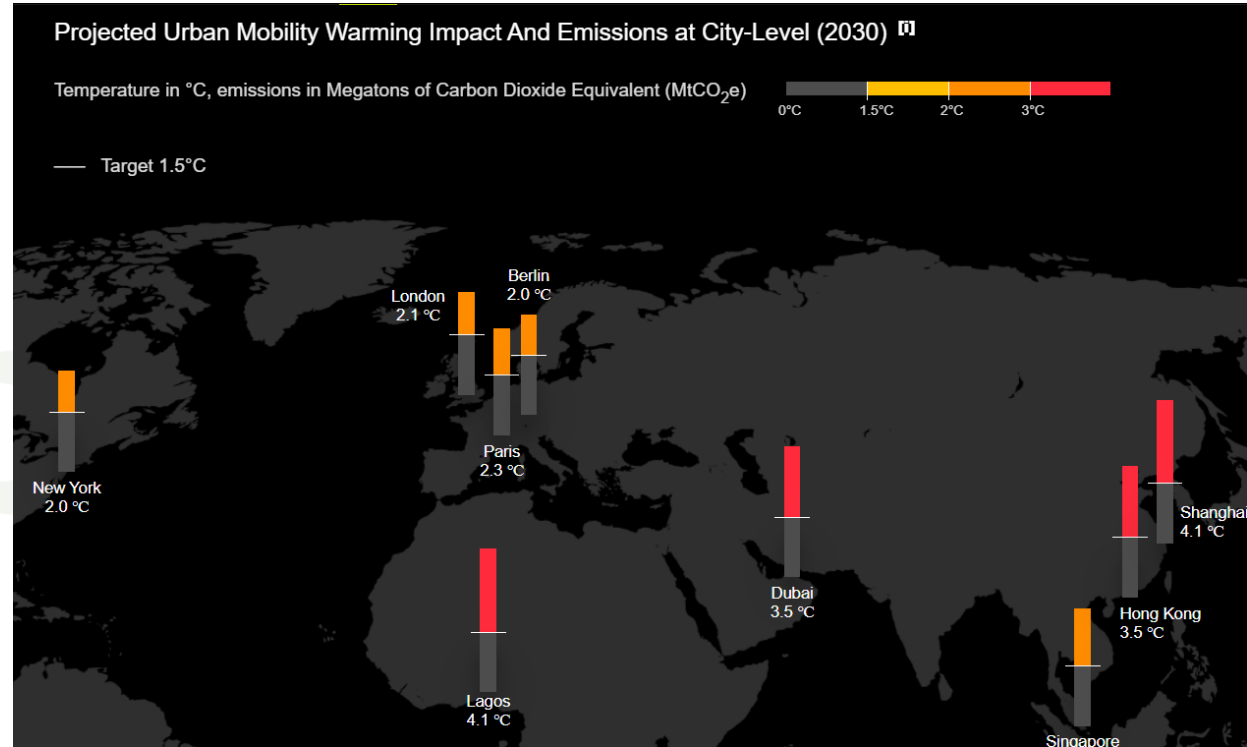
This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO₂eq.

Our World
in Data



Mobility, greenhouse gases and climate change

More than 700 cities globally have committed to meet The Paris Agreement goals of halving their carbon emissions and limiting global warming to 1.5-degrees Celsius by 2030. The task isn't easy, and time is running out, but cities can make significant progress by focusing greater attention on transport emissions, which account for about a third of their carbon footprint.



Thank you for your attention!

