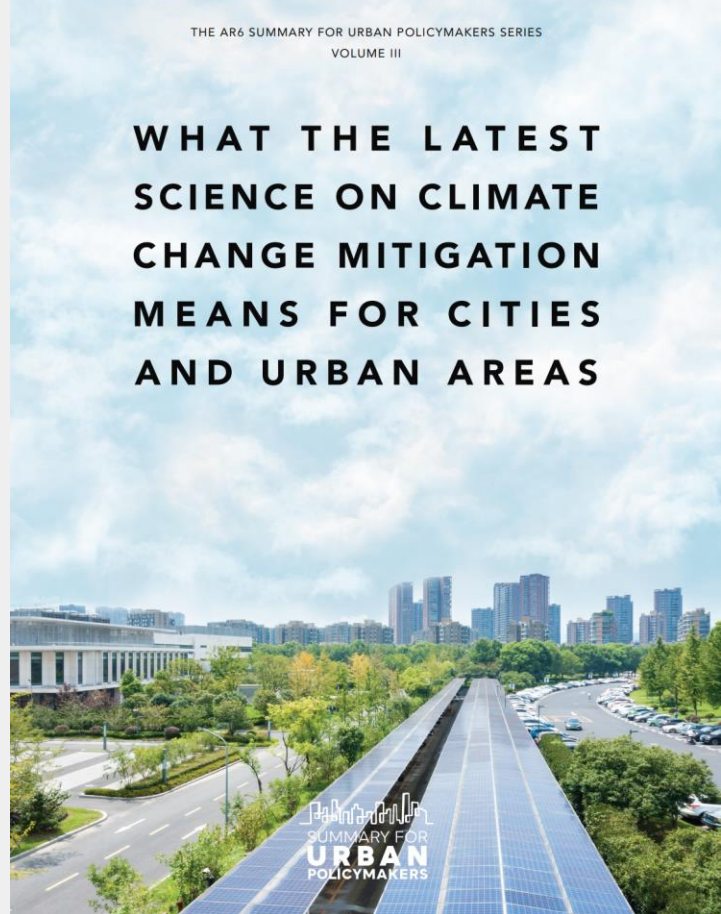


The **Summary for Urban Policymakers** of the IPCC's Sixth Assessment Report

What the Latest Science on Mitigation of Climate Change Means for Cities and Urban Areas

KEY MESSAGES

**WHAT THE LATEST
SCIENCE ON CLIMATE
CHANGE MITIGATION
MEANS FOR CITIES
AND URBAN AREAS**





Tokyo, Japan

The global urban population is currently 4.5 billion and will touch 7 billion by 2050.

Urban population will grow further along with an expansion in urban land area, over the 21st century

This will lead to a rise in demand for resources, infrastructure and services, that the Urban and Infrastructure transition could address to limit emissions

Urban climate change mitigation has a crucial role in determining the future of the global climate.

Actions taken, or not, will lead to different emissions scenarios, and different futures.

How cities and urban areas are planned, designed, built, retrofitted, managed and powered will influence urban GHG emissions.



A large share of people in low-emitting countries lack access to modern energy and mobility services. Eradicating extreme poverty, energy poverty, and providing decent living standards can help achieve sustainable development.

Cities in the Global South, at an early stage of urban development, need new infrastructure and buildings, leading to potentially high material demand and embodied emissions.

Established cities across the world, often in the global North, need to replace or rebuild ageing infrastructure and retrofit buildings.

If unaddressed, these challenges could drive unsustainable emission growth from urban consumption and production through the 21st century.



An Avoid-Shift-Improve (ASI) framework can support climate mitigation across urban and other systems, with an emphasis on demand-side climate mitigation.

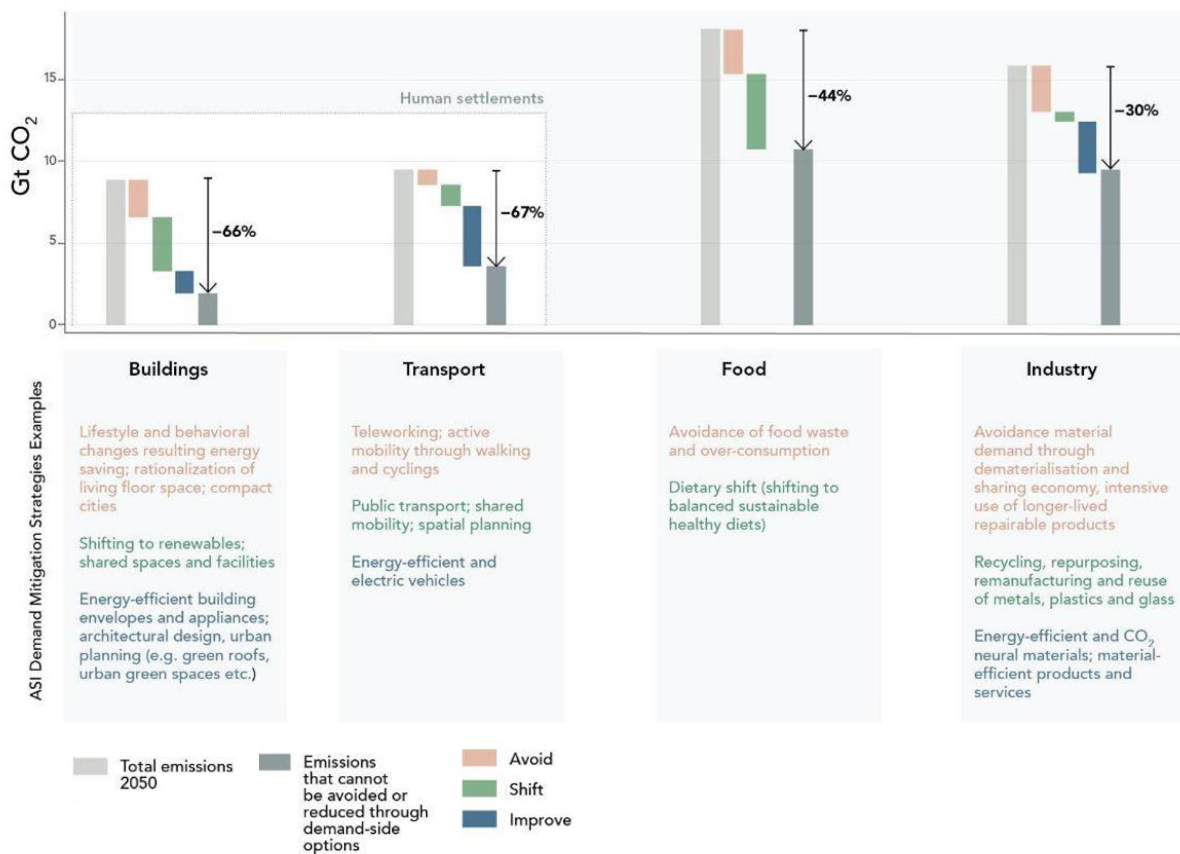
Avoid actions help limit emissions via individual behavioral and lifestyle changes, and redesigning service provisioning.

Shift actions accelerate choices to competitive low-carbon technologies and service-provisioning systems

Improve actions help increase end-use efficiency of technologies in and across urban systems

Figure 1: Mitigation potential of demand-side options by 2050

a. Mitigation potentials in end-use sector classified in Avoid-Shift-Improve options



Cities are diverse: across multiple dimensions such as their climate, economy, demography and resources. **Hence, feasible and effective mitigation strategies vary considerably across cities.**

Buenos Aires, Argentina



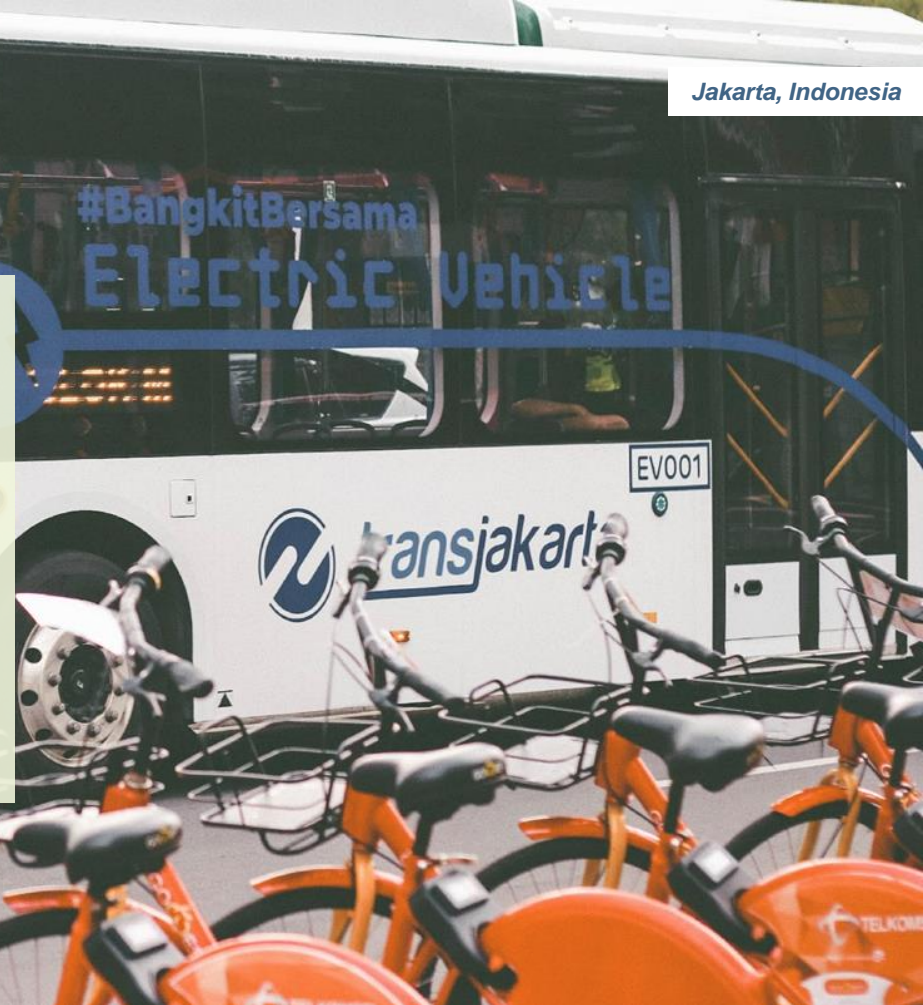
Cities of all types can accelerate systemic climate responses through five interconnected Systems Transitions: energy, urban and infrastructure, land and ecosystems; industry; and societal.

Urban mitigation actions linked to these Systems Transitions can reach across multiple sectors, urban boundaries and regions.

Energy Systems Transitions

Cities and urban areas have a key role in the **Energy Systems Transitions** on the demand-side & supply-side

- Compact urban form can reduce energy demand
- Demand management can increase energy systems flexibility to accommodate more variable renewable energy sources



Urban and Infrastructure Systems Transitions

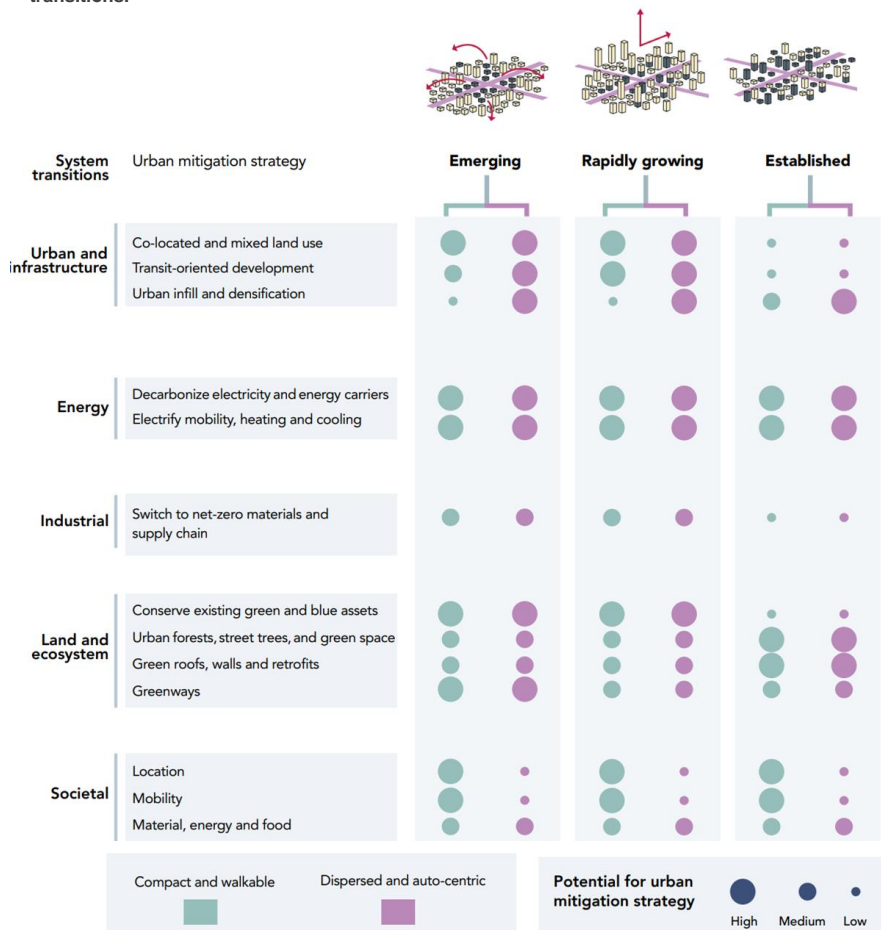
The **Urban and Infrastructure Systems Transitions** brings together a range of energy, buildings, transportation, and land use options.

The feasibility and effectiveness of these options is mediated by urban land use and spatial form and state of urbanisation

This includes whether the city is:

- an **Emerging City** building its infrastructure
- a **Rapidly Growing City** with new infrastructure
- an **Established City** with existing infrastructure

Figure 2: Potential of urban mitigation strategies across urban typologies (growth x form) and system transitions.



Land and Ecosystems Transitions

Land use change contributes 13-21% of GHG emissions.

The Land and Ecosystems Transitions can reduce emissions and climate impacts by expanding local urban green and blue infrastructure and promoting urban farming that limits transport and food waste.

The urban land and ecosystems can also be an important carbon sink, if properly managed.

Mandaue City, Philippines





Industrial Systems Transitions

Cities can play an important role in the Industrial Systems Transitions through spatial planning that limits material demand; design standards, building codes, efficient material procurement; and reusing and recycling waste.

Coordinated value chains decarbonisation is necessary to reach net-zero industry CO₂ emissions.

Societal Transitions

Demand-side strategies across all sectors, can reduce emissions by 40-70% by 2050.

Societal Transitions are needed to accelerate these strategies and implement the Systems Transitions.

Amsterdam, Netherlands



There are multiple feasible mitigation options and synergies between mitigation action and sustainable development across key urban sectors and approaches such as urban planning.

Among these, energy efficiency and expanding renewable energy have multiple sustainable development benefits.

Expanding clean energy and public transport use can improve SDG outcomes on health, employment, energy security and equity.

Related Sustainable Development Goals:

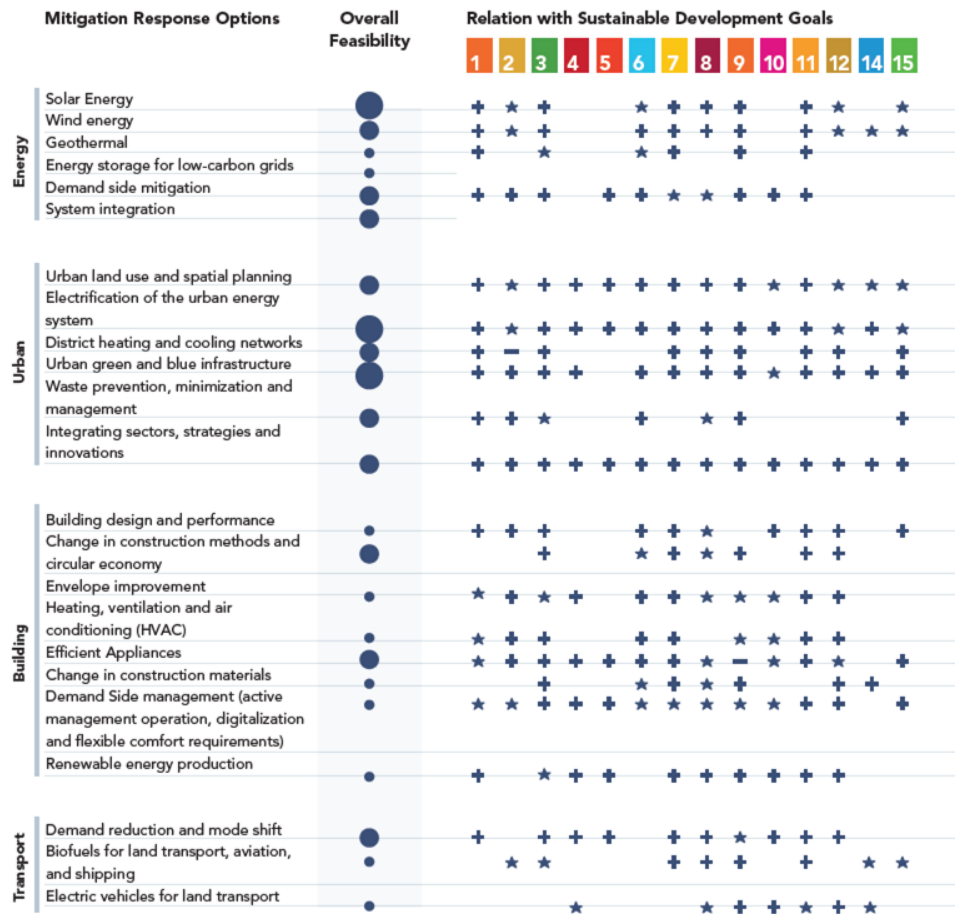
- 1 No poverty
- 2 Zero hunger
- 3 Good health and wellbeing
- 4 Quality education
- 5 Gender equality
- 6 Clean water and sanitation
- 7 Affordable and clean energy
- 8 Decent work and economic growth
- 9 Industry, innovation and infrastructure
- 10 Reduced inequalities
- 11 Sustainable cities and communities
- 12 Responsible consumption and production
- 13 Climate action
- 14 Life below water
- 15 Life on land
- 16 Peace, justice and strong institutions
- 17 Partnership for the goals

- + Synergies
- ★ Synergies and trade-offs
- Trade-offs
- Blanks represent no assessment

Overall Feasibility

- High
- Medium
- Low

Figure 3: Overall feasibility of mitigation options and synergies and trade-offs between sectoral mitigation options and the SDGs



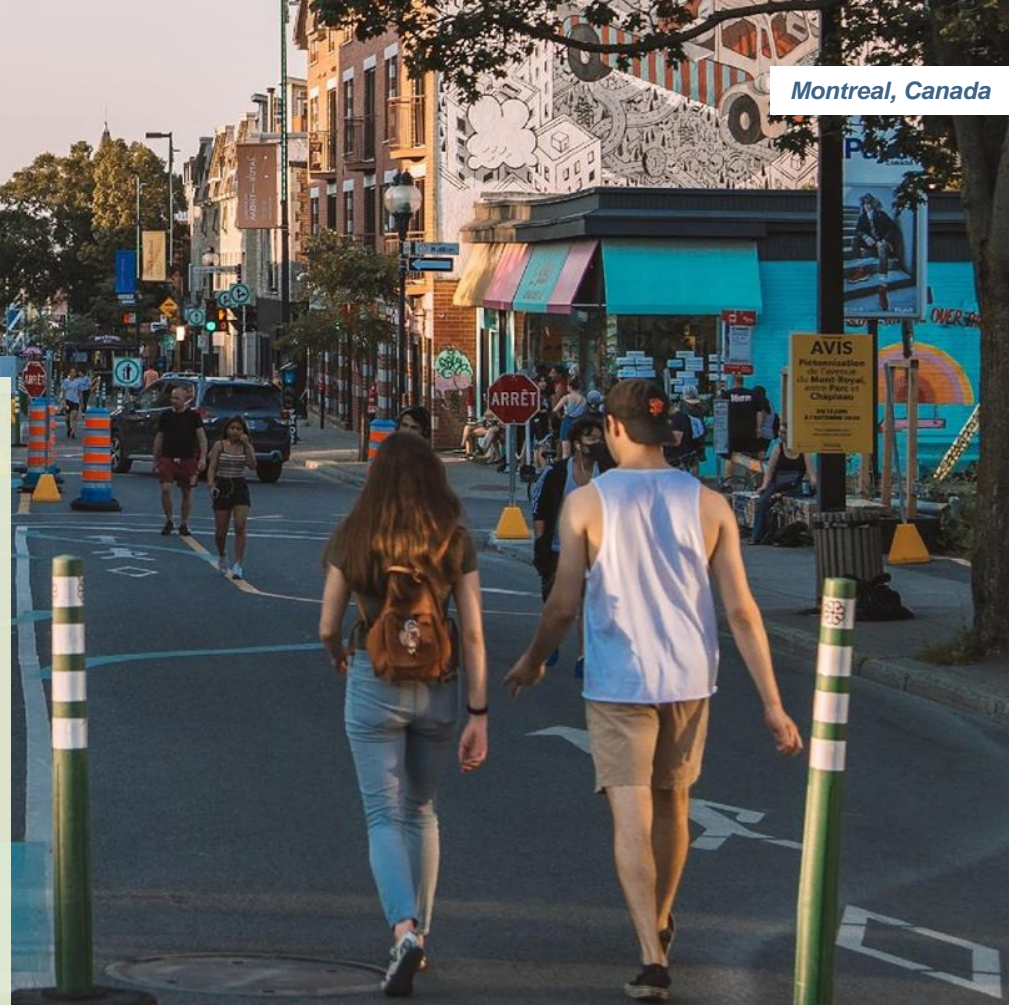
Enhanced mitigation that shifts development pathways towards sustainability can create new green job opportunities, raise incomes and reduce inequalities within and between countries.



Enhanced mitigation action can deliver local adaptation benefits, like reduced flood risk, limiting urban heat island impact, and enhanced health because of reduced air pollution.

These act at the interface of urban planning and infrastructure design:

- walkable areas combined with clean energy
- networks of green and open spaces
- urban forests and wetlands
- urban agriculture
- water-sensitive design





Trade-offs between mitigation and adaptation need to be addressed

- Increasing urban density can reduce travel demand and hence emissions but increase vulnerability to heat waves and flooding
- Urban electrification powered by hydropower, biofuel and nuclear sources can impact aquatic, coastal and marine ecosystems

Enabling Conditions promote or advance systems transitions and ultimately transformation. They play a critical role in enabling widespread, effective and accelerated implementation.

Urban policy and planning, governance, finance, lifestyle and behaviour change, and innovation and technology are key levers to accelerate mitigation action.



Hangzhou, China



Urban Policies and Spatial Planning

Urban Policies and Spatial Planning, across scales can alter urban attributes that drive urban emissions.

Doing this successfully needs an integrated approach to urban policy across administrative and territorial levels, including vertical and horizontal integration of local, regional, national spatial and sector policies, and partnerships between the public and private sector.



Multi-level Governance

Implementing ambitious urban climate action needs active governance and coordination at multiple levels across a range of actors.

Regional, national and international climate action has most impact when local governments partner and coordinate with all levels of government, the private sector and other non-state actors. This provides the legal and institutional basis to respond systemically to the mitigation agenda

Climate Finance

Strengthening the financial capacity and credit worthiness of cities can **expand the availability and access to climate finance**, is crucial to successful urban mitigation.

Cities, in partnership with national government and international financial institutions and markets can help mobilise climate finance across key sectors to enable mitigation and adaptation.



Lifestyle and Behavioural Change

Lifestyle and Behavioural Change is important to **mitigate climate change** supported by policy and system changes, including pricing, sustainable technology, and making low-carbon choices the default option.

Public support for system changes, improves when benefits and costs are shared, and when decision making processes encourage trust.



Technology and Innovation

Mitigation technologies and innovation have progressed significantly. They can support System Transitions and shift development pathways towards sustainability and limit warming.

Improved financing for international cooperation and enhancing developing countries capacity across the value chain can accelerate this.

Effective policy and governance of technology can limit negative externalities and avoid trade-offs.



Cities can implement aggressive and ambitious mitigation policies while contributing to sustainable development. Pursuing mitigation and adaptation actions together can promote Climate Resilient Development and improve enhancing human and planetary health. **Our climate is our future.**

AUTHORS

Mustafa Babiker (Saudi Arabia)

Coordinating Lead Author, Chapter 12, IPCC AR6 WGIII
Lead Author, Chapter 4, IPCC Special Report on 1.5°C
Saudi Aramco

Amir Bazaz (India)

Contributing Author, Chapter 4, IPCC Special Report on 1.5°C
Indian Institute for Human Settlements

Paolo Bertoldi (Italy)

Lead Author, Chapter 9, IPCC AR6 WGIII
Lead Author, Chapter 4, IPCC Special Report on 1.5°C
European Commission

Felix Creutzig (Germany)

Coordinating Lead Author, Chapter 5, IPCC AR6 WGIII
Mercator Research Institute on Global Commons and Climate Change

Heleen De Coninck (Netherlands)

Coordinating Lead Author, Chapter 16, IPCC AR6 WGIII
Coordinating Lead Author, Chapter 4, IPCC Special Report on 1.5°C
Eindhoven University of Technology

Klaine De Kleijne (Netherlands)

Chapter Scientist, Chapter 12, IPCC AR6 WGIII
Contributing Author, Chapter 4, IPCC Special Report on 1.5°C
Radboud University

Shobhakar Dhakal (Thailand)

Coordinating Lead Author, Chapter 2, IPCC AR6 WGIII
Asian Institute of Technology

Stuti Halder (India)

Indian Institute for Human Settlements

Kejun Jiang (China)

Lead Author, Chapter 3, IPCC AR6 WGIII
Coordinating Lead Author, Chapter 2, IPCC Special Report on 1.5°C
Energy Research Institute

Şiir Kılıç (Turkey)

Lead Author, Chapter 8, IPCC AR6 WGIII
The Scientific and Technological Research Council of Turkey

Ian Klaus (USA)

Series Editor of the SUP Series
Chicago Council of Global Affairs

Jagdish Krishnaswamy (India)

Coordinating Lead Author, Chapter 7, IPCC Special Report on
Climate Change and Land
Indian Institute for Human Settlements

Shuaib Lwasa (Uganda)

Coordinating Lead Author, Chapter 8, IPCC AR6 WGIII
Lead Author, Chapter 6, IPCC Special Report on Climate Change and
Land
Global Center on Adaptation

Leila Niamir (Iran/Austria)

Chapter Scientist and Contributing Author, Chapter 5, IPCC AR6
WGIII Report
International Institute for Applied Systems Analysis

Minal Pathak (India)

Scientist, IPCC WGIII Technical Support Unit
Ahmedabad University

Joana Portugal Pereira (Brazil)

Lead Author, Chapter 4, IPCC AR6 WGIII
Coordinating Lead Author, Annex C, IPCC AR6 WGIII
Universidade Federal do Rio de Janeiro

Aromar Revi (India)

Coordinating Lead Author, Chapter 18, IPCC AR6 WGII
and Chapter 4, IPCC Special Report on 1.5°C
Indian Institute for Human Settlements

Joyashree Roy (India/Thailand)

Coordinating Lead Author, Chapter 5, IPCC AR6 WGIII
and Chapter 5, IPCC Special Report on 1.5°C
Asian Institute of Technology

Karen C. Seto (USA)

Coordinating Lead Author, Chapter 8, IPCC AR6 WGIII
Yale University

Chandni Singh (India)

Lead Author, Chapter 10, IPCC AR6 WGII
Author, Cross-Chapter Paper 2, IPCC AR6 WGII
Indian Institute for Human Settlements

Shreya Some (India)

Contributing Author Chapter 17, IPCC AR6 WGIII Report
and Chapter 5, IPCC Special Report on 1.5°C
Scientist, IPCC WGIII Technical Support Unit
Asian Institute of Technology

Linda Steg (Netherlands)

Lead Author, Chapter 6, IPCC AR6 WGIII
Lead Author, Chapter 4, IPCC Special Report on 1.5°C
University of Groningen

Diana Ürge-Vorsatz (Hungary)

Vice-Chair, Working Group III, IPCC
Central European University

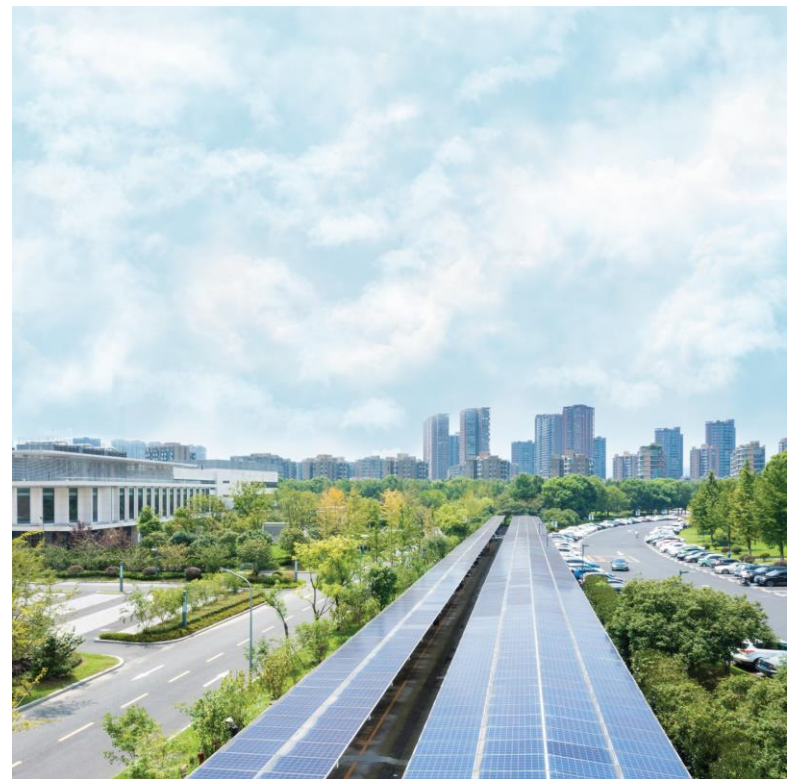
REVIEW EDITORS

Priyadarshi R. Shukla (India)

Co-Chair, Working Group III
IPCC

Jim Skea (UK)

Co-Chair, Working Group III
IPCC



ADVISORS: CITY OFFICIALS

Hamidou Baguian
City of Bobo-Dioulasso, Burkina Faso

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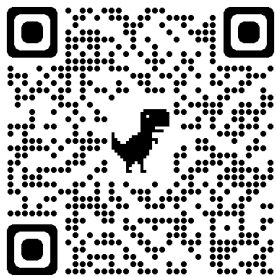
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Ivanhoe Cambridge

Christine Wissink
Wood

David Wright
National Grid

Daniela Zuloaga
Arup





For more information: <https://supforclimate.com/>

SUP Technical Team: sup@iihs.ac.in



Federal Ministry
for Economic Aff
and Climate Acti

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