Delivering high wellbeing with low energy demand:

Key findings from AR6 and outlook for the AR7 cycle

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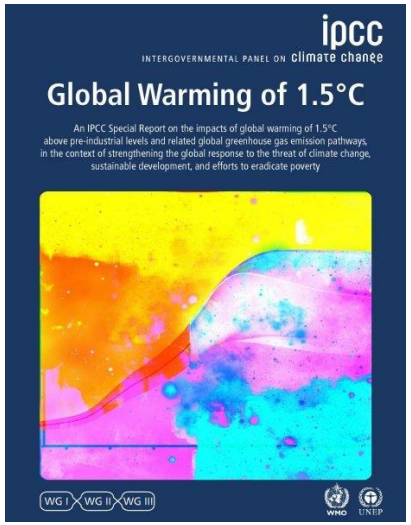
IPCC Vice Chair

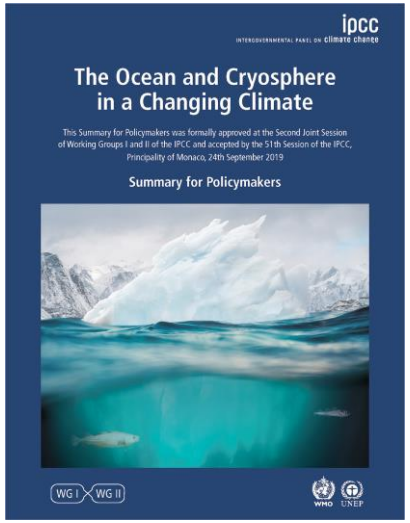
EDITS conference

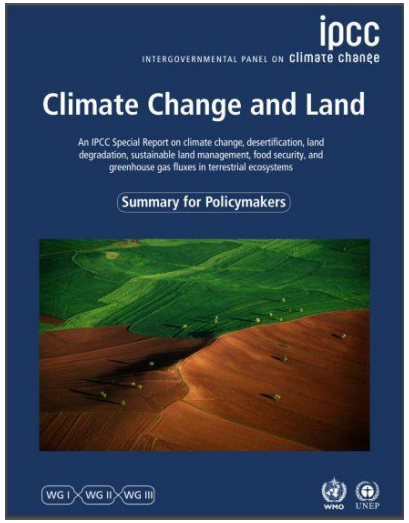
Fog Opening the Dawn
Jeong Jinsil
Weather and Climate Photography & Video Contest 2021
Korea Meteorological Administration

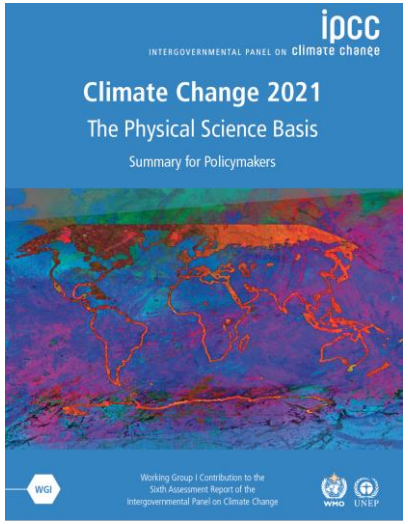
Sixth Assessment Report | Synthesis Report

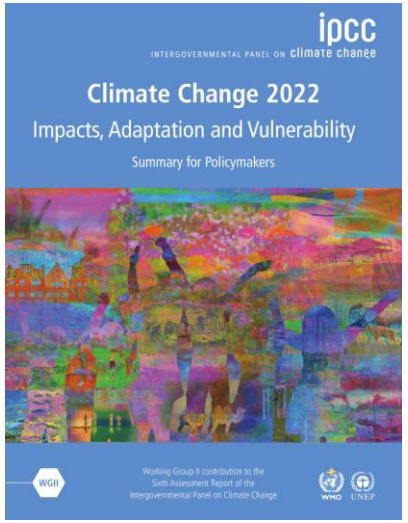
The 6th Assessment Cycle (AR6) October 2015 – July 2023

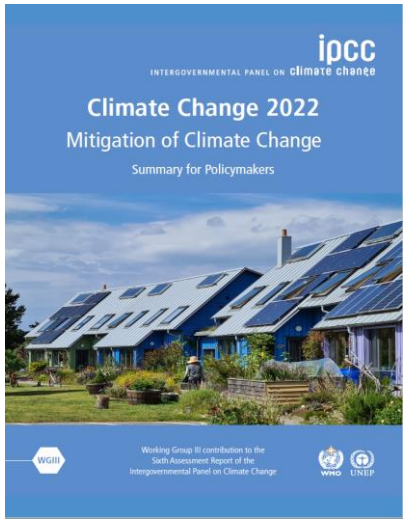


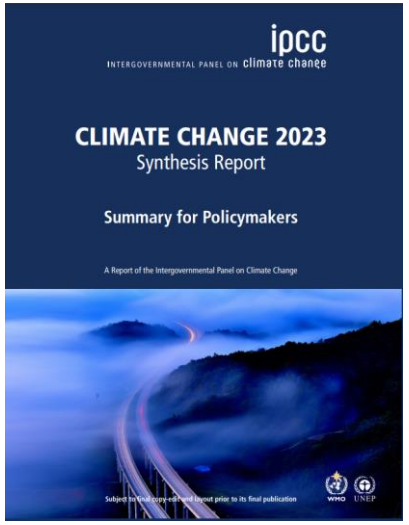








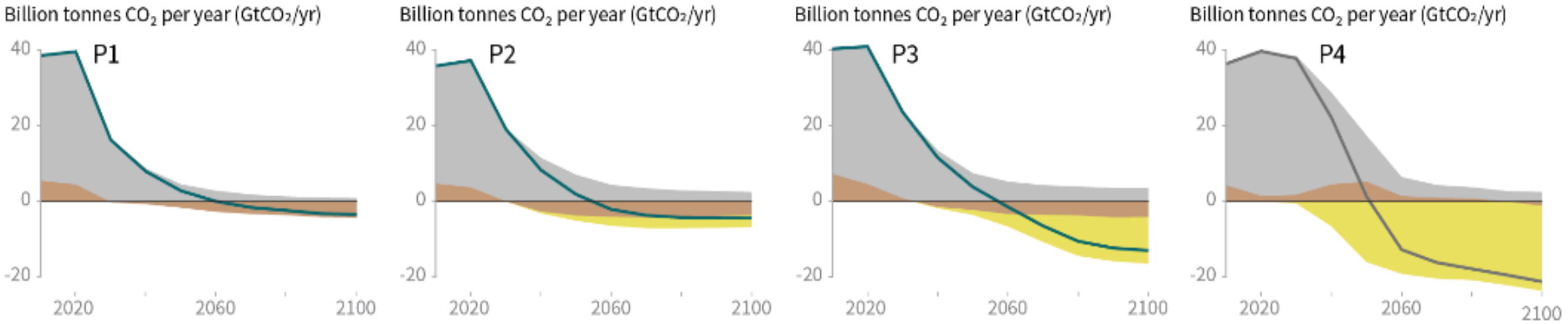




Characteristics of four illustrative model pathways

Breakdown of contributions to global net CO_2 emissions in four illustrative model pathways

Fossil fuel and industry AFOLU BECCS



P1: A scenario in which social, business and technological innovations result in lower energy demand up to 2050 while living standards rise, especially in the global South. A downsized energy system enables rapid decarbonization of energy supply. Afforestation is the only CDR option considered; neither fossil fuels with CCS nor BECCS are used.

P2: A scenario with a broad focus on sustainability including energy intensity, human development, economic convergence and international cooperation, as well as shifts towards sustainable and healthy consumption patterns, low-carbon technology innovation, and well-managed land systems with limited societal acceptability for BECCS.

P3: A middle-of-the-road scenario in which societal as well as technological development follows historical patterns. Emissions reductions are mainly achieved by changing the way in which energy and products are produced, and to a lesser degree by reductions in demand.

P4: A resource- and energy-intensive scenario in which economic growth and globalization lead to widespread adoption of greenhouse-gas-intensive lifestyles, including high demand for transportation fuels and livestock products. Emissions reductions are mainly achieved through technological means, making strong use of CDR through the deployment of BECCS.

Sixth Assessment Report
WORKING GROUP III – MITIGATION OF CLIMATE CHANGE

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Climate Change 2022

Energy demand and services were a novel but key pillar of mitigation in AR6

[Matt Bridgestock, Director and Architect at John Gilbert Architects]

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

Demand and services

Energy

Land use

Industry

Urban

Buildings

Transport

C.4 Reducing GHG emissions across the full energy sector requires major transitions, including a substantial reduction in overall fossil fuel use, the deployment of low-emission energy sources, switching to alternative energy carriers, and energy efficiency and conservation. The contin
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C.5 Net-zero CO_2 emissions from the industrial sector are challenging but possible. Reducing industry emissions will entail coordinated action throughout value chains to promote all mitigation options, including demand management, energy and materials efficiency, circular

C.6 Urban areas can create opportunities to increase resource efficiency and significantly reduce GHG emissions through the systemic transition of infrastructure and urban form through low-emission development pathways towards net-zero emissions. Ambitious mitigation efforts for established, rapidly growing and emerging cities will encompass 1) reducing or changing energy and material consumption, 2) electrification, and 3) enhancing carbon uptake and storage in the urban environment. Cities can achieve net-zero emissions, but only if emissions are reduced

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regions. There are many sustainable options for demand management, materials efficiency, and circular material flows that can contribute to reduced emissions, but how these can be applied will vary across regions a
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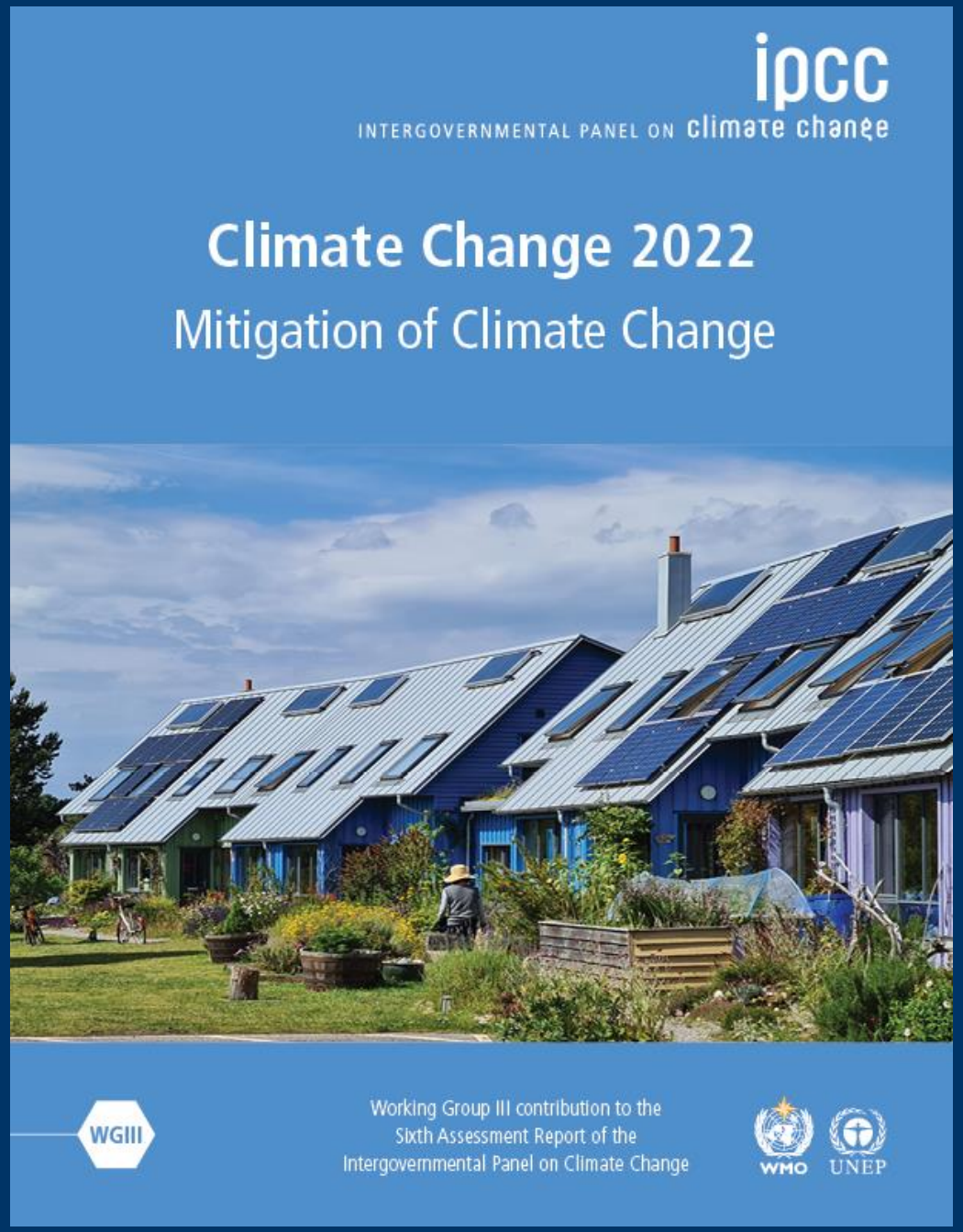
scenarios

C.7. In modelled global scenarios, existing buildings, if retrofitted, and buildings yet to be built, are projected to approach net zero GHG emissions in 2050 if policy packages, which combine ambitious sufficiency, efficiency, and renewable energy measures, are effectively implemented and barriers to decarbonisation are removed. Low ambitious policies increase the

underestimated compared to bottom-up industry-specific models. (*high confidence*) {3.4, 5.3, Figure

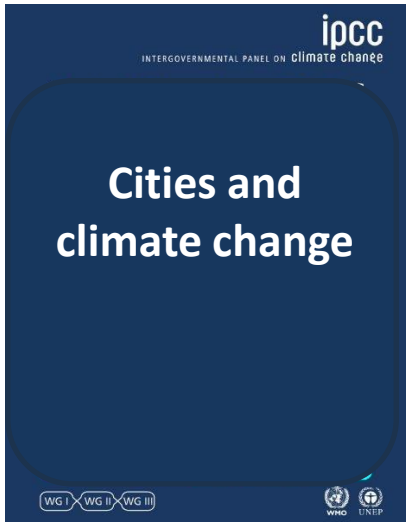


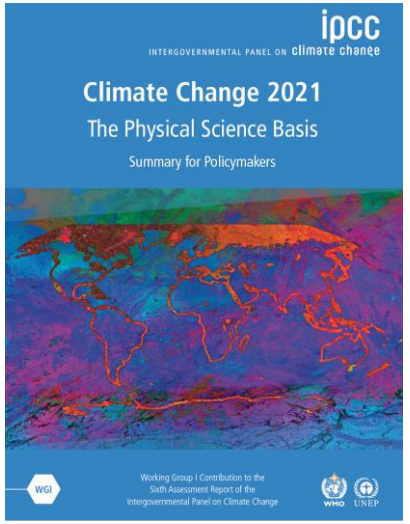
[Matt Bridgestock, Director and Architect at John Gilbert Architects]

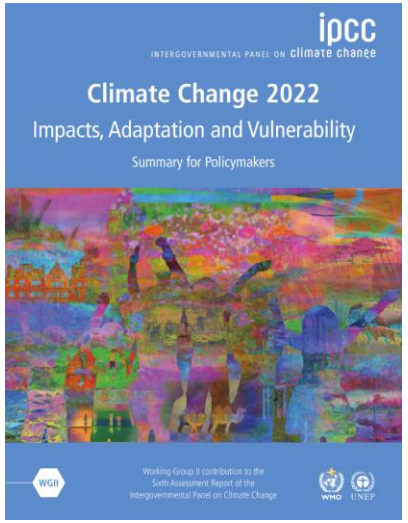
Demand is especially important in developed countries

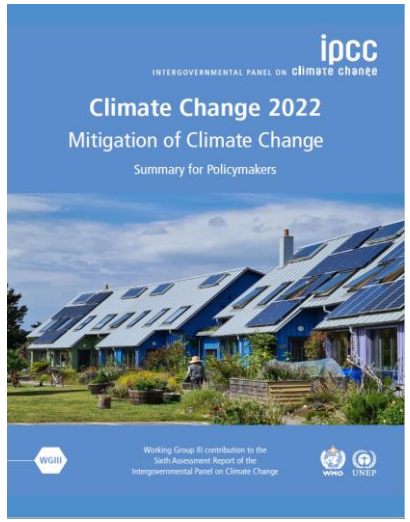
In developed countries, most technological, social, business (model) innovations are needed for **rethinking** and **restructuring** existing urban space, **repurposing**, **retrofitting** and **reusing existing** infrastructure, vehicle stocks and equipment rather having to build/produce new

The 7th Assessment Cycle (AR7)

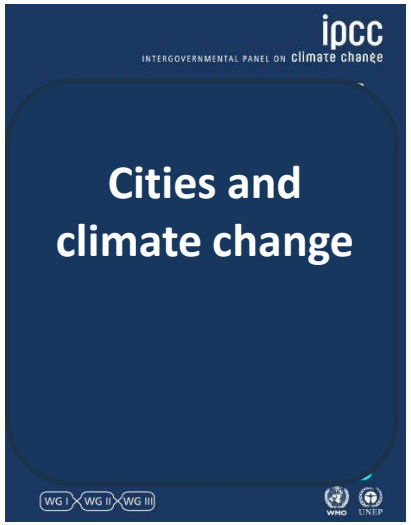


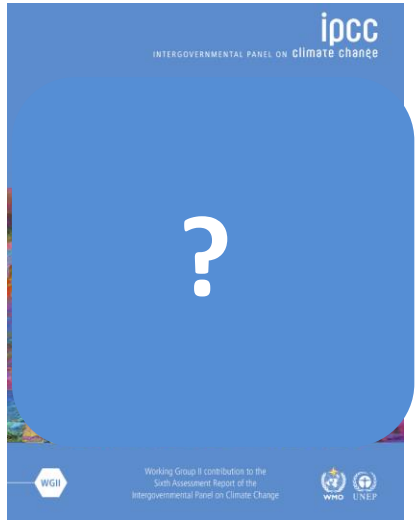


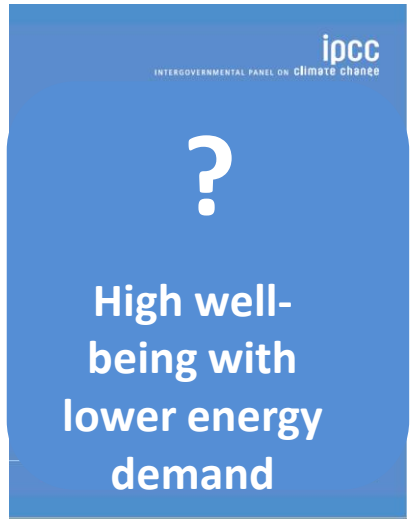


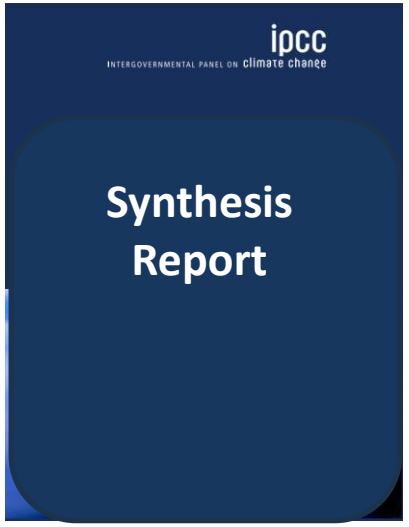


The 7th Assessment Cycle (AR7)





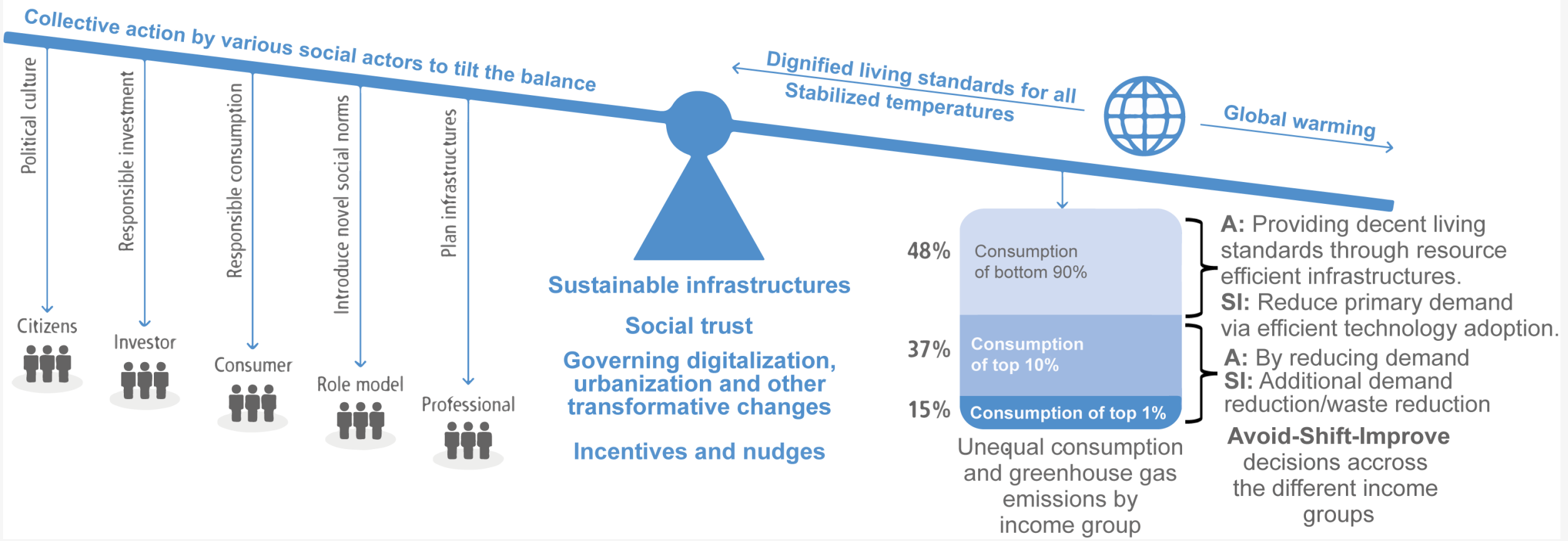




Individuals are important, but people alone cannot bring in change: need infrastructure, technology access, incentives, equity

Demand side mitigation is about more than behavioural change. Reconfiguring the way services are provided while simultaneously changing social norms and preferences will help reduce emissions and access. Transformation happens through societal, technological and institutional changes.

Tilting the balance towards less resource intensive service provisioning

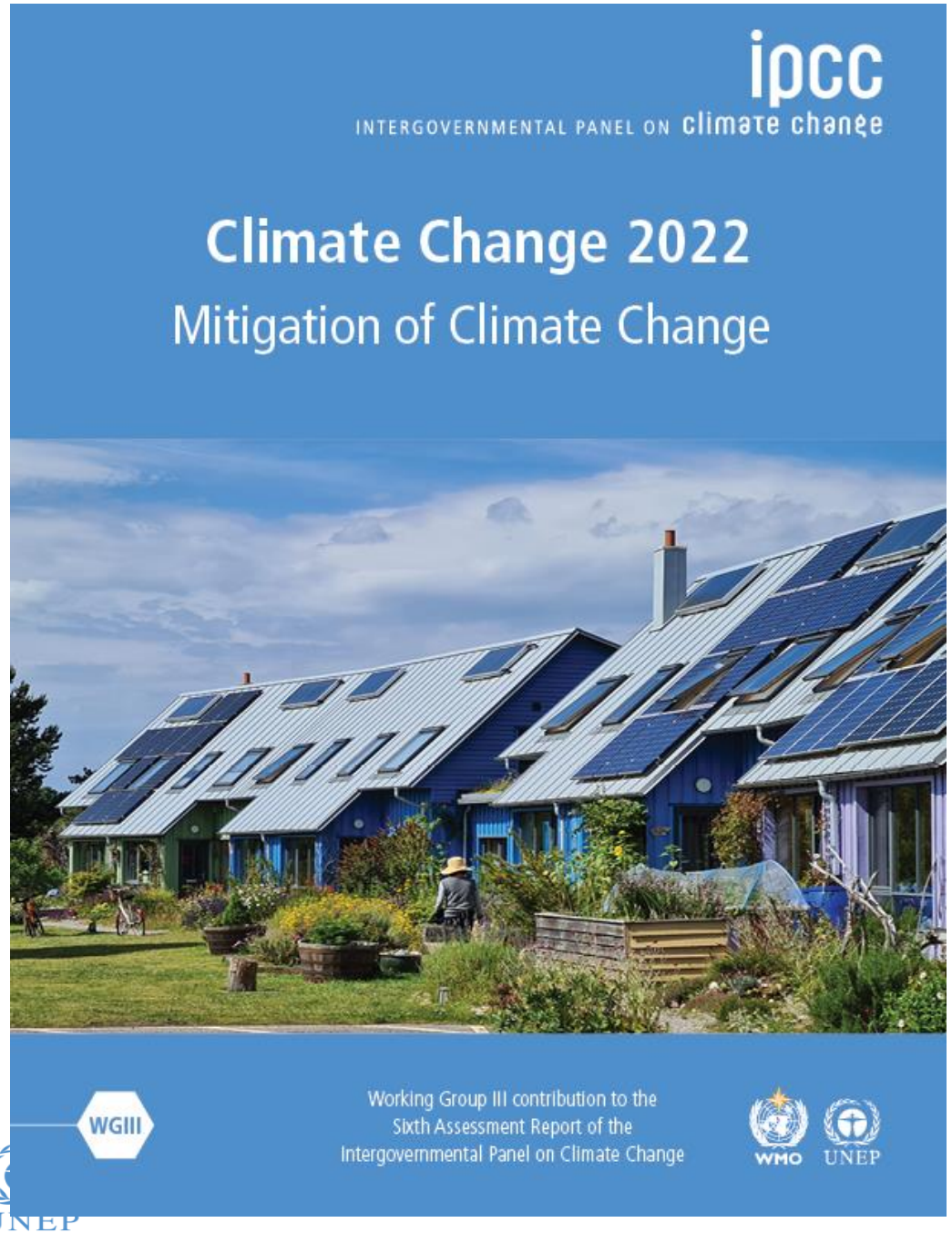


Broad research agendas exist to pave the way for novel demand-side knowledge for strong mitigation impacts in AR7

- What policies can affect the top 10% and 1% to reduce their energy demand?
  - Sufficiency
- MORE FOCUS ON COSTS
  - How do demand-focused scenario costs compare to those of alternatives?
- how to implement systemic/infrastructural change? Especially in cities? (how to kick-start shared mobility transitions?)
- What sectoral policies can shift demand towards re-… and shared systems than new individual focused ones?
- Costs and potentials, co-benefits?
  - What are the critical mineral and other resource benefits of a low-demand scenario as compared to the supply-focused ones?
  - How to harness adaptation benefits through demand-side policies? (heat resilience&lower AC, less vulnerable infrastructure, etc)
- ?

Suggested to focus on creating a 3-year research agenda for how novel demand side knowledge can help stronger climate impact in AR7

- Connect to the big picture
  - Should inventories include indirect emissions accounting?
  - Sectoral scenarios/potentials complementing IAMs
  - Stronger connection to IAMs?
  - Cost and benfifts of achieving climate goals
  - Resilience against crises
- Add the recent climate context:
  - Reduced need for CDR
  - SRM?
  - Adaptation
  - Loss and damage



Thank you for your attention

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