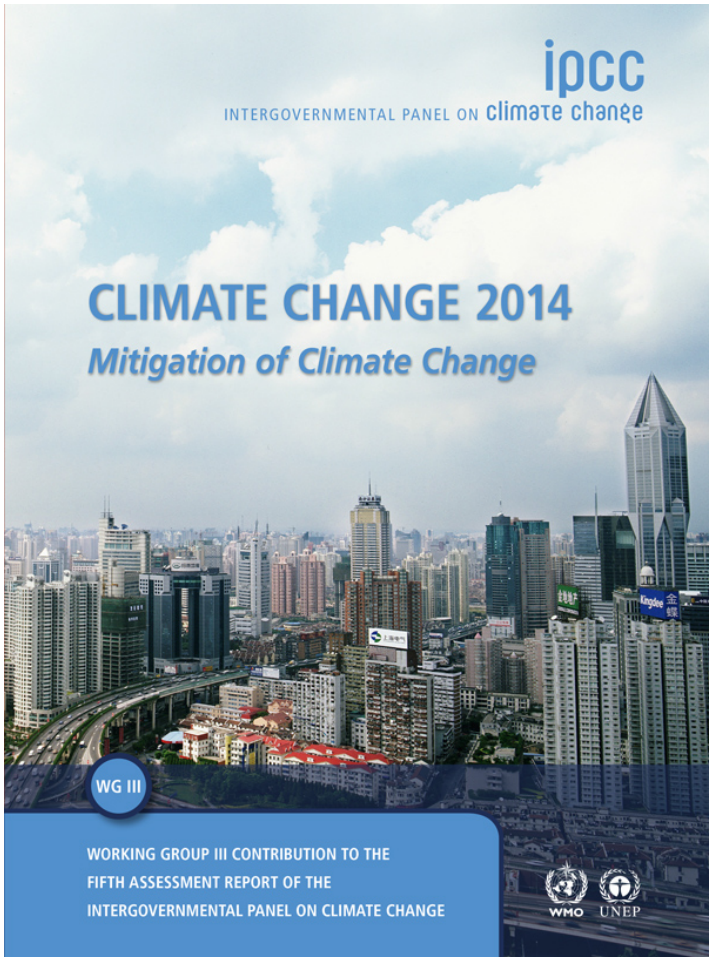
Working Group III contribution to the IPCC Fifth Assessment Report

WMO UNEP

IPCC reports are the result of extensive work from scientists around the world

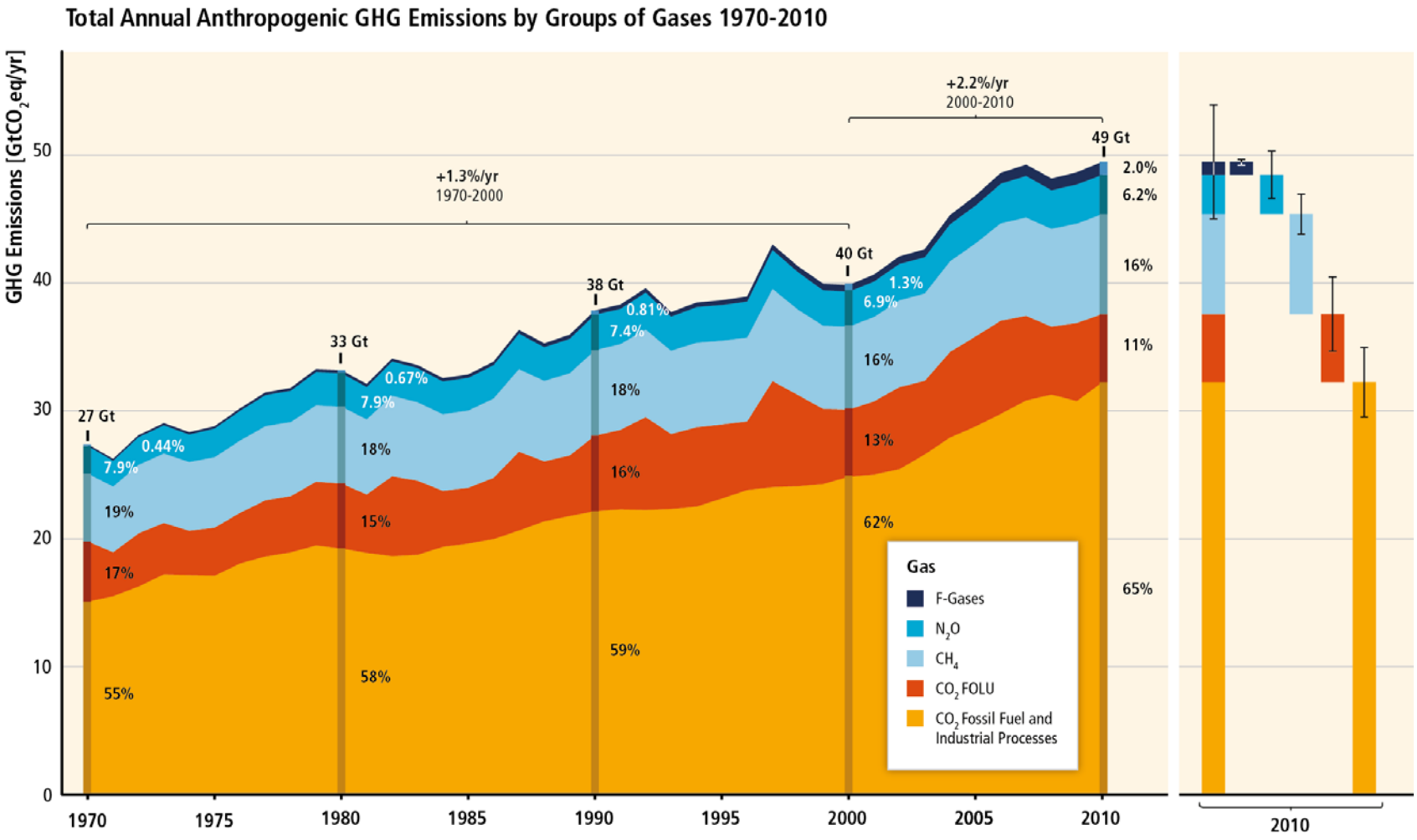
1 Summary for Policymakers
1 Technical Summary

16 Chapters
235 Authors
900 Reviewers
More than **2000** pages
Close to **10,000** references
More than **38,000** comments



KEY MESSAGE 1

GHG emissions accelerate despite reduction efforts.



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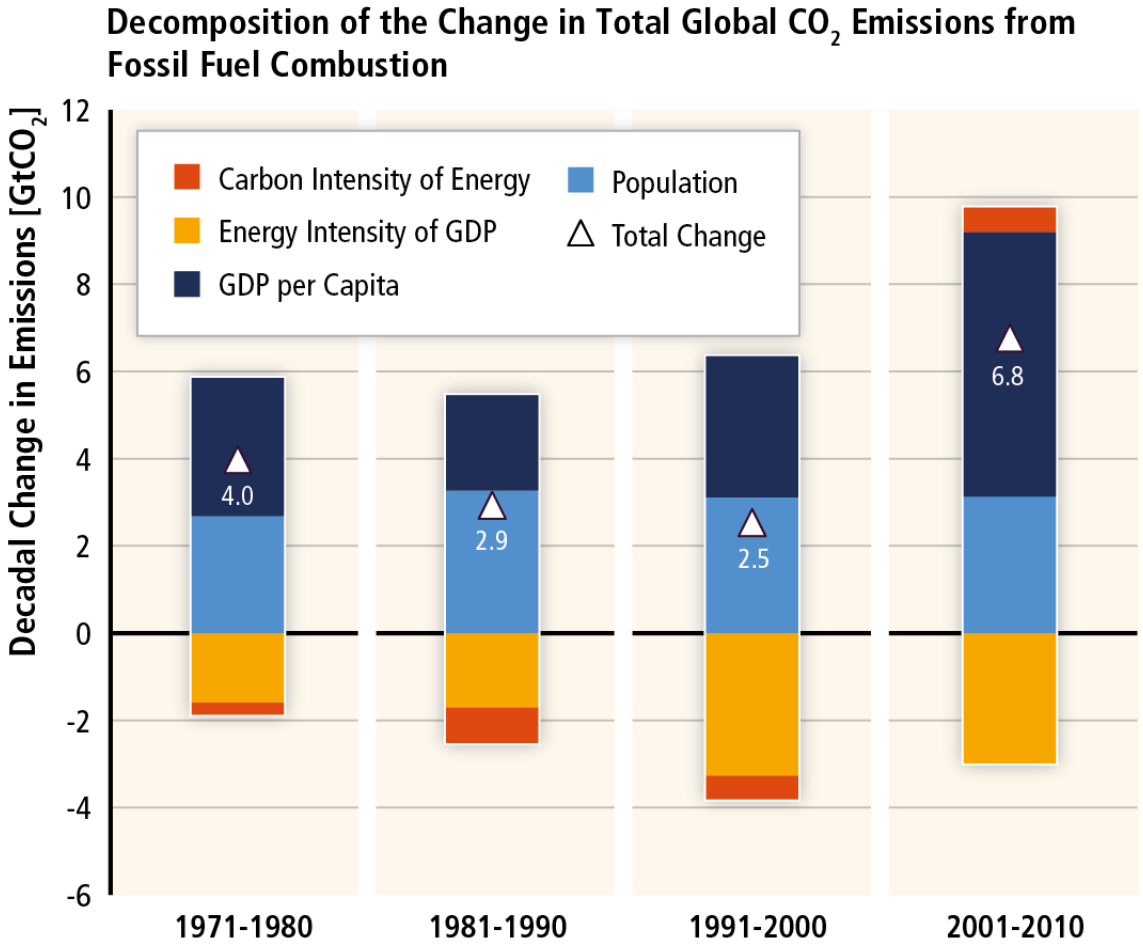
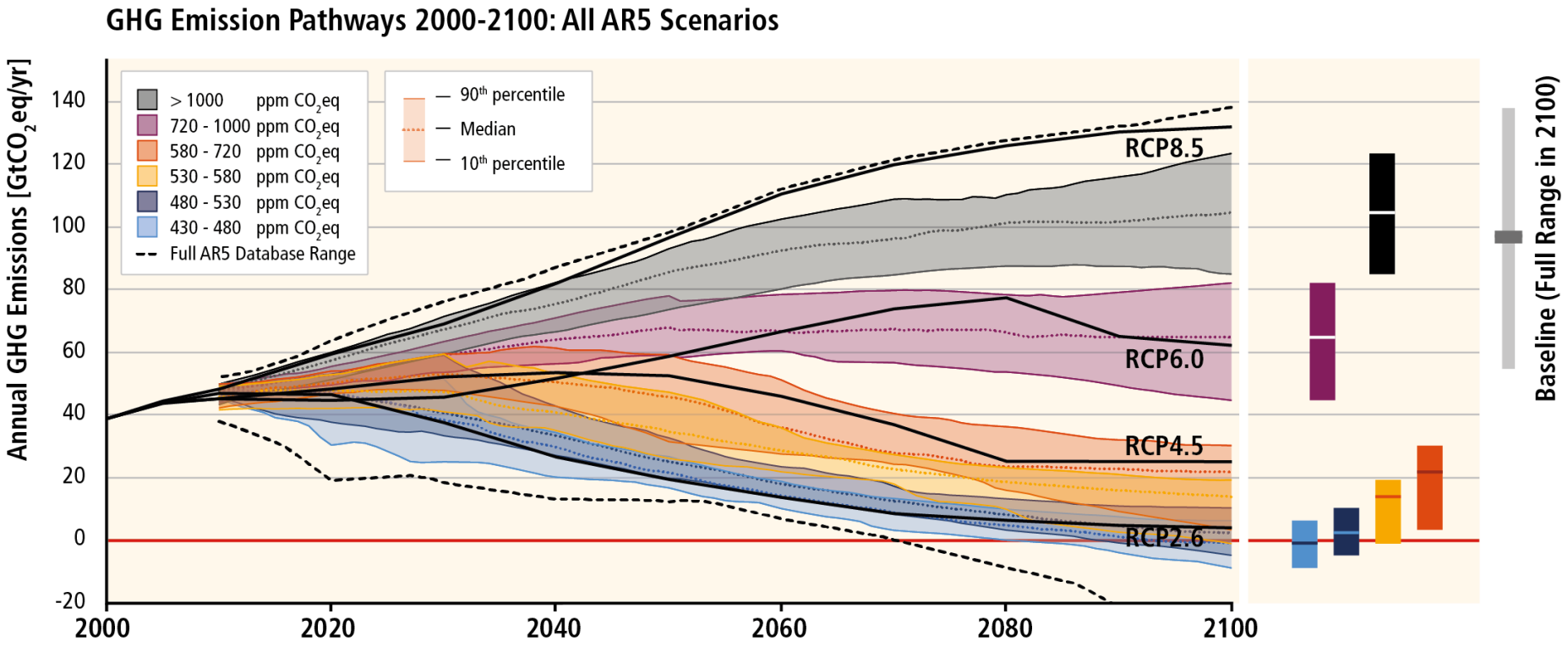
KEY MESSAGE 2

GHG emissions rise with growth in GDP and population; long-standing trend of decarbonisation of energy reversed.



KEY MESSAGE 3

Without more mitigation, global mean surface temperature might increase by 3.7° to 4.8°C over the 21st century.



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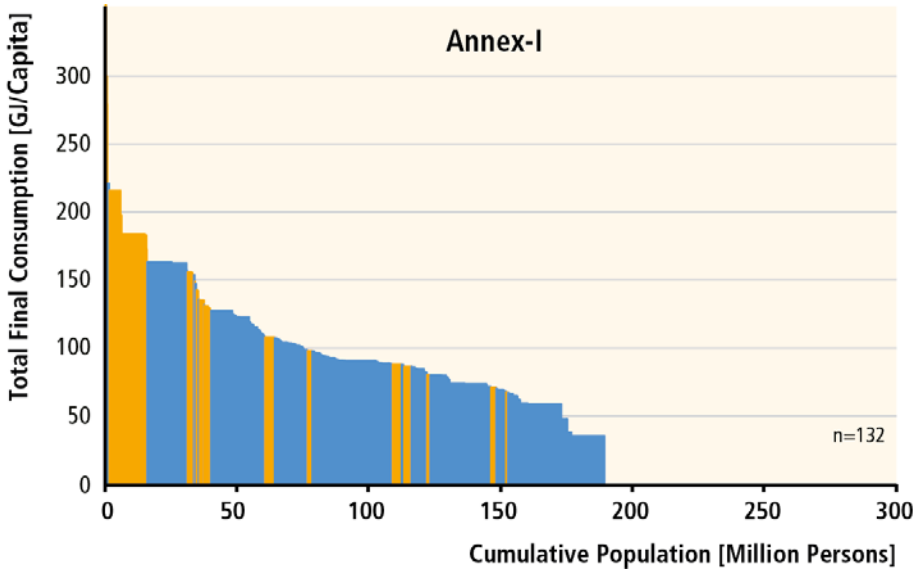
Chapter 12: Human Settlements, Infrastructure, and Spatial Planning

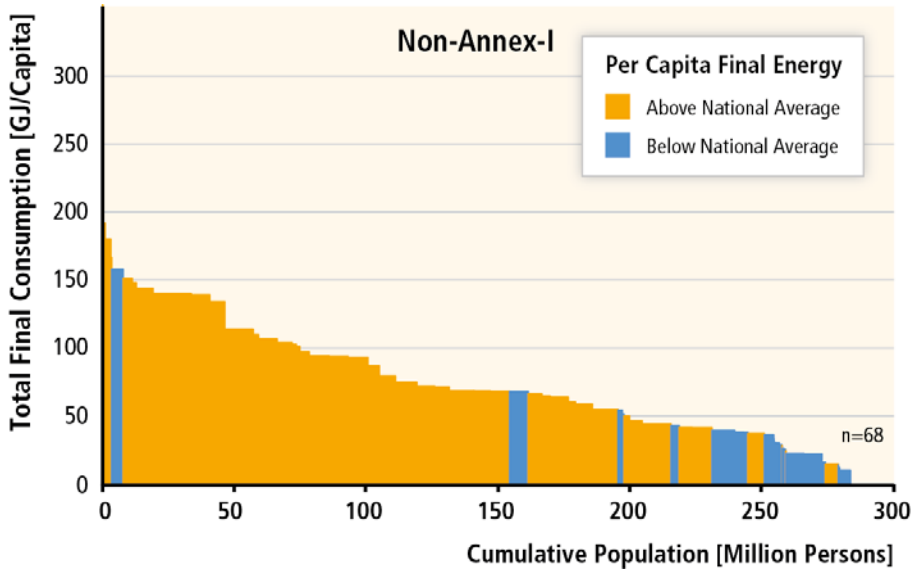
2 Coordinating Lead Authors
30 Authors
2 Review Editors
2 Chapter Science Assistants

More than **110** pages
Nearly **700** references
More than **3,000** comments

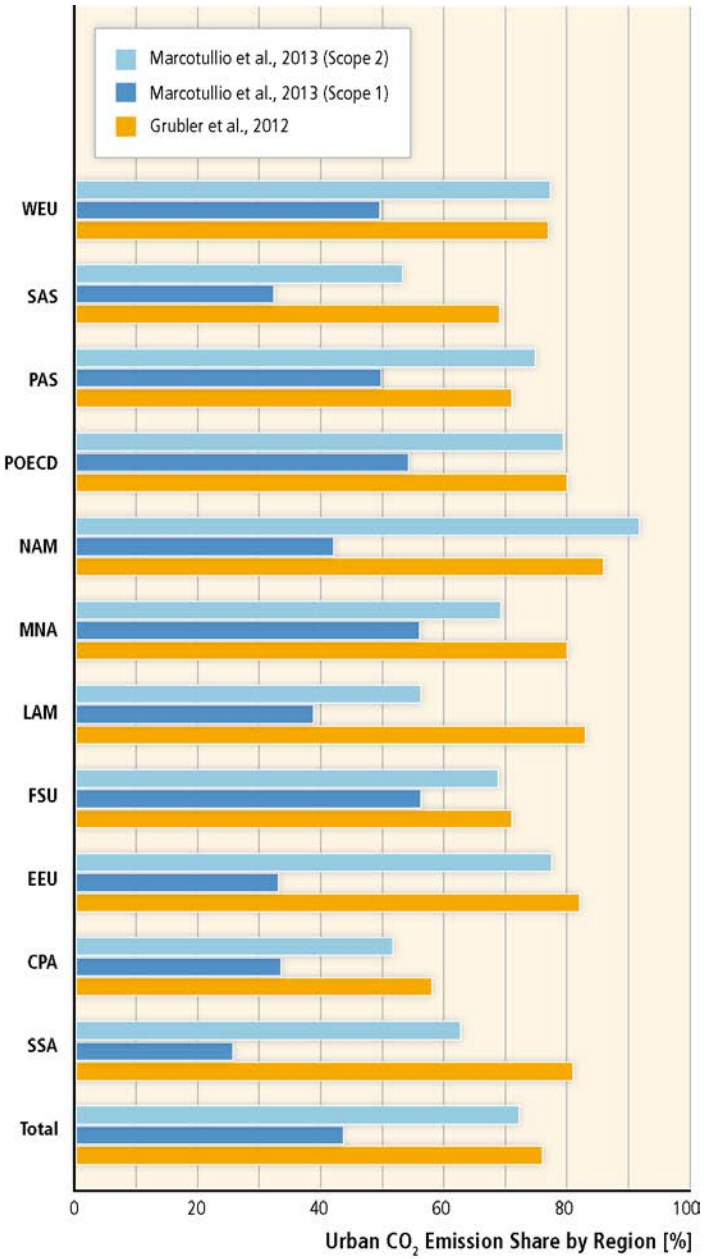
KEY MESSAGE 1

In 2006, urban areas accounted for 67–76% of energy use and 71–76% of energy-related CO2 emissions. Cities in non-Annex I countries generally have higher levels of energy use compared to the national average, whereas cities in Annex I countries generally have lower energy use per capita than national averages.





LARGE VARIATIONS IN THE SHARE OF URBAN CO_2 EMISSIONS ACROSS WORLD REGIONS



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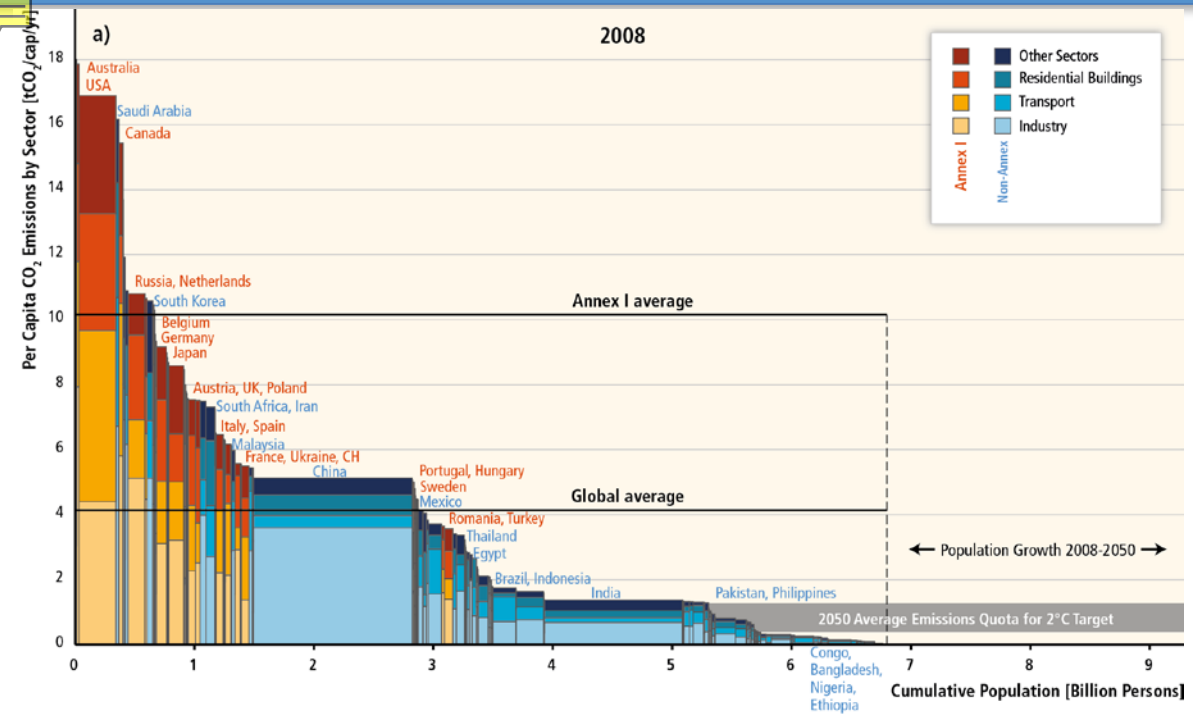
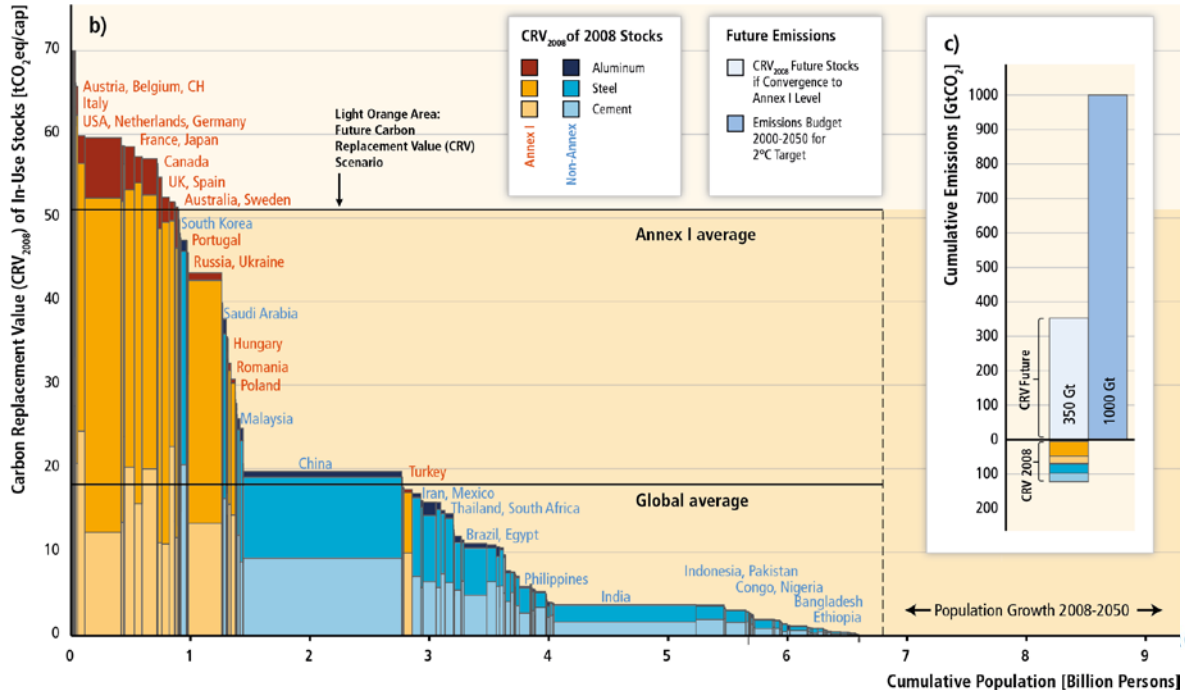
KEY MESSAGE 2

The next two decades present a window of opportunity for mitigation in urban areas, as a large portion of the world's urban areas will be developed during this period.

Study	Scenario	Urban Land 2000 (km²)	Projected Urban Expansion to 2030 (km²)							% of projected urban land in 2030 to be built between 2000-2030
			Africa	Asia	Europe	Latin America	North America	Oceania	TOTAL (%increase from 2000)	
Seto et al (2011)	SRES A1	726,943	107,551	1,354,001	296,638	407,214	73,176	16,996	2,255,576 (310)	76
	SRES A2	726,943	113,423	702,772	162,179	122,438	49,487	15,486	1,165,785 (160)	62
	SRES B1	726,943	107,551	1,238,267	232,625	230,559	86,165	18,106	1,913,273 (263)	72
	SRES B2	726,943	136,419	989,198	180,265	131,016	74,572	15,334	1,526,805 (210)	68
Seto et al (2012)	>75% probability	652,825	244,475	585,475	77,575	175,075	118,175	9,700	1,210,475 (185)	65
			Africa	Asia	East Asia and the Pacific	Europe and Japan	Latin America and the Caribbean	Land Rich Developed Countries	TOTAL	
Angel et al (2011)	0 density decline	602,864	58,132	120,757	43,092	9,772	49,348	54,801	335,902 (56)	36
	1% density decline	602,864	92,002	203,949	75,674	74,290	98,554	119,868	664,337 (110)	52
	2% density decline	602,864	137,722	316,248	119,654	161,379	164,975	207,699	1,107,677 (184)	65





The build-up of infrastructure in developing countries will result in significant future emissions

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Indirect emissions play a large role in the building sector: in 2010 double of direct emissions

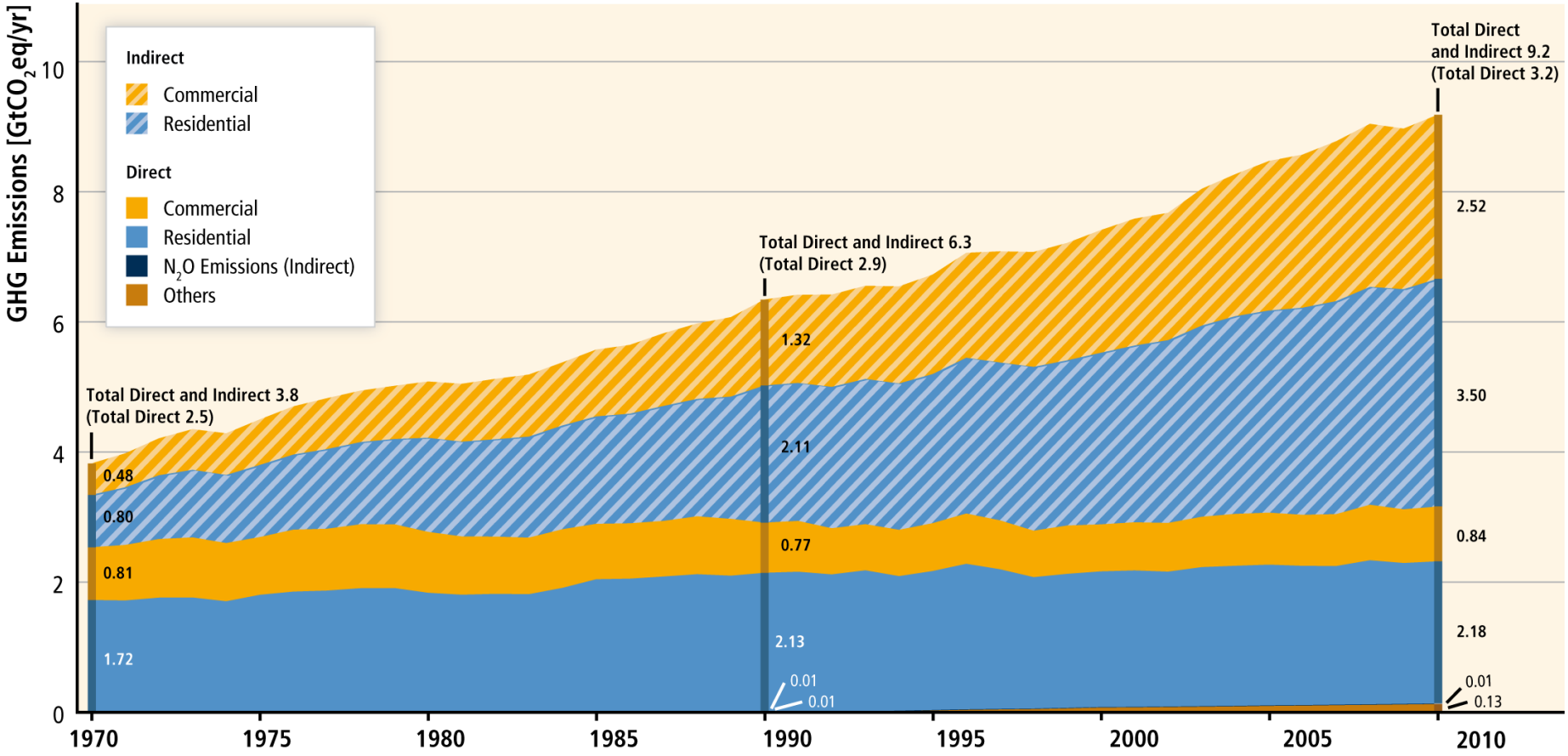

Figure 9.1. Direct and indirect (from electricity and heat) emissions in the building subsectors (IEA, 2012a; JRC/PBL, 2013; see Annex II.8).

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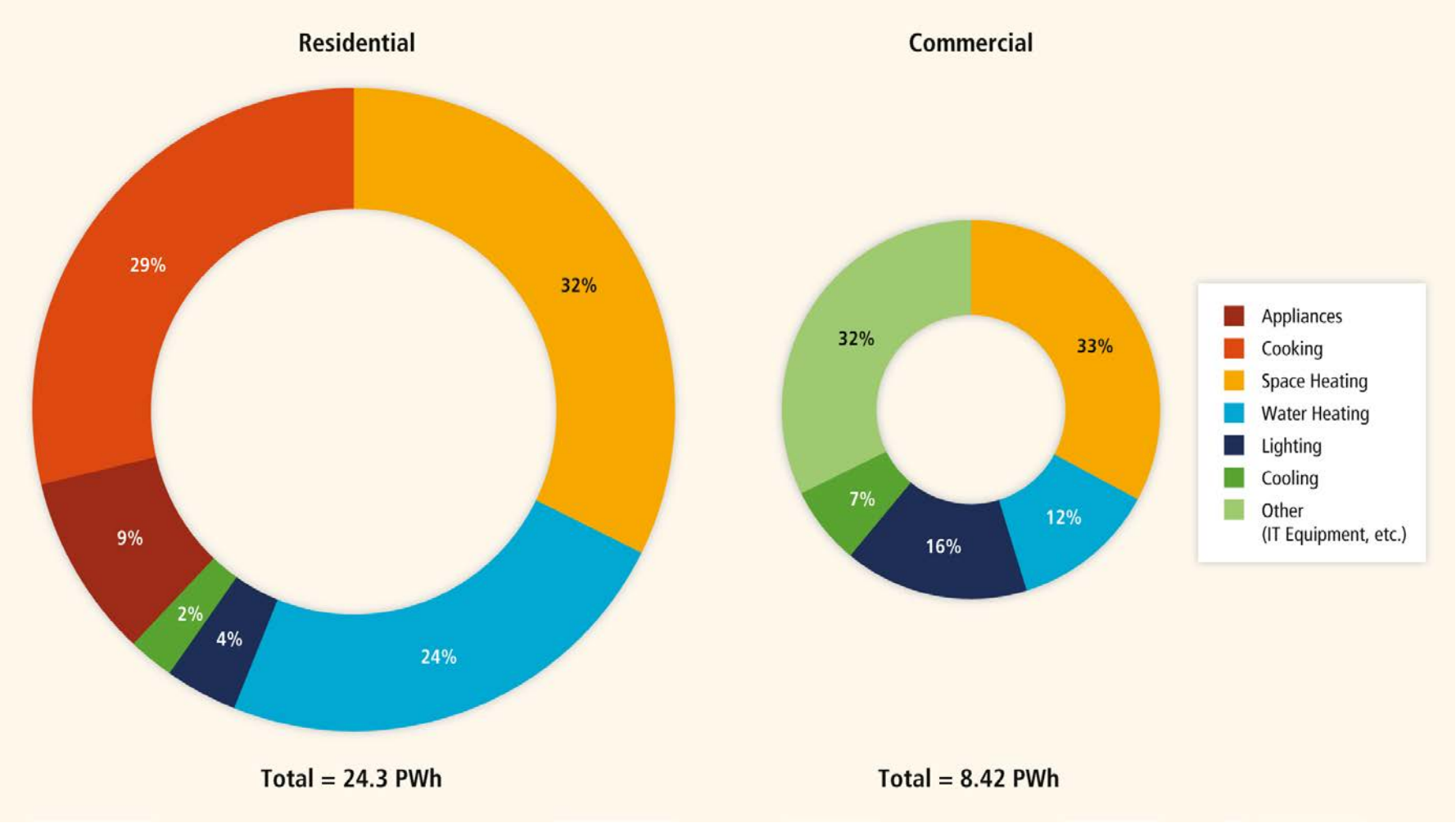
World building final energy consumption by end-use in 2010



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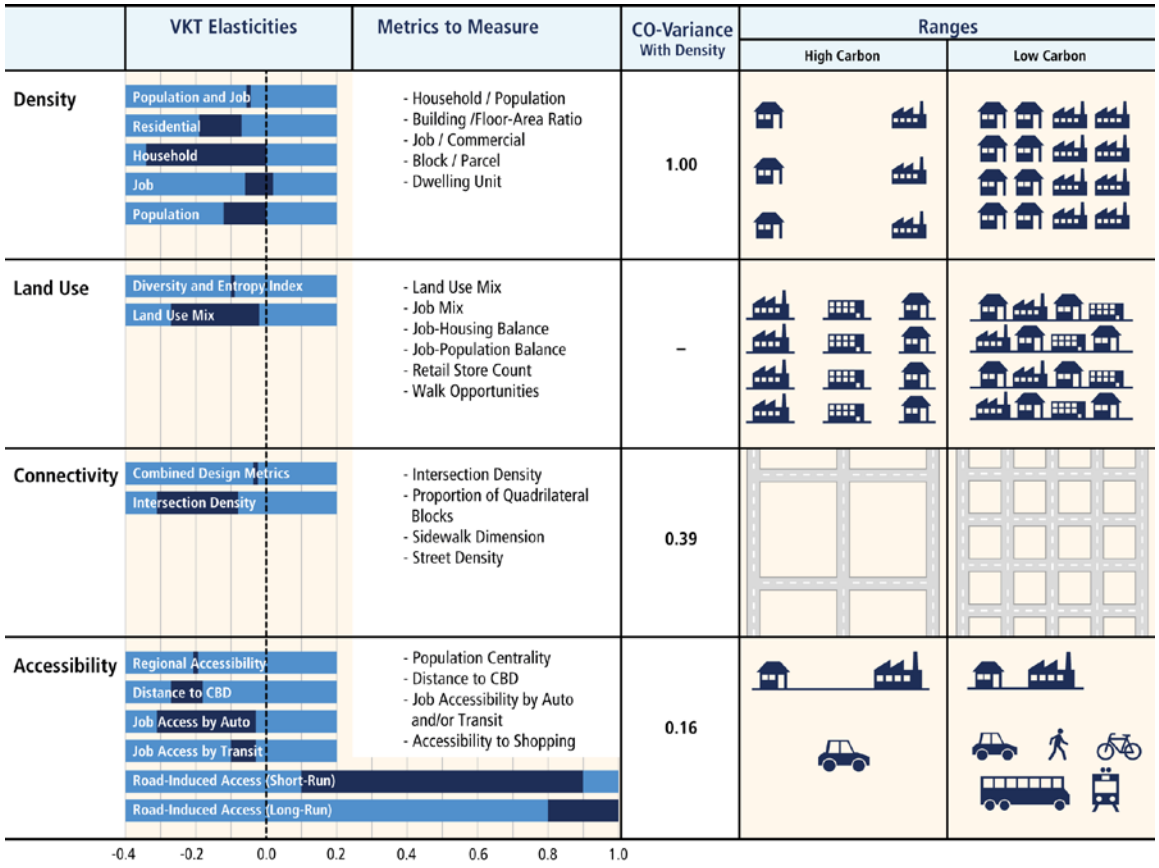
KEY MESSAGE 3

Mitigation options in urban areas vary by urbanization trajectories and are expected to be most effective when policy instruments are bundled.



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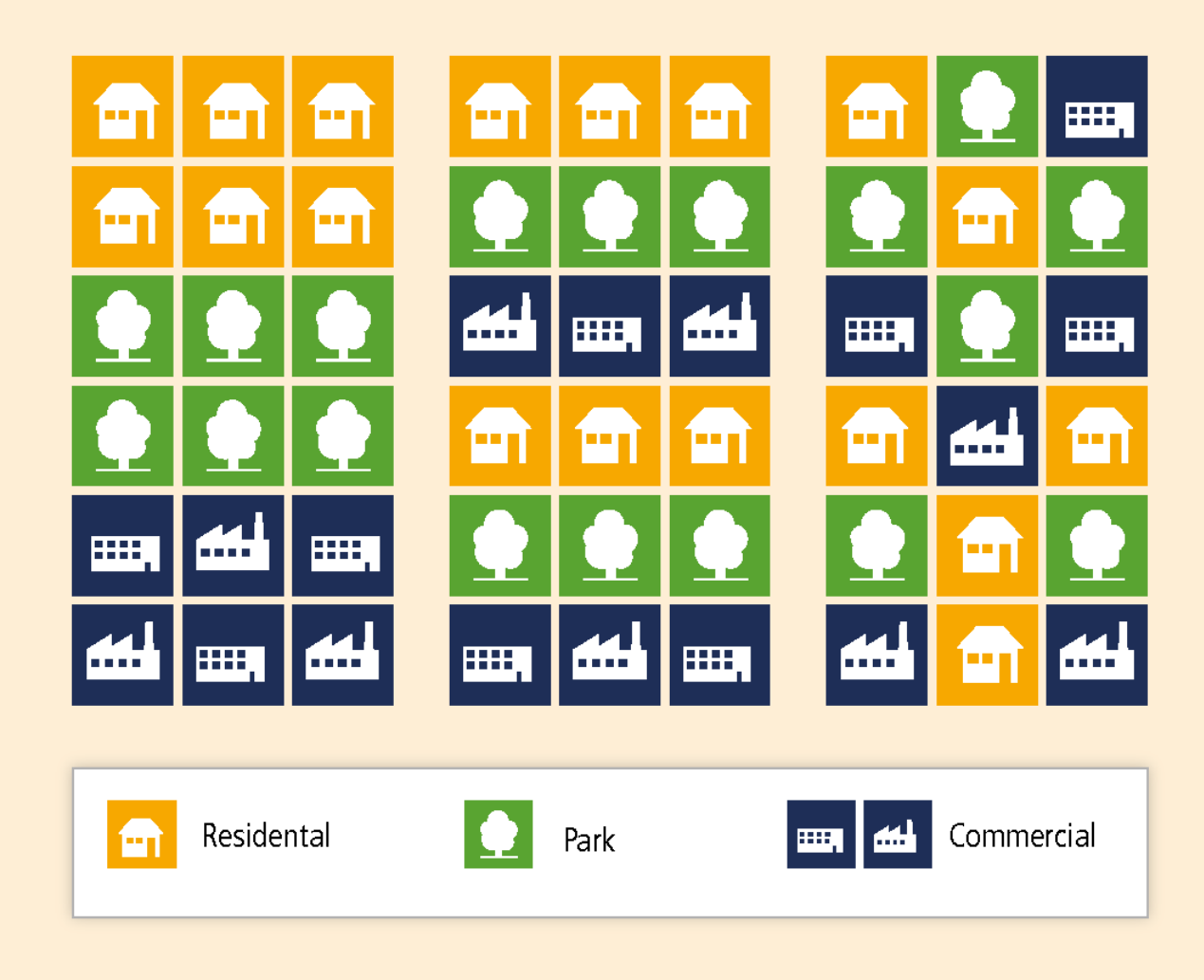
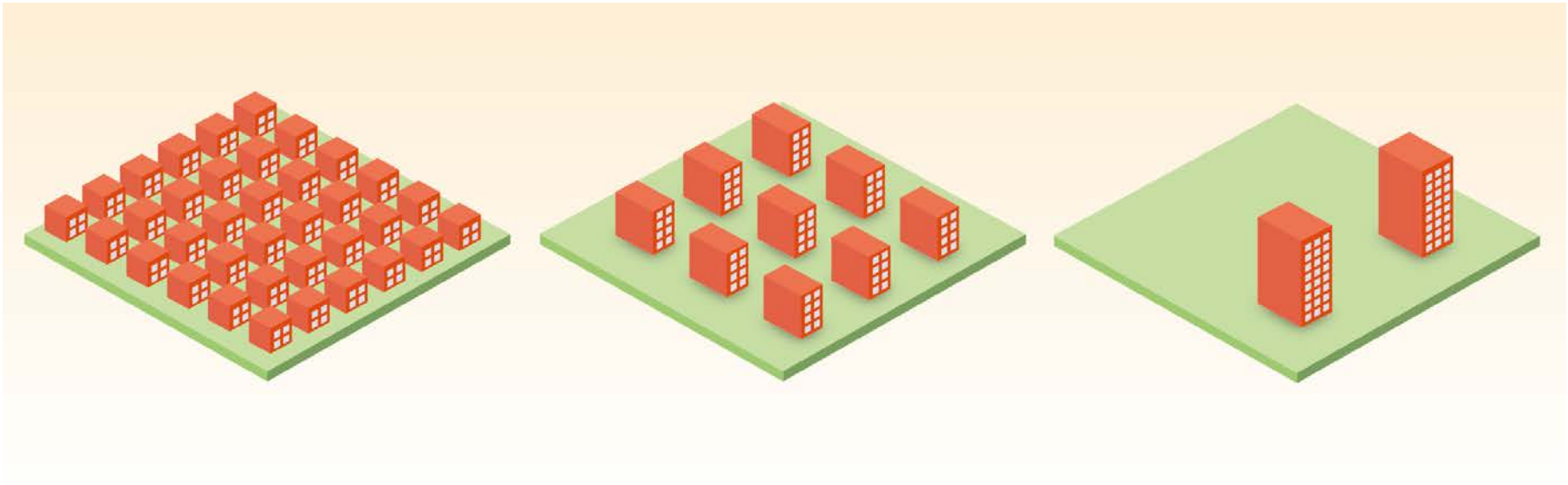
Need to understand urban land use mix

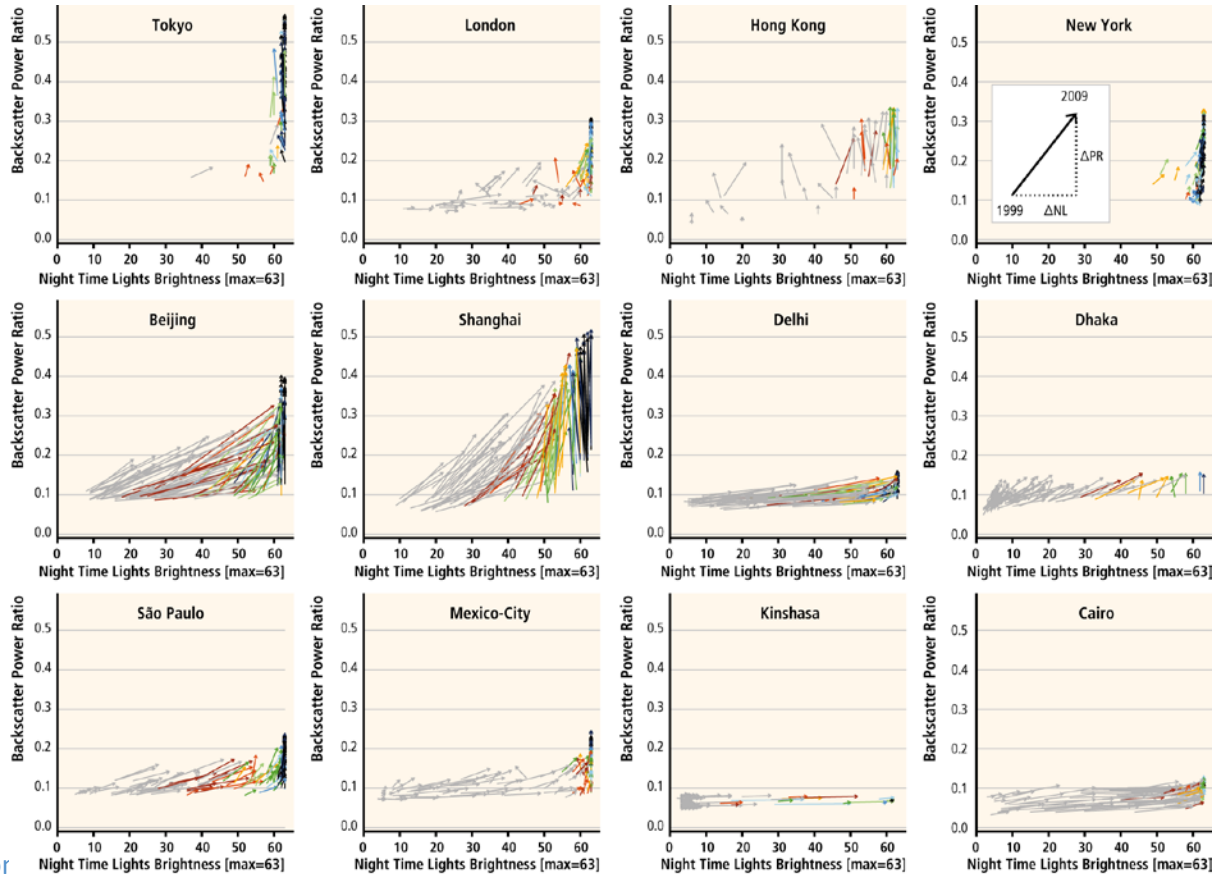


Density is necessary but not sufficient condition for lowering urban emissions



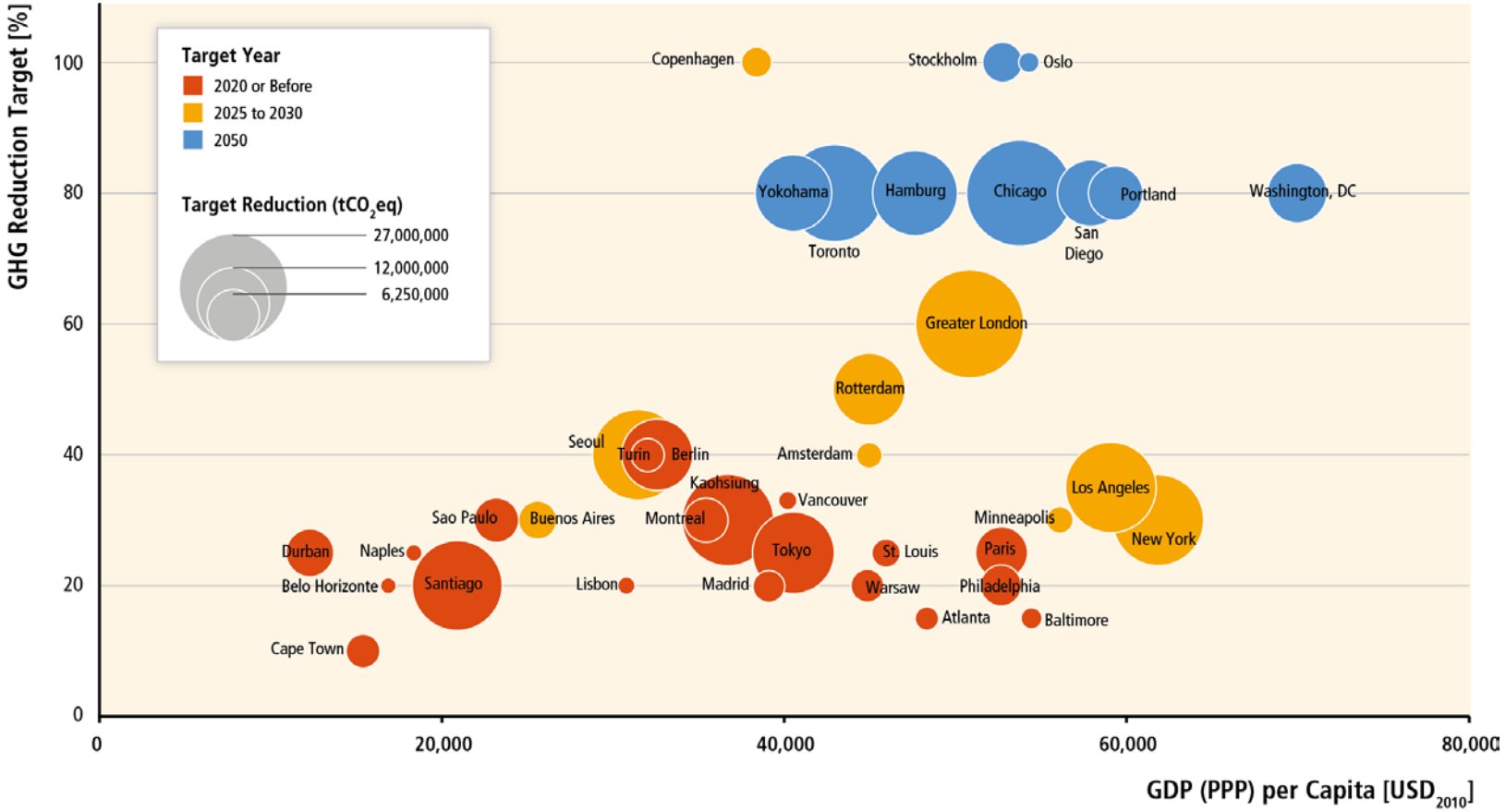
KEY MESSAGE 4

The largest mitigation opportunities with respect to human settlements are in rapidly urbanizing areas where urban form and infrastructure are not locked in, but where there are often limited governance, technical, financial, and institutional capacities.



KEY MESSAGE 5

Thousands of cities are undertaking climate action plans, but their aggregate impact on urban emissions is uncertain



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KEY MESSAGE 6

Action on urban-scale mitigation often depends on the ability to relate climate change mitigation efforts to local co-benefits.

Mitigation measures	Effect on additional objectives/concerns		
	Economic	Social (including health)	Environmental
Compact development and infrastructure	↑ Innovation and productivity[1] ↑↑ Higher rents & residential property values[2] ↑ Efficient resource use and delivery[5]	↑ Health from physical activity[3]	↑ Preservation of open space[4]
Increased accessibility	↑ Commute savings[6]	↑ Health from increased physical activity[3] ↑ Social interaction & mental health[7]	↑ Air quality and reduced ecosystem/health impacts[8]
Mixed land use	↑ Commute savings[6] ↑↑ Higher rents & residential property values[2]	↑ Health from increased physical activity[3] Social interaction and mental ↑ health[7]	↑ Air quality and reduced ecosystem/health impacts[8]

KNOWLEDGE GAPS

1. Lack of consistent and comparable emissions data at local scales.

2. Little scientific understanding of the magnitude of the emissions reduction from altering urban form, and the emissions savings from integrated infrastructure and land use planning.

3. Lack of consistency and thus comparability on local emissions accounting methods.

4. Few evaluations of urban climate action plans and their effectiveness.

5. Lack of scientific understanding of how cities can prioritize climate change mitigation strategies, local actions, investments, and policy responses that are locally relevant.

6. Large uncertainties as to how urban areas will develop in the future.

For further information

www.mitigation2014.org