Prepared for ECA-Talk (18th January 2024)

THRIVING

MAKING CITIES GREEN, RESILIENT AND INCLUSIVE IN A CHANGING CLIMATE

City Resilience Program

WORLD BANK GROUP

GFDRR
Global Facility for Disaster Reduction and Recovery

Territorial and Spatial Development
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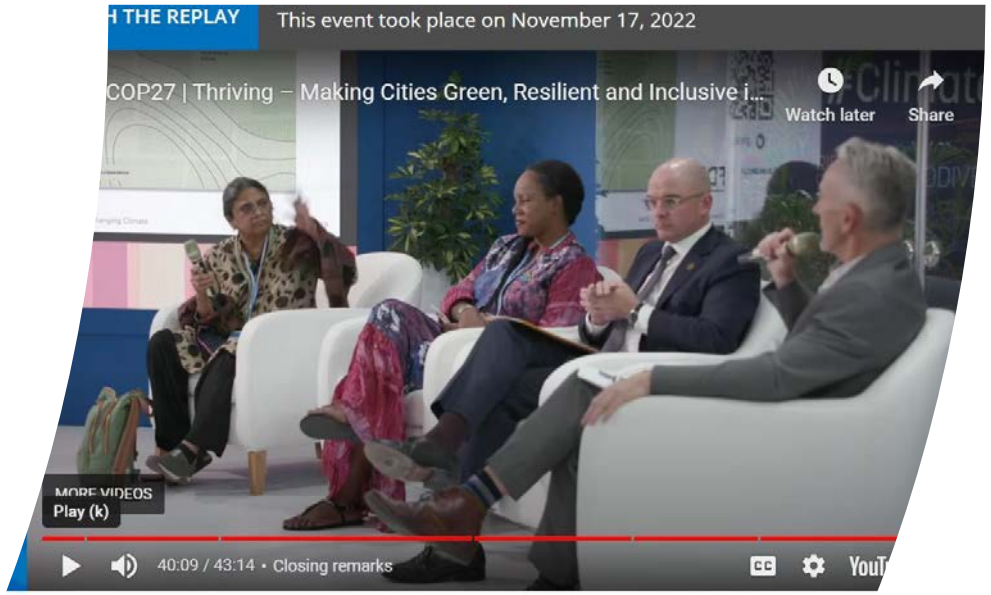
#ThrivingCities

Thriving - Making Cities Green, Resilient & Inclusive in a Changing Climate

ng – Making Cities Green, Resilient and Inclusive in a Changing



Thriving – Making Cities Green, Resilient and Inclusive in a Cl
Climate

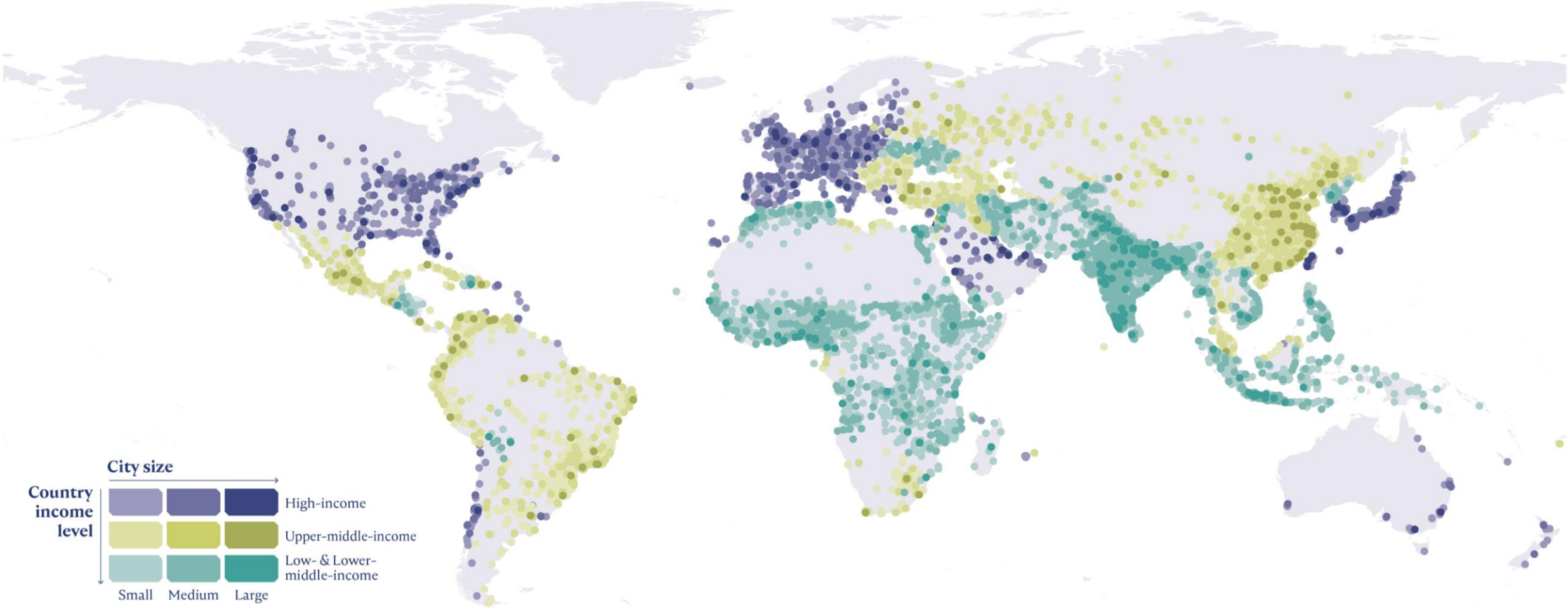
Two key objectives

- Evidence on how climate change impacts cities & how urban development affects the environment
  → tailored evidence for ECA

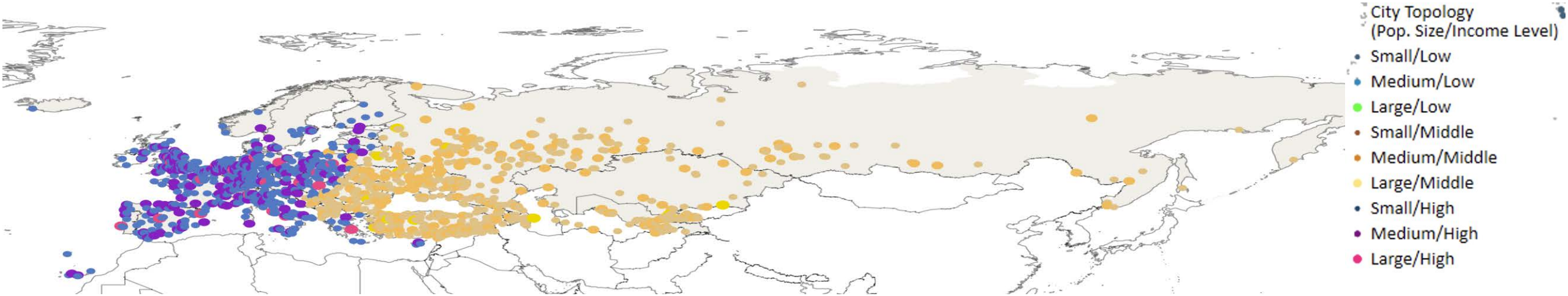
- Policy compass to help cities thrive

The cities – climate change nexus

A global typology of cities



Including 1,344 (mainly high- & upper-middle country) cities in ECA



9 typologies of cities in ECA

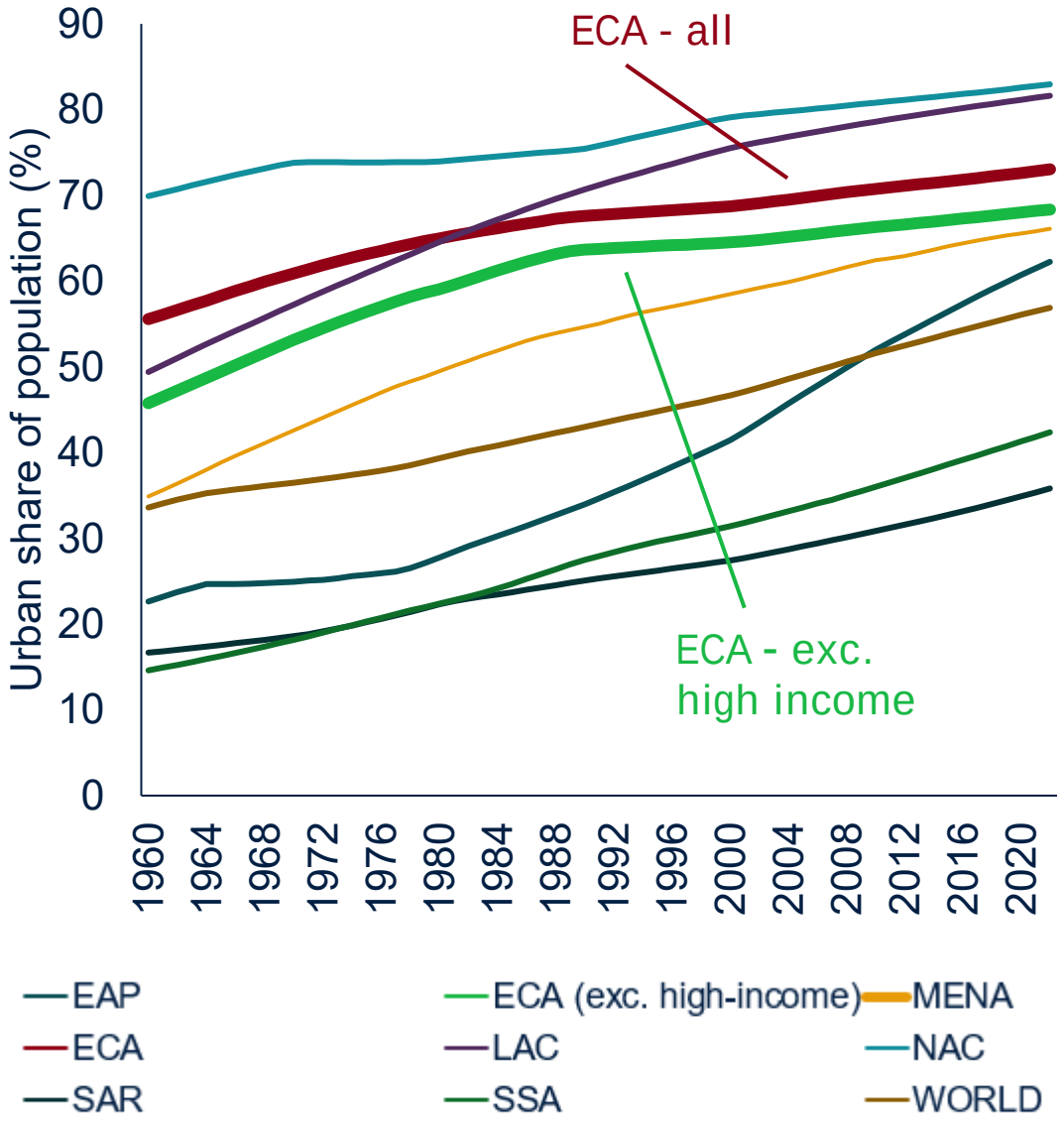
		Population		
		Small (50k-200k)	*Medium (200k-1.5m)*	*Large (over 1.5m)*
Income	*Lower Middle-Income*	115	42	2
	Upper Middle-Income	357	135	10
	High Income	513	151	21
Total		**985**	**328**	**33**

By ECA Subregion

Eastern Europe	420
Northern Europe	181
South America	1
South-Central Asia	118
Southern Europe	229
Western Asia	163
Western Europe	227
Total	1,344

Source: World Bank analysis based on European Commission's Global Human Settlement (GHS) Urban Centre Database R2019

ECA has reached an advanced stage of urbanization



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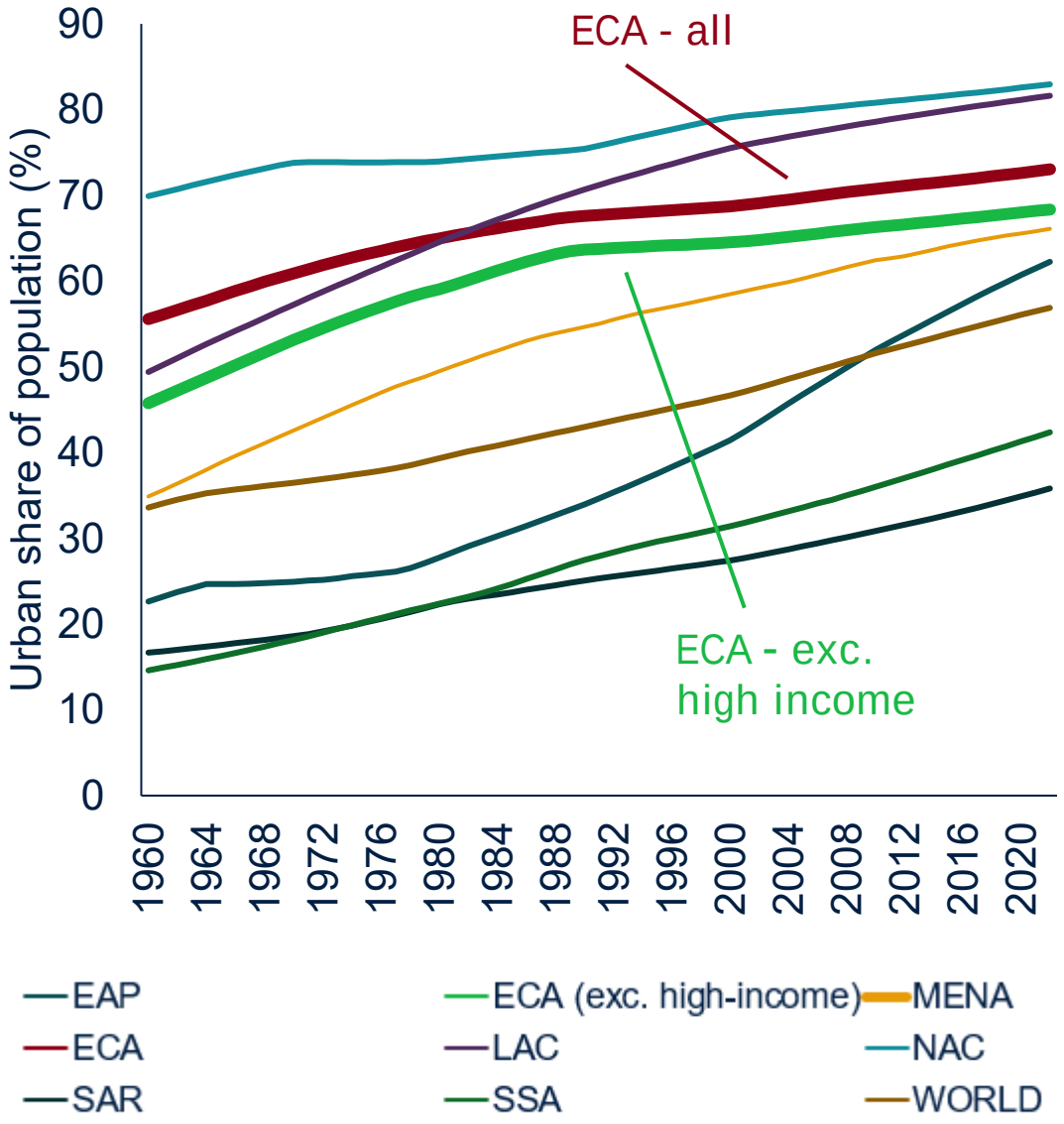
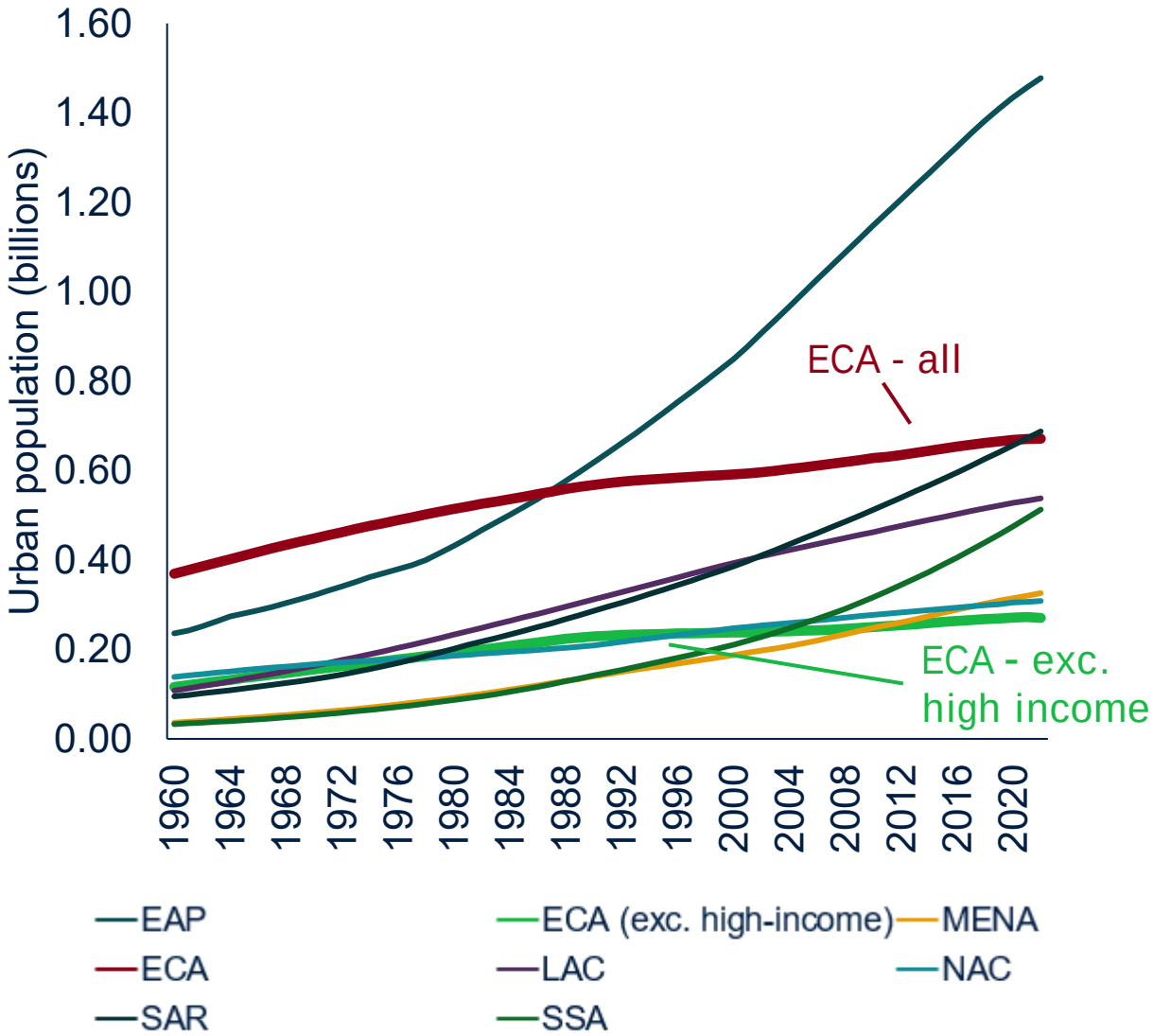
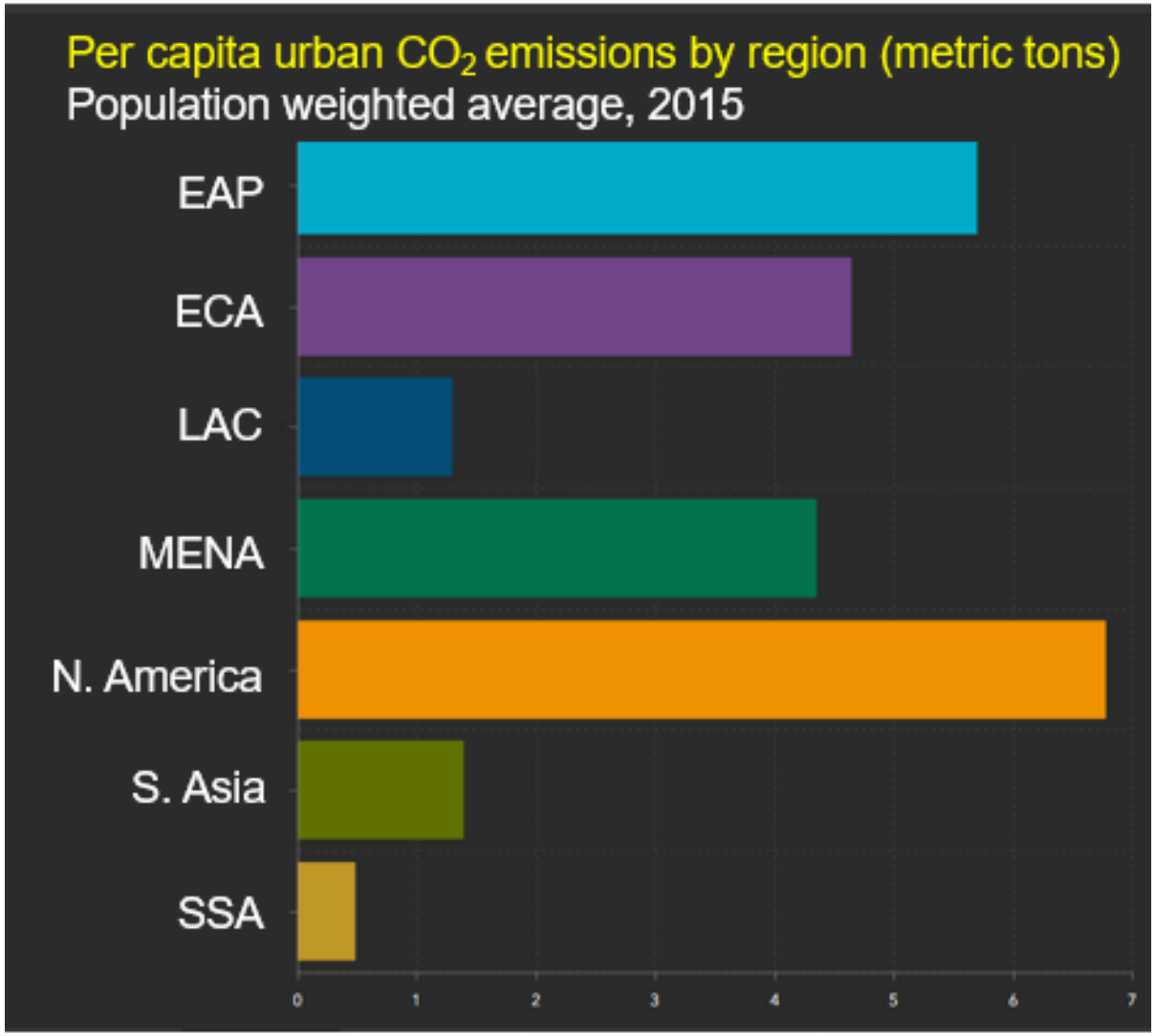




Relatively high per capita urban CO_2 emissions in ECA …



Source: WB analysis based on Thriving cities database

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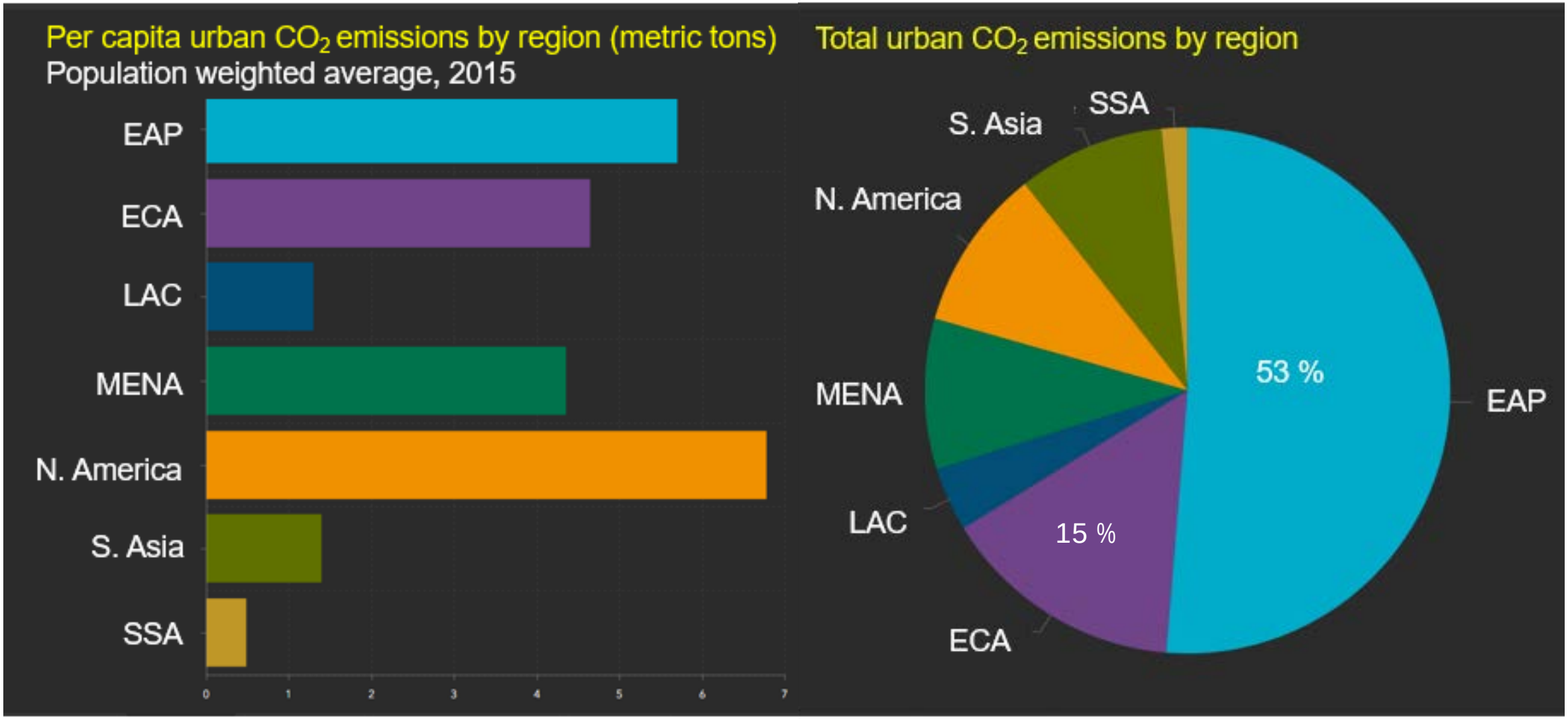
… and ECA's share of global urban CO_2 emissions is roughly in line with its share of global urban population



Source: WB analysis based on Thriving cities database

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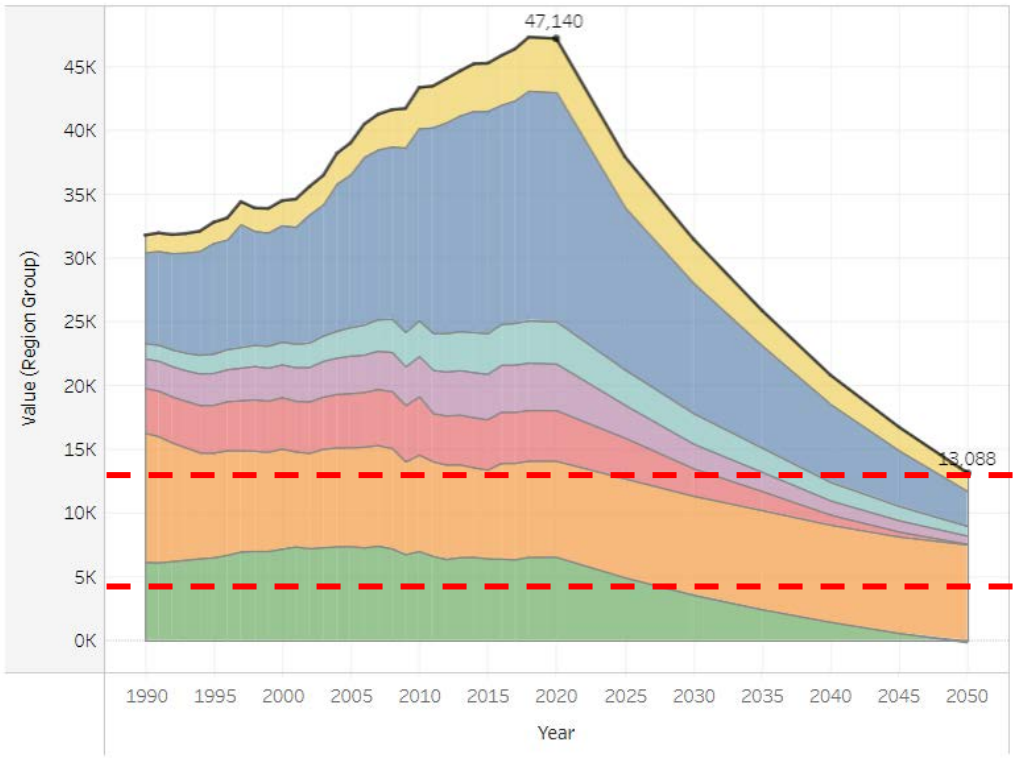
Without ECA, net zero by 2050 cannot be achieved

Projected GHG Emissions - Net Zero Policies Everywhere *Except* ECA



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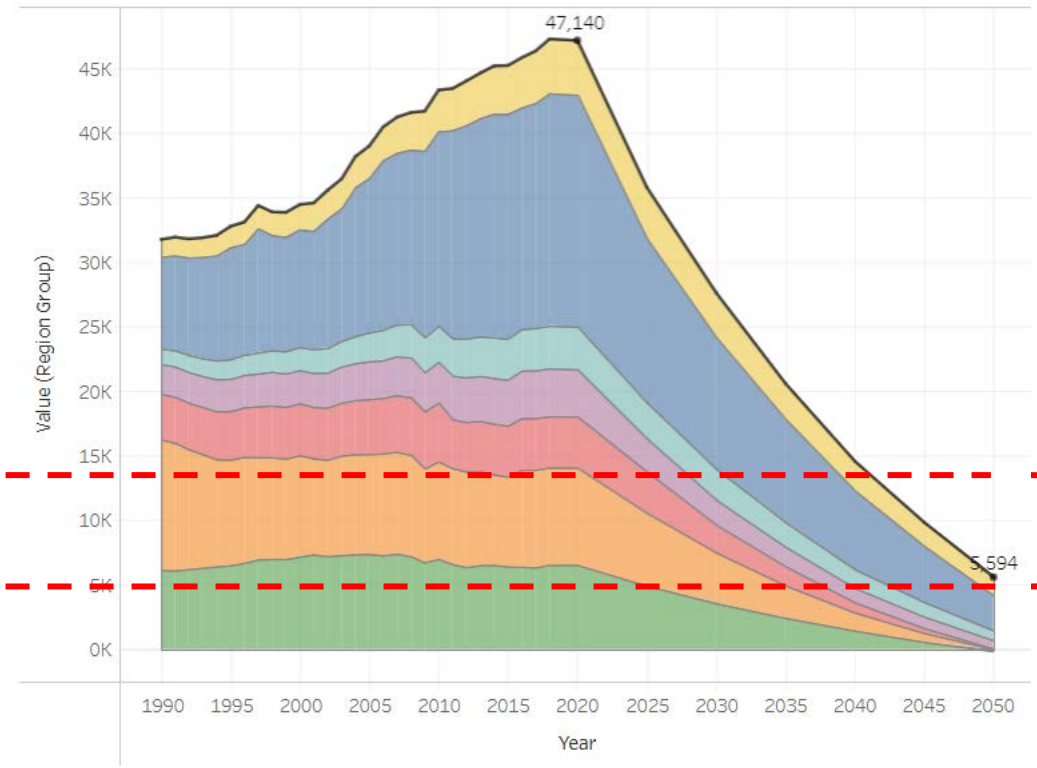

2.3 times too high

Region
- South Asia
- East Asia & Pacific
- Middle East & North Africa
- Sub-Saharan Africa
- Latin America & Caribbean
- Europe & Central Asia
- North America

Source: WB analysis using the WB's Greenhouse Gas Emissions Pathways Dashboard, whose input is NGFS v 2 data.

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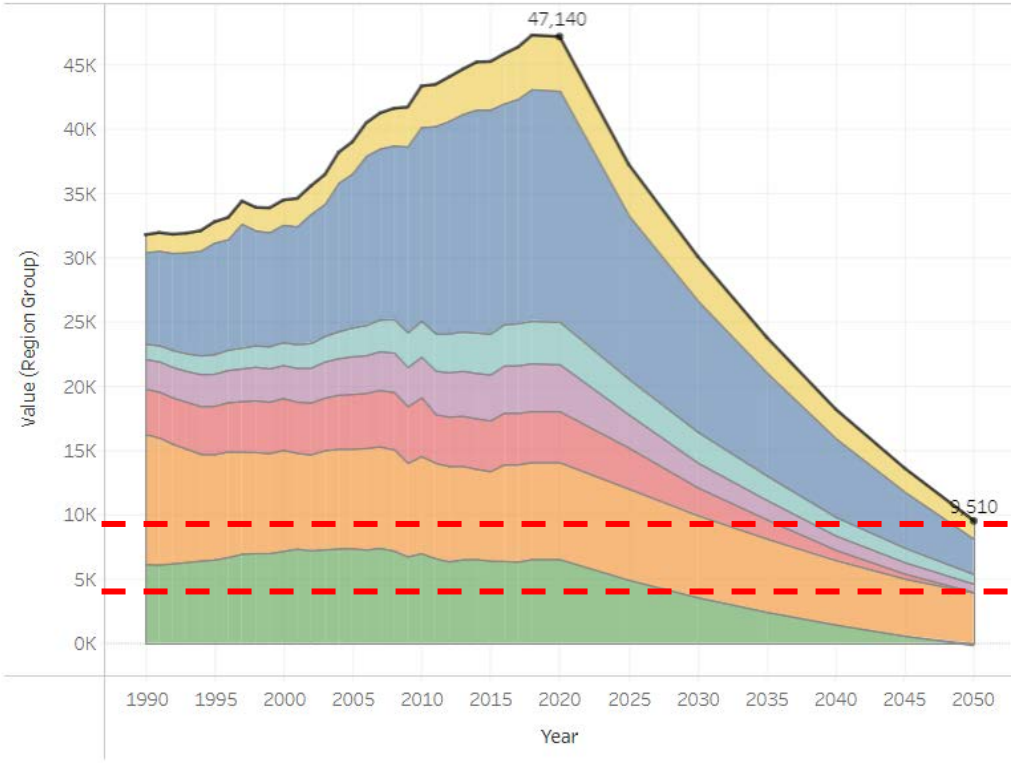
ECA countries need to be even more ambitious

Projected GHG Emissions - Net Zero Policies Everywhere; *NDC policies in ECA*



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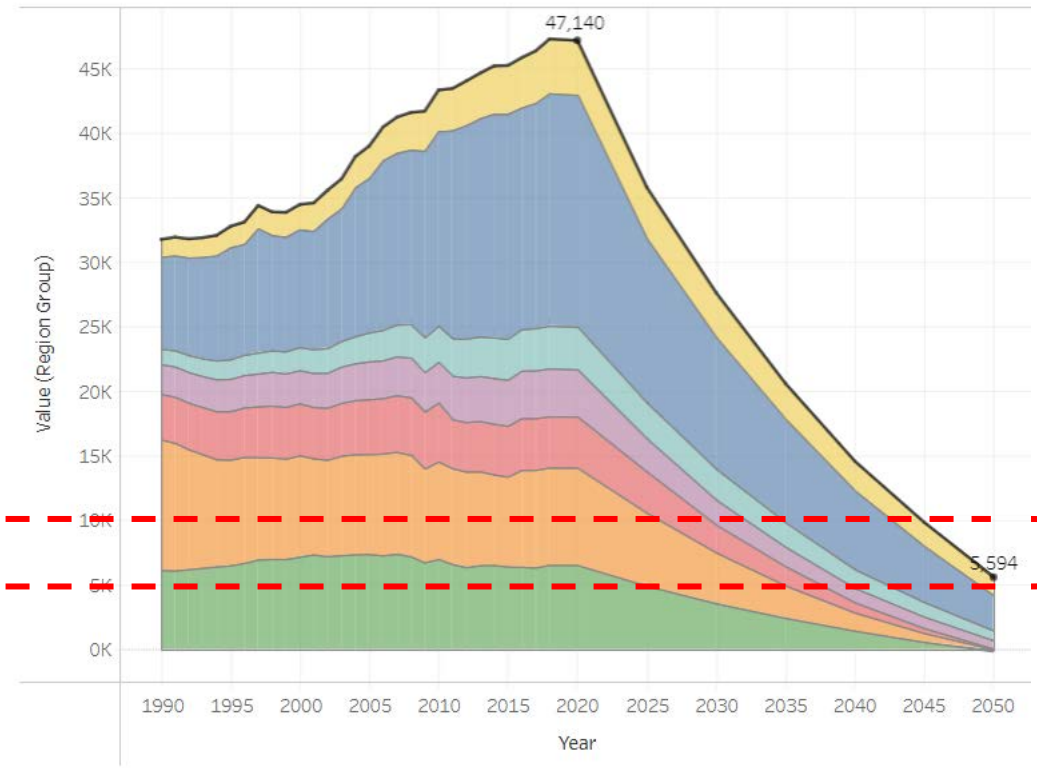

1.7 times too high

Region
- South Asia
- East Asia & Pacific
- Middle East & North Africa
- Sub-Saharan Africa
- Latin America & Caribbean
- Europe & Central Asia
- North America

Source: WB analysis using the WB's Greenhouse Gas Emissions Pathways Dashboard, whose input is NGFS v 2 data.

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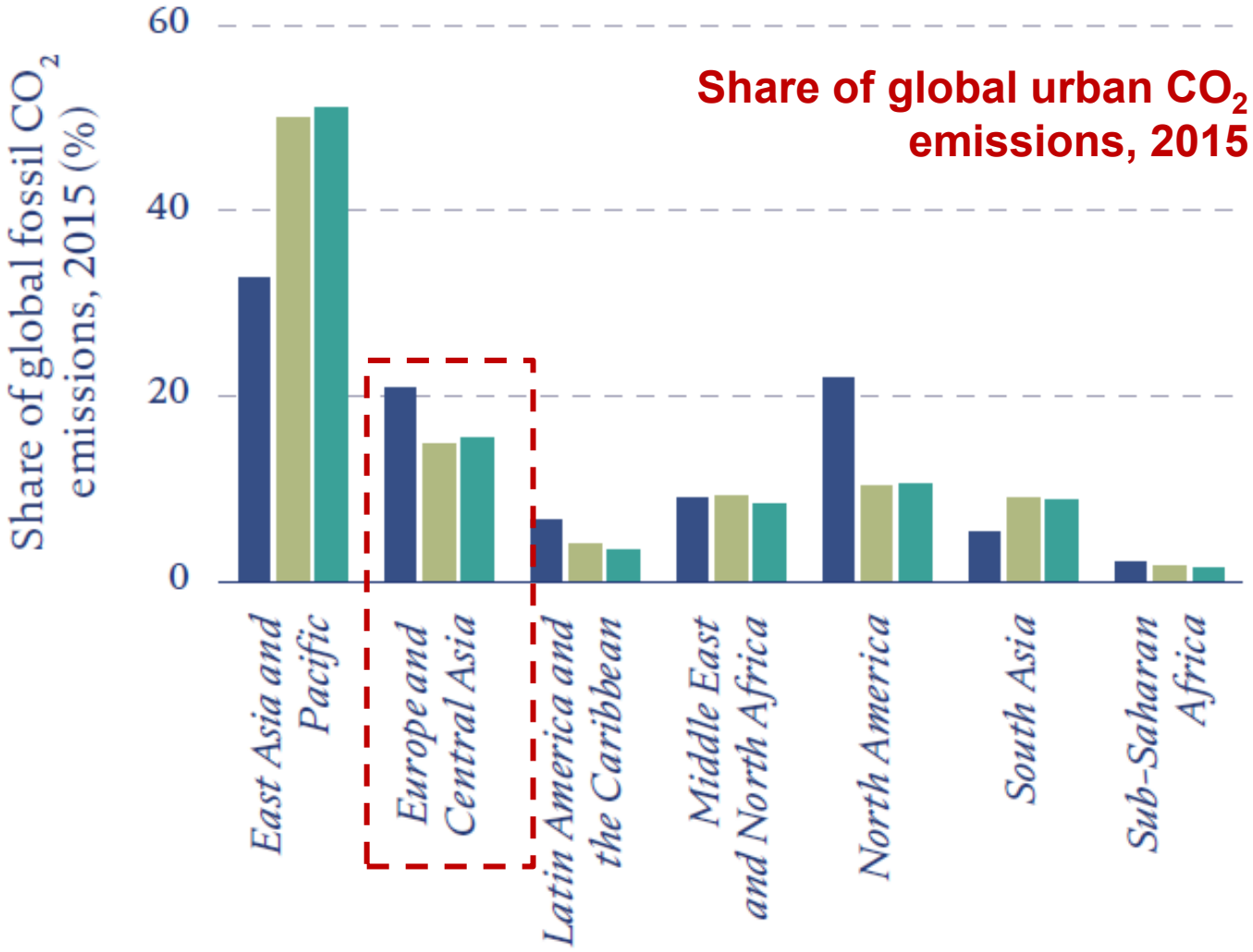
Residential & transport sectors are important sources of emissions in ECA



Source: World Bank calculations based on data from the European Commission's Global Human Settlement (GHS) Urban Centre Database R2019

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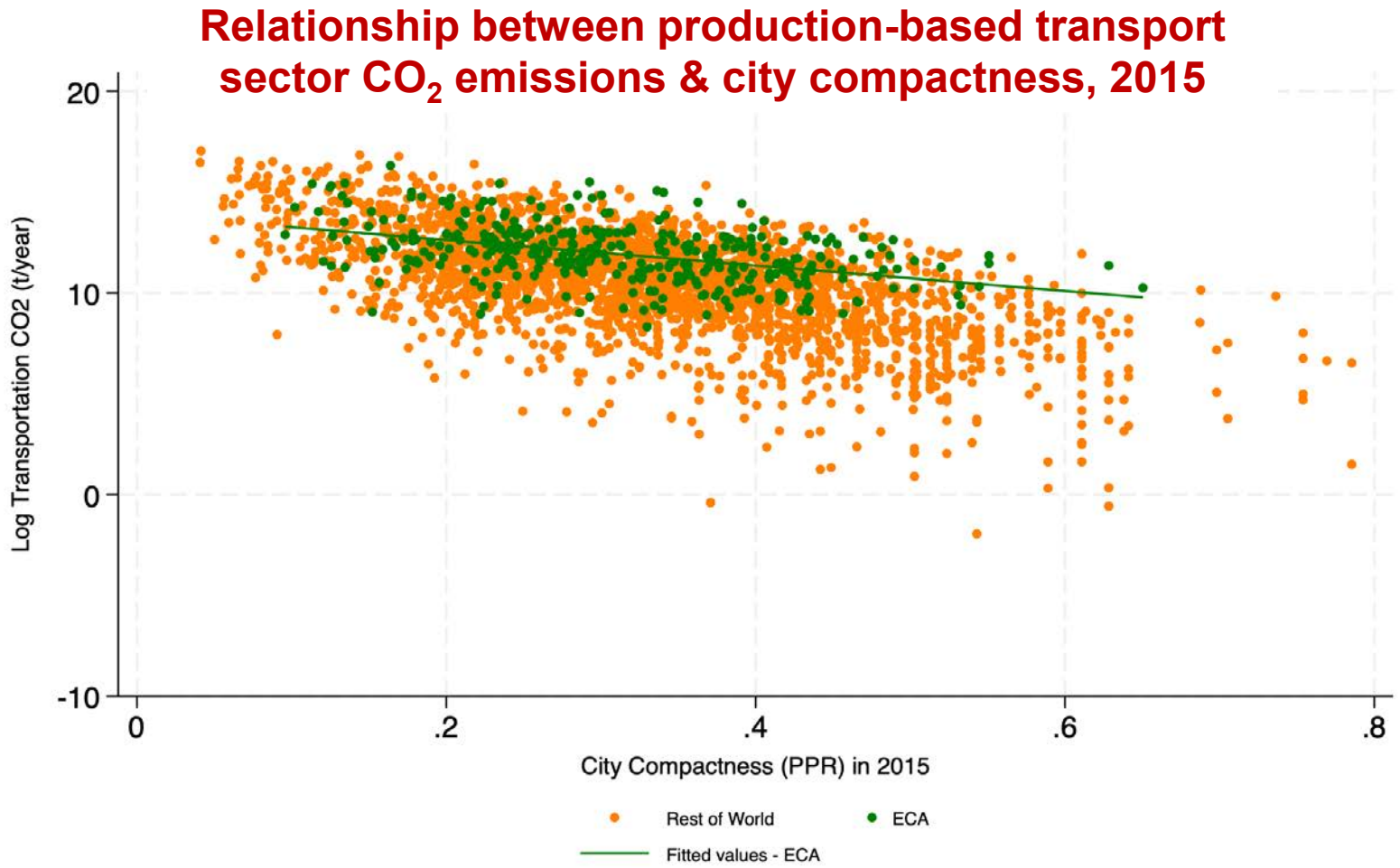
More compact transit oriented urban development is associated with lower CO_2 emissions …

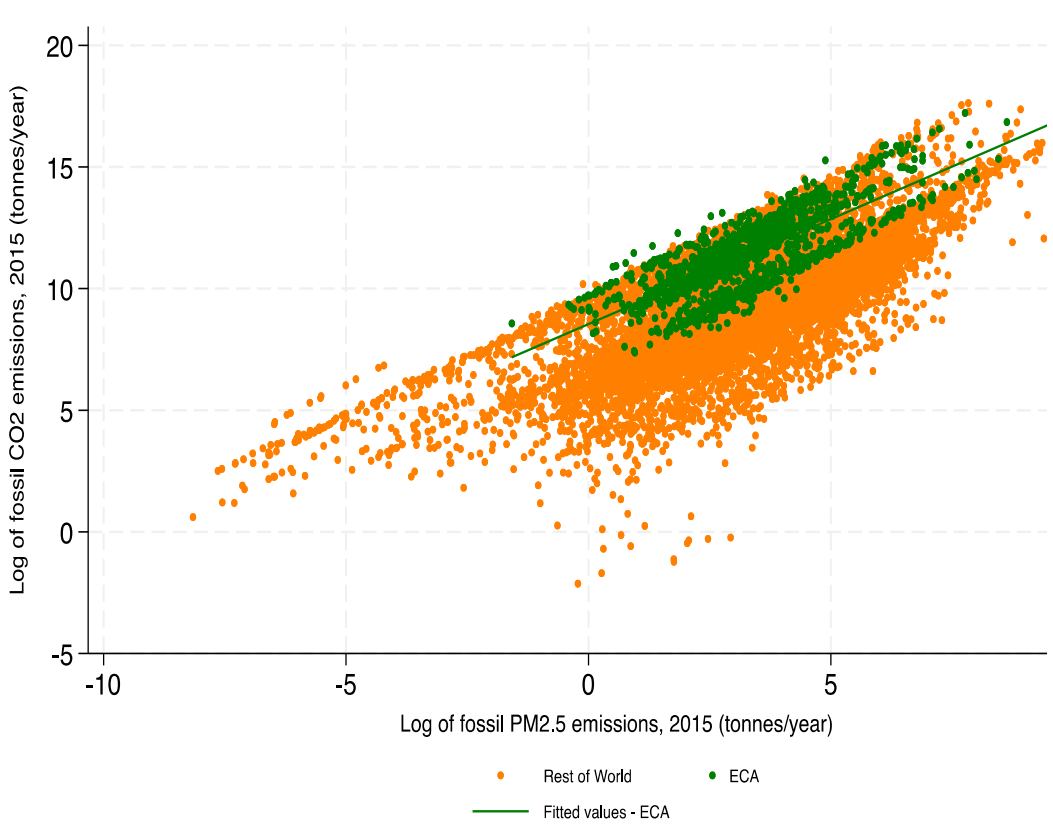


Source: World Bank calculations based on data from the European Commission's Global Human Settlement (GHS) Urban Centre Database R2019

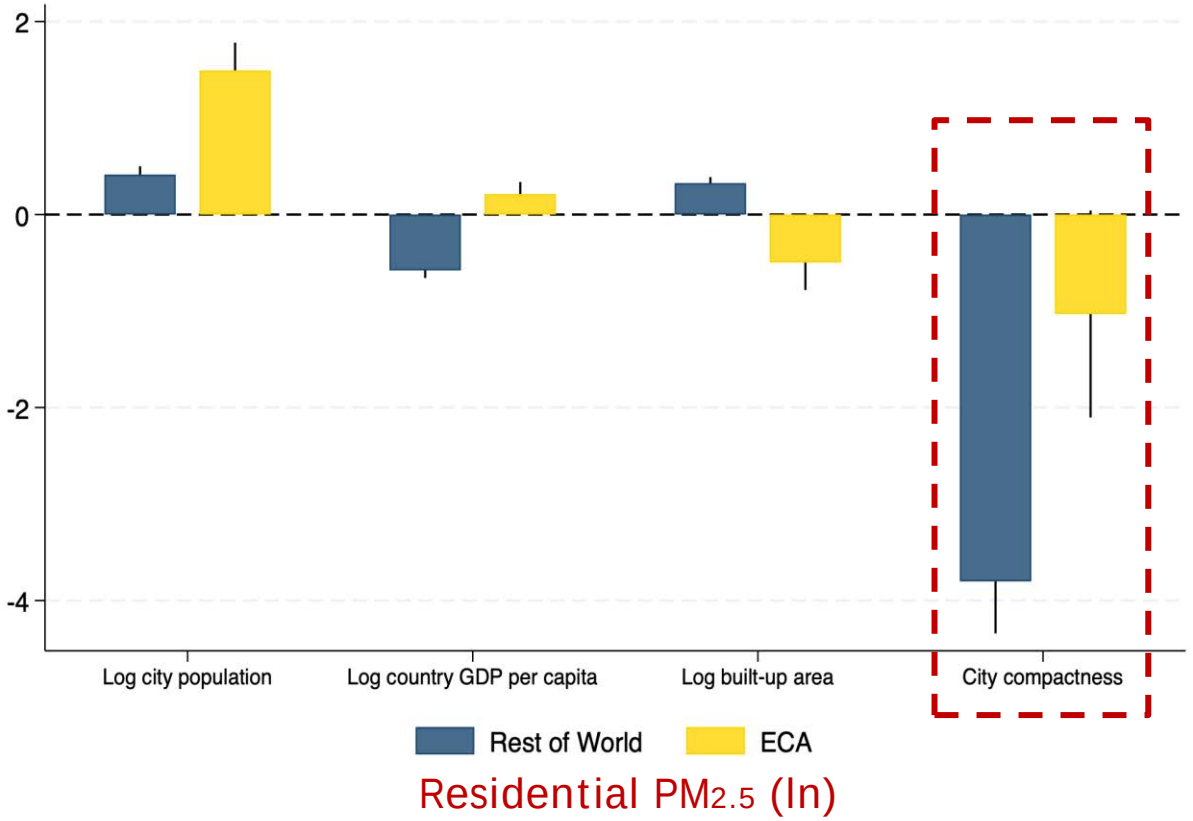
NB: measure of compactness used (the Polsby-Popper Ratio) measures how circular a city's shape is, a circle being the most compact geometric shape. This is just one dimension/interpretation of "compactness."

… with co-benefits for local air quality …

Relationship between production-based CO_2 & $PM_{2.5}$ emissions, 2015



Relationship between production-based $PM_{2.5}$ emissions & city characteristics, 2015



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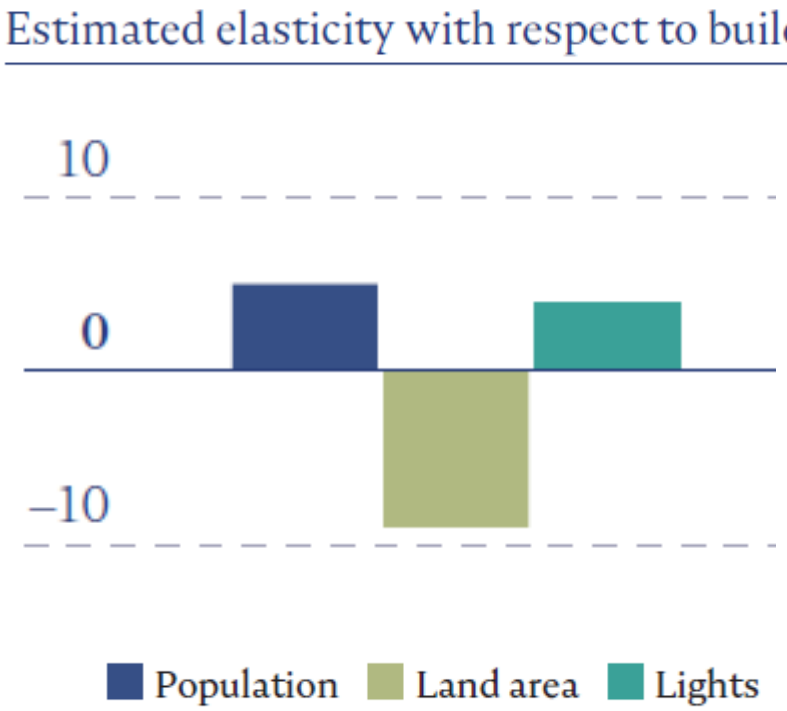
… and local economic activity

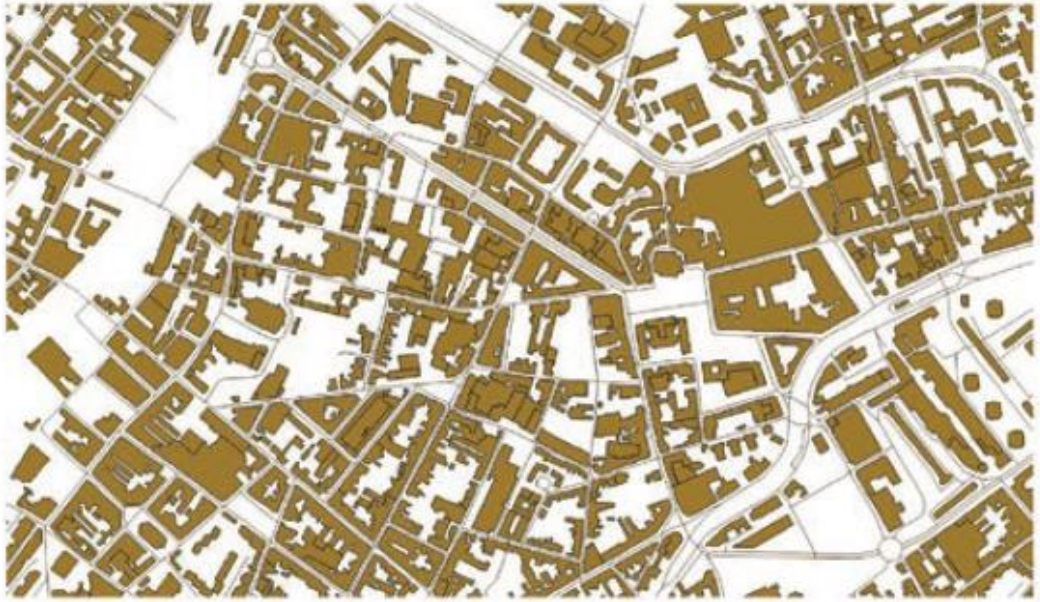


Source: World Bank based on results from Ahlfeldt and Jedwab (2022), whose data on tall buildings are based on data from Emporis.

- Figure shows estimated impact of a doubling of a city's total sum of tall building heights on population, land area, & NTL intensity
- Illustrated results are based on OLS but are robust to various IV strategies
- ⇒ taller cities are not only more compact & populous, but also more prosperous

But it's not just about tall buildings - urban design also matters

a. Fractal dimension: 1.81 (Roubaix, France)

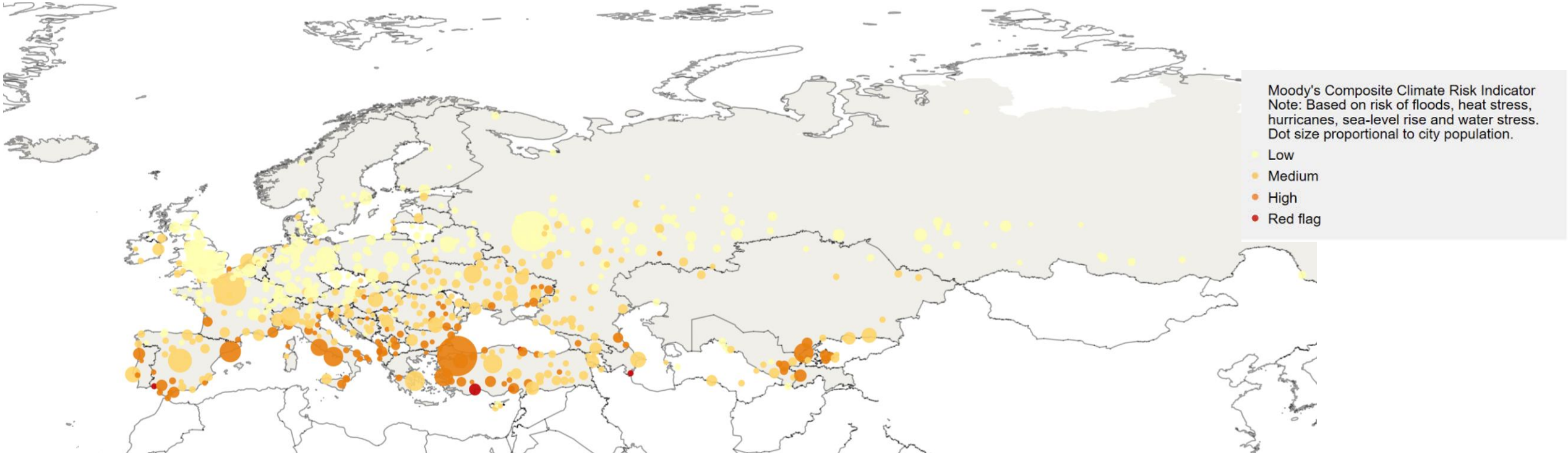


b. Fractal dimension: 1.65 (Créteil, France)

Source: Blaudin de Thé, Carantino, and Lafourcade 2021.

- Evidence for France ⇒ cities with more visually interesting / walkable urban environments have lower carbon "car-prints"

ECA cities increasingly exposed to climate related hazards



- 2030-40: 6 ECA cities in 'Red Flag' category of projected climate hazard risk; 45 cities facing extreme risk of water stress
- 7 ECA cities among top 20 in world facing extreme risk of sea level rise

Source: World Bank analysis based on data from Moody's ESG Solutions, Sub-Sovereign Physical Climate Risk Scores, October 2021 (https://esg.moodys.io/climate-solutions).
For detailed explanation on the construction of each risk score, see https://www.moodysanalytics.com/-/media/whitepaper/2022/Climate-Change-Scenarios-and-Scores.pdf

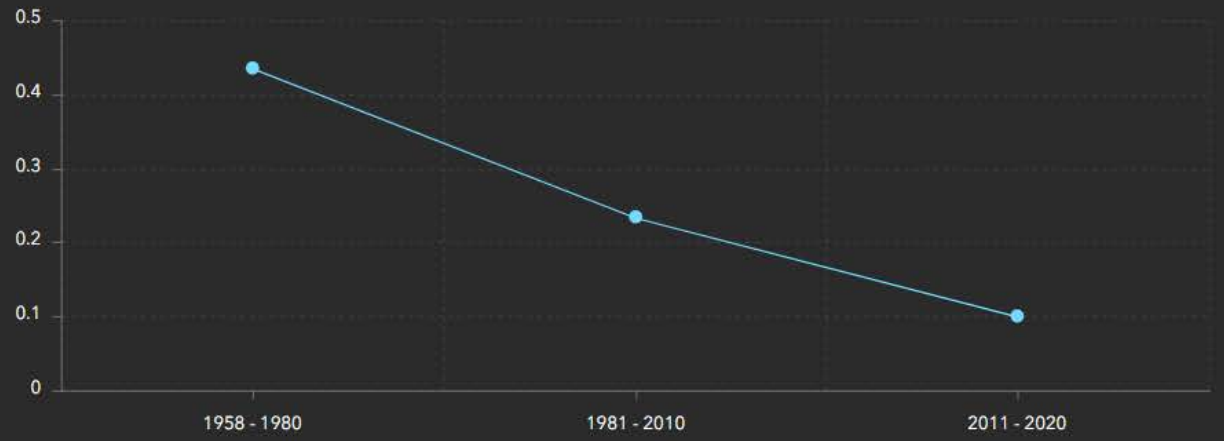
ECA cities increasingly exposed to climate related hazards

Mostar, Bosnia & Herzegovina - Evolution of Extreme Weather Anomaly Frequencies (Months per year)

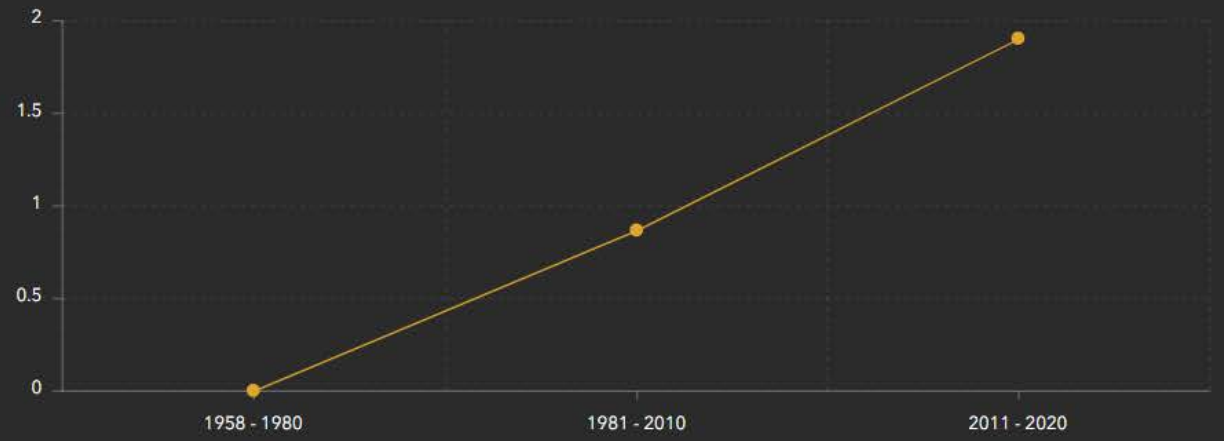
Extreme Hot

Extreme Wet

Extreme Cold



Extreme Dry



Source: Thriving cities database

Urban heat island effect is compounding extreme heat in ECA's cities

Evolution of Vienna's urban heat island effect (UHI)

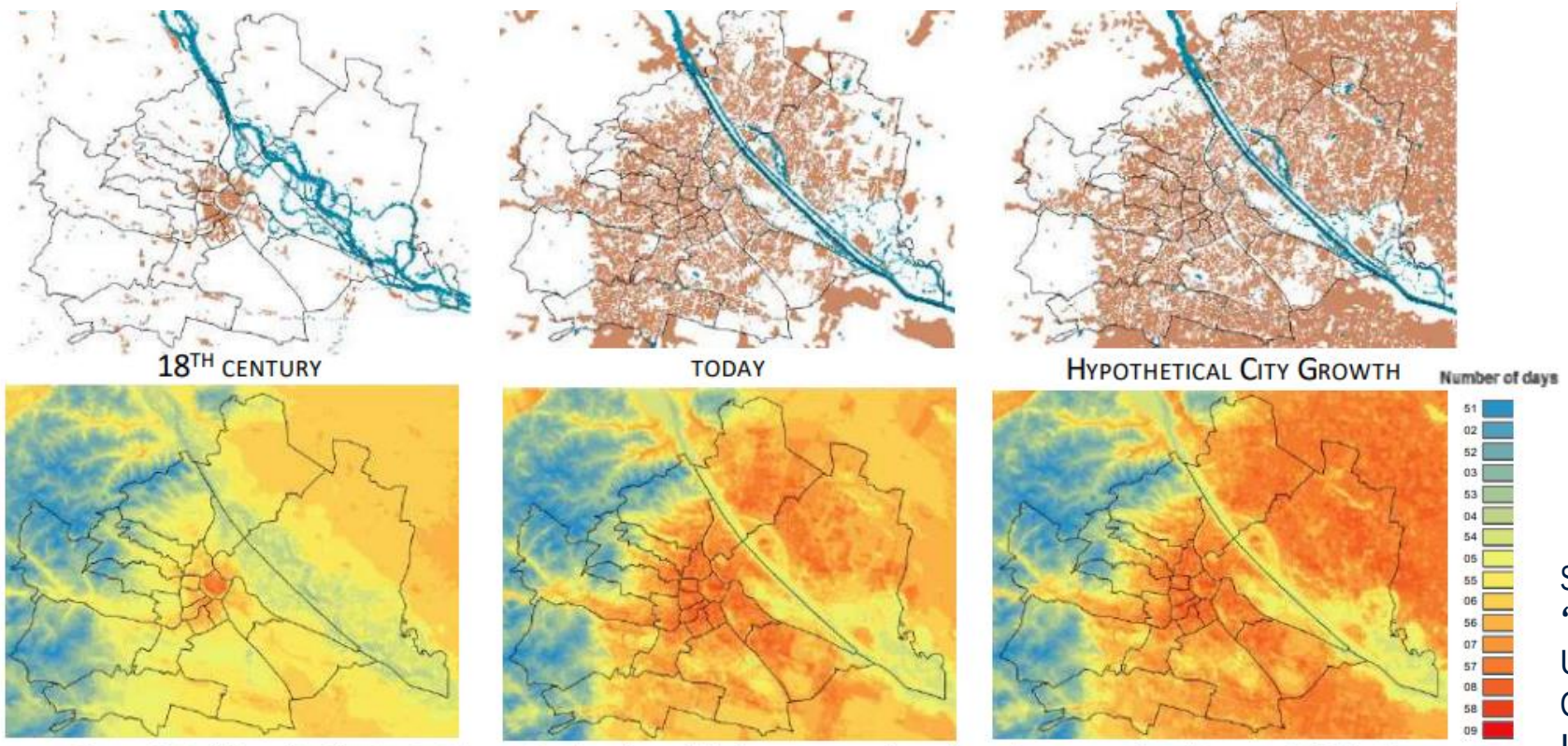


Figure 9. Building distribution in Vienna (top) and modeled mean annual number of summer days (Tmax ≥ 25°C) in Vienna (bottom). The bottom maps use climatological data for the period 1981–2010 based on historical maps of the First Military Mapping Survey of the Austrian Empire, from the period 1764–1787 (left), a current land use survey provided by the Vienna city administration (center), and hypothetical city growth in the northeast and southeast (right). Adapted from Zuvela-Aloise et al. 2013, 2014.

Source: World Bank. 2020. "Analysis of Heat Waves and Urban Heat Island Effects in Central European Cities and Implications for Urban Planning." Washington, D.C.: World Bank

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Extreme Heat Threatens Competitiveness

City GDP losses due to UHI + climate change:

- Median of 1.4-1.7% by 2050, max of 11% by 2100
  - Up to 2.6x loss due to climate change alone

Source: Estrada, Wouter Botzen, and Tol (2017)

Illustration credit
Cabinet/Shut

Lack of inclusiveness contributes to lack of resilience

Sources: World Bank analysis based on the following sources: (1) inequality indicator: compiled from Roberts, Gil Sander, and Tiwari (2019) for Indonesia; Behrens and Robert-Nicoud (2015) for the United States; Ferreyra and Roberts (2018) for 16 countries in Latin America and the Caribbean; (2) services indicator: Henderson and Turner (2020) and https://doi.org/10.7910/DVN/YZ46FJ.

- Different types of city face different inclusiveness challenges
- ⇒ need for a tailored policy approach

Policies for making cities greener, more resilient, & more inclusive in a changing climate

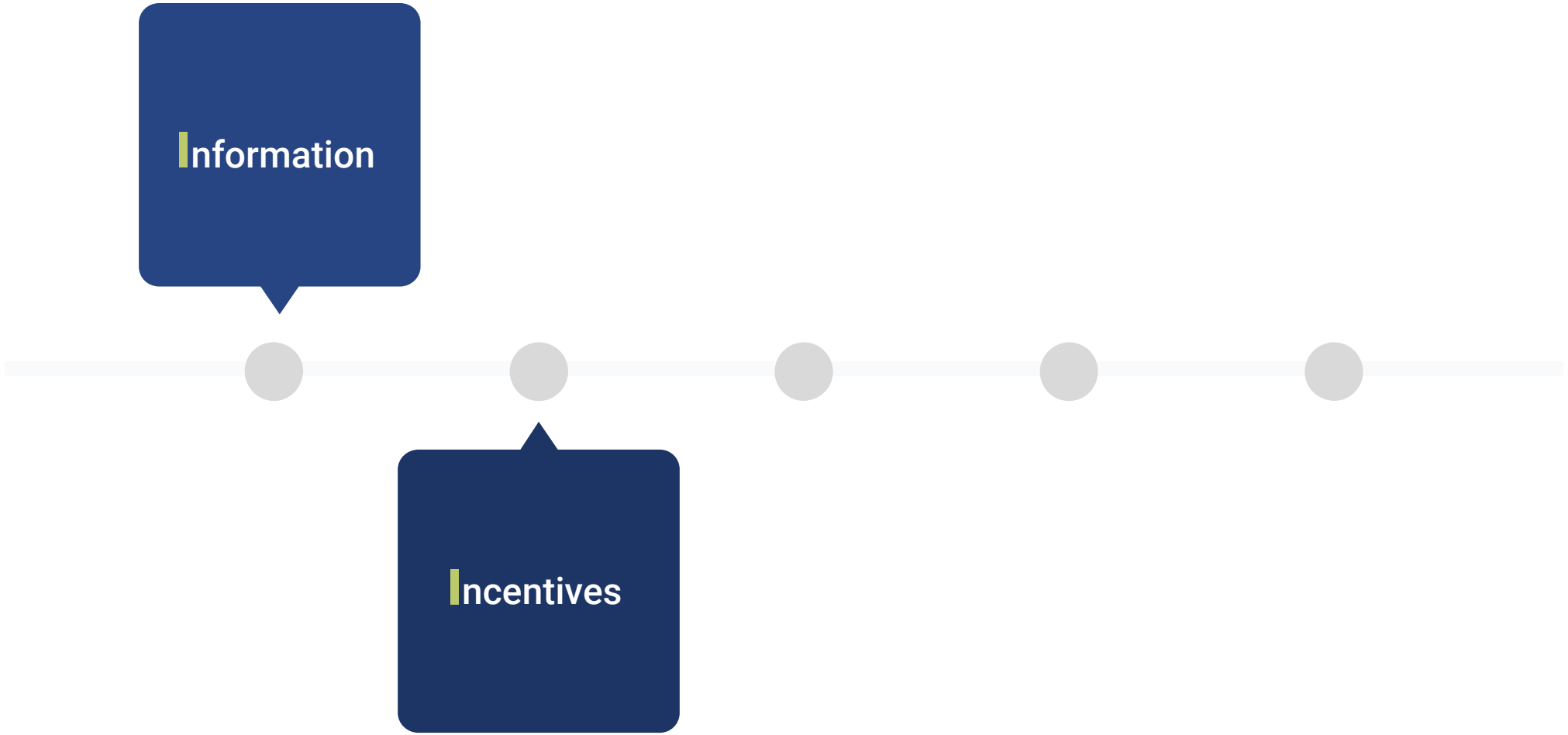

What can be done?
Who does it?
How does it get done?

WHAT are the choices?

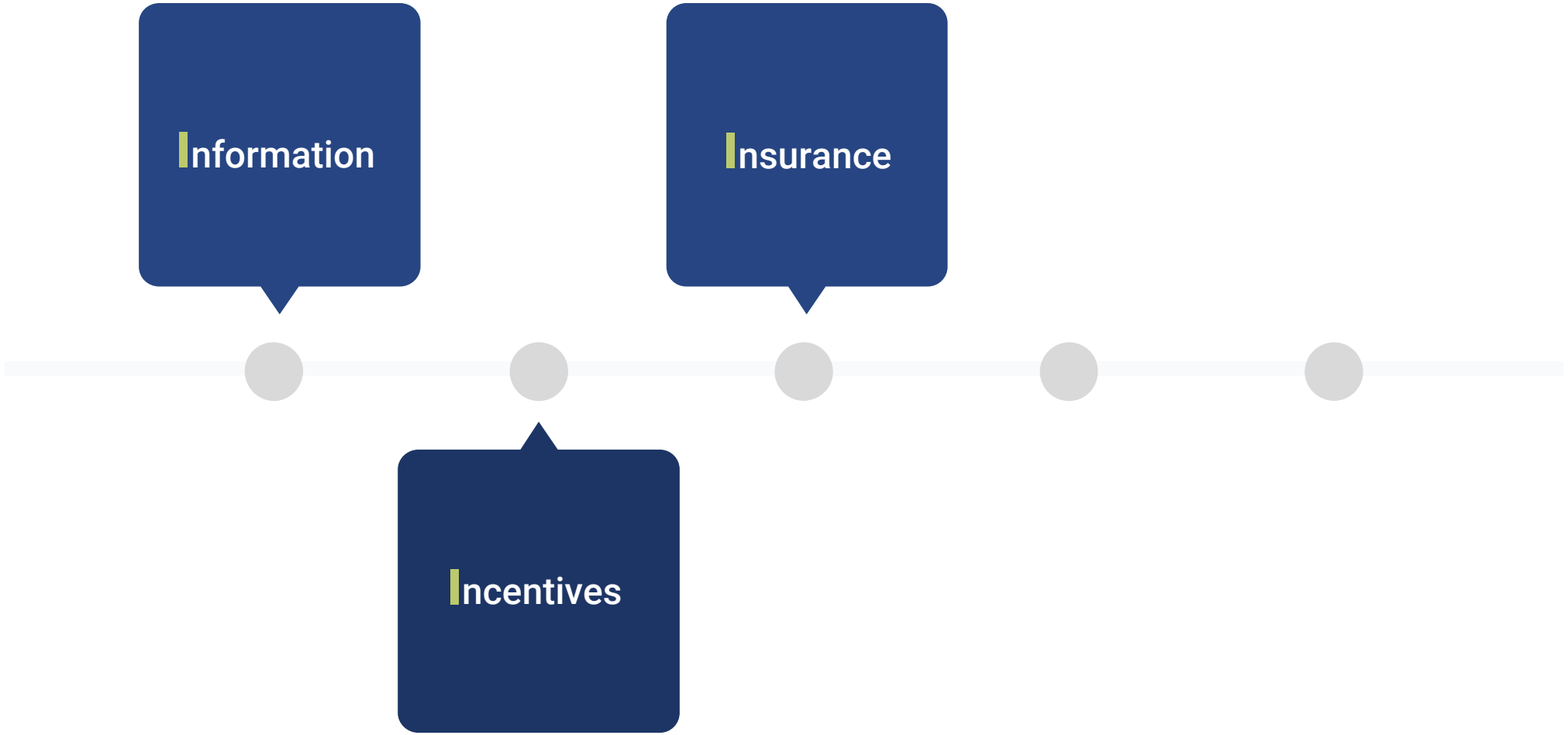
WHAT are the choices?

Information

WHAT are the choices?



WHAT are the choices?



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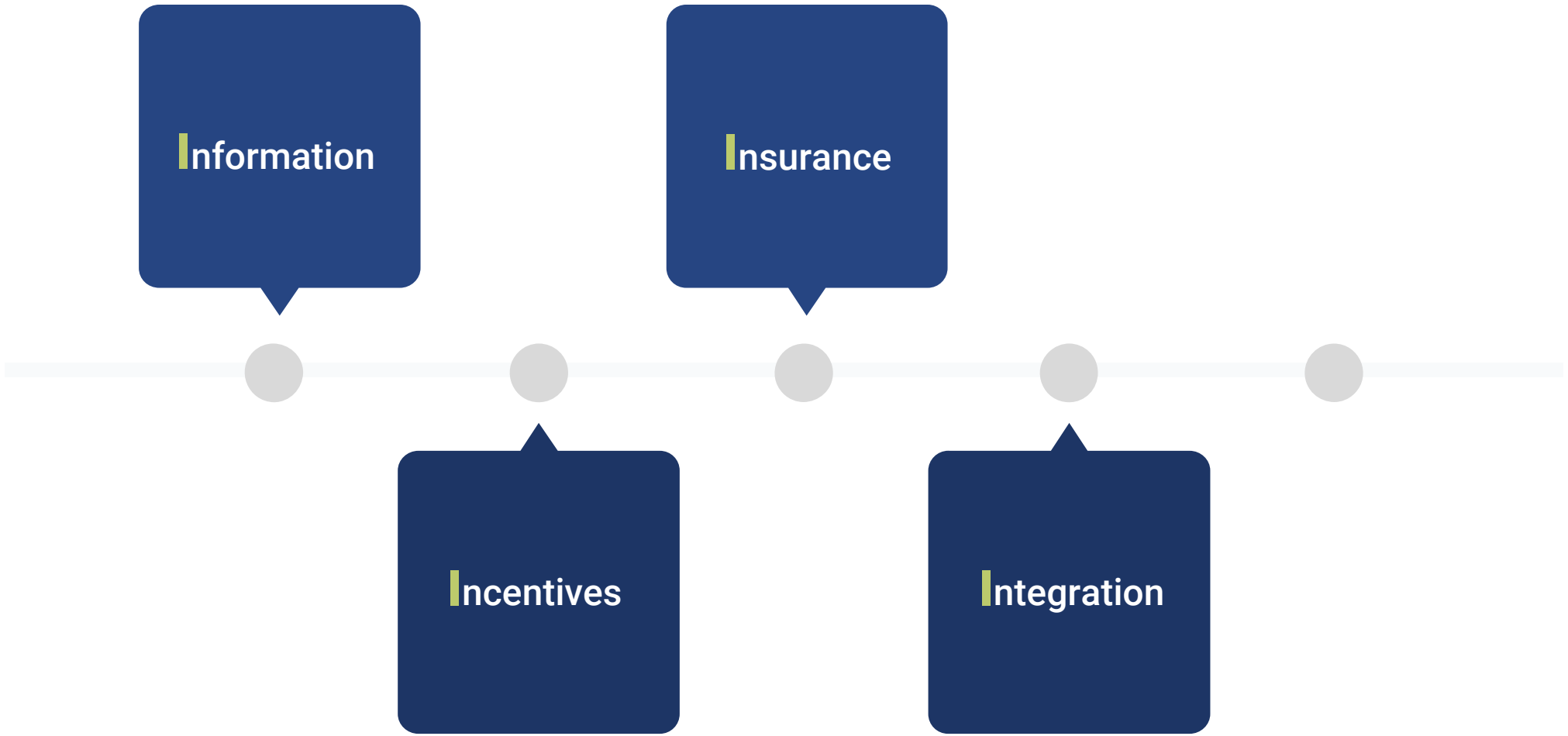

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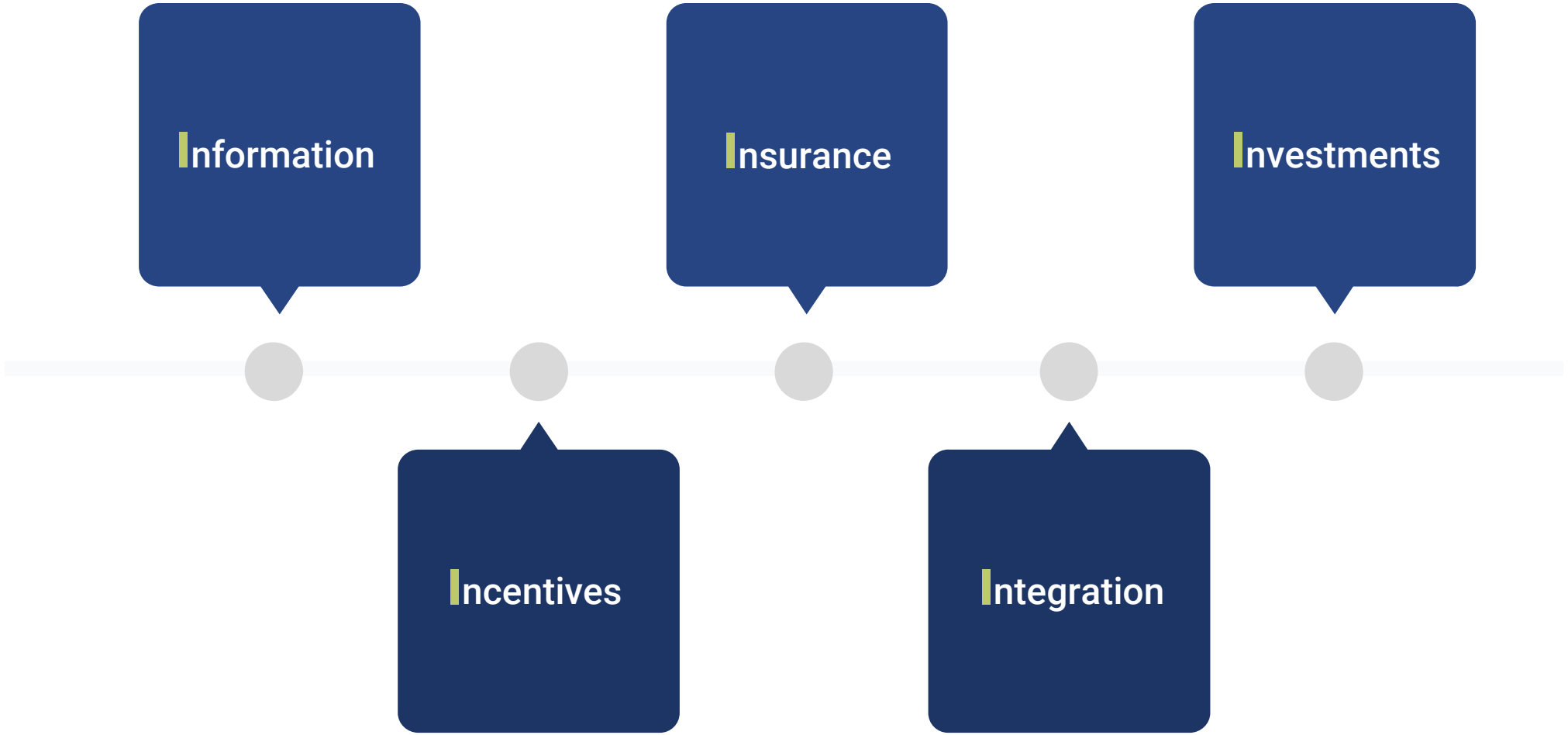

WHO makes the choices?

CPR training teaches us that…

Children are not small adults…

Cities are not small countries…

HOW to get it done?

Actions common to all cities

- *How to green?*
- *How to increase resilience?*
- *How to further inclusion?*

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Accounting for differences

- *Stronger emphasis on greening*
- *Stronger emphasis on resilience*
- *Stronger emphasis on inclusion*

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Bundles of policy instruments for typologies of cities

Thank you!

Download

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