Sixth Assessment Report
WORKING GROUP III – MITIGATION OF CLIMATE CHANGE

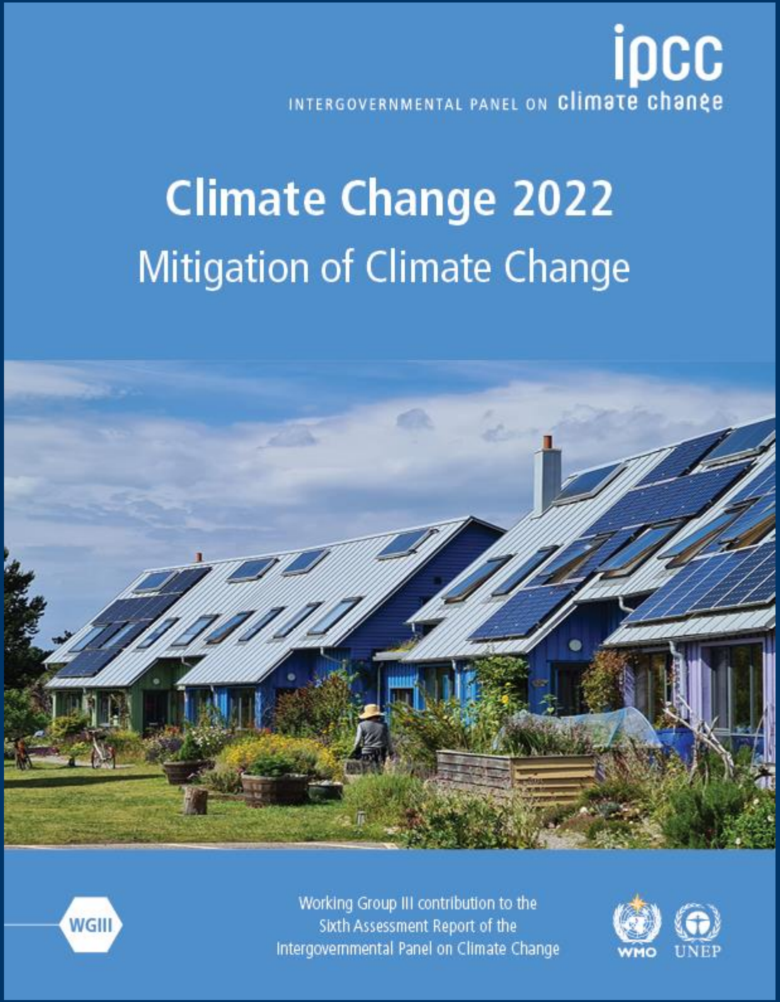
ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

Climate Change Mitigation 2022

Synergies with sustainable development: insights from the IPCC WGIII report

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

New framework in AR6:



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

Shift from co-benefits focus to synergies and trade-offs with SDGs

Earlier: co-benefits, multiple impacts

[Duy Pham/Unsplash]

Accelerated climate action is critical to sustainable development

Accelerated and equitable climate action is critical to sustainable development

The SDGs can be used as a basis for evaluating climate action in the context of sustainable development

[Charlie Chesvick/IStock.com]

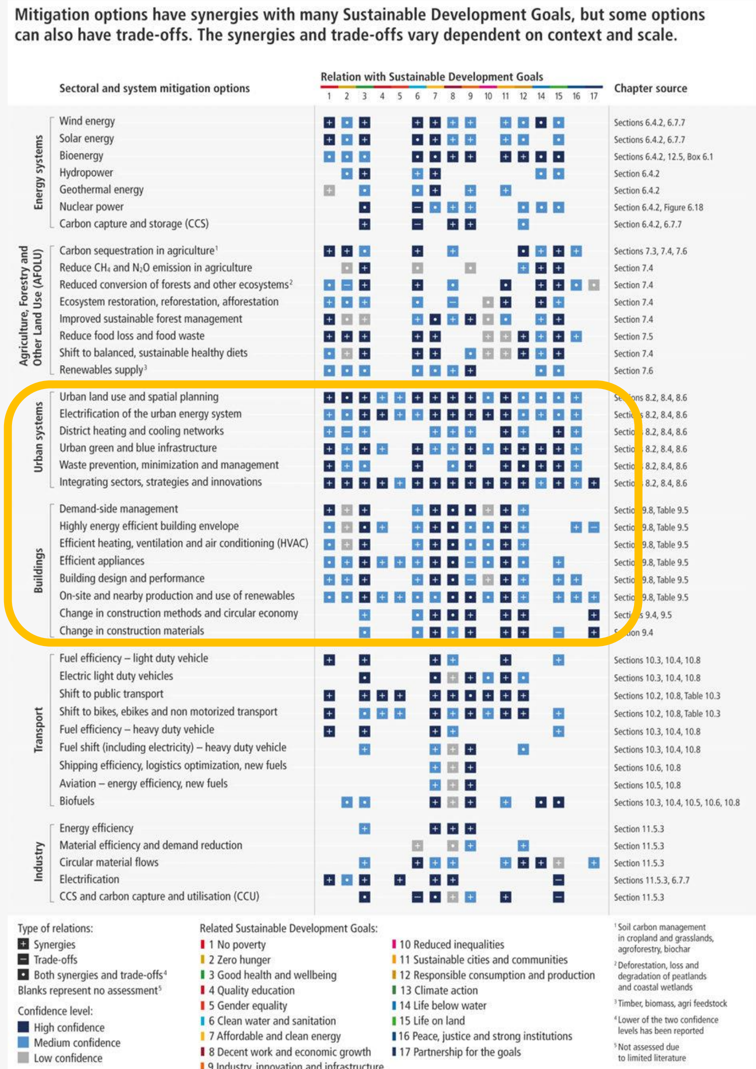
Synergies and trade-offs are highly context dependent

- development context incl inequalities
- climate justice
- means of implementation
- scale
- intra- and inter-sectoral interactions
- cooperation between countries and regions
- the sequencing, timing and stringency of mitigation actions
- governance, policy design

Synergies and trade-offs between sectoral and system mitigation options and the SDGs

Numerous synergies found in:

- energy efficiency
- renewable energy
- urban planning with more green spaces
- active mobility
- demand side mitigation
    - including shifts to balanced, sustainable healthy diets



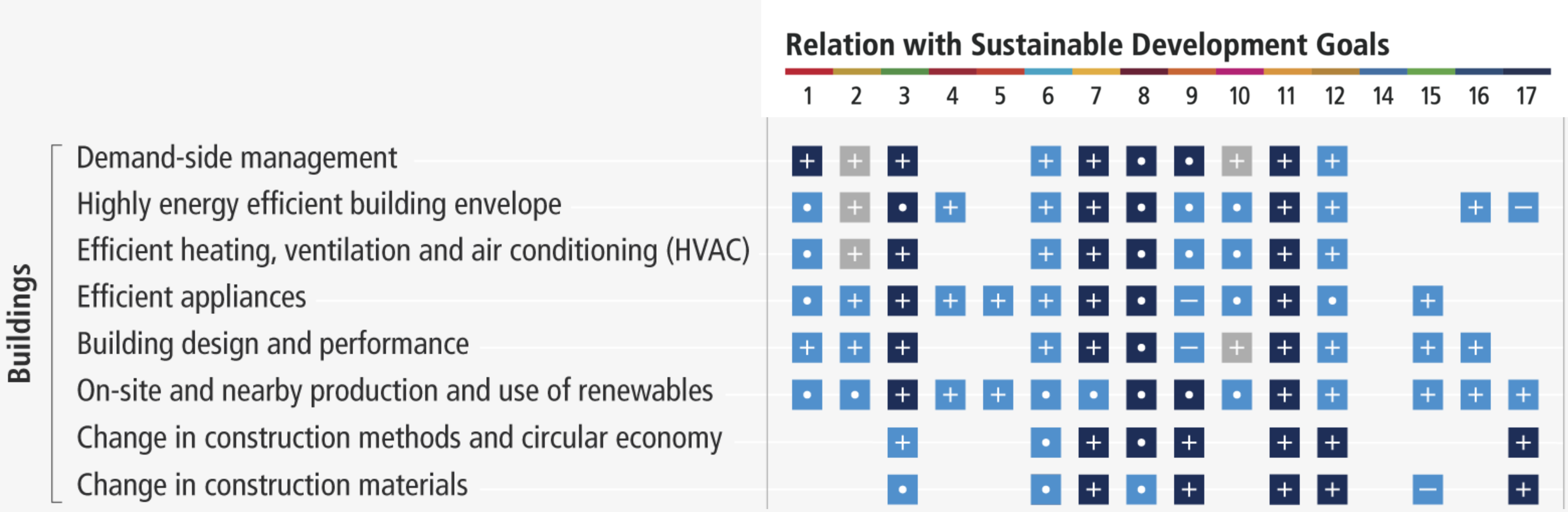
Examples for co-benefits in AR6 WGIII

- Low-emission energy sector transitions can advance:
  - energy access, air and water pollution, health, energy security, water security, food security, economic prosperity, international competitiveness, and employment
- The economic benefits on human health from air quality improvement arising from mitigation action **can be of the same order of magnitude as mitigation costs, and potentially even larger**
- transport sector:
  - **air quality improvements, health benefits (active transport), equitable access to transportation services, reduced congestion, and reduced material demand**
- Demand and services:
  - 'Sustainable healthy diets' promote all dimensions of individuals' health and wellbeing; have low environmental pressure and impact; are accessible, affordable, safe and equitable
- Buildings:
  - significant global transition from coal and biomass use in buildings towards modern energy carriers and efficient conversion technologies has led to **significant gains in health and well-being outcomes in developing regions.**

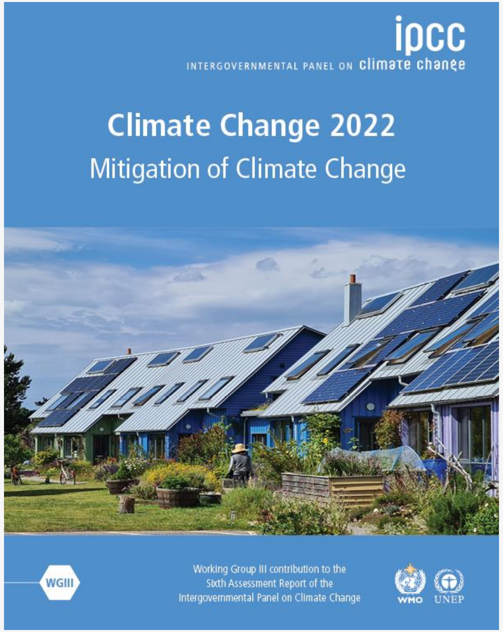
Examples for co-benefits in AR6 WGIII

- Just transition policies can enhance **job creation, macro-economic stability, economic growth, and public health and welfare**
- Urban:
  - enhance resilience against climate change impacts
  - contributing to social equity, public health, and human well-being
  - Urban mitigation actions that facilitate economic decoupling can have positive impacts on employment and local economic competitiveness

Mitigation options in buildings



Net zero energy buildings are feasible in all climates and are economic for almost all building types, both for new and retrofit



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Advances Toward a Net-Zero Global Building Sector

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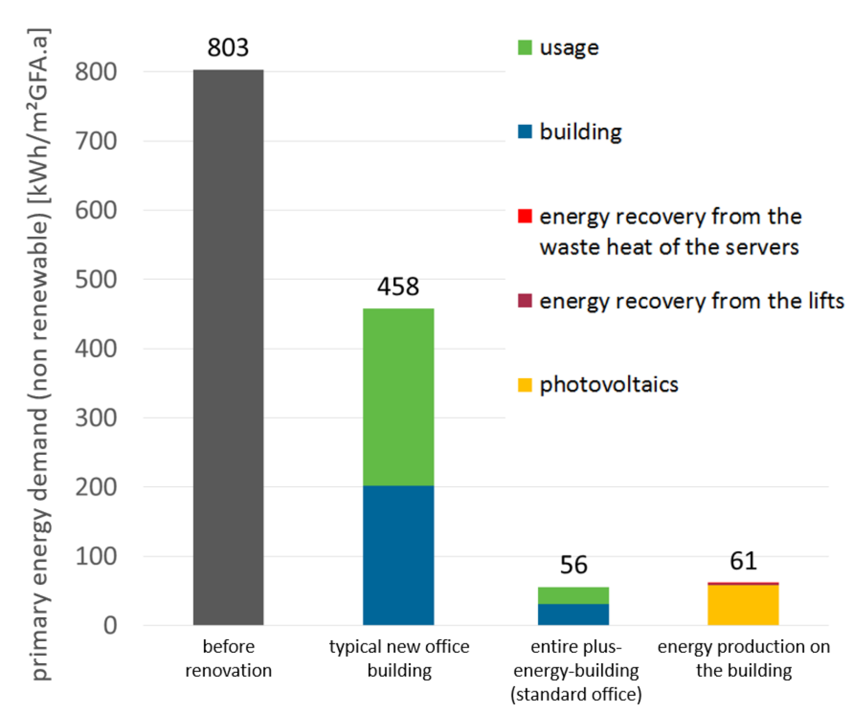
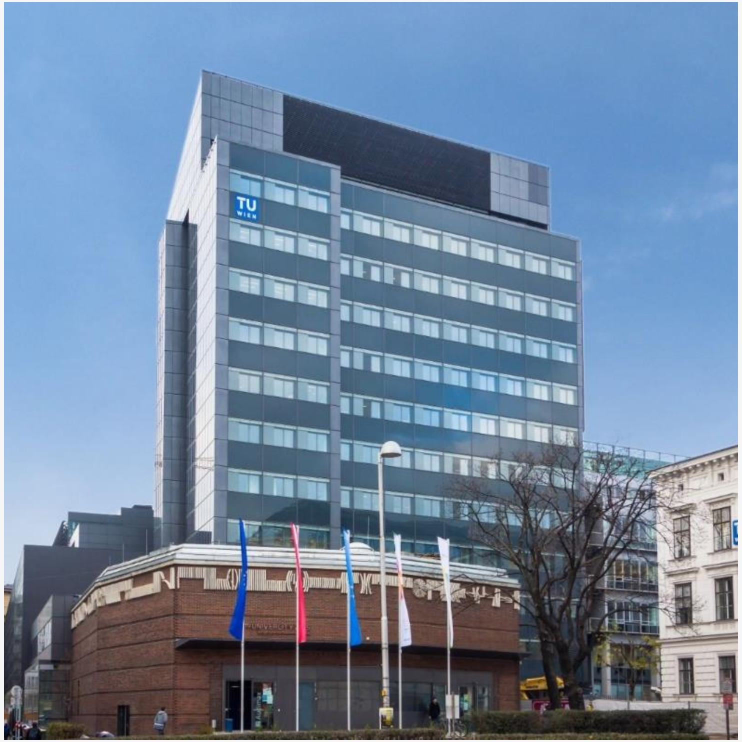
forrás: Klemens Schlögl, Schöber & Pöll, Austrian World Summit 2018, Vienna, May 2018

Energy plus (Enerphit) retrofit of the Vienna Technical University tower





Source: Klemens Schlögl, Schöber & Pöll, Austrian World Summit 2018, Vienna, May 2018

HILLTOP COMMUNITY HEALTH PASSIVE HOUSE RETROFIT

DOCTORS AT THE HILLTOP COMMUNITY HEALTHCARE CENTER HAD PRACTICED FROM A DOUBLE-WIDE TRAILER FOR NEARLY 10 YEARS. THE SIZE OF THE MECHANICAL SYSTEM WAS REDUCED BY 50% DUE TO IMPROVEMENTS IN THE BUILDING ENVELOPE, SAVING A SIGNIFICANT AMOUNT OF CONSTRUCTION COST AND FUTURE ENERGY COSTS. THE INTERIORS WERE DESIGNED WITH A COMBINATION OF NEW AND SALVAGED FURNISHINGS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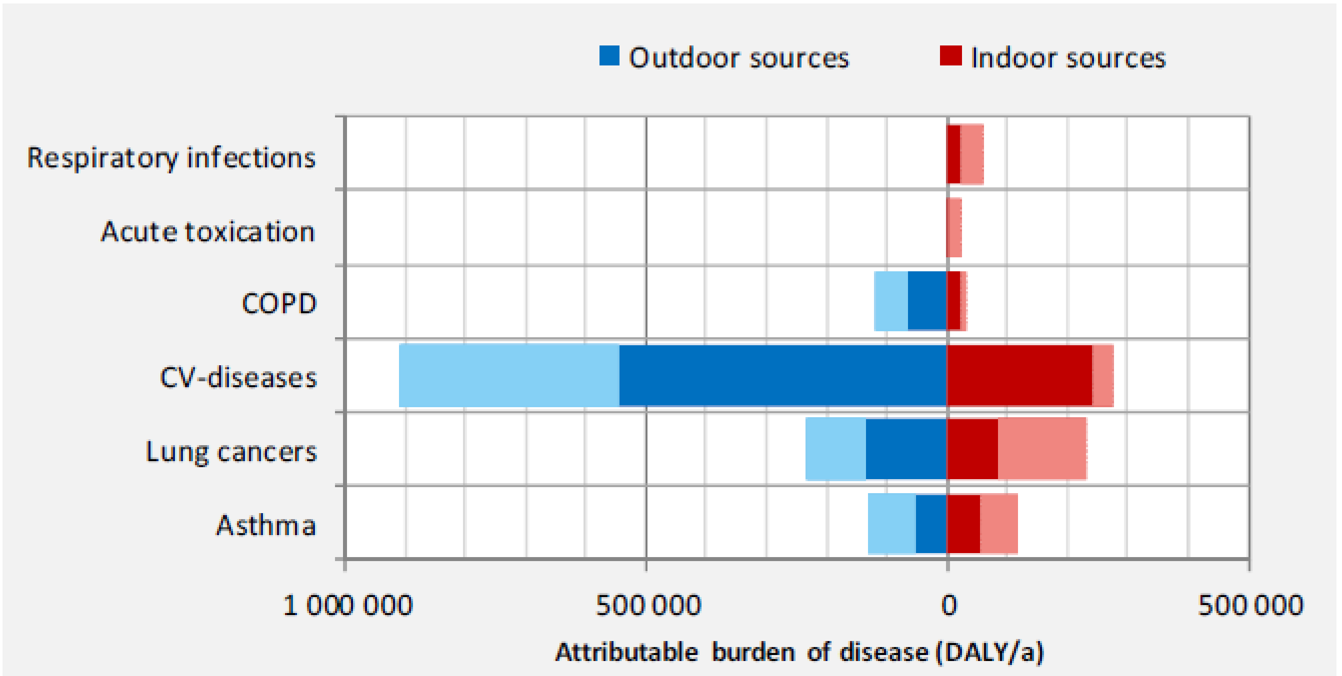
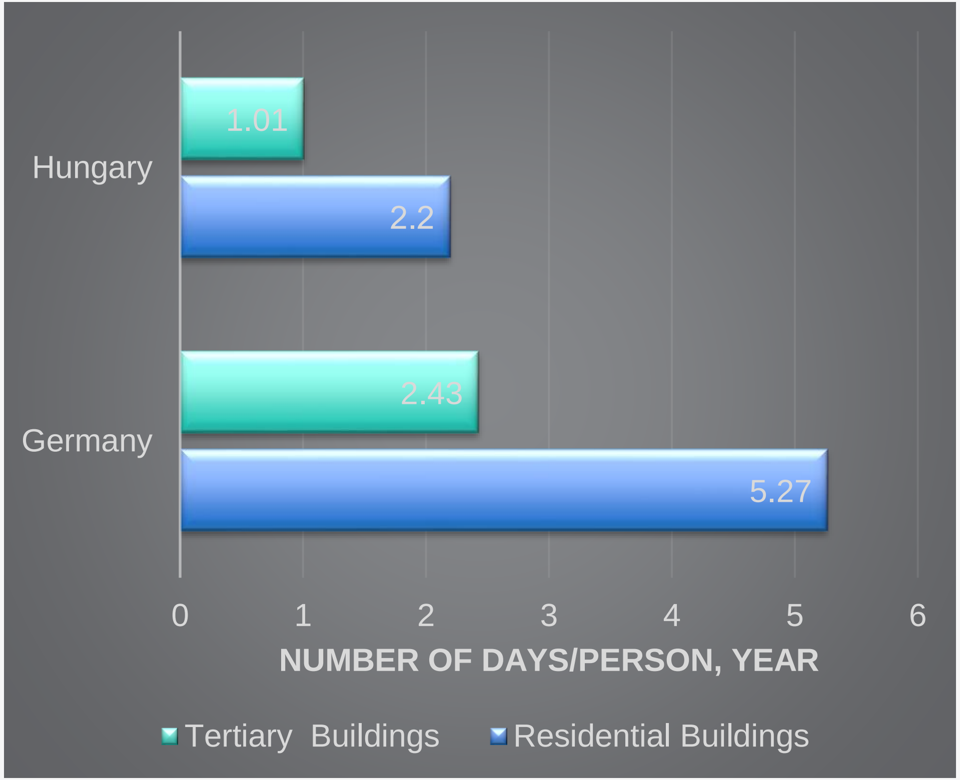
Burden of disease in the EU due to indoor and outdoor air pollution

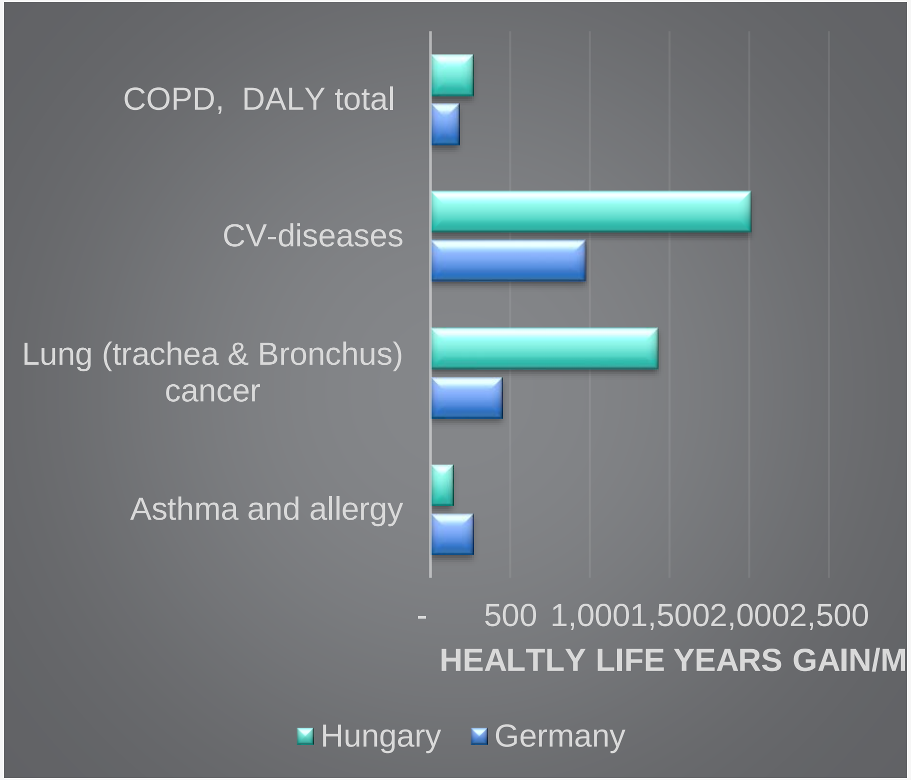
light shaded bar segments are preventable by high-efficiency buildings with ventilation systems



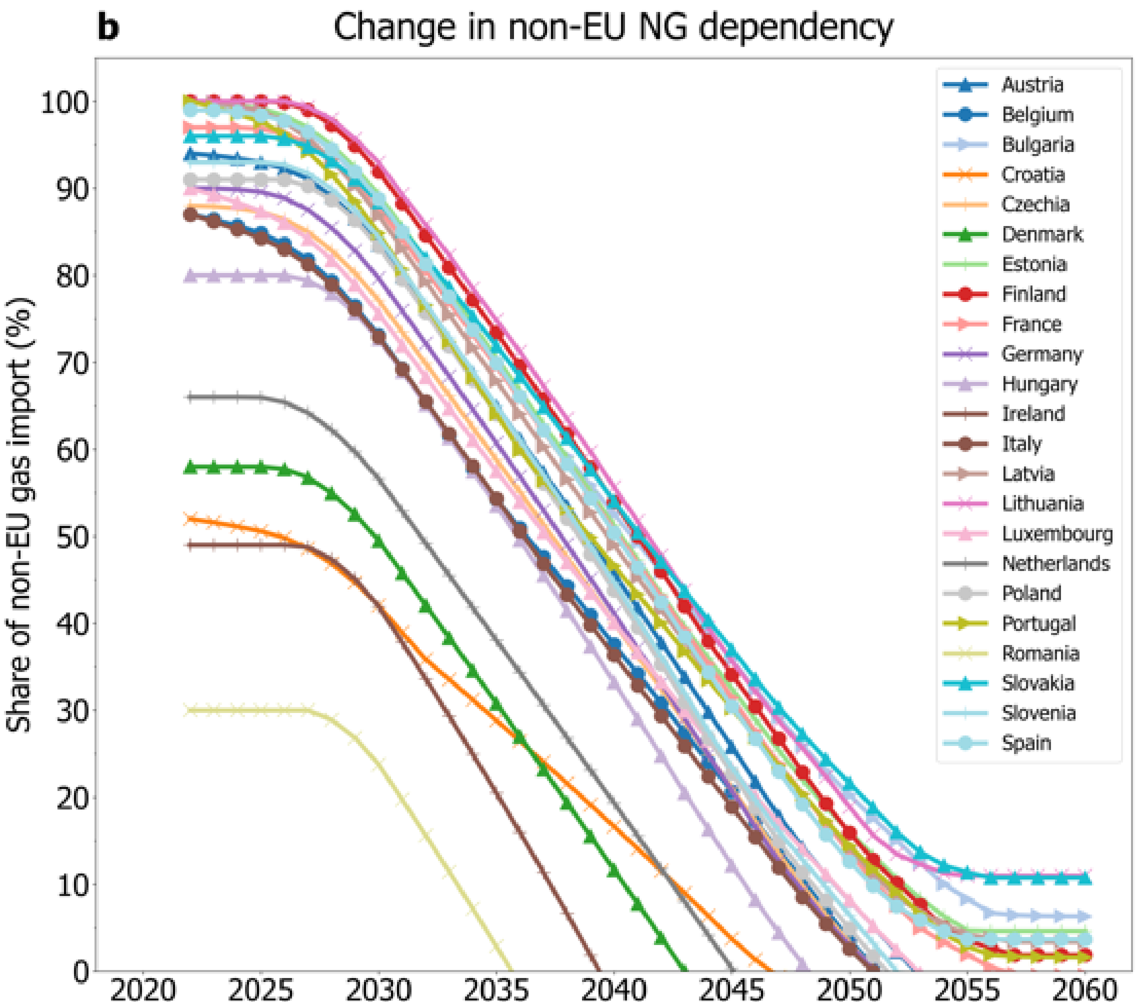
Source: Otto Hänninen and Arja Asikainen (Eds.) 2013. Efficient reduction of indoor exposures Health benefits from optimizing ventilation, filtration and indoor source controls

Active days and healthy life years gain from transitioning to net zero buildings





Source: Chatterjee, S., & Ürge-Vorsatz, D. (2021). Measuring the productivity impacts of energy-efficiency: The case of high-efficiency buildings. Journal of Cleaner Production, 318, 128535. doi.org/10.1016/j.jclepro.2021.128535



Source: own research, unpublished

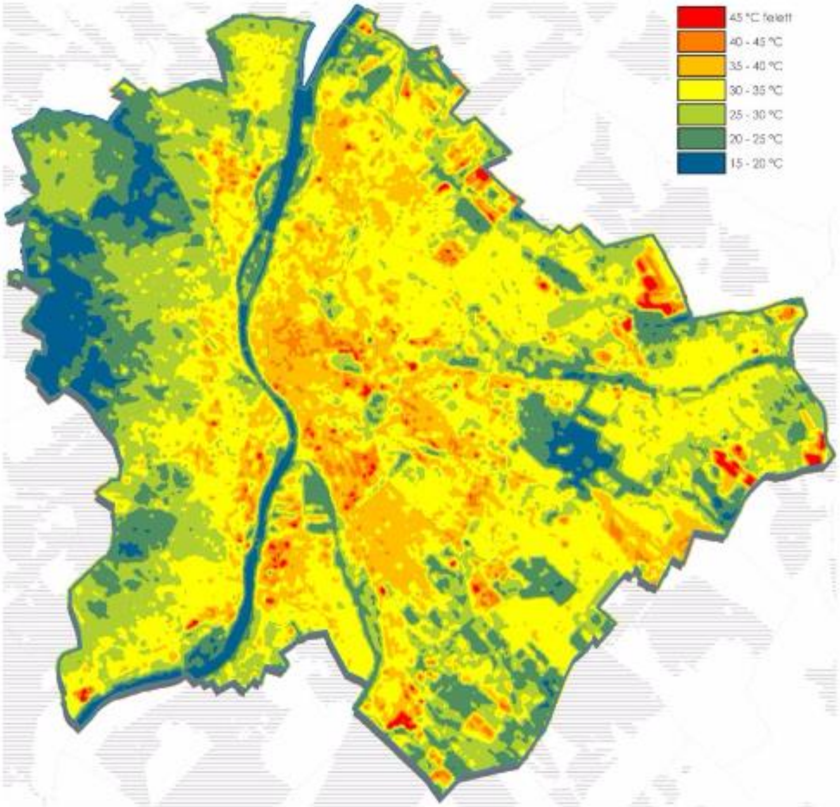
Vernacular and energy efficient architecture reduces emissions and resilience against heat stress

Mitigation options in urban areas

Relation with Sustainable Development Goals

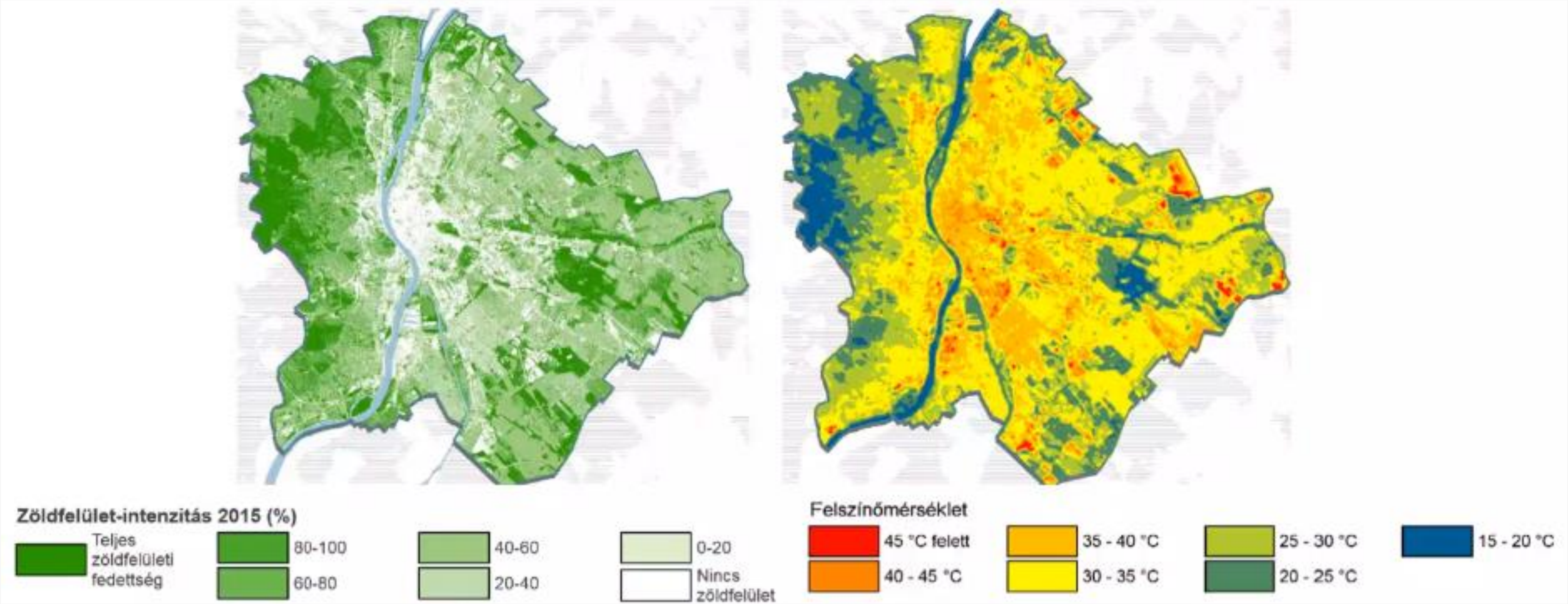
	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17
Urban land use and spatial planning	+	•	+	+	+	+	+	+	+	•	+	•	•	•	+	
Electrification of the urban energy system	+	•	+	+	+	+	+	+	+	+	+	•	+	•	+	
District heating and cooling networks	+	−	+				+	+	+		+	+		+	+	
Urban green and blue infrastructure	+	+	+	+		+	+	+	+	•	+	+	+	+	+	
Waste prevention, minimization and management	+	+	•			+		•	+		+	•	+	+	+	
Integrating sectors, strategies and innovations	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Land surface temperature, Aug 31, 2016, 11am – 12am



Budapest felszínhőmérséklet térképe 2016 aug. 31-én 11:00 és 12:00 között zavartalan napfényes időszakban (forrás: Budapest Zöldinfrastruktúra Koncepciójának helyzetelemzése)

Foliage intensity correlates strongly with surface temperature



Forrás: Greenscope Kft térképei Landsat felvételek alapján (2015), in: Bp. Zöldinfrastruktúra Stratégiája (2018)

- Capturing and storing carbon by living biomass and soils
- Providing shading and cooling by foliage
- Improving well-being and mental health
- Globally, urban trees store approximately 7.4 billion tonnes of carbon, and sequester approximately 217 million tonnes of carbon annually
- *“green and blue infrastructure reduce the urban heat island (UHI) effect and heat stress, reduce stormwater runoff, improve air quality, and improve the mental and physical health of urban dwellers, while also provide benefits to climate adaptation”*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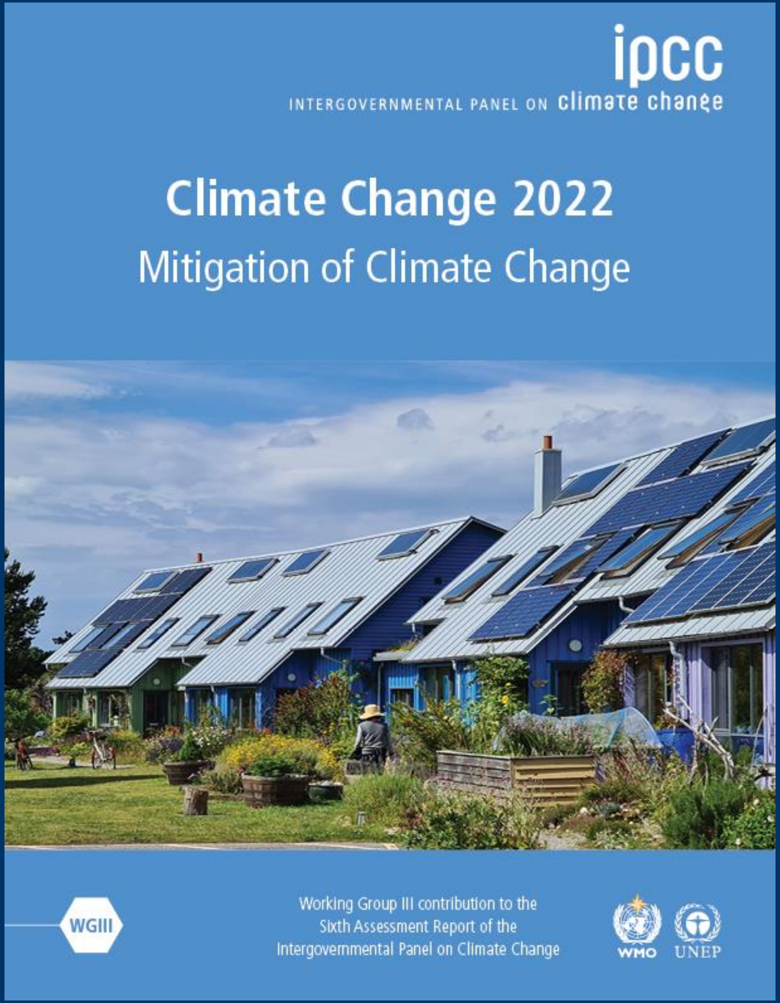
“ **The evidence is clear: The right choices of mitigation response measures can enhance sustainable development and with right policies can minimise trade-offs**



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

Thank you

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