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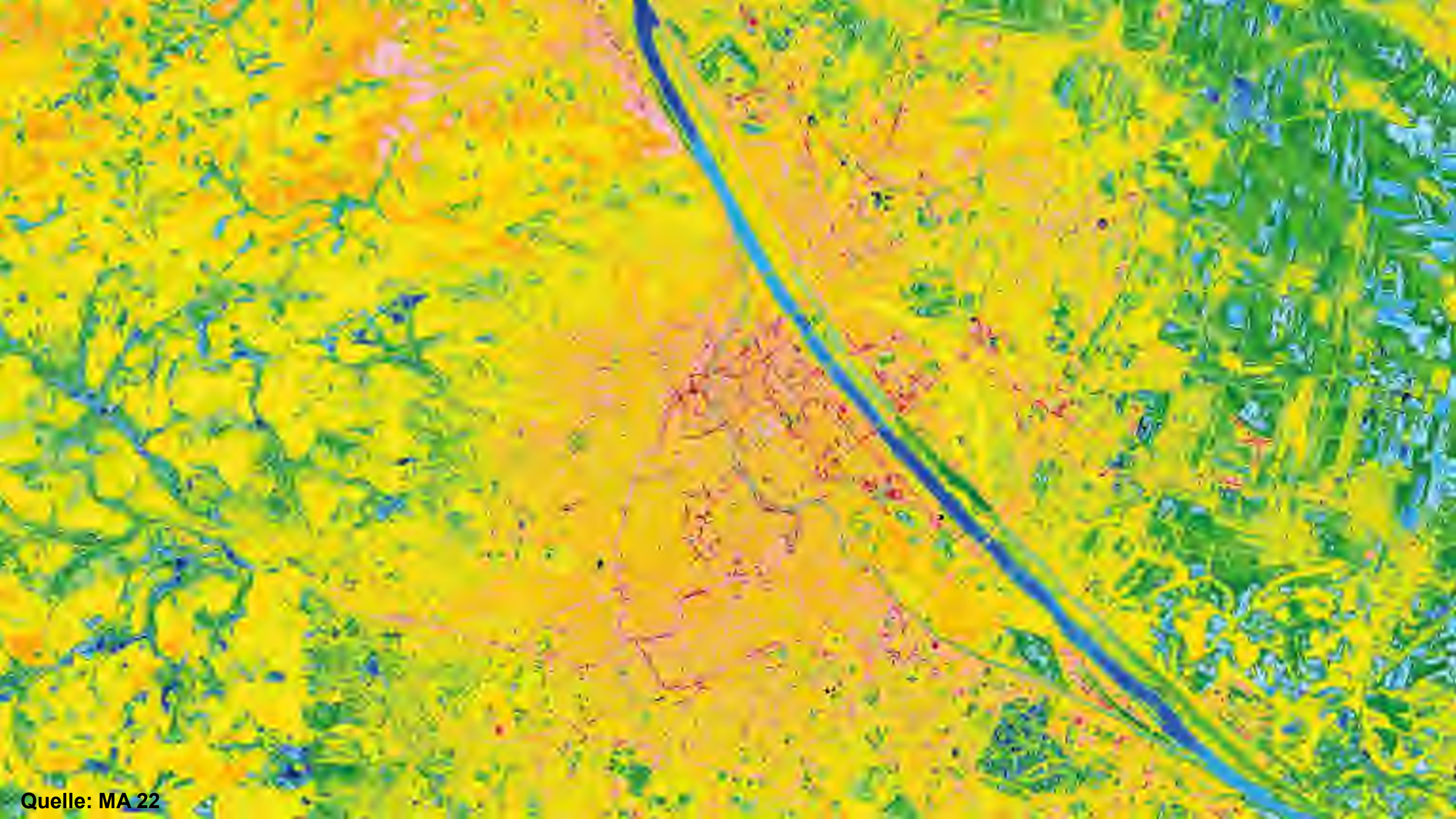


Climate-smart urban development on the example of Biotope City Wienerberg

Florian Reinwald

Theme-based training of teaching staff for acquiring new practical skills
Biotope City, Vienna, 4.4.2024

This project has been funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.



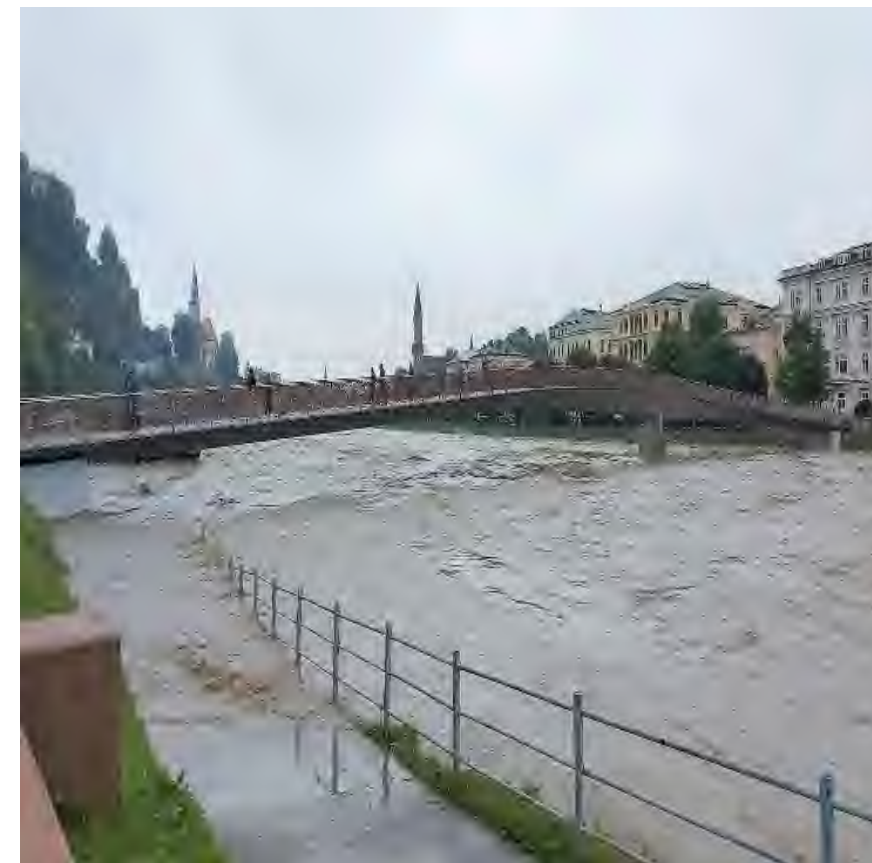
Impacts of climate change on Austrian cities



Evening in Vienna on a summer day
© Dimitry Anikin / Unsplash



Dry period in 2021 in Vienna © APA – Helmut Fohringer



Flooding in Salzburg, 18.07.2021 © Land Salzburg – Stefan Mayer

CCA/CCM Strategies



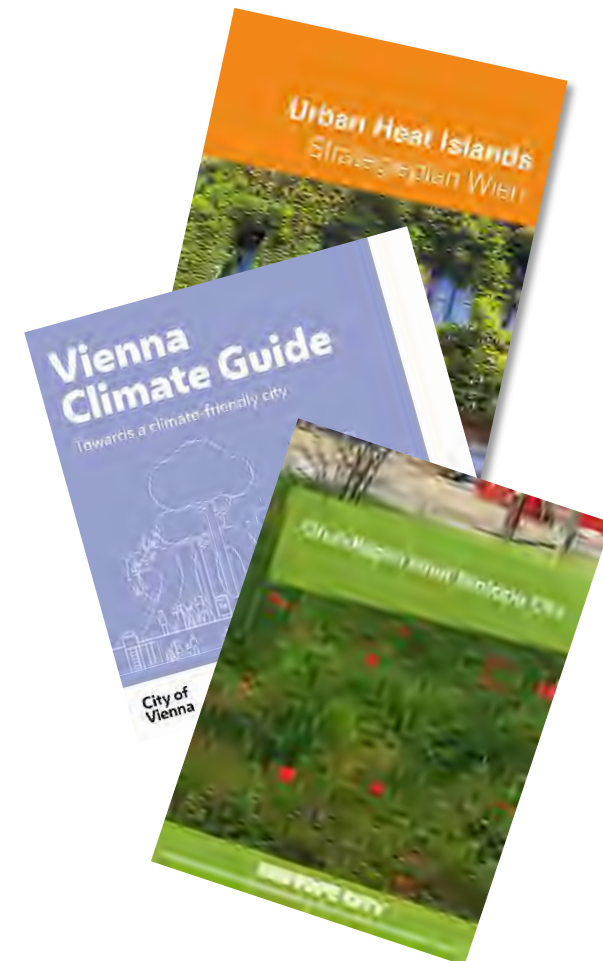
UGI/NBS Strategies



Planning Strategies



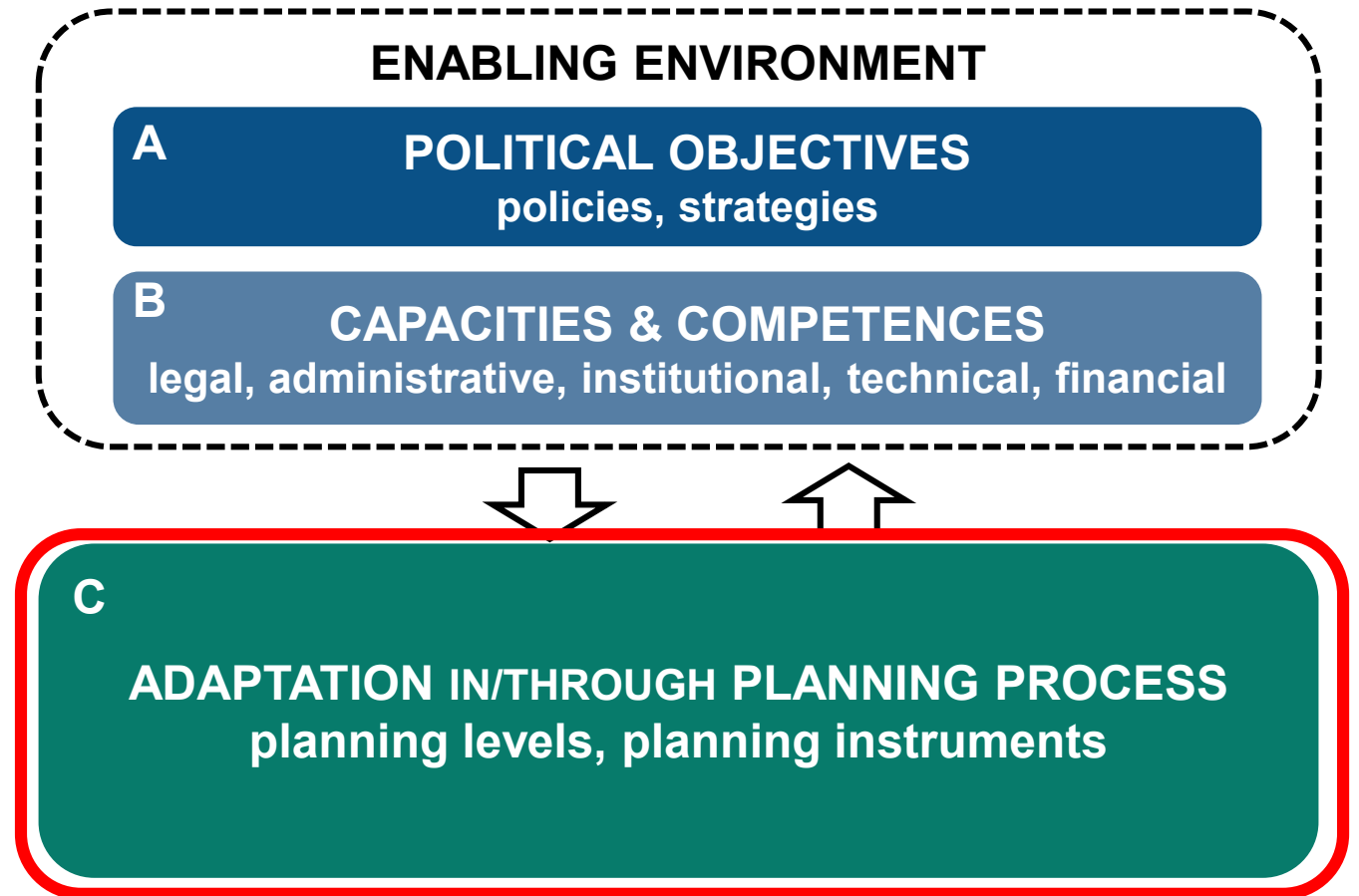
Implementation Strategies



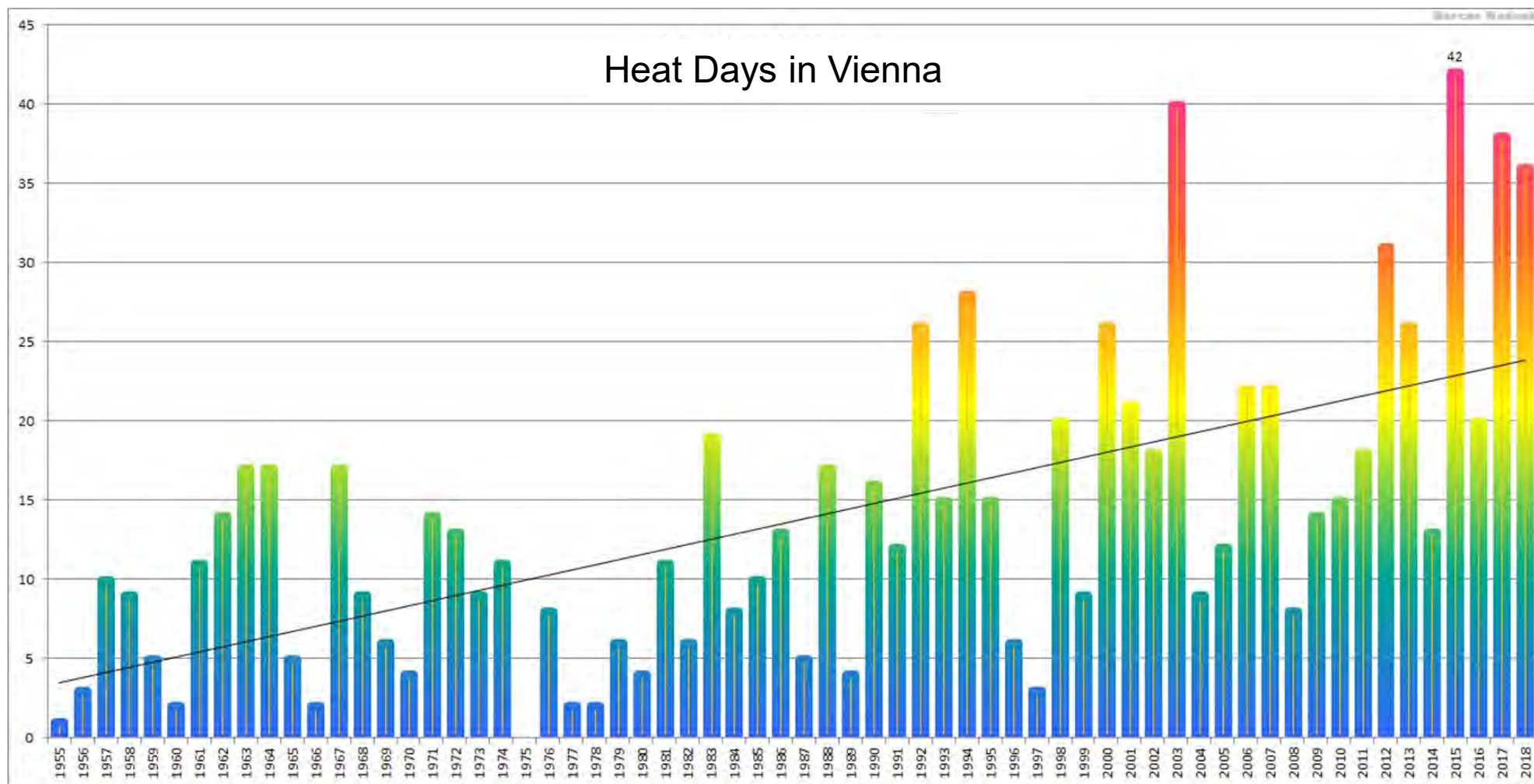
Integrating CCA in spatial planning and urban development

“Climate proofing”
= **holistic integration** of CCA
in spatial planning system

= **A + B + C**

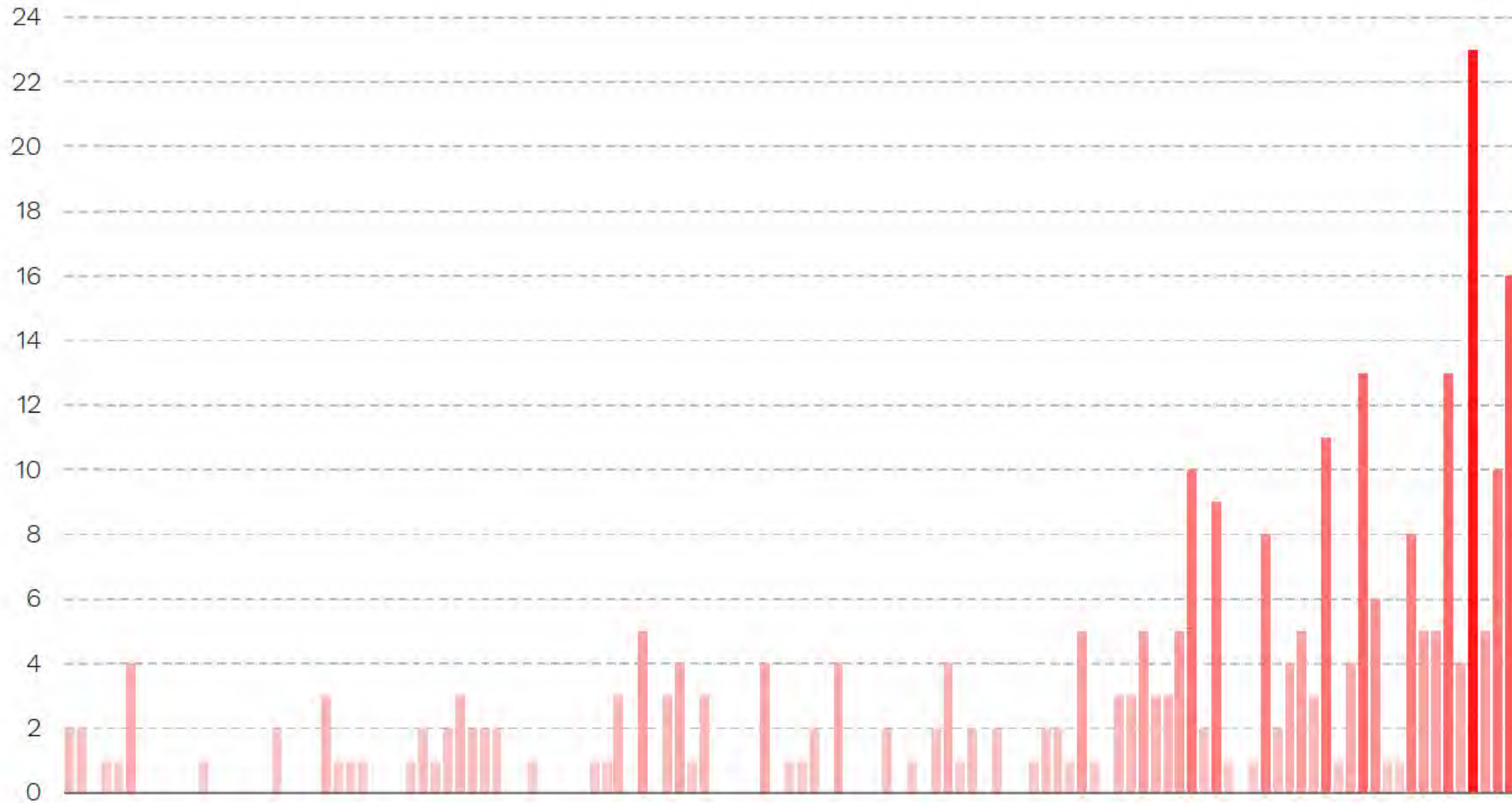


Heat Days in Vienna



Tropical nights since 1900 in Vienna

(temperature does not fall below 20°C)

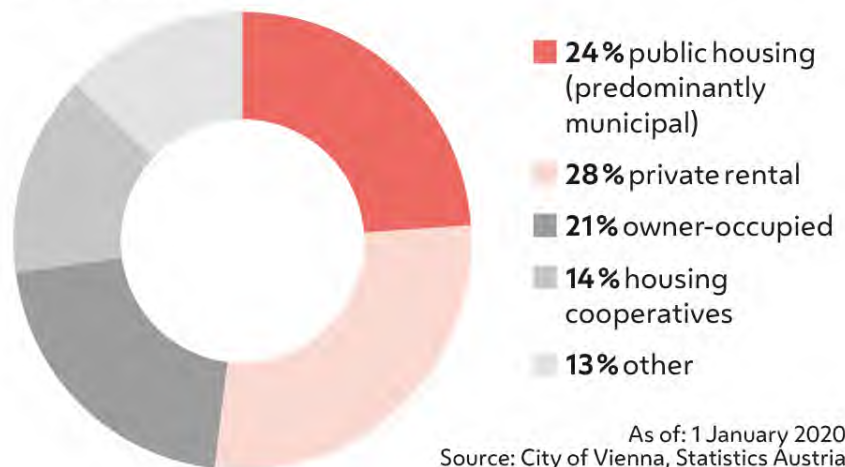


Zentralanstalt für Meteorologie und Geodynamik (ZAMG)

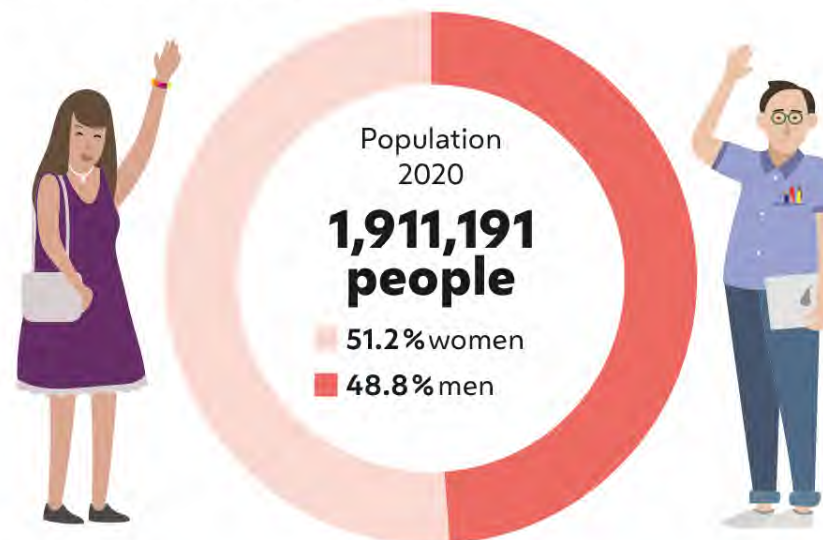


Social Housing Vienna

Housing tenure



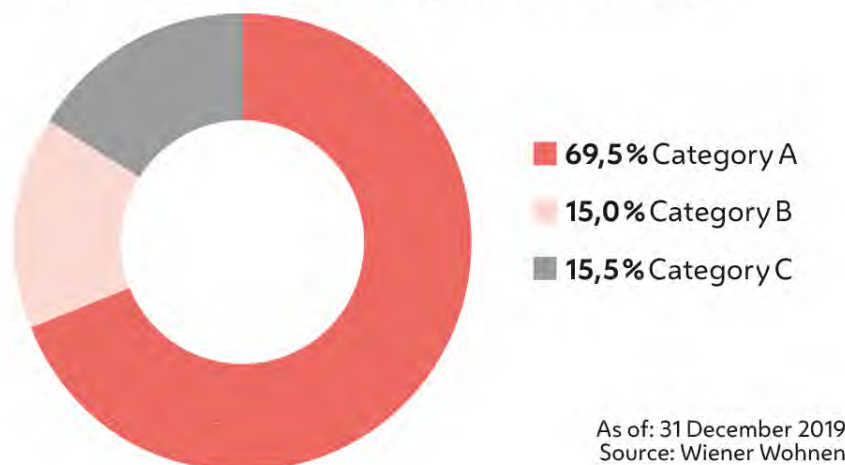
Vienna is growing



Vienna's population increased by
221,196 people in the period 2010 to 2020

As of: 1 January 2020
Source: City of Vienna, Statistics Austria

Standard of municipal dwellings

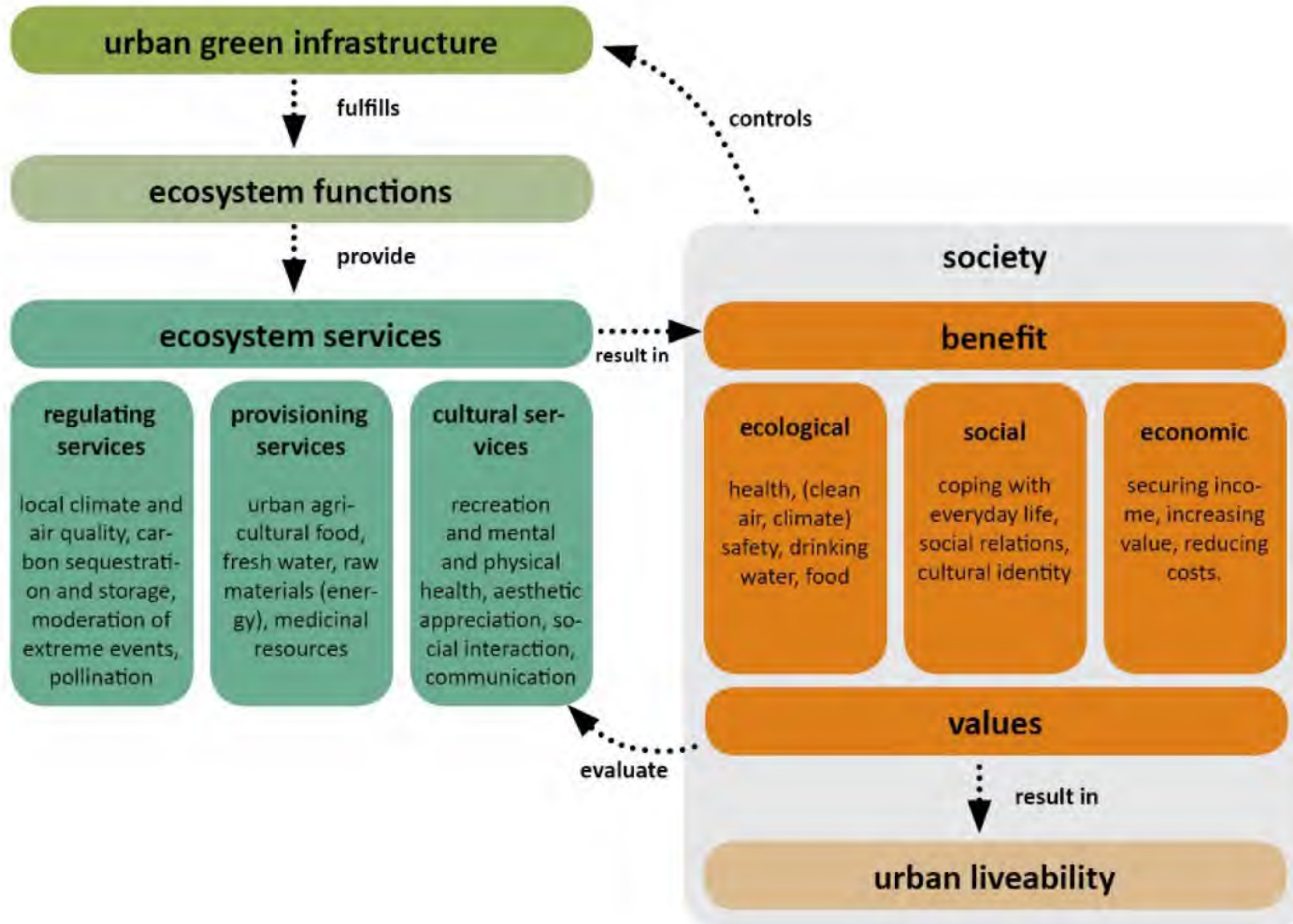


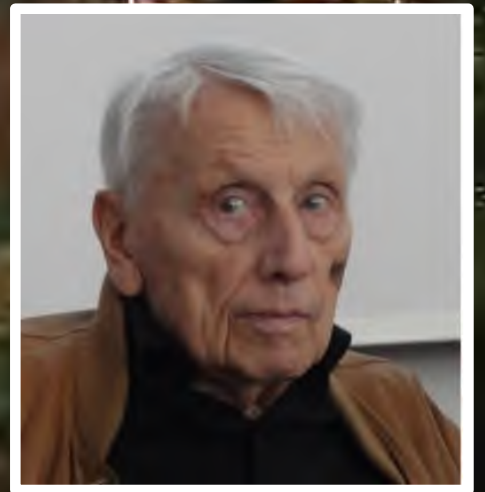


The concept “Biotope City” – the city as nature



Ecosystem services of urban green infrastructure





Harry Glück



“Do not longer see the dense city as the antithesis of nature, but as one of its forms of development.”



Helga Fassbinder

10 Effects of the concept 'Biotope City':

- **Urban climate regulation** and thus mitigation of the consequences of climate change as well as an increase in thermal well-being.
- **Optimisation of the wind field** for the microclimate
- Water retention through infiltrative surfaces
- Storage and management of **precipitation water**
- **Absorption** of fine dust and **pollutants** by plants
- **Fixation of CO₂** by plants
- Compensation of sealing through **greening measures**
- Increasing **biodiversity**
- Space for movement and encounter
- **Experience of nature as an essential part of life**

Source: Fassbinder, Glück et. al. 2015



Helga Fassbinder

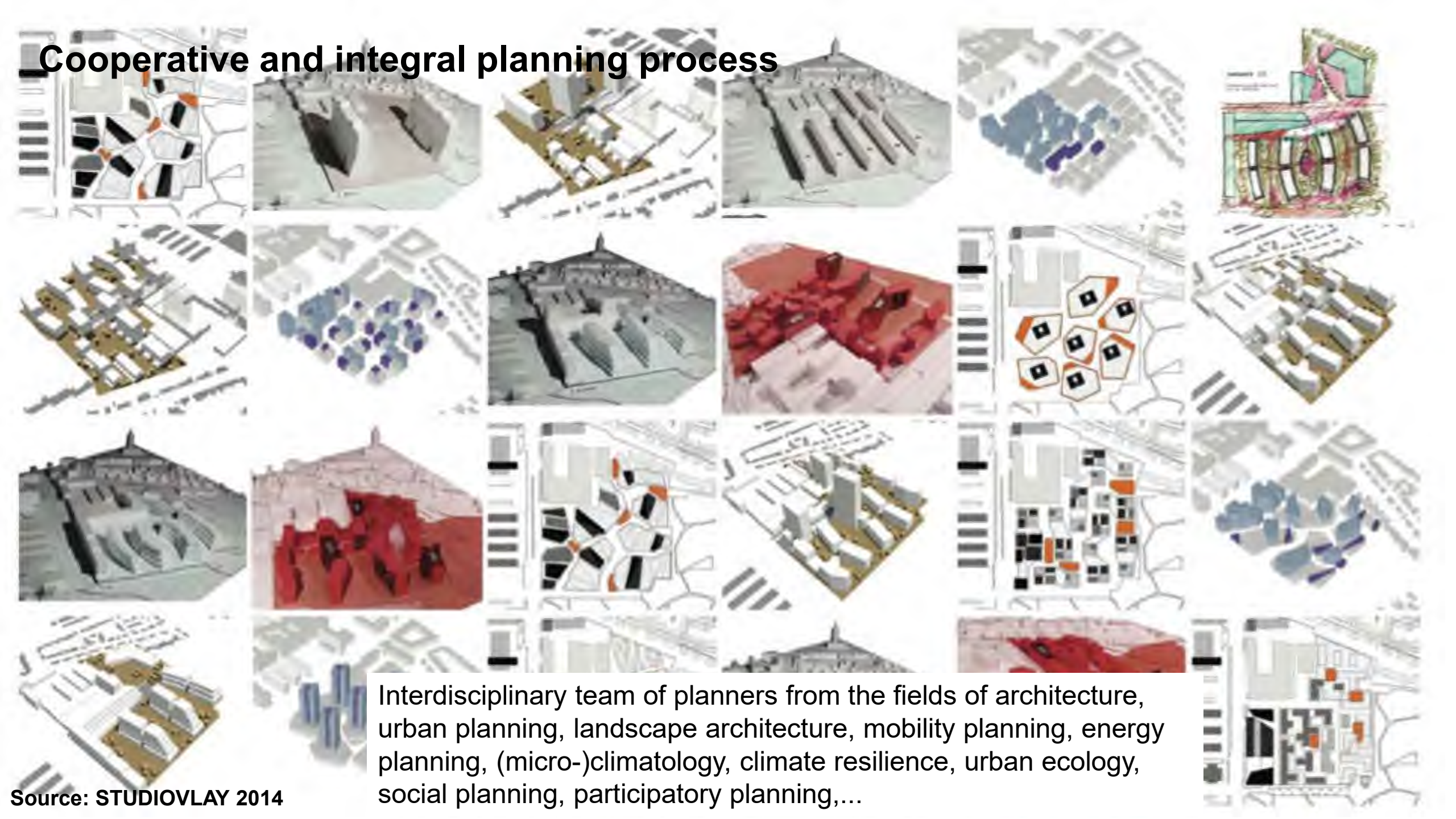


Solution



Or more like that?

Cooperative and integral planning process



Interdisciplinary team of planners from the fields of architecture, urban planning, landscape architecture, mobility planning, energy planning, (micro-)climatology, climate resilience, urban ecology, social planning, participatory planning,...



MASTERPLAN MIT QUALITÄTENKATALOG

CCA - CocaCola Areal | Wien 4.8.2015

CCA_interdisziplinäres
Planungsteam CocaCola Areal

Architekt DI Dr
Harry Glück

RÜDIGER
LAINER+
PARTNER **RLP**

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MASTERPLAN MIT QUALITÄTENKATALOG
Planstand August 2015

Master plan with quality catalogue

- Social principles
- Urban planning principles
- Principles for greening
- Architectural principles
- Quality assurance



Facts and Figures

On 5.4 ha of total area there are:

- approx. 990 apartments
- of which approx. 600 in the social rental sector
- 1 school, 1 kindergarten
- 2 swimming pools
- about 250 trees
- 8,900 m² meadow areas
- 930 m² perennial areas
- 13,600 m² green roofing
- 2,200 m² facade greening
- 760 m² retention pond
- 2,000 m² children/youth playgrounds
- 600 m² community gardens
- 3,850 m² ground floor gardens
- 420 bike parking spaces
- 1,720 m² common rooms
- approx. 20,000 m² of commercial space
- 152 hotel rooms

Landscape architecture Biotope City Wienerberg:

Masterplan open space/preliminary design: Auböck + Kárász Landscape Architects
Design, detail, and implementation planning open residential space and public areas: Knollconsult Umweltplanung ZT GmbH
Design, detail, and implementation planning school: Carla Lo Landschaftsarchitektur

Microzone ground floor

- 1 Mobility, information, and initiative room
- 2 KitchenChildrenLivingroom
- 3 Room option for teenagers
- 4 Sports and exercise center (club)

Mikrozone first floor

- 5 Multifunction room
- 6 Library
- 7 Creative room and studio



Toddler game



Children & youth game



Free ball game



Urban gardening



© Caritas Stadtteilarbeit/Bearbeitung: Knollconsult

Mikrozone Erdgeschoss





HIDDEN TREASURES

> Invisible Building Blocks of
Sustainable City

Biotope City
Wienerberg

IBA
WIEN
Neum.
Socrates
Wannen

 Für die
Stadt Wien

- Urban mining
- Planning process
- Urban design
- Microclimatic analyses
- Water management
- Legal framework

<https://www.iba-wien.at/en/service/project-related-publications/booklet-hidden-treasures>



Recycling and re-use



Substrates and exchange
between construction sites

2013 – 2022
→ Planning and implementation process



From project planning to implementation



Vision



Planning



Implementation

Source: AUBÖCK + KÁRÁSZ LANDSCAPE ARCHITECTS



master plan



preliminary draft



submission plan

-  tree (new planting)
-  tree (existing)
-  hedge
-  climbing plant
-  bushes
-  perennials and grass
-  urban gardening
-  lawn
-  private gardens

	master plan	preliminary draft	submission plan
Total area of vegetation	17.870 m ²	18.530 m ²	17.430 m ²
Trees (new plantings)	223 pcs.	271 pcs.	295 pcs.
Urban gardening	210 m ²	221 m ²	123 m ²
Roof greening	--	--	48 %
Facade greening	--	--	12 %

Microclimatic analyses and optimisation

Three greened scenarios simulated

ACTUAL PLANNING

WORST CASE: 100 % degree of sealing;

MODERATE: 50 % of the roof areas extensively greened,

extensively greened, façade greening;

MAXIMUM: 50 % of the roof areas intensively greened,

extensively greened, façade greening.

Rainwater management and water retention



Lessons learned and open questions - in a nutshell

1. Quality assurance – how to cover the whole planning and implementation process?
2. Legal framework – construction standards for facade greening
3. Biodiversity and Animals
4. Costs



Legal framework – how to prescribe the necessary amount of greening in a legally binding way?

§ 5.

Inhalt der Bebauungspläne.

(2) Der Fluchtlinienplan hat zu enthalten:

- d) die Baufluchtlinien, das sind jene Grenzen, über die gegen den Vorgarten, den Seitenabstand (Bauwich), den Hof oder den Garten (vordere, seitliche, innere Baufluchtlinie) mit dem Bau oder mit Bauteilen im allgemeinen nicht vorgerückt werden darf; die Bestimmungen, unter denen Vorbauten zulässig sind, regelt § 85. Für die nach dieser Vorschrift unbebaut zu belassenden Vorgärten und Seitenabstände kann eine besondere Art der Einfriedung und die gärtnerische Ausgestaltung vorgeschrieben werden; die gleiche Vorschrift kann für die an Grenzfluchtlinien anzulegenden Hintergärten getroffen werden. Der Bebauungsplan kann ferner anordnen, daß auch andere unbebaut bleibende Flächen des Bauplatzes gärtnerisch ausgestaltet werden;

- ✓ green roofs and green facades
- Trees and urban greening → „horticultural design“ (?)



Source: Law of 25 November 1929 enacting a building code for Vienna.

Today: § 5 para. 4 lit. p BC for Vienna

→ The building code is not a „tree code“



Photo: City-Reader



Image Courtesy of WOHA



Image Courtesy of WOHA



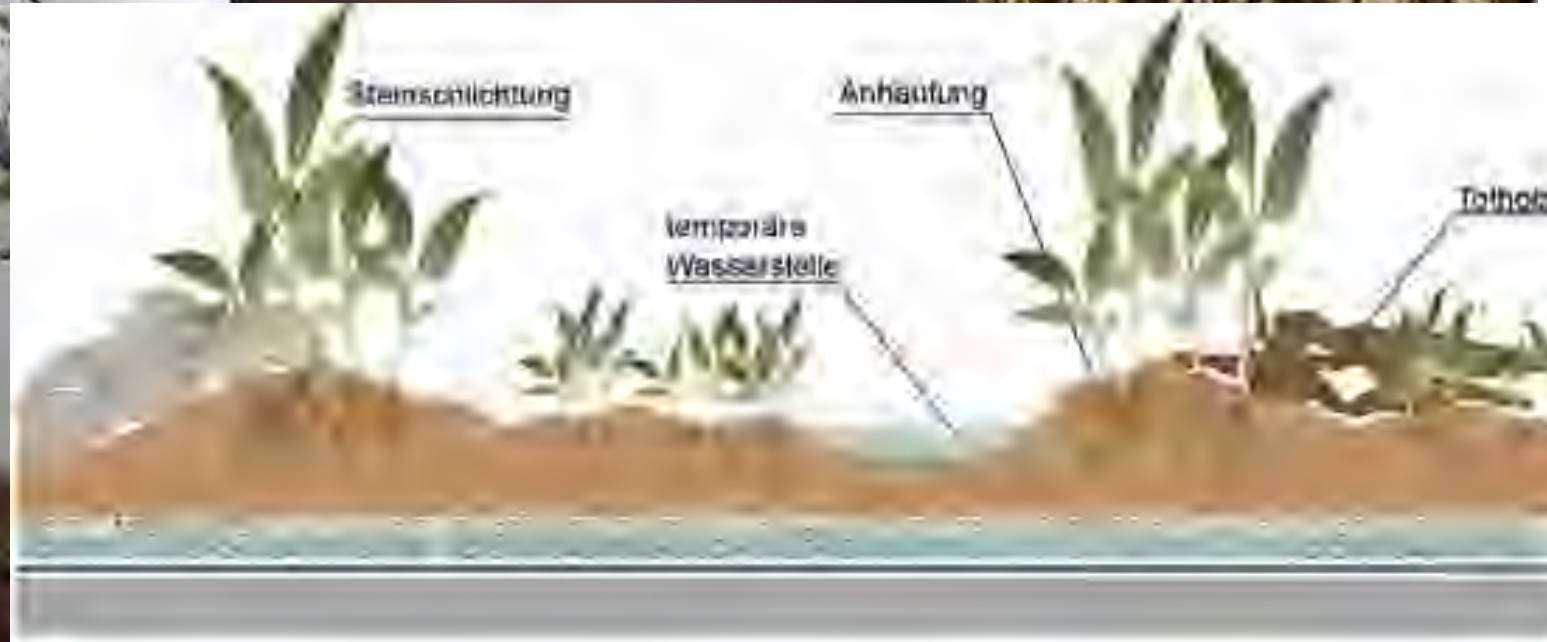
Legal framework – construction standards for facade greening



Biodiversity and animals

Measures to promote Biodiversity on buildings:

- Near-natural green roofs
- Natural roof, bee roof, retention roof...
- Species-rich façade greening
- Habitats for animals
- Nesting boxes, Nesting sites
- Bird impact protection
- Stone or wood habitats
- Water areas







nature deficit disorder → reconnect people with nature



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Biotope City - building instructions for a climatresilient, green and nature-inclusive city



<https://boku.ac.at/rali/ilap/projekte/biotope-city>