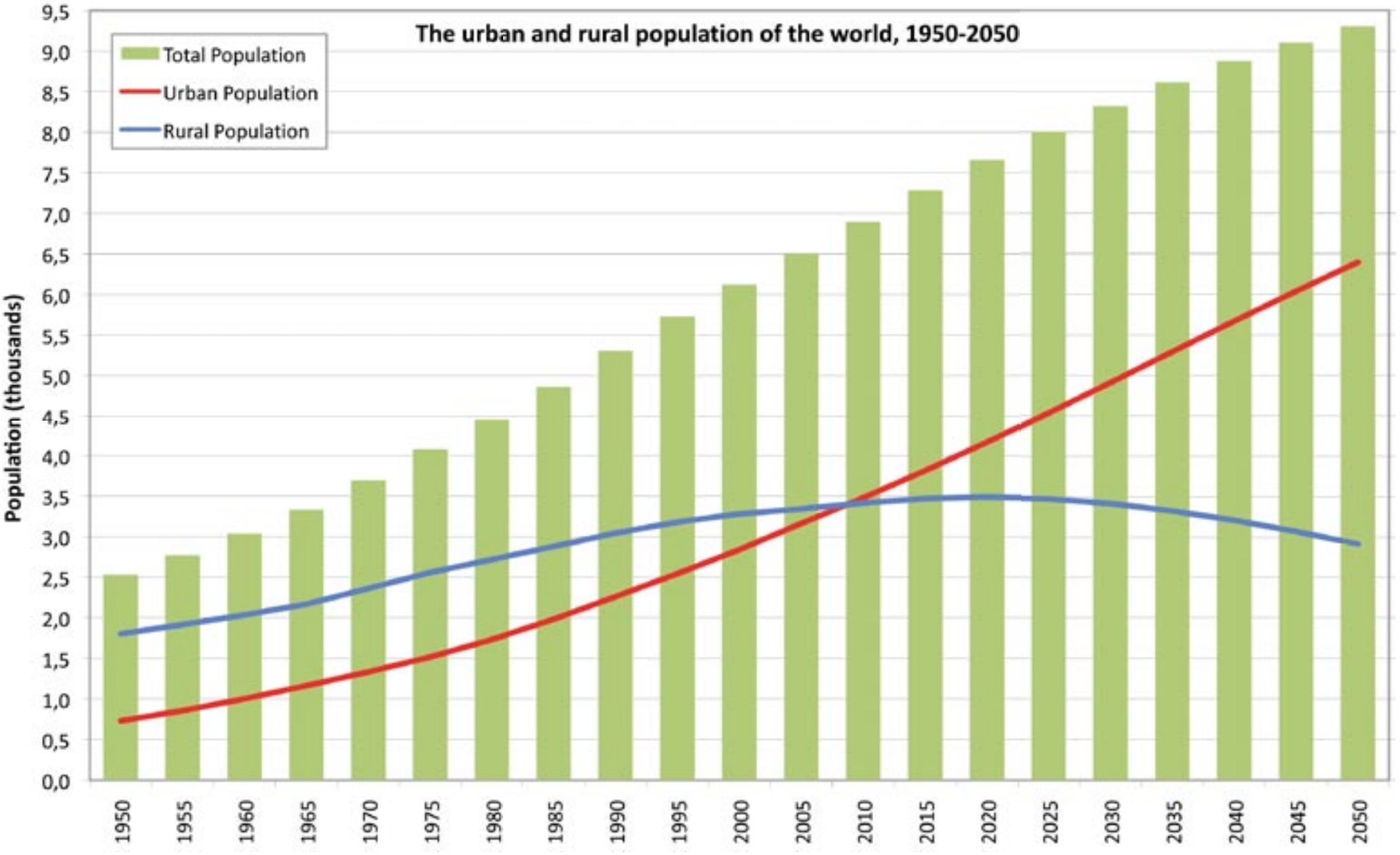
Urban Greenblue Grids

September 18, 2012

atelier GROENBLAUW
Hiltrud Pötz

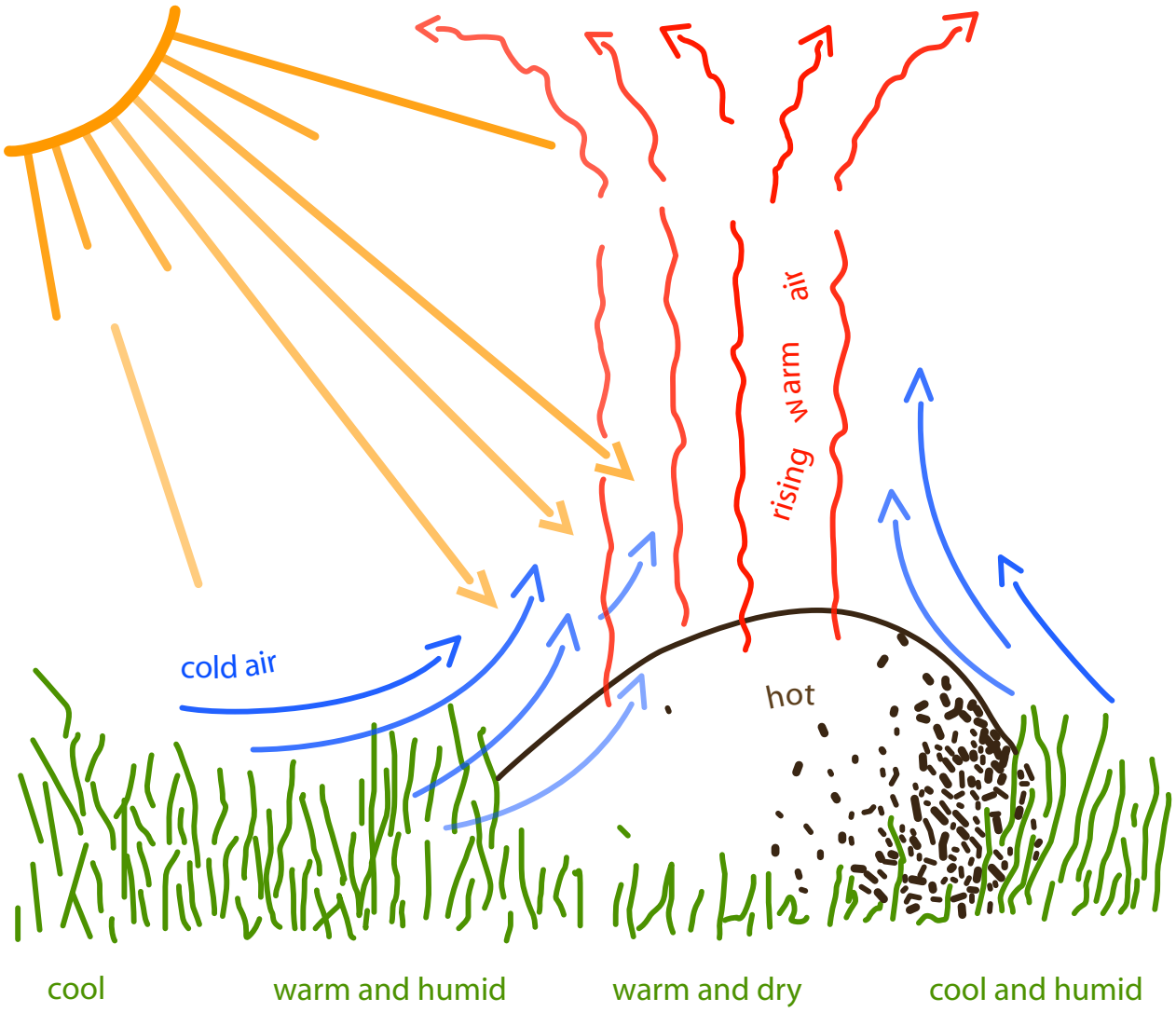
Urbanization



Thesis:
With urban greenblue grids we hit 7 flies in one stroke

- **Climate adaptation**
- **Sustainable energy production**
- **More biodiversity**
- **Less heat stress**
- **Better air quality**
- **Food production**
- **Quality of life**

Urban microclimate and biodiversity



[based on Krusche, 1982]

Challenges for Dutch delta cities in times of climate change

Be prepared for:

- **More heavy storm rains**
- **Longer dry periods**
- **Urban heating**

and keep our cities safe and attractive!

Use of natural processes and location characteristics

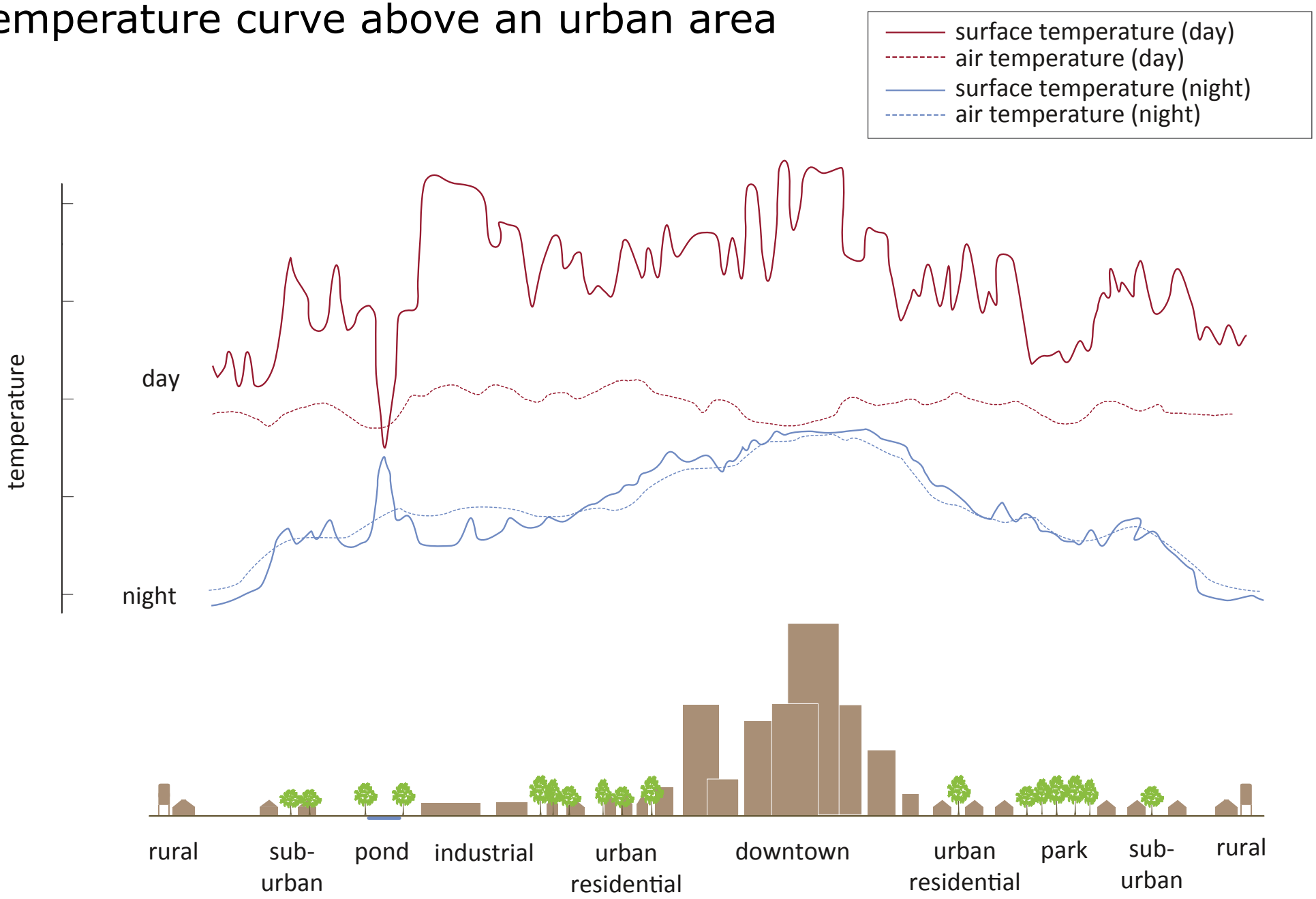
Visable water systems
Re-use of wastewater
Use of rainwater
Reduction of pavement
Infiltration

Reduction of groundwater extraction

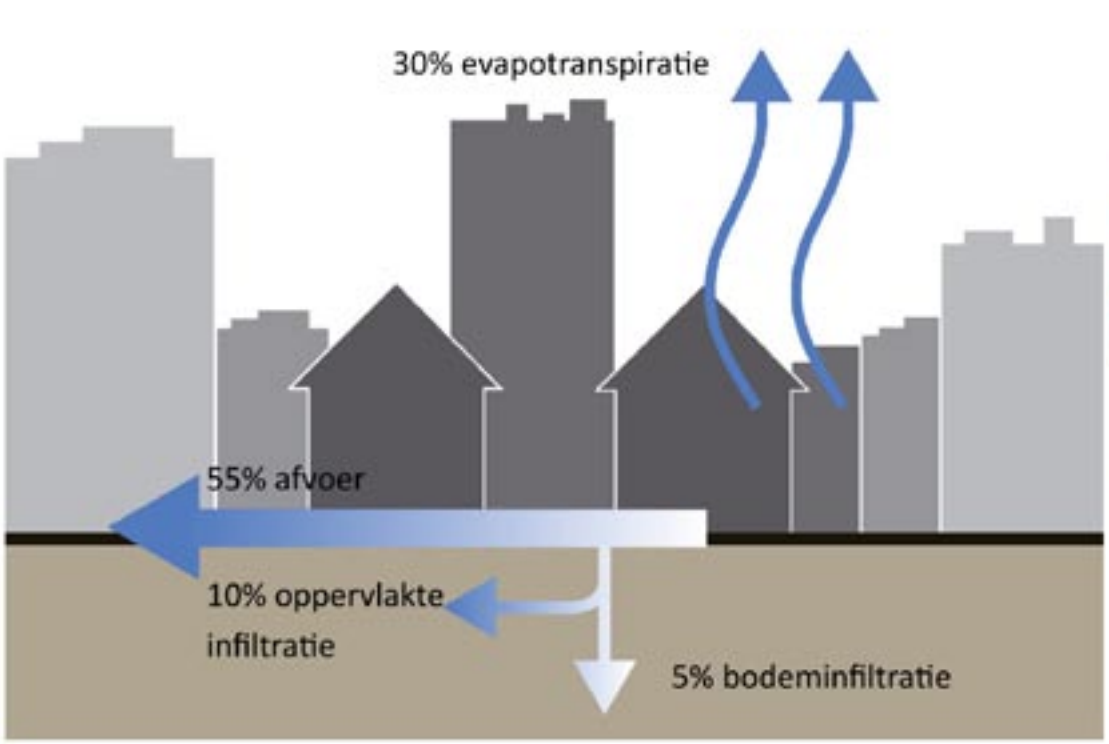
Small water cycles
Fewer overflows

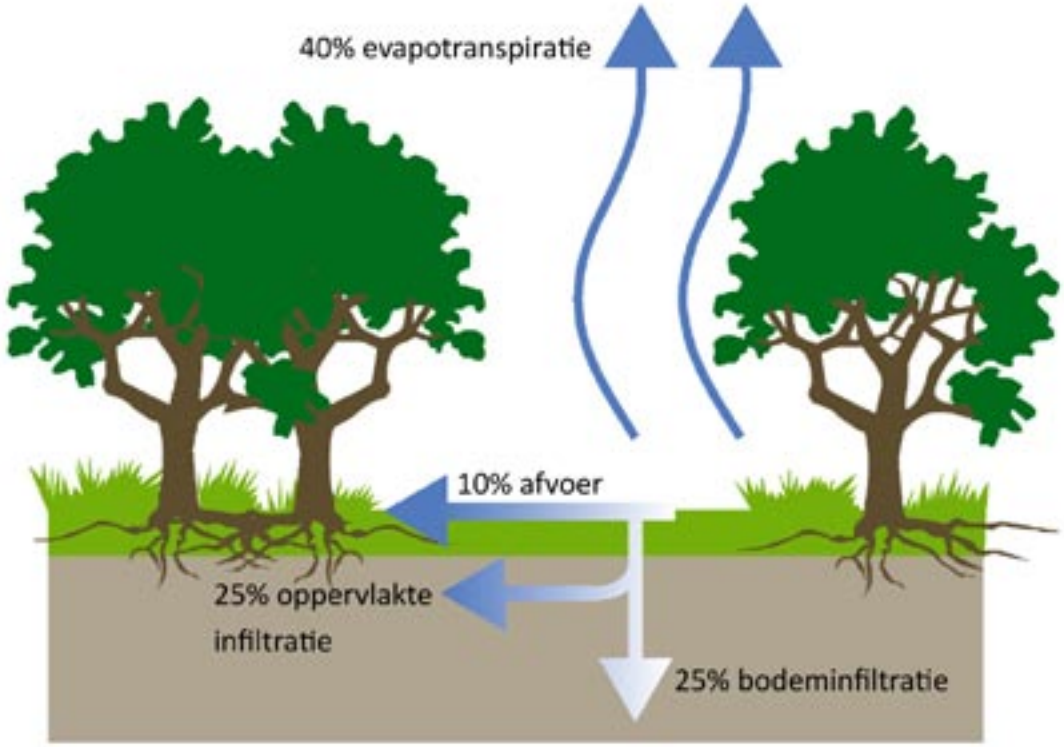
Heat stress

Temperature curve above an urban area

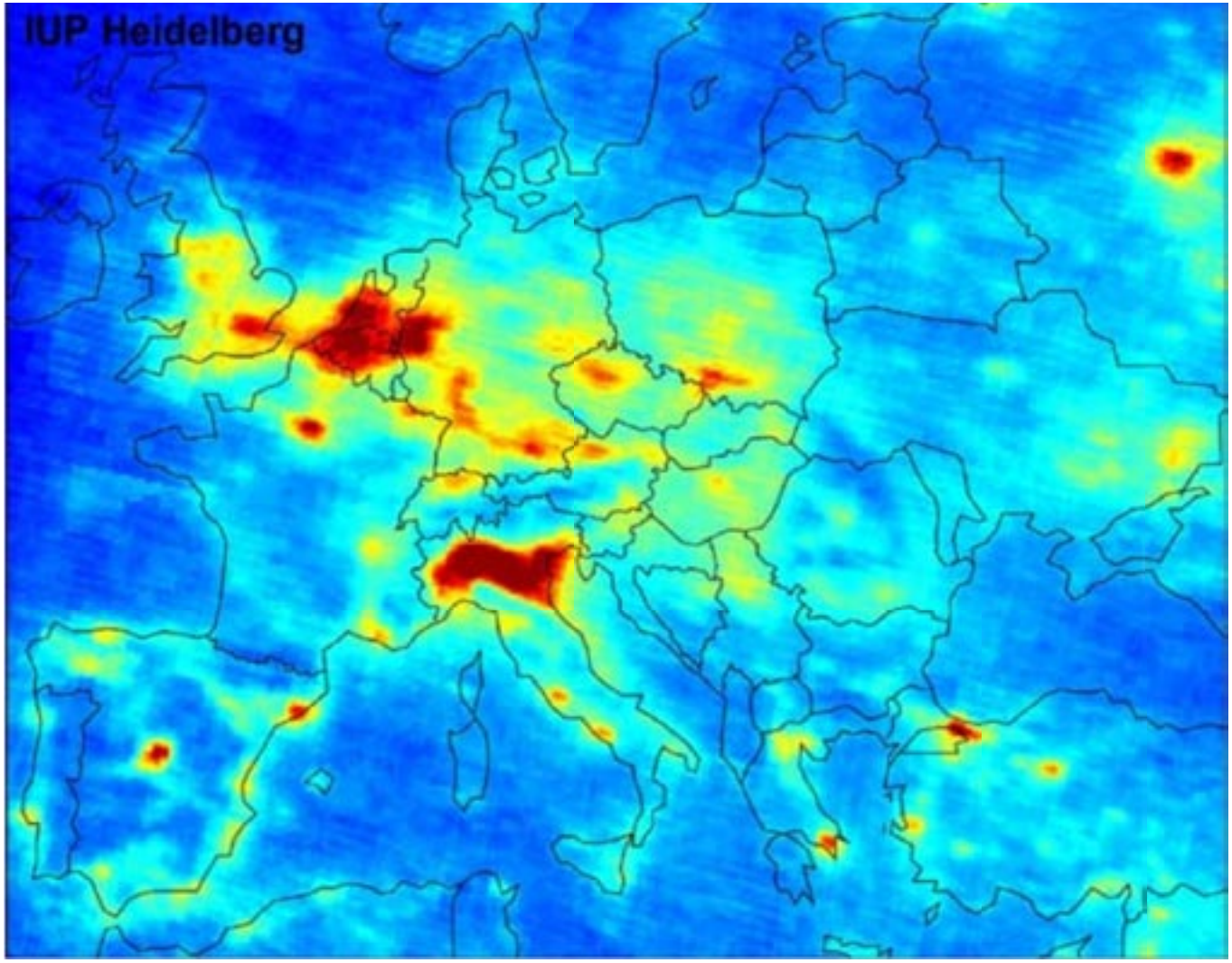


Heat stress
Water balance in the city and in nature

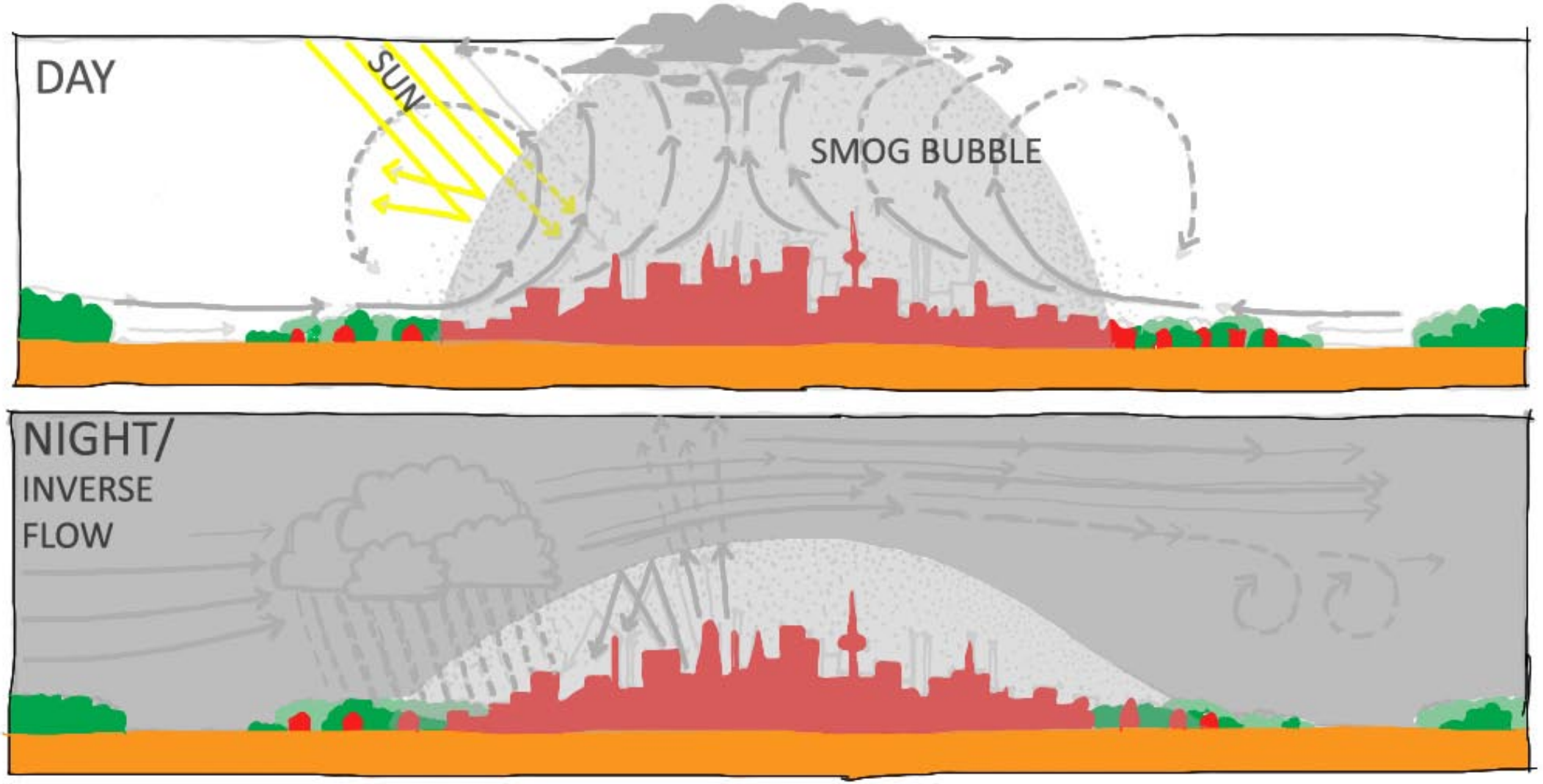




Air quality
Particle matter

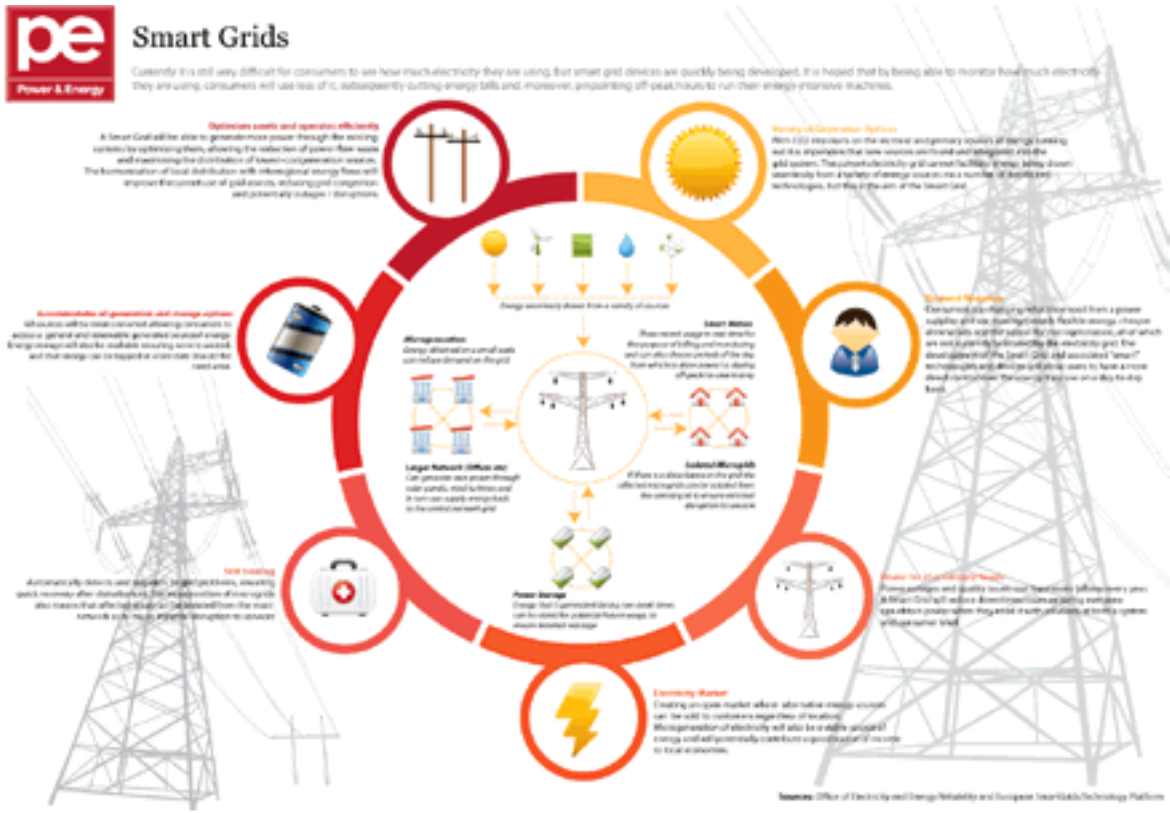


Air quality
Smog bubble and inverse flow



Smart grids
For sustainable energy production

- **Wind**
- **Sun**
- **Ambient energy**
  - **Water**
  - **Soil**
  - **Air**
- **Biomass**
  - **Wooden pallets**
  - **Etc.**
- **Waste**
  - **Organic waste**
  - **Waste water**



Participation

Active participation of citizens in designing and shaping the city

Food production
City farms and urban gardening

Synergy
Effects of more nature; green and blue in the city

More biodiversity

Better quality of life

Food production

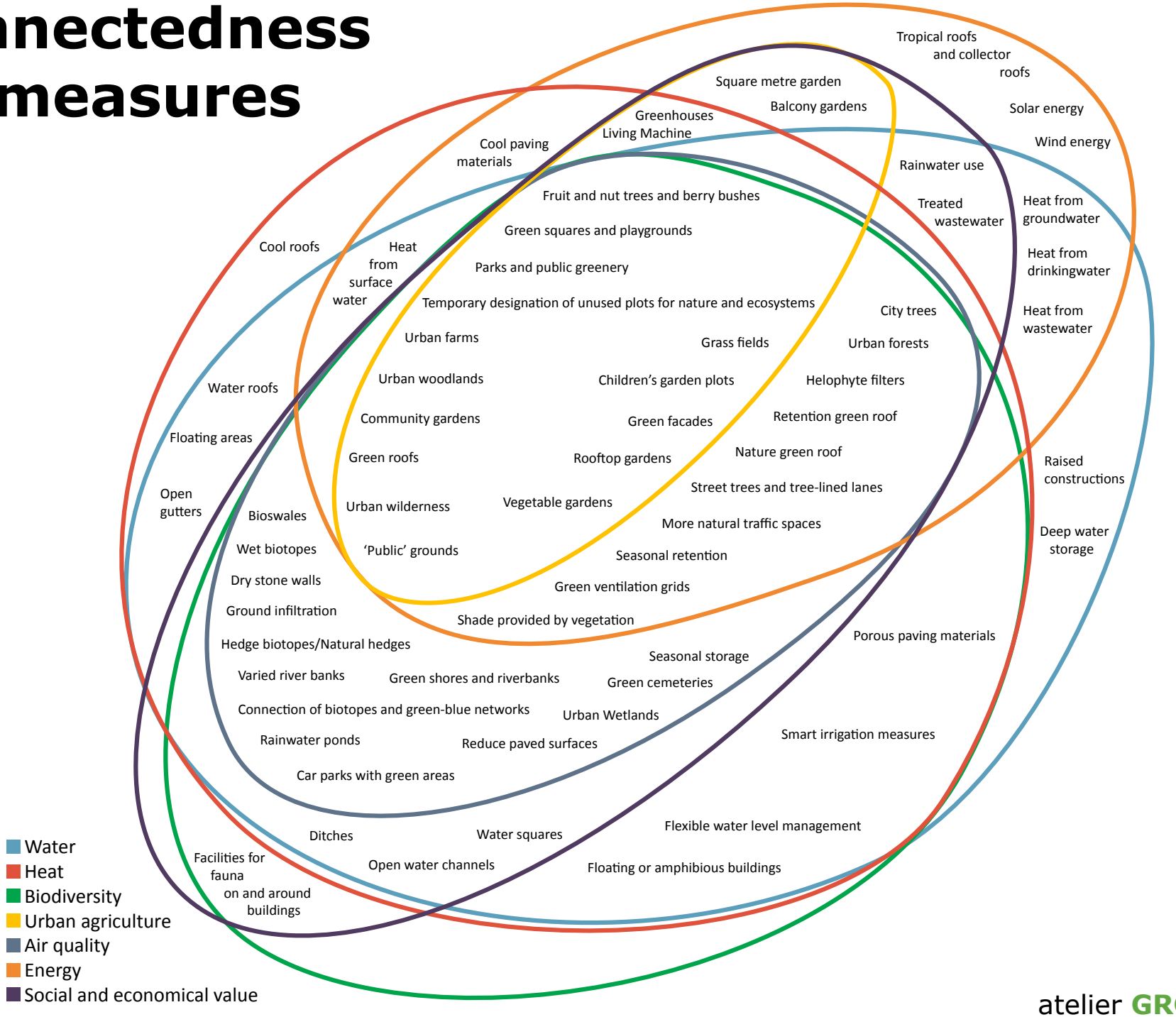
Increased sponge effect

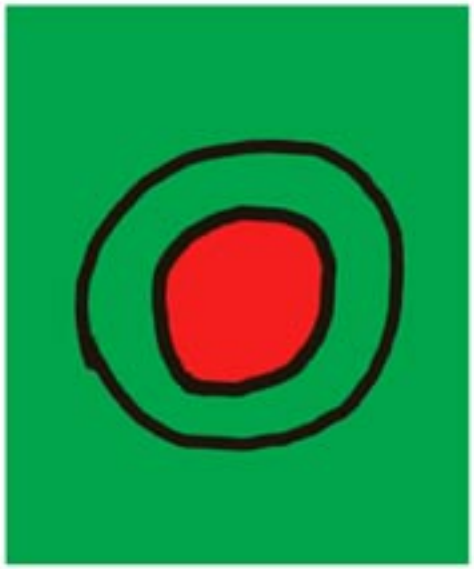
Less heat stress

Better air quality

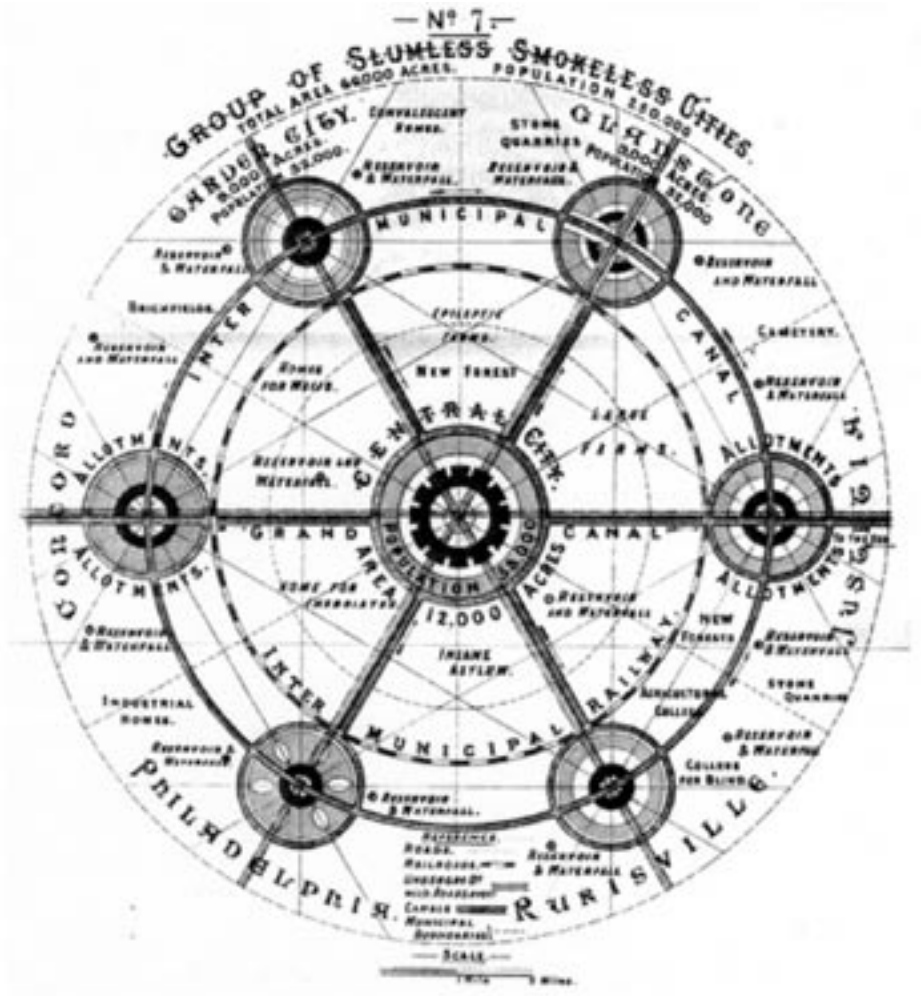
Biomass for energy production

Connectedness of measures



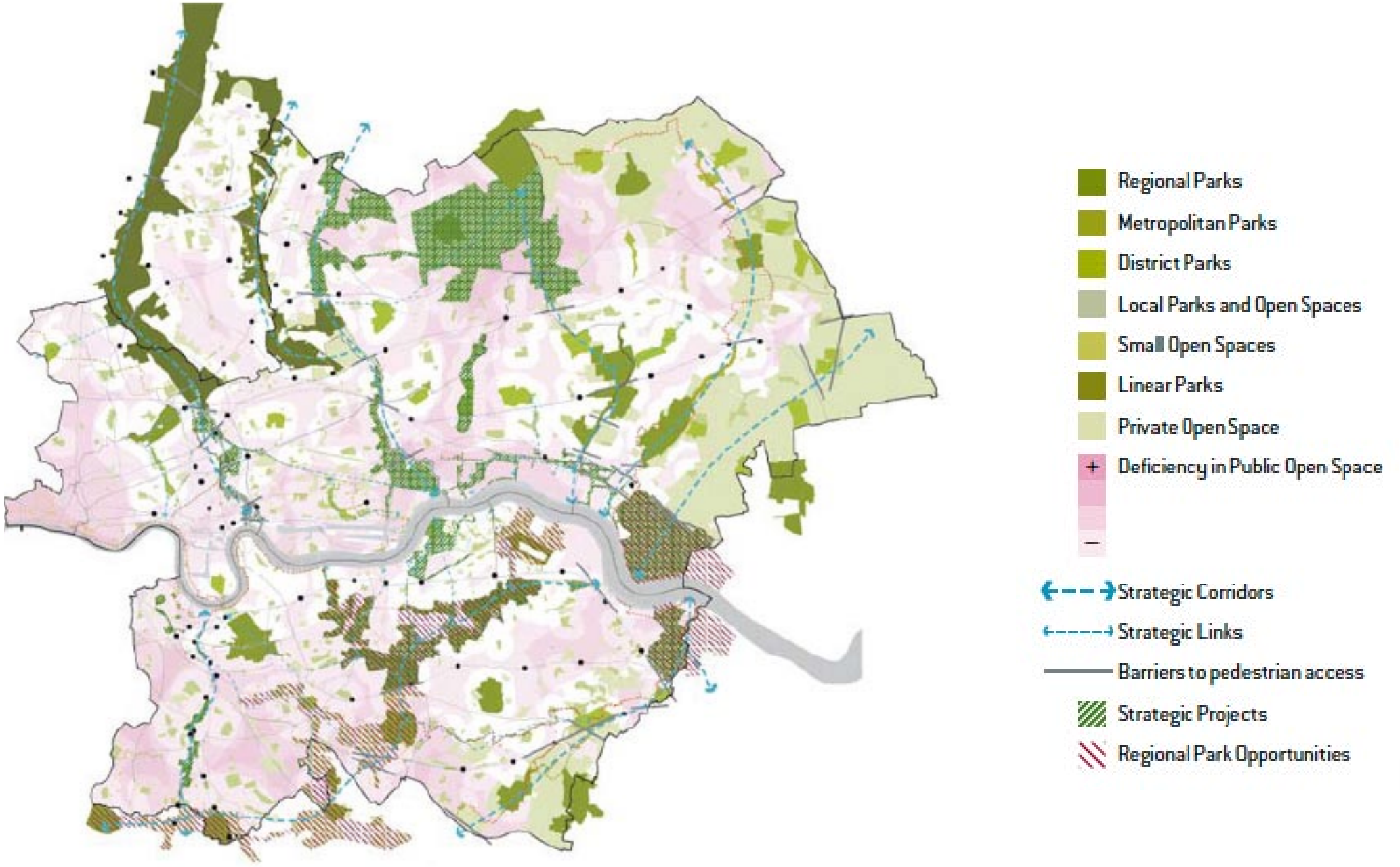
History
Group of slumless smokeless cities and the fertile landscape



[From Lohrberg, 2011, p.19, by Howard 1898, Bollerey e.a. 1990- Einband]

[From Lohrberg, 2011, p.38, by Berlins, Migge 1933, Uhlig 1981-106]

London Green Grid

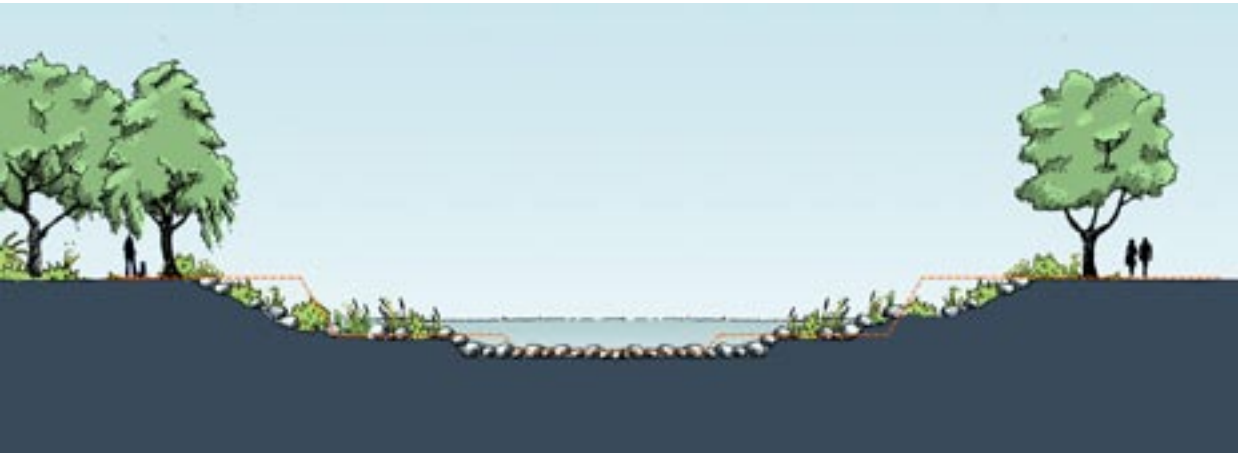


London Green Grid

- **Rainwater retention and purification**
- **Creating a healthy city**
- **Heat stress reduction**
- **Biodiversity**
- **Making the city more liveable**
- **Creating more leisure space**
- **Attractive walking and cycling networks**

London Green Grid

Singapore
Transformation of the canals



Singapore

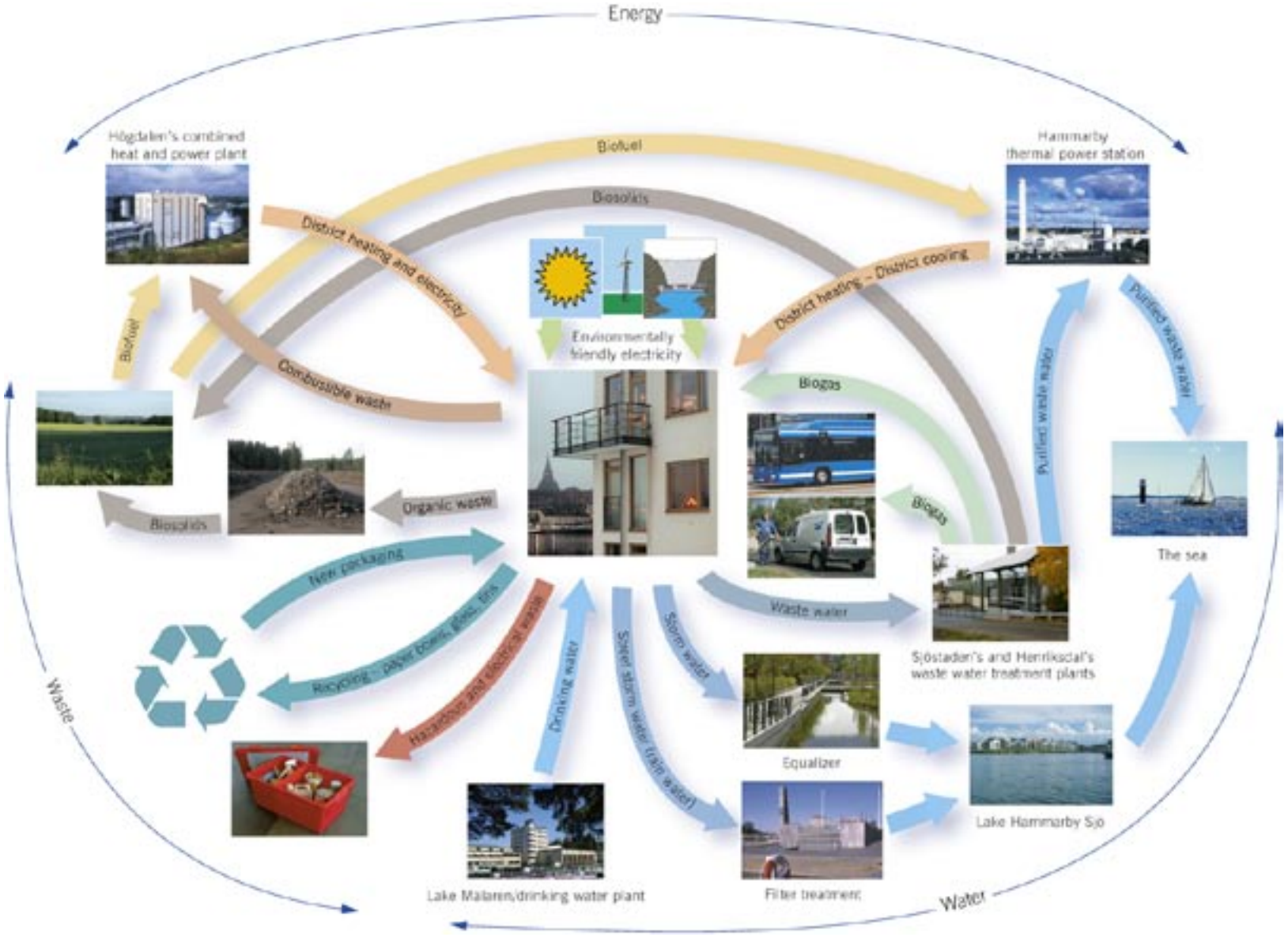
Singapore

Hammarby Sjöstad, Stockholm, Sweden

Hammarby Sjöstad, Stockholm, Sweden

- **Surface drainage**
- **100% rainwater retention**
- **Ecological green management**

Hammarby Sjöstad, Stockholm, Sweden



Hammarby Sjöstad, Stockholm, Sweden

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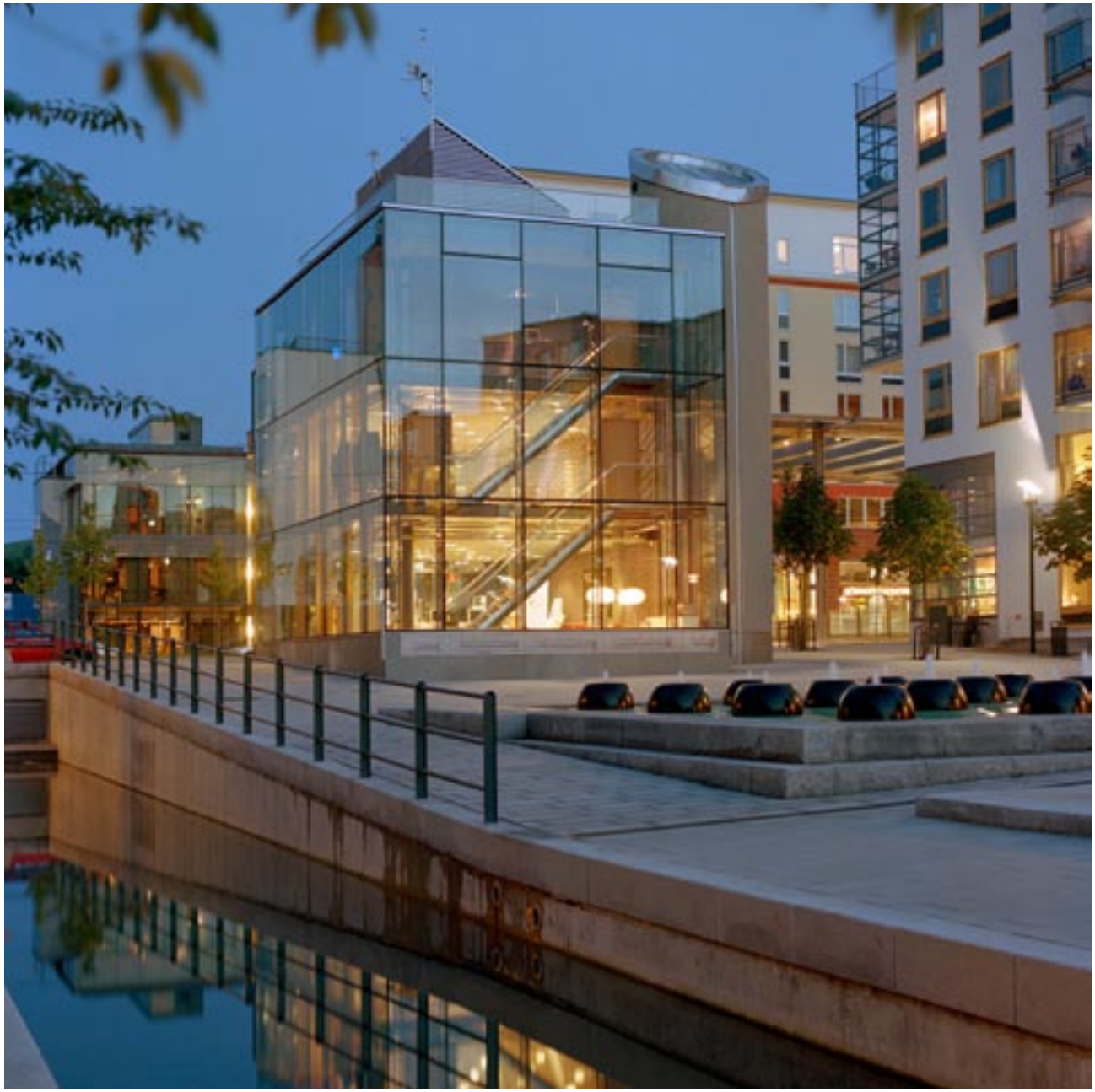


Hammarby Sjöstad, Stockholm, Sweden

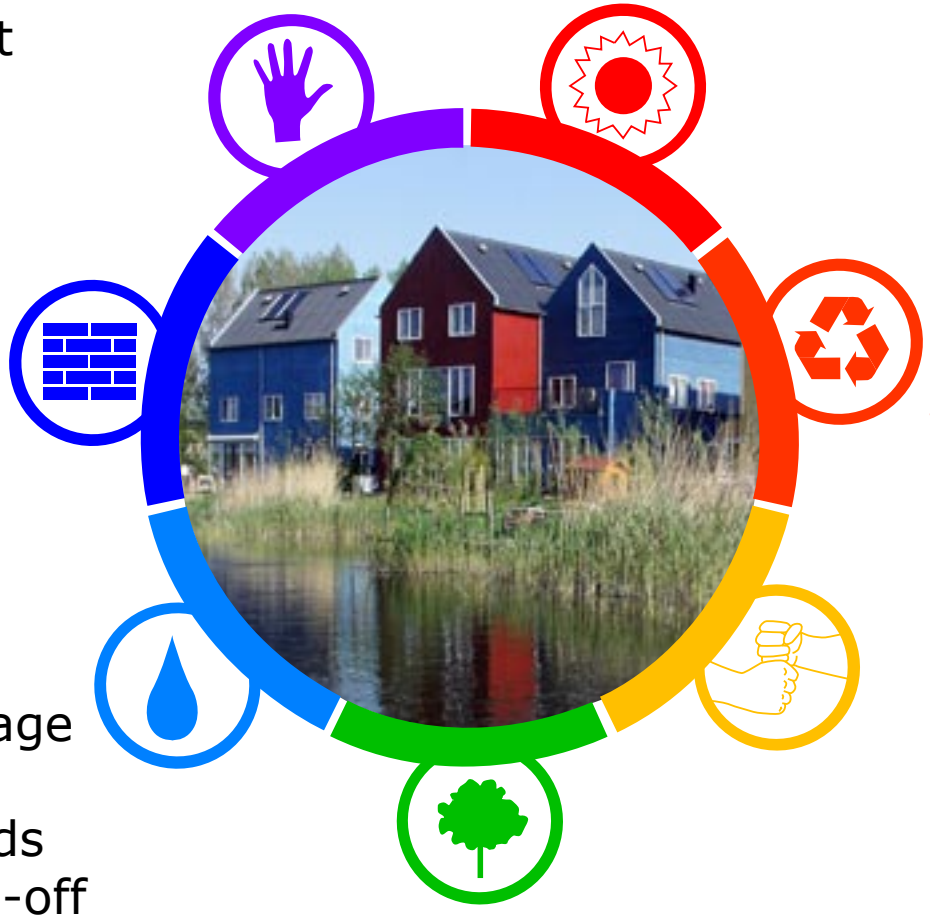
Eva Lanxmeer, Culemborg

Eva Lanxmeer, Culemborg

PERCEPTION
- Green trafficless residential environment
- Safe for children

MATERIALS
- No PVC
- Natural based paint
- Modified wooden facades
- Natural (half) pavements

WATER
- 100% Rainwater storage
- Grey water treatment in constructed wetlands
- Surface rainwater run-off



ENERGY
- Heatpump (added to drinking water production)
- 50% reduce in energy consumption

WASTE
- Biogas from black water
- Composting of organic waste

PARTICIPATION
- Design and management of communal gardens

ECOLOGY
- Ecological green management
- Minimalization pavement
- Recovered old river (Lek)

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Eva Lanxmeer, Culemborg

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Rijkswaterstaat office, Terneuzen

Rijkswaterstaat office, Terneuzen

PERCEPTION
- Natural ventilation
- Natural materials

MATERIALS
- Reused and recycled materials
- Reused more posts
- Cellulose insulation
- Renewable raw materials

WATER
- 100% Reuse filtered waste water
- 80% reduction in drink water consumption
- Rainwater buffering on the green roof

ECOLOGY
- Use of existing green as wind buffer
- Green roof
- Minimized pavement

ENERGY
- Use of surface water for heating system
- PV panels
- 66% reduction in energy consumption

WASTE
- Reuse of waste materials
- 100% reuse of waste water

PARTICIPATION
- Involvement of the employees during the design process

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Rijkswaterstaat office, Terneuzen

Measurable sustainability

Rijkswaterstaat office, Terneuzen

Rijkswaterstaatkantoor, Terneuzen

Waterfabriek, Dierenpark Emmen

Waterfabriek, Dierenpark Emmen

- **100% decentralized treatment and re-use of wastewater**
- **Visualization and public accessibility of purification plant**
- **Control of the provincial drinking water system from the water pavilion**

Waterfabriek, Dierenpark Emmen

Waterfabriek, Dierenpark Emmen

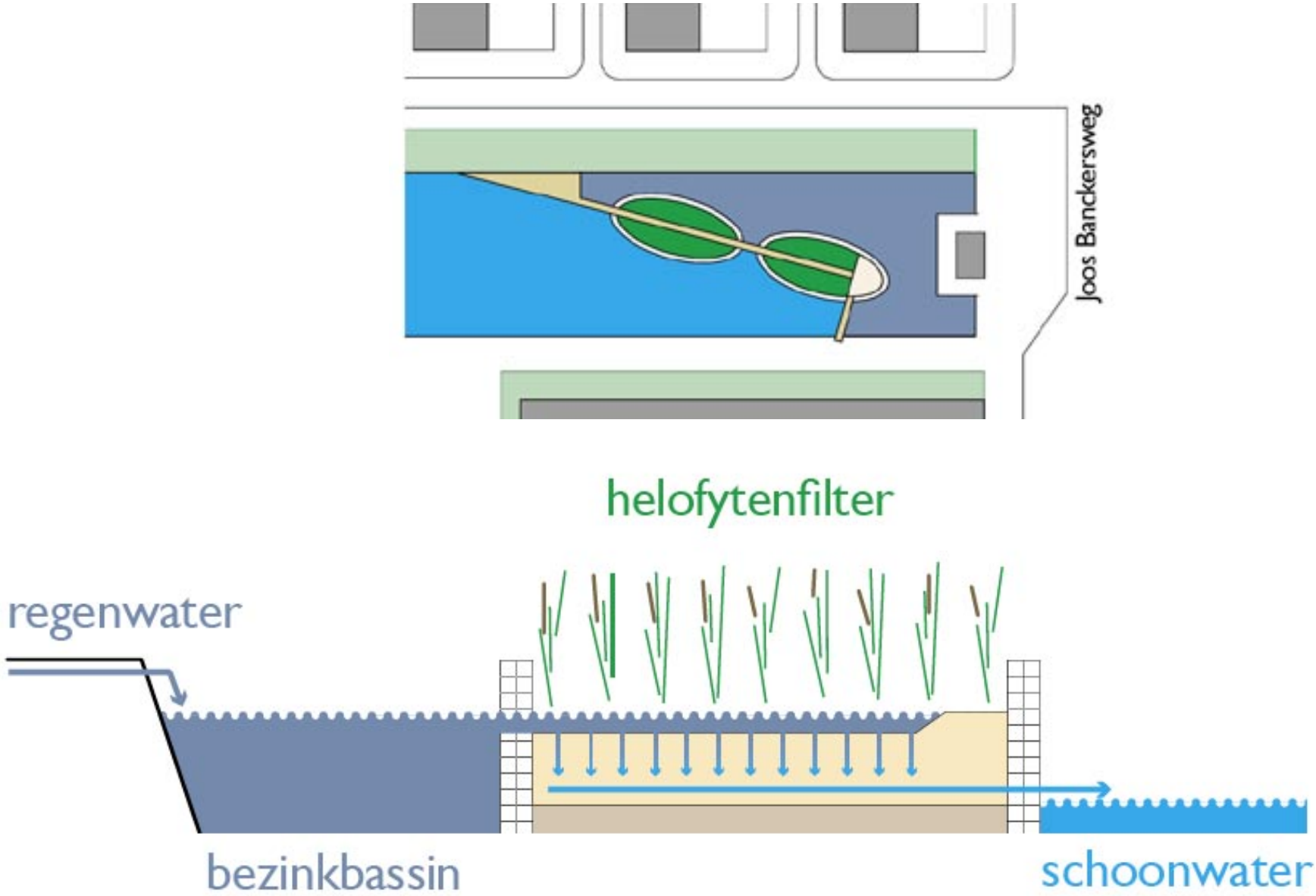
Waterfabriek, Dierenpark Emmen

Erasmusgracht, Amsterdam

Erasmusgracht, Amsterdam

- **Disconnect runoff water from the combined sewer system**
- **Decentralized treatment of rainwater**
- **Creating leisure space**
- **Wildlife habitat**

Erasmusgracht, Amsterdam



Erasmusgracht, Amsterdam

Speeldernis, Rotterdam

Speeldernis, Rotterdam

- **Water awareness**
- **Water storage**
- **Water experience**
- **Water retention**
- **Biodiversity**

Speeldernis, Rotterdam

Speeldernis, Rotterdam

Waternet, Amsterdam

Waternet, Amsterdam

- **Rainwater storage under the building**
- **Purification of rainwater**
- **Re-use of rainwater for toilets**

Waternet, Amsterdam

Brasserhout, Den Haag

Brasserhout, Den Haag

- **Rainwater storage**
- **Biodiversity**
- **Minimalized pavements**

Brasserhout, Den Haag

Brasserhout, Den Haag

Brasserhout, Den Haag

Climate workshop

- Multidisciplinary
- Proactive
- Creative
- Integral

Building blocks for a greenblue city

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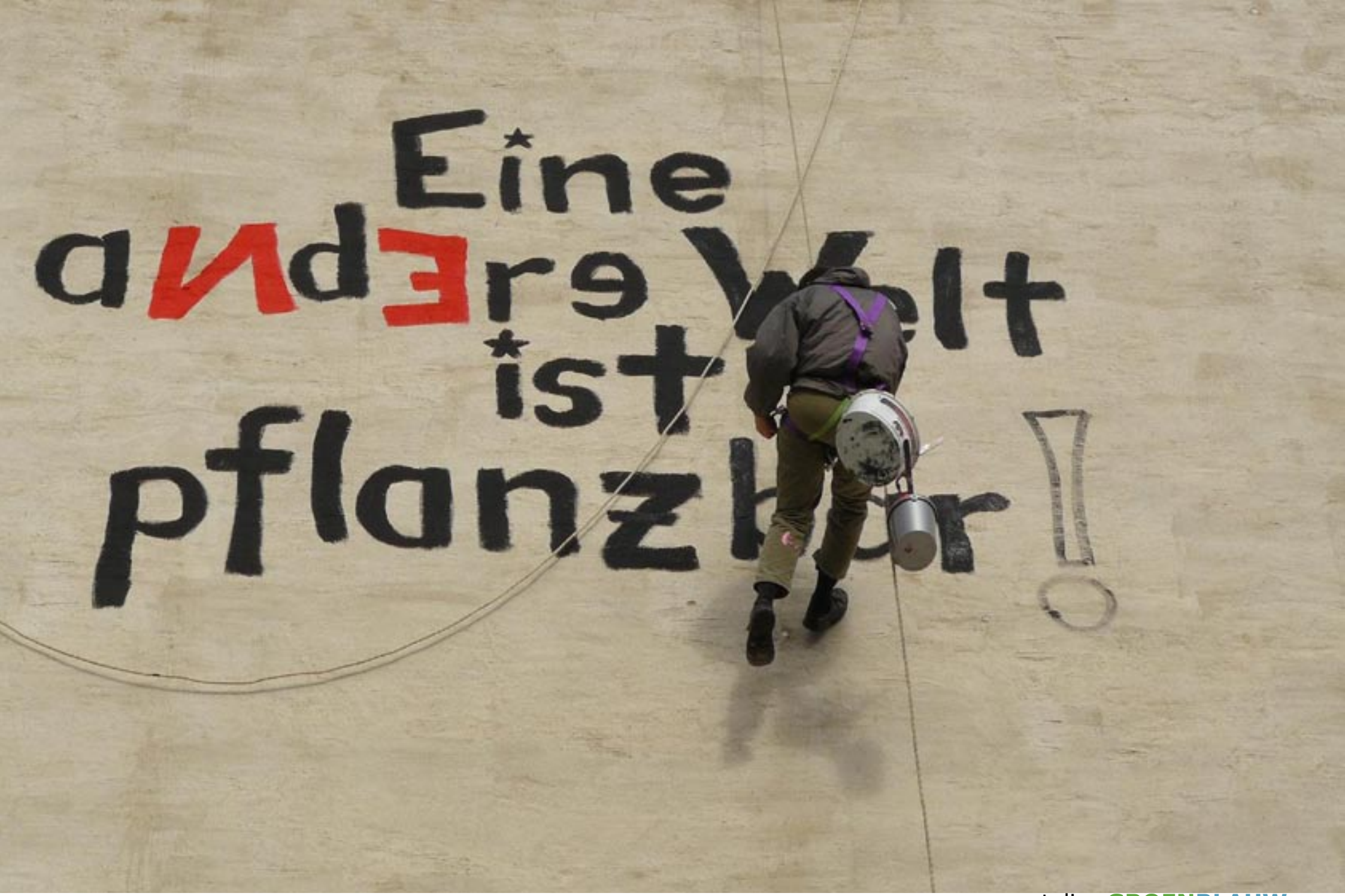
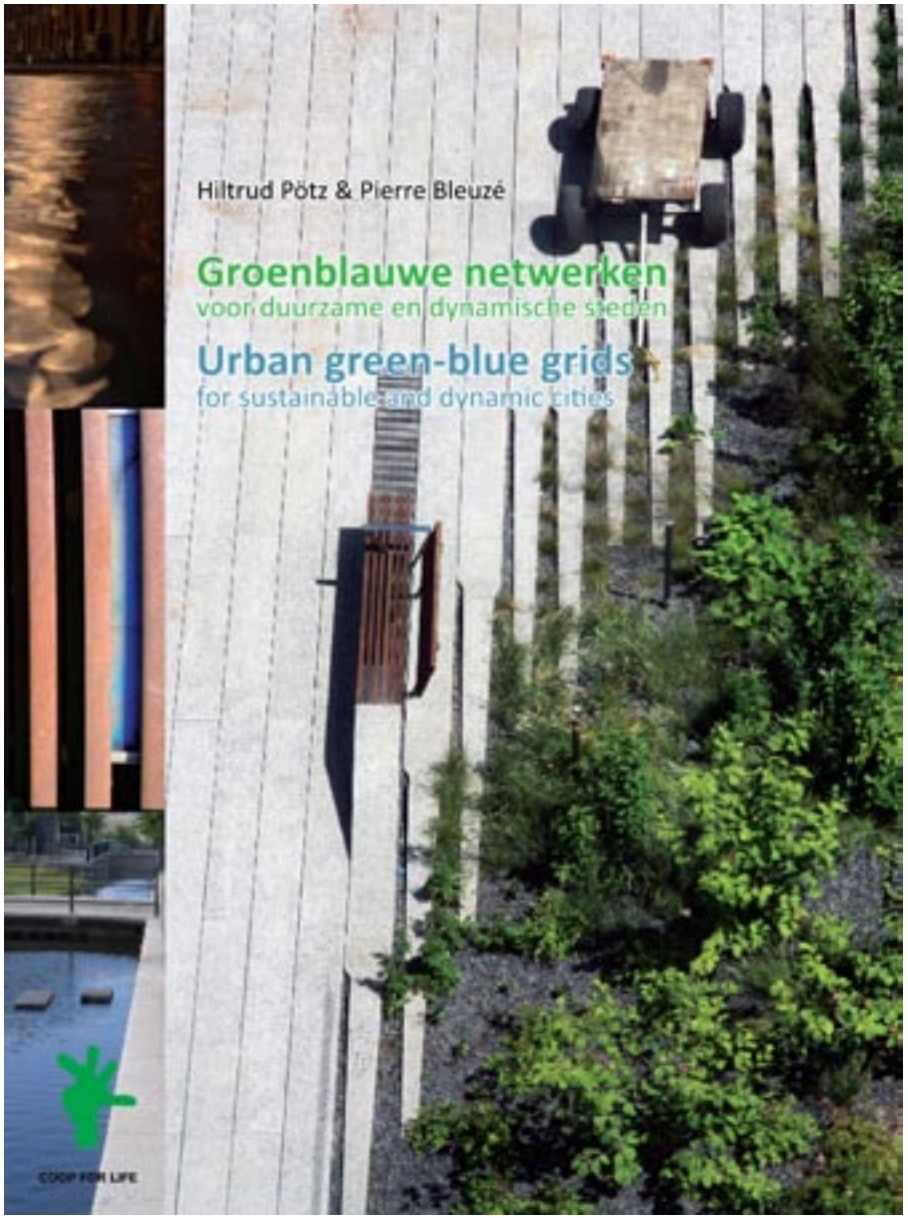
Benefits of the process

- **The climate challenge concerns us all**
- **Conflict transformed into creative solutions**
- **We developed integral and concrete ideas**
- **By solving the climate challenge, we also improve ecology, life quality and reduced urban heating**


Eine
andere Welt
ist
pflanzbar!

Urban green-blue grids for sustainable and dynamic cities



Thank you!