12 March 2019 I MIPIM

Prof Jürgen Bruns-Berentelg

HafenCity

European Waterfront Cities

HafenCity: Dimensions of Sustainability. Planetary Boundaries and the Future of Inner-city Urban Development

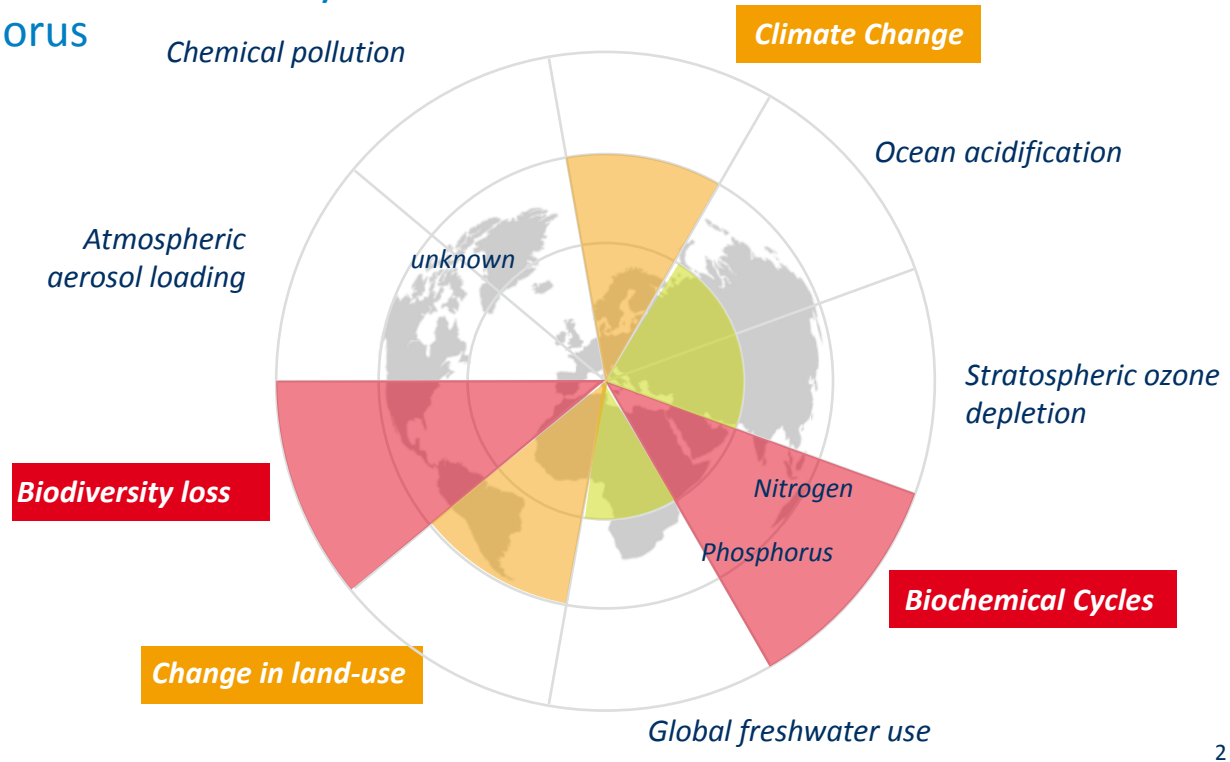




Planetary Boundaries

Climate change imposes a significant risk on human development,

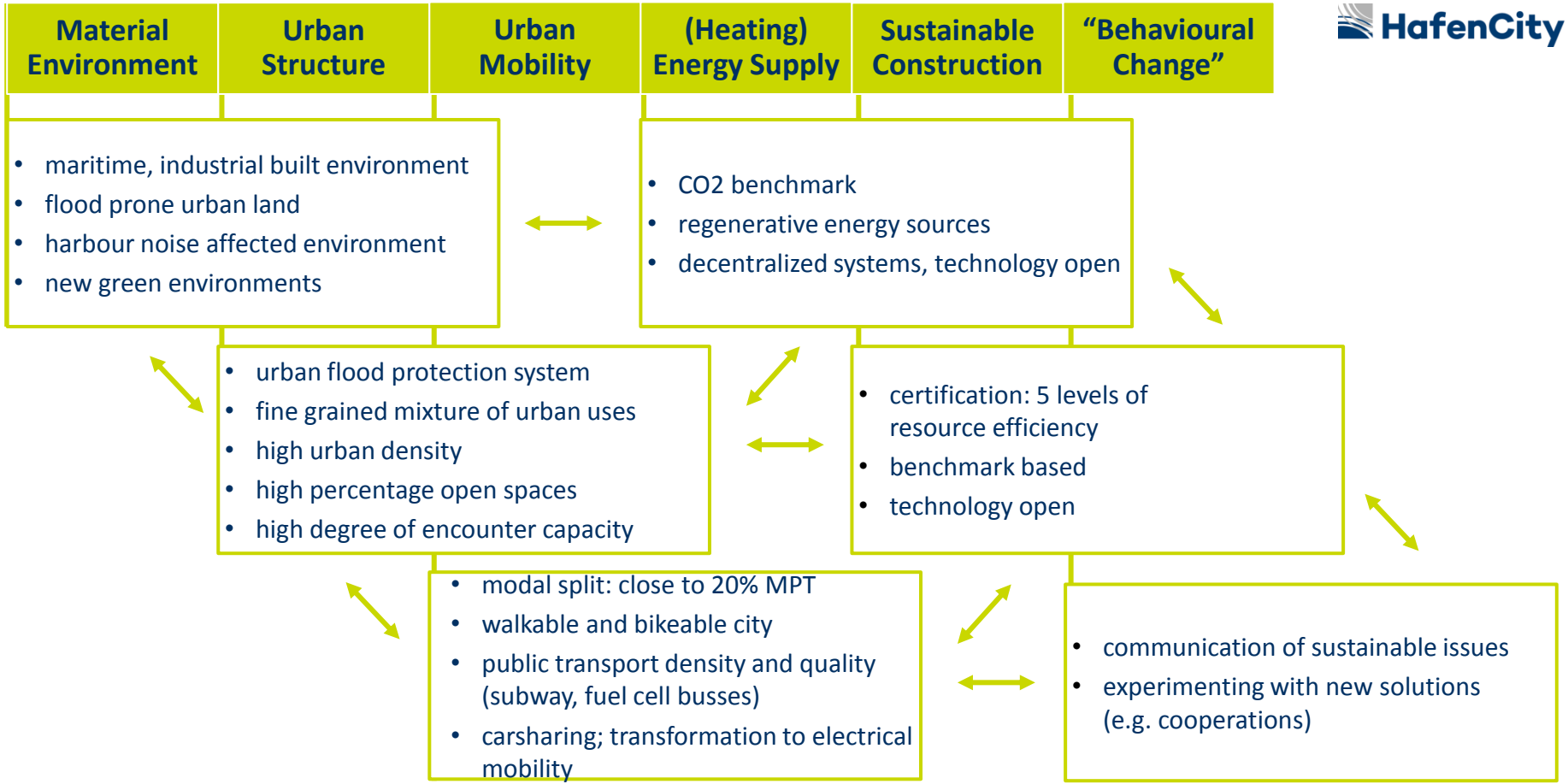
but the consequences of the loss of biodiversity and human overuse of phosphorus may even be worth.



Unknown impact
Significant risk
Safe

Steffen, W. et al. (2015): Planetary Boundaries: Guiding human development on a changing planet. In: Science 347(6223).

Adopted from:
Rockström, J. et al. (2009): A Safe Operating Space for Humanity. In: Nature, S. 472-475.



HafenCity

Material Environment	Urban Structure	Urban Mobility	(Heating) Energy Supply	Sustainable Construction	"Behavioural Change"

- maritime, industrial built environment
- flood prone urban land
- harbour noise affected environment
- new green environments

- CO2 benchmark
- regenerative energy sources
- decentralized systems, technology open

- urban flood protection system
- fine grained mixture of urban uses
- high urban density
- high percentage open spaces
- high degree of encounter capacity

- certification: 5 levels of resource efficiency
- benchmark based
- technology open

- modal split: close to 20% MPT
- walkable and bikeable city
- public transport density and quality (subway, fuel cell busses)
- carsharing; transformation to electrical mobility

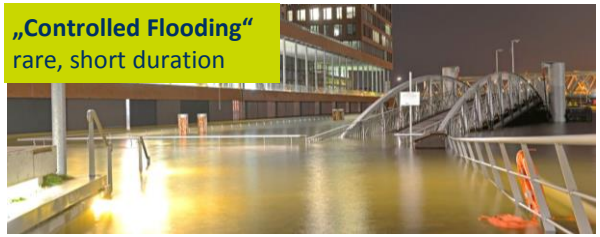
- communication of sustainable issues
- experimenting with new solutions (e.g. cooperations)

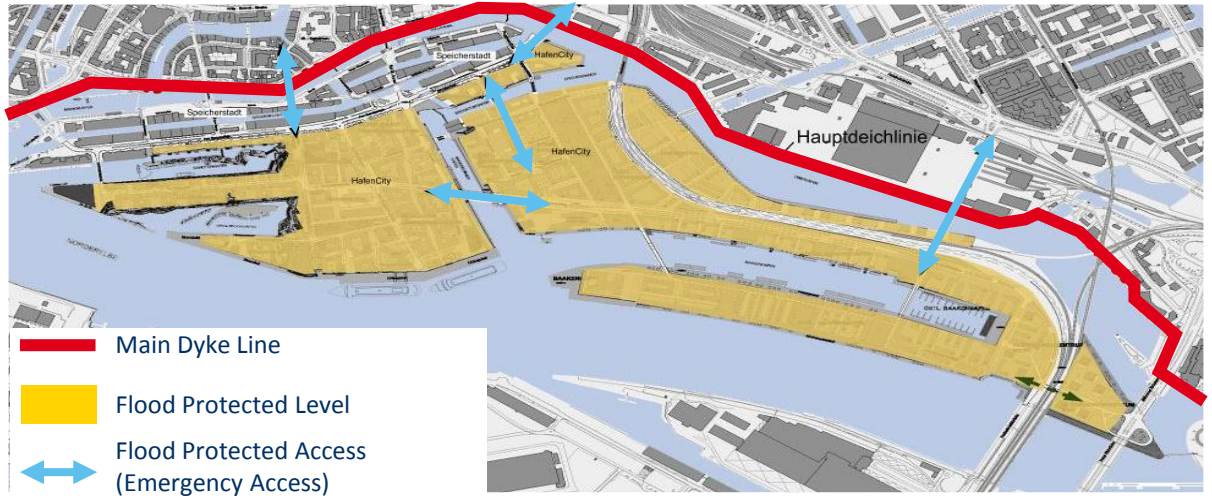
Urbanistic Flood Protection Concept Considering Climate Adaptation (Double Utilisation of Infrastructure / Parking)

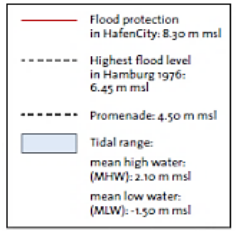
Usual Case

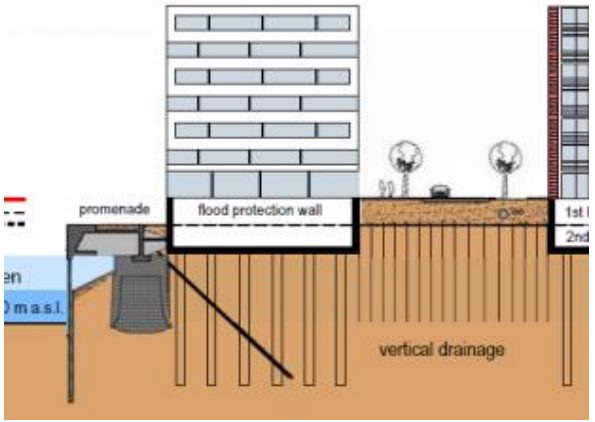


„Controlled Flooding"
rare, short duration









Nature-based Solutions

Near-natural Embankment

- Increase of biodiversity
- Protected vegetation
- Bird nesting places
- Monitoring

Diverse Planting and Rain Water Filtration

- 100% filtration in parks
- Permeable path surface, drainage and filtration
- High degree of planting (500 trees and 20 tree types incl. fruit trees)
- Habitats for animals, shading, noise and wind reduction
- Protected near-natural areas
- Reduction of maintenance

Health, Well-being and Social Aspects

- Diversity of sports opportunities
- Planting and typography delimit sports and playground areas
- Use by football club, urban gardening group, etc.
- Integration of deportation memorial









A Compact, Mixed-use Inner City with Significant Public Spaces



Water area*:	28,2 ha	
Public spaces on the water	1,4 ha	5%
Land area*:	109,8 ha	
Traffic areas	25,6 ha	23%
Built up area	35,2 ha	32%
Public spaces (places/promenades/parks/playgrounds)	26,5 ha	24%
Private open spaces: publicly accessible (at least way-leave)	15,2 ha	14%
Private spaces: not publicly accessible	7,3 ha	7%
* without Quarter Oberhafen		
Quarter Oberhafen	8,6 ha	

Priority for Public Transport (U-Bahn, S-Bahn, Ferries, Busses), Cyclability, and Walkability

Subway Service

Three newly built stations, two existing stations, frequent service



Busses and Ferries

complementary network, hydrogen busses, autonomous e-bus



Cyclability

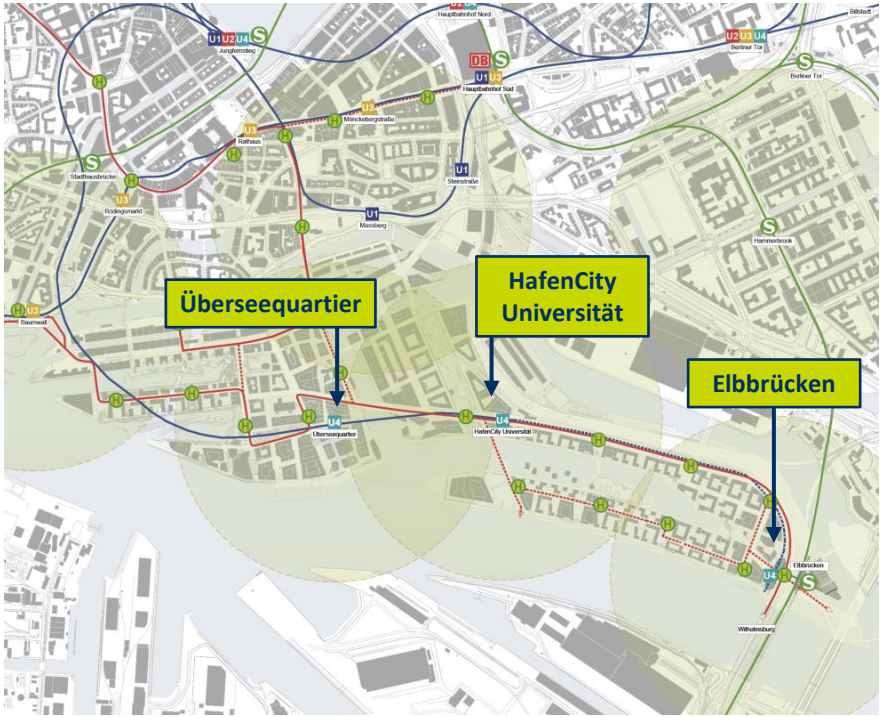
15.9 km of cycle network, bike sharing, bicycle parking



Walkability

34.8 km of path, largely separated form roads





Mobility Hubs

Linking high quality public transit with car-/bike-sharing, storage for private bicycles







Smart Mobility Concept

1. Maximum of **0,4 parking spaces** per residential unit, reduction by 70-75% for parking for offices; and thereof a minimum of **30 % for Carsharing**
2. Minimum of **40-80 % of parking spaces** for residential units and offices **with a wallbox** (all Carsharing-parking spaces)
3. Generation of **solar power for own consumption** and green roofs
4. Booking a car via Phone/Computer
5. **Comprehensive underground parking access system**; Underground parking **with Wi-Fi and mobile coverage**
6. High comfort for **bicycle parking facilities**
7. "**City of short distances**" invites to cycling
8. Test field for **autonomous driving**
9. **High Quality Subway Mobility and Switchh Point** Elbbrücken (U-Bahn, S-Bahn, Switchh-Station, E-car, Bike + Ride)



New Standards for Decentralised Heating

Western HafenCity supplied by Vattenfall
CO2-Benchmark: 175 g / kWh (Contract 2003)
Technology open tendering

Eastern HafenCity supplied by enercity (ex Dalkia)
CO2-Benchmark: 70 g / kWh
Technology open tendering



Heating supply by mix of resources
- CHP unit (biogas fired)
- Conventional heating boilers for peak loads
- Industrial waste heat from copperplant (2017 / Potential of 70 Megawatt)

District heating system locally completed by:
- Solar heating
- Fuel Cells (temporary)
- CHP units (gas fired)

Obligatory HafenCity EcoLabel: Raising Construction Standards





General Features

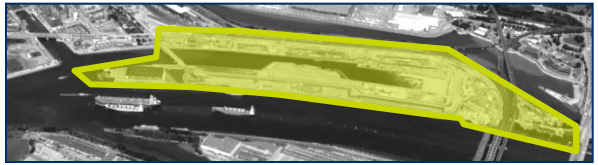
- First certificate in January 2007
- Certificate became mandatory for all developers in 2010
- Major adjustments in 2010 and 2017

Benchmarking System / Categories

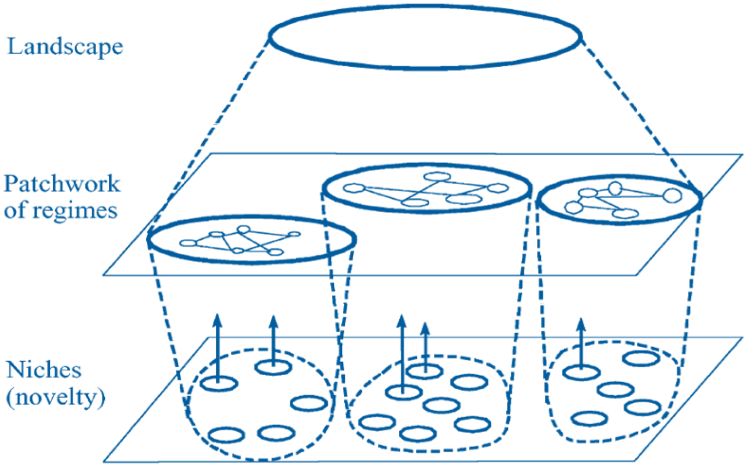
1. Sustainable use of energy resources (required Platinum standard for every building)
2. Sustainable use of public goods (including mobility requirements such as integration of electric mobility and carsharing system)
3. Use of environmentally friendly building materials (elements of cradle-to-cradle)
4. Special consideration for environment, comfort and health protection
5. Sustainable Facility Management

New: Mandatory Platinum Certification in Eastern HafenCity (new benchmarks and requirements)

- platinum standard in three categories (sustainable use of energy mandatory)
- gold standard in the other two categories
- No further demand on heat loss prevention via fascade
- Instead energy generation of solar energy (30% of roof top area) and green roofs
- Integration of electric mobility as minimum standard (40% of spaces fitout, 60% prepared)
- Very low primary energy factor (approx. 0.11), industrial waste heat of Aurubis copper melting plant
- Monitoring process of energy consumption after two years of operation



Urban Transformation towards Sustainability by Innovation



Source: Frank W. Geels: Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and case-study. In: Research Policy 31 (2002) 1257-1274

city quarter

roll out and scale-up of experimental micro-level

site / building

e.g.

- *building certification*
- *cradle-to-cradle / green infrastr.*
- *publically used ground floors*

district / city

planned emergence new governance mode

new urban development area

e.g.

- *district management (formation)*
- *Smart mobility concepts*


Thank you for your Attention!
Prof. Jürgen Bruns-Berentelg
HafenCity
Hamburg



European Waterfront Cities Planetary Boundaries Session

Lex Brans, Director Taskforce Residential MRA

MIPIM 12.03.2019

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Already below sea-level..

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85 cm sea-level increase



Bron: Actueel Hoogtebestand Nederland (AHN)
*Bovengrens bandbreedte stijging volgens KNMI klimaatscenario in de 21ste eeuw


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Climate adaptation is in our DNA
Yet building higher dikes is not enough

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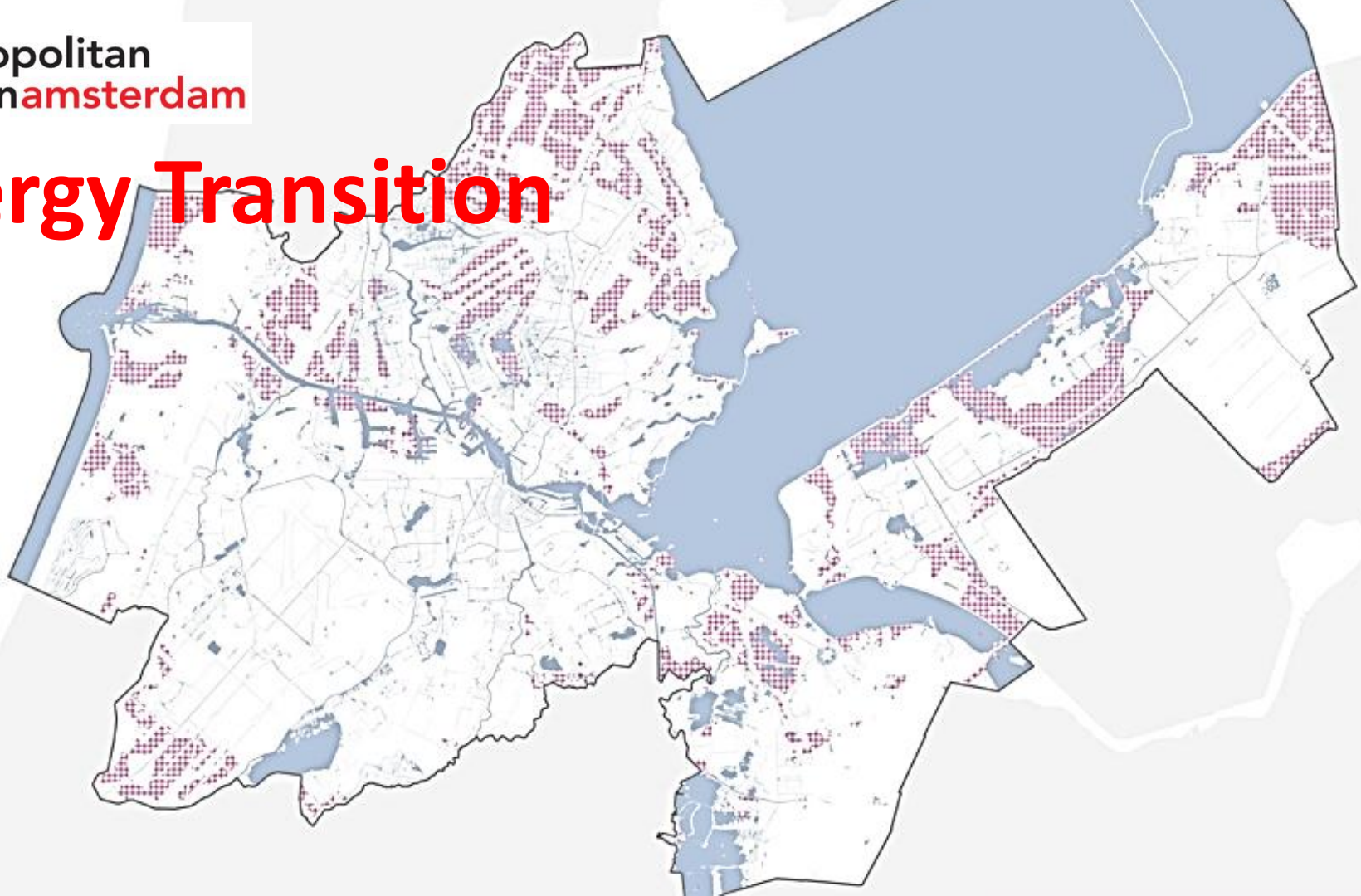
Energy Transition



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Climate adaptation

Target: Climate-proof city

Condition: rain-proof development: 60mm/h
(containment, storage, drainage)

Ambitions:

- water-robust construction
- Green roofs and facades

‘New theme’: heat and drought



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Emission-free mobility and clean air

Target: clean air, with as little as possible nitrogen dioxide, fine dust and soot.

- NO2 decreased with 35% in 2025
- Concentration of soot decreased by 30% in 2025

Conditions:

- *Confine car-use via parking standards*
- *Stimulate bicycle-use via parking standards*
- *Sensitive places for air-quality not close to congested big roads*

Ambitions:

- *Stimulate car-sharing*
- *Electric charging points for 10-30% of parking lots*
- *100% prepared for electric charging points*



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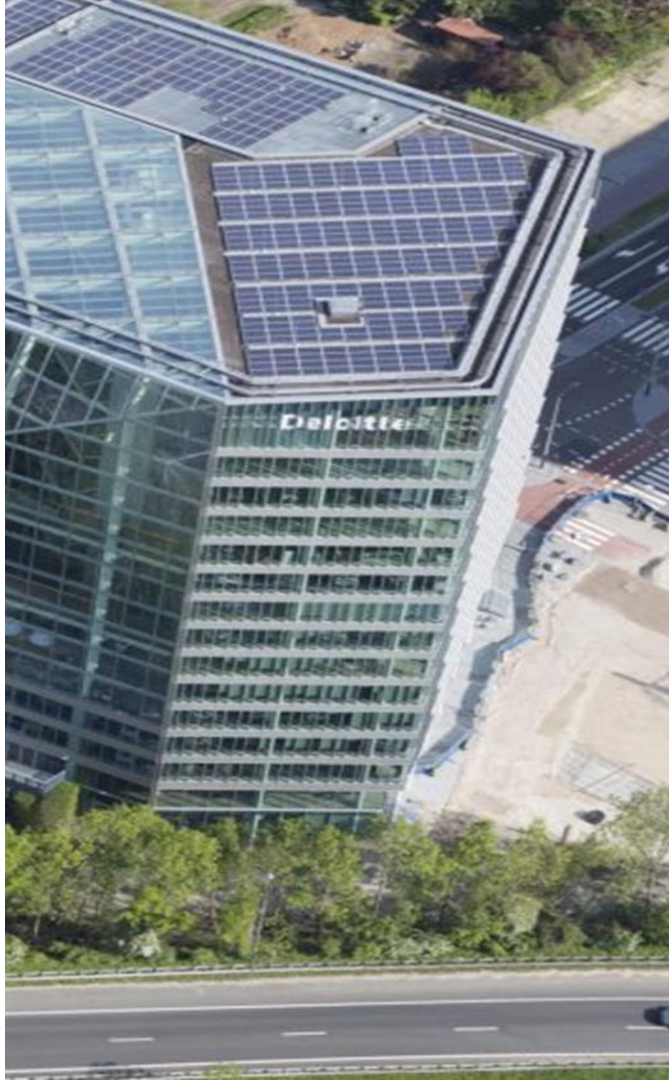
Sustainable energy and natural gas free

Target:

- 2030: 55% reduction of Co2 emissions
- 2050: 95% reduction of Co2 emissions & 100 % renewable energy sources

Conditions:

- Natural gas free and sustainable heating and cooling systems
- New construction not adjoined to natural gas
- Alternative: electricity



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Scenario's

Gateway to Europe



New Industrial Revolution





International Ecosystems



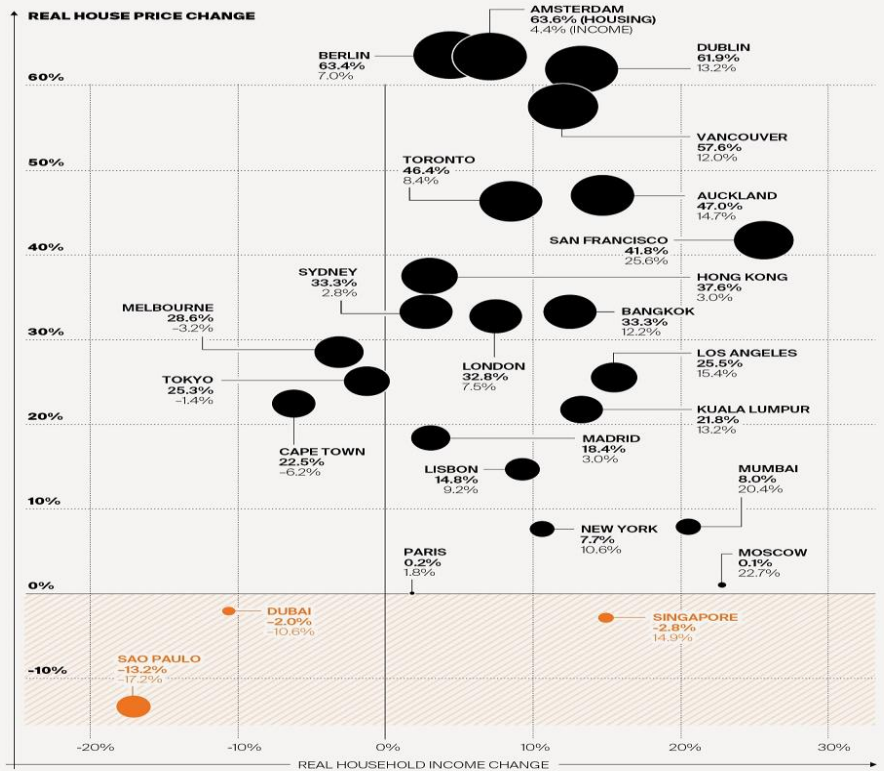
Local Communities

THE KNIGHT FRANK GLOBAL AFFORDABILITY MONITOR

LEAST AFFORDABLE	**SECOND LEAST**
AMSTERDAM	BANGKOK
AUCKLAND	BERLIN
HONG KONG	DUBLIN
LOS ANGELES	LONDON
SAN FRANCISCO	MELBOURNE
SYDNEY	NEW YORK
TORONTO	SINGAPORE*
VANCOUVER	TOKYO
SECOND MOST	**MOST AFFORDABLE**
BRUSSELS	DUBAI
CAPE TOWN	ISTANBUL
MADRID	JAKARTA
MIAMI	KUALA LUMPUR
MOSCOW	LISBON
MUMBAI	MANILA
PARIS	ROME
STOCKHOLM	SAO PAOLO

MIND THE GAP

Real house price growth and real disposable household income growth over the past five years for 25 key cities, percent change to September 2018*



*or latest available

SOURCES: KNIGHT FRANK RESEARCH, MACROBOND, AUSTRALIAN BUREAU OF STATISTICS, BRAZILIAN FOUNDATION INSTITUTE OF ECONOMIC RESEARCH (FIPE), TERANET, FRENCH NATIONAL INSTITUTE OF STATISTICS & ECONOMIC STUDIES (INSEE), VDP RESEARCH, HONG KONG RATING & VALUATION DEPARTMENT, INDIAN NATIONAL HOUSING BANK (NHB), IRISH CENTRAL STATISTICS OFFICE (CSO), JAPANESE MINISTRY OF LAND, INFRASTRUCTURE, TRANSPORT AND TOURISM, MALAYSIAN VALUATION & PROPERTY SERVICES DEPARTMENT, STATISTICS NETHERLANDS (CBS), QUOTABLE VALUE, PORTUGUESE NATIONAL STATISTICS INSTITUTE (INE), RUSSIAN FEDERAL STATE STATISTICS SERVICE (ROSSTAT), SINGAPORE URBAN REDEVELOPMENT AUTHORITY, FIRST NATIONAL BANK, SPANISH MINISTRY OF DEVELOPMENT, BANK FOR INTERNATIONAL SETTLEMENTS, REIDIN, U.K. LAND REGISTRY, S&P CASE SHILLER, OXFORD ECONOMICS

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Mobility demand and climate change

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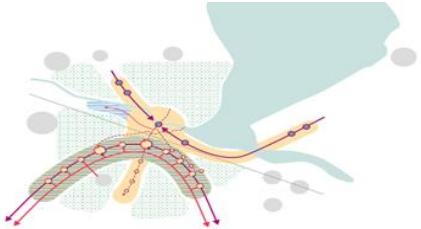
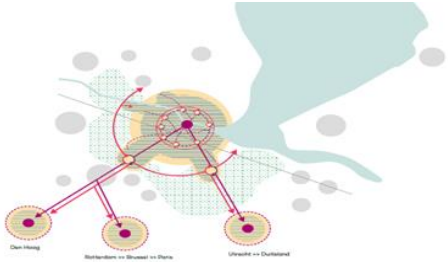
Urban development and mobility



Linear metropole

- Multifunctional corridors
- Housing corridors with multifunctional nodes



Compact metropole

- Maximum density increase in core-city
- Connecting the city with other urban centres



Garden city – ring metropole

- Compact city centres
- Consecutive urban region with lower densities



Polycentric metropole

- Core-city Amsterdam
- Regional urban centres
- Satellites

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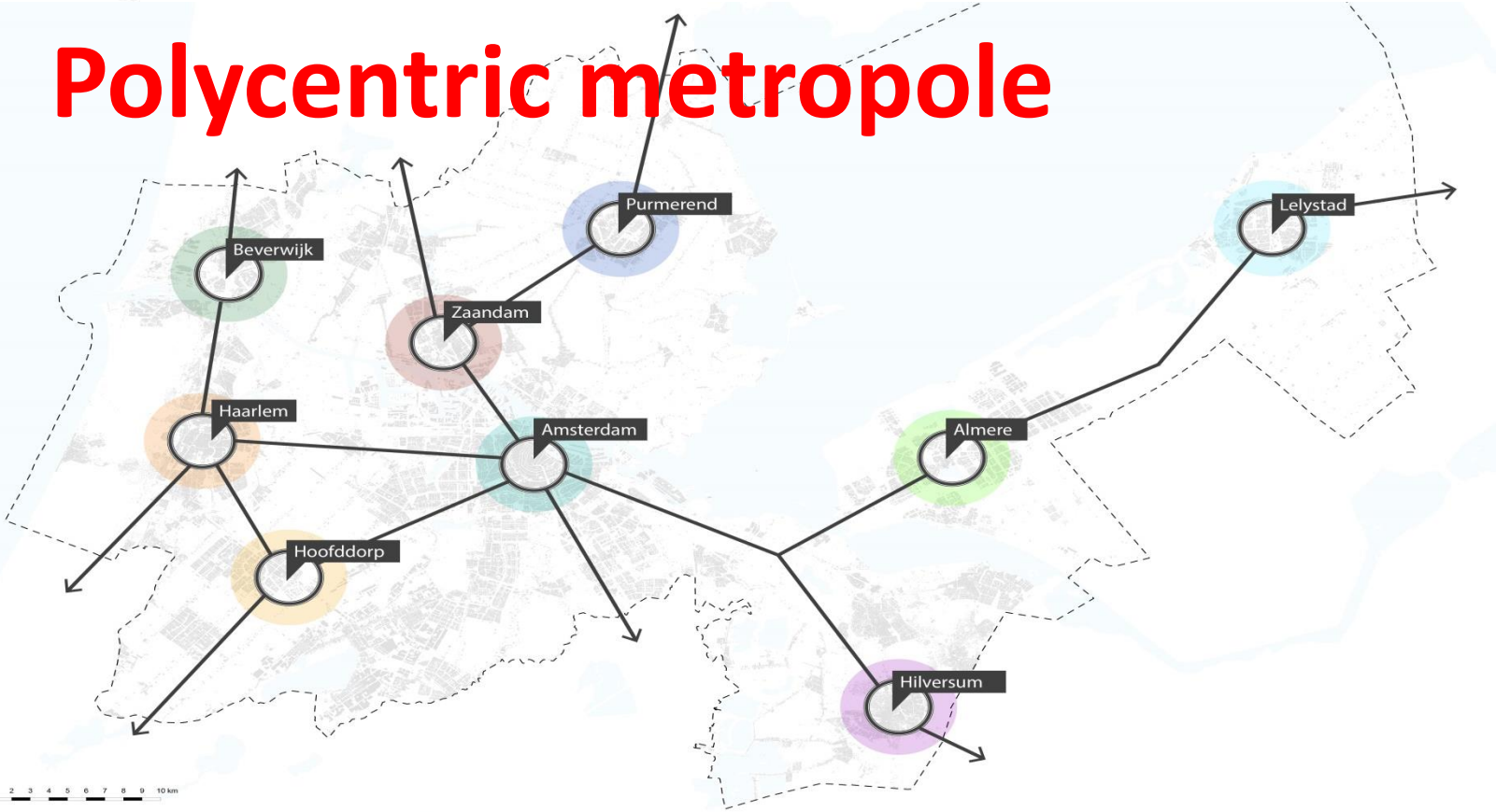
Polycentric metropole



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Economy and skills

Talent & Technology

Connecting education hubs to businesses

High quality of life

Densification and mixed-use




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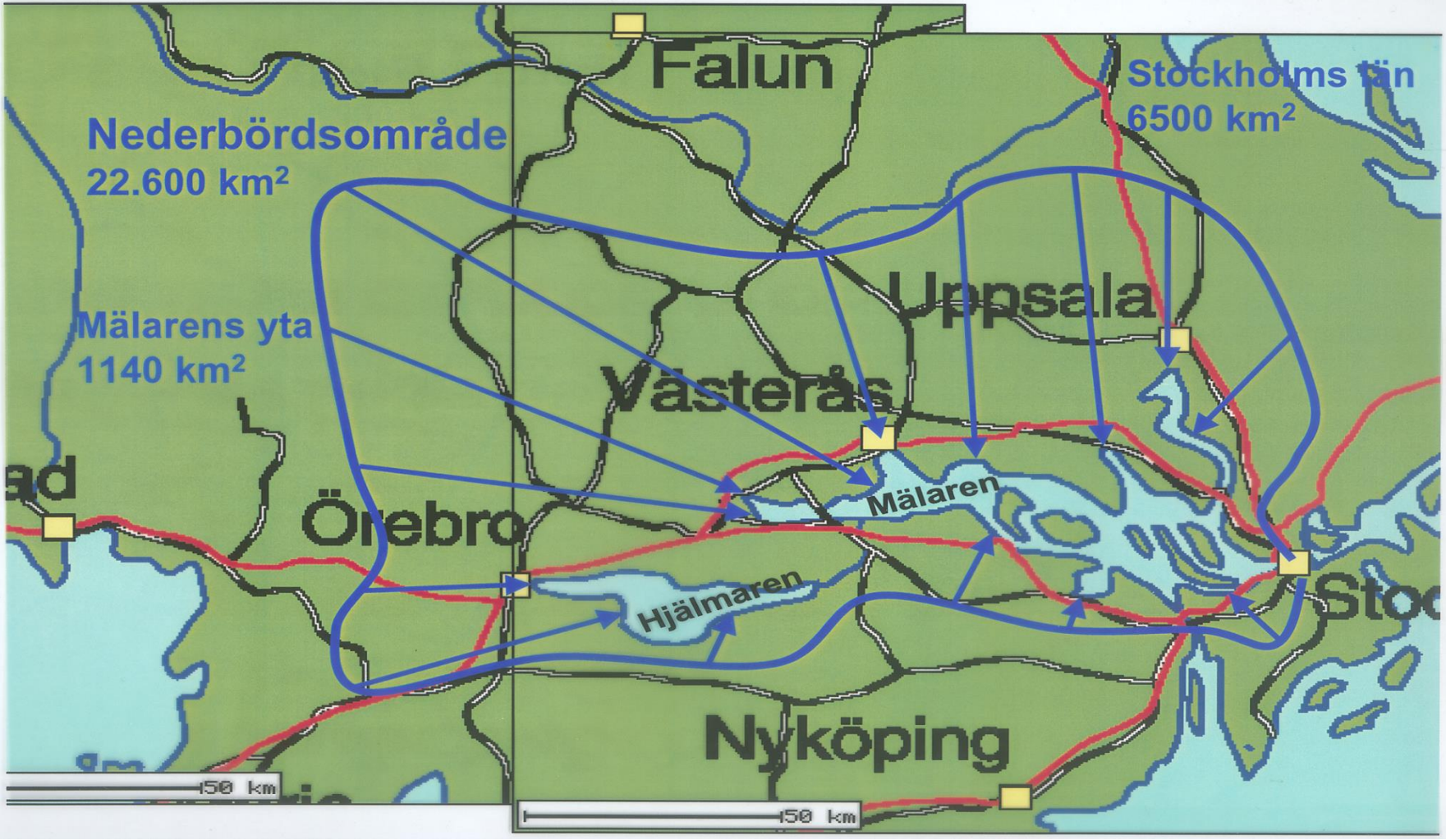
Healthy Cities
Inclusive communities
Sustainable energy

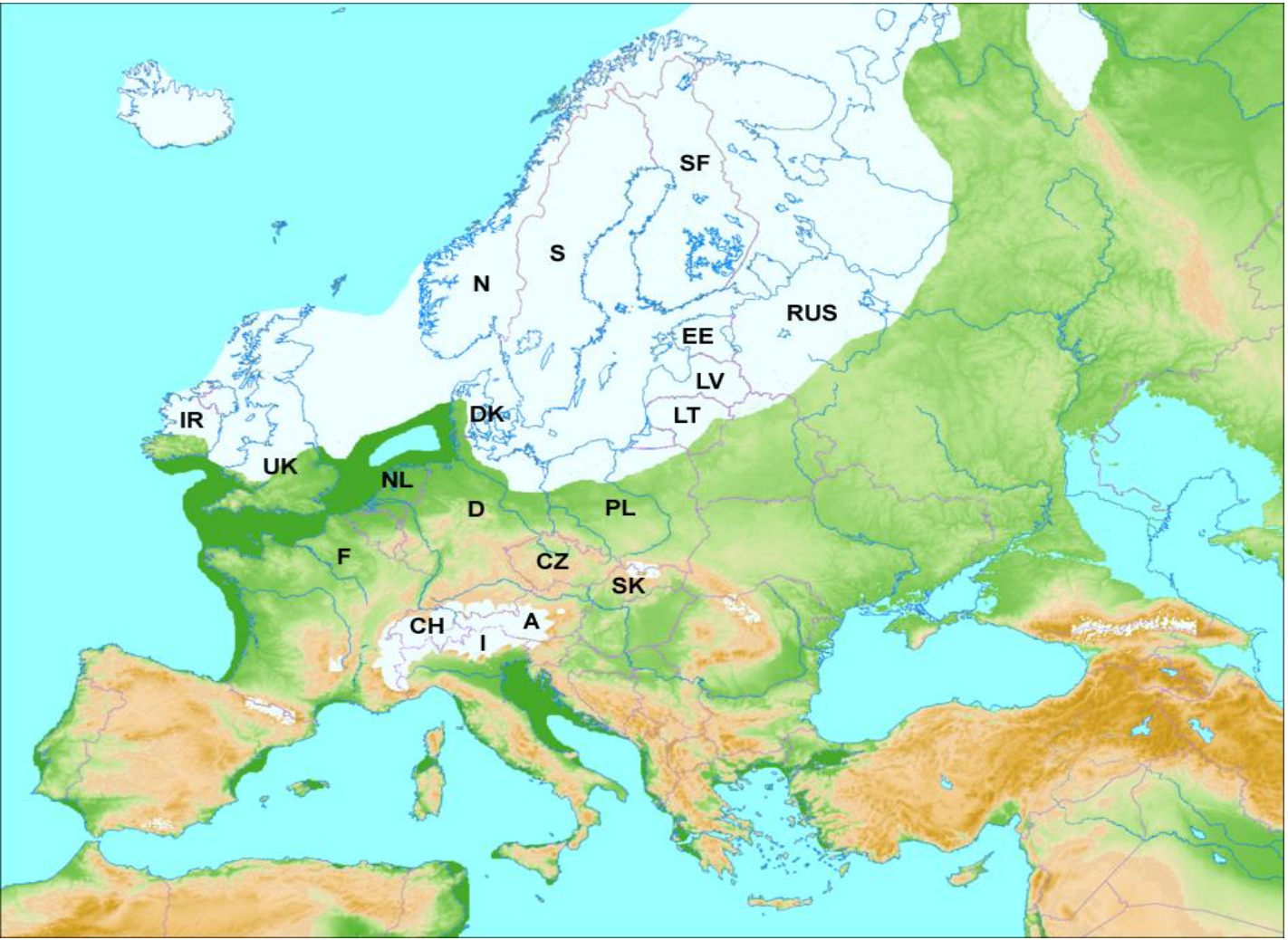

Stockholm
The Capital of Scandinavia
Climate Change and
Urban Development
Flooded from Sea or Land?
Olle Zetterberg
Chairperson Invest
Stockholm




Falun
Nederbördsområde
22.600 km²
Stockholms län
6500 km²
Mälarens yta
1140 km²
Uppsala
Västerås
Örebro
Mälaren
Hjälmaren
Nyköping
50 km
50 km


SKANSKA


DAGENS NYHETER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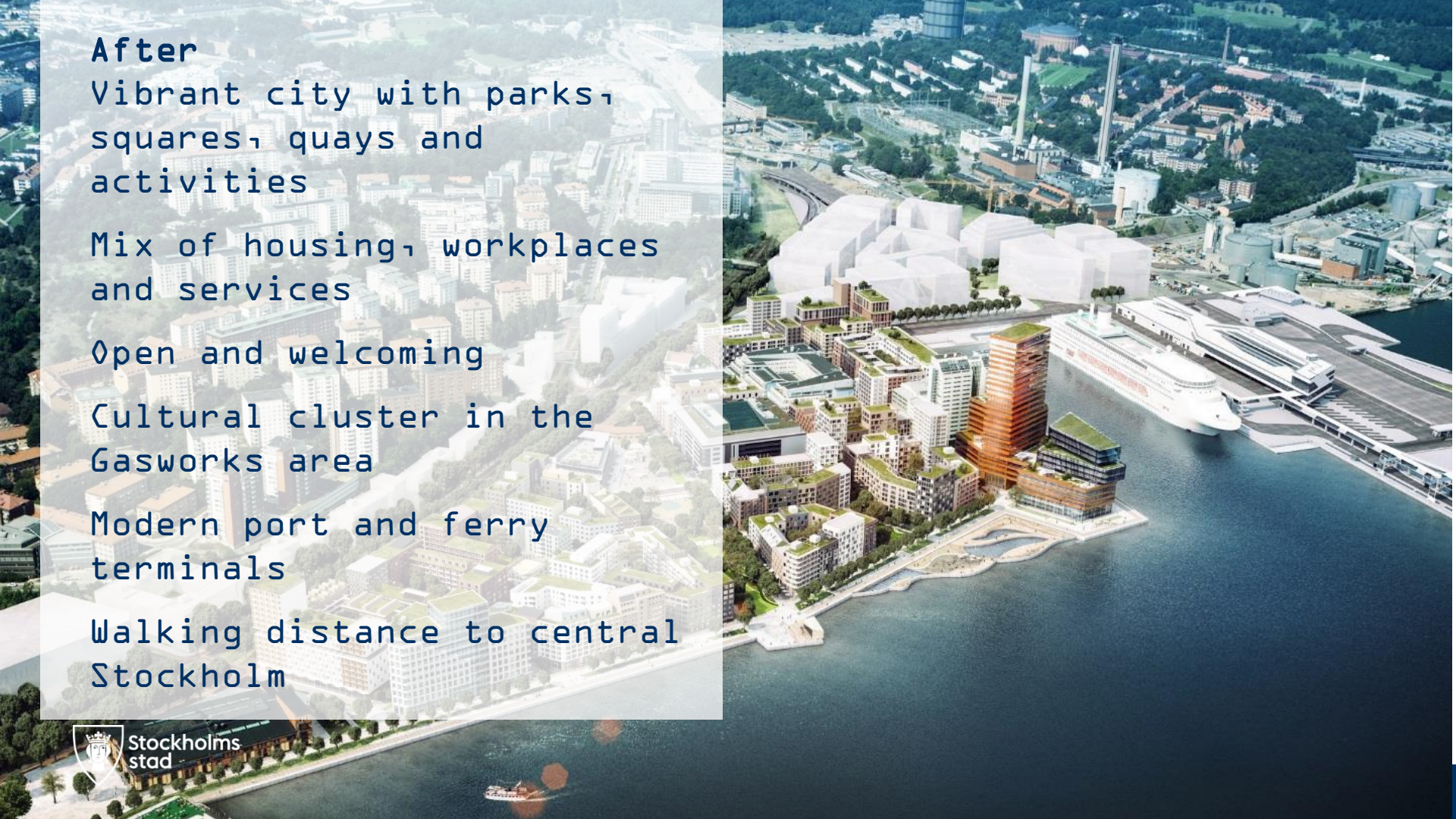
Before
Port and ferry terminals
Gasworks area
Oil depot
Container terminal
Stockholms stad



After

Vibrant city with parks, squares, quays and activities

Mix of housing, workplaces and services

Open and welcoming

Cultural cluster in the Gasworks area

Modern port and ferry terminals

Walking distance to central Stockholm

Stockholms stad

Thank you !



Stockholm
The Capital of Scandinavia