

Construction Products Europe.  
Adaptation to Climate Change, from Cities to Buildings.  
Brussels, 28. October 2015



# Supporting Cities developing Resilience Strategies

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ICLEI is the world's leading network of 12 mega-cities, 100 supercities and urban regions, 450 large cities, and 450 small and medium-sized cities and towns in 84 countries with more than 660 million inhabitants, which strive towards sustainable development





# Cities Ahead!

**"Cities and local governments are not waiting for the world to change. We together are changing the world. This is what really sets the tone at ICLEI."**

**Park Won Soon  
Mayor of Seoul,  
President of ICLEI**



# We know enough ...

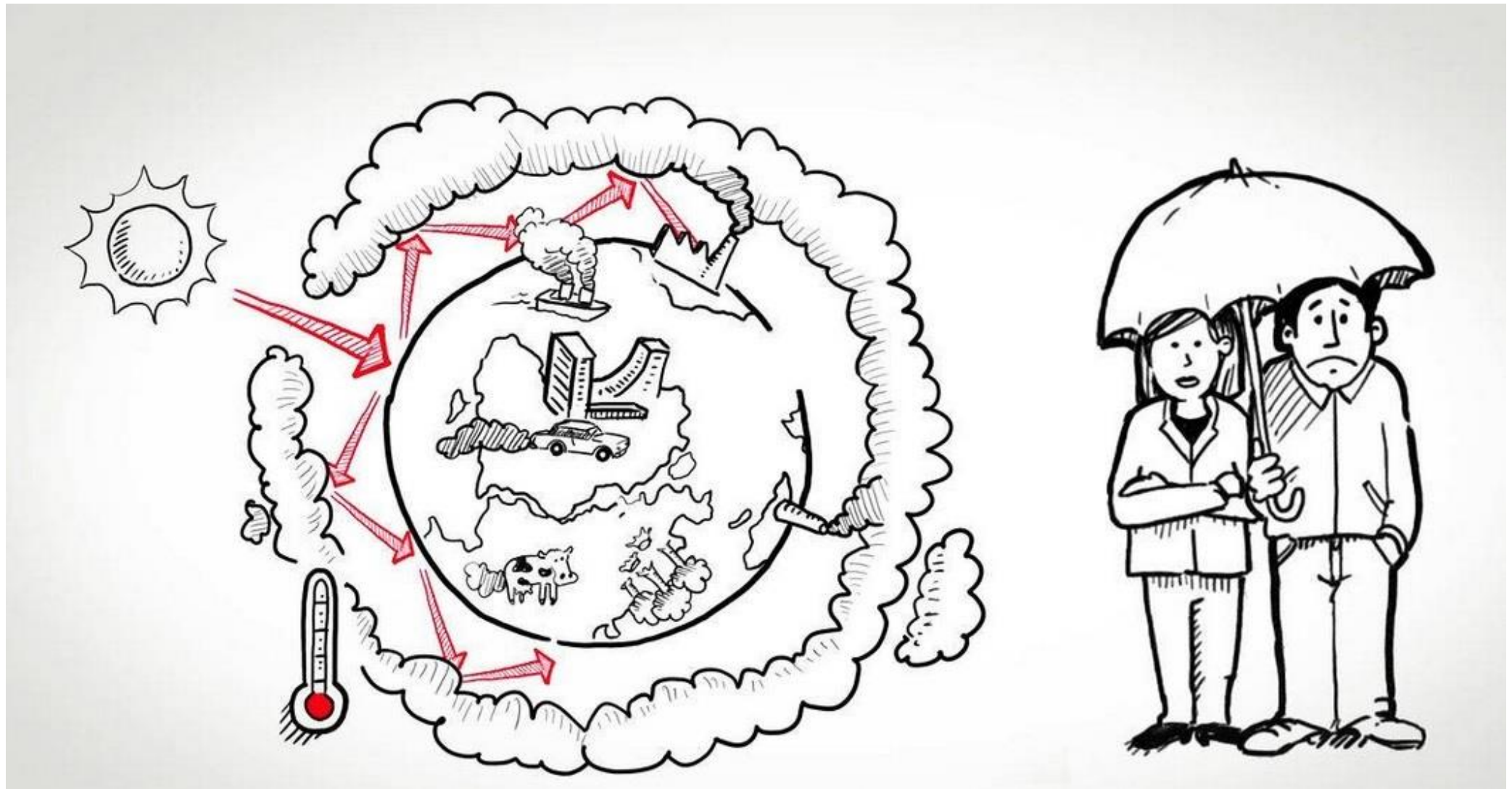


Image from clip: We know enough about climate change; <https://vimeo.com/39053686>



Copenhagen, Denmark



Photo: Bax Lindhardt, 05.07.2011



Copenhagen, Denmark



Photo: Bax Lindhardt, 05.07.2011





Gloucestershire, UK

Source: BBC online





Gondo, Switzerland





# Adapting to a changing climate

# The European Adaptation Agenda

## Why should cities adapt?



Cities are Europe's social, economic and cultural cornerstones

Cities have to cope with a number of challenges to sustain and enhance the quality of life of the citizens

Climate change is emerging as one of the most prominent of these challenges – a major challenge to achieving the vision of a secure and prosperous future for European cities

Adaptation has a key role in achieving resilient and sustainable urban development

Since 73% of European live in urban areas (set to rise to 82% in 2050) European cities are the key places where adaptation action will need to happen



# Paris towards an Adaptation Strategy



- Well-documented and increasing **temperature rise** in Paris:
  - 2.6 to 3.4°C rise in average daily temperature by the end of the 21<sup>st</sup> century;
  - Increase in the number of hot, very hot and extremely hot days;
  - Increase in the number of heatwaves.



- Cold periods** still occur but less frequently:
  - Fewer frosty days;
  - Winters becoming shorter;
  - Very cold periods still occur but becoming less frequent and less intense.



- Occurrences of rain** with high total rainfall could become more frequent, but there is no major trend.



- Towards more frequent **droughts**:
  - Uncertainty over changes to total annual rainfall, but trend for total summer rainfall for fall;
  - Reduction in the rate of flow of the Seine, estimated to be 29% by 2100;
  - Increased risks of agricultural drought by 2050, severe risk by 2080.



- Uncertainty regarding **wind-related phenomena**.



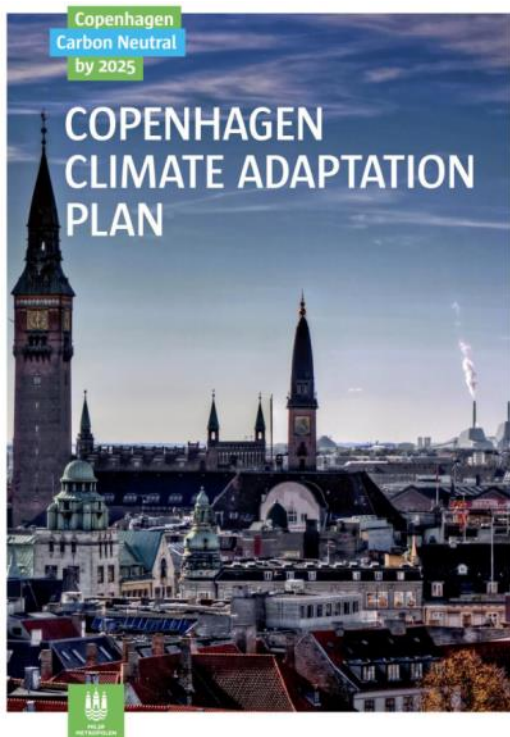
ADAPTATION

AN ADAPTATION  
STRATEGY

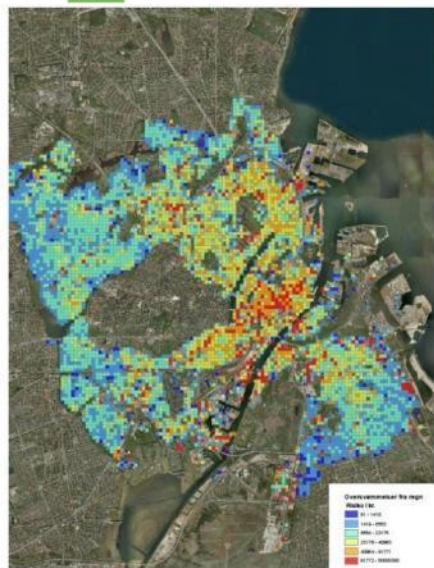


Source: Paris Climate and Energy Action Plan

# Copenhagen: re-designing the city for the future



- Inspired by cities like New York, London and Rotterdam;
  - Work started in 2009;
  - Plan approved by City Council in August 2011
- 
- Impact of future weather in Copenhagen;
  - Risk assesment;
  - Strategies for action;
  - Suggestion of first actions;
  - An estimated implementation period of 30-50 years;
  - Focus on opportunities of climate change.



Risk map for flooding caused by rain in 2110



Risk map for storm surges from the sea in 2110



# Rotterdam (The Netherlands)

## Rotterdam Climate Change Adaptation Strategy

- Maintaining and strengthening the basics;
- Making use of the entire urban environment;
- Working with the National Government (Delta Programme);
- Working with citizens, businesses and universities for adaptation;
- Creating added value for the environment, society, economy and ecology.





# Stepping up to urban resilience ...



„Human rights are  
violated not  
only by terrorism,  
repression  
or assassination, but  
also by  
unfair economic  
structures that  
create huge  
inequalities.”

(Pope Franziskus  
cited in UN Human  
Development Report 2014)



## Emerging stresses (according to resilience assessment in 3 cities)

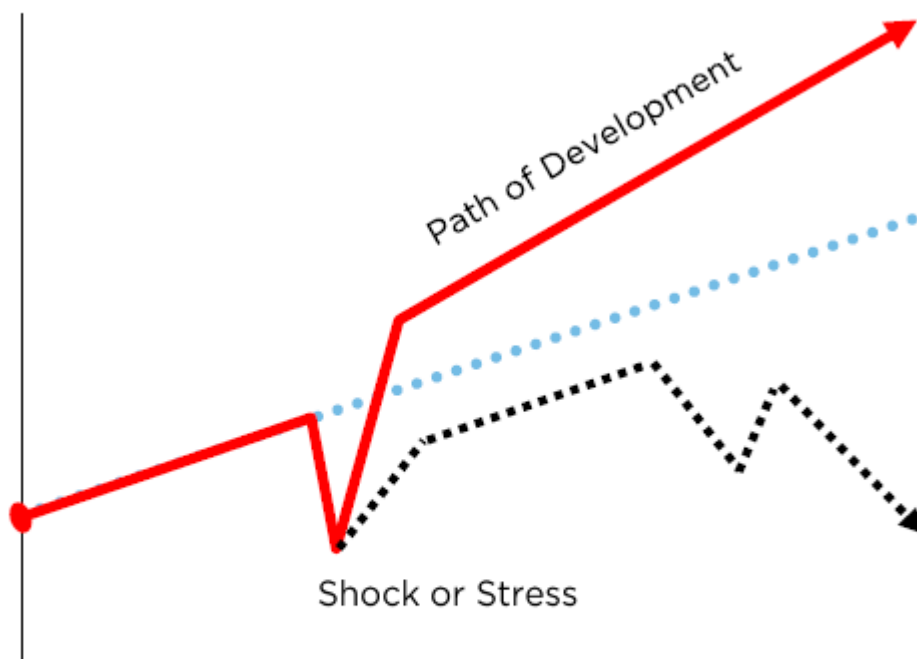
- **Social cohesion** has become a stress for cities. There is an increasing gap between people involved in the society and people who are not. People with higher income leave the city while poverty/ inequity is increasing.
- **Shifting economic trends** contribute to these developments.
- There is a lack of good **education** or the current educational system does not perform well enough. A lack of teachers further increases this stress.
- **Aging infrastructure** represents a chronic stress.





# City resilience

(according to '100 Resilient Cities' Programme)



“City Resilience is the capacity of individuals, communities, institutions, businesses and systems within a city to *survive, adapt, and grow* no matter what kinds of **chronic stresses** and **acute shocks** they experience.”

Resilience planning is about making a city better, in both good times and bad, for the benefit of all its citizens, particularly the poor and vulnerable.

**100 RESILIENT CITIES**

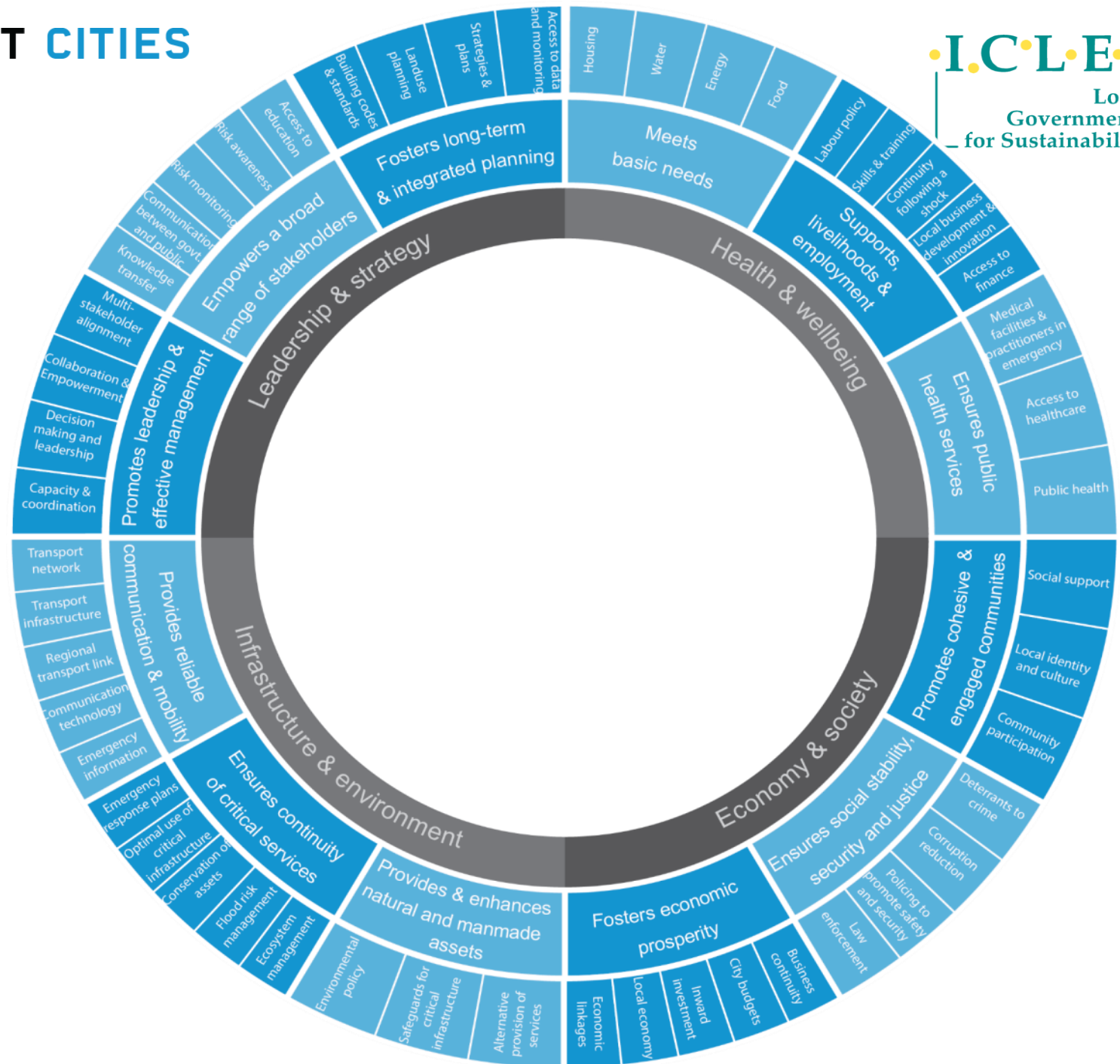


photo: [www.wikimedia.org](http://www.wikimedia.org)



## A City Resilience Framework

- 4 Dimensions
- 12 Drivers
- 50 Indicators
- 7 Qualities
  - Reflective
  - Robust
  - Redundant
  - Flexible
  - Resourceful
  - Inclusive
  - Integrated





Gemeente Rotterdam



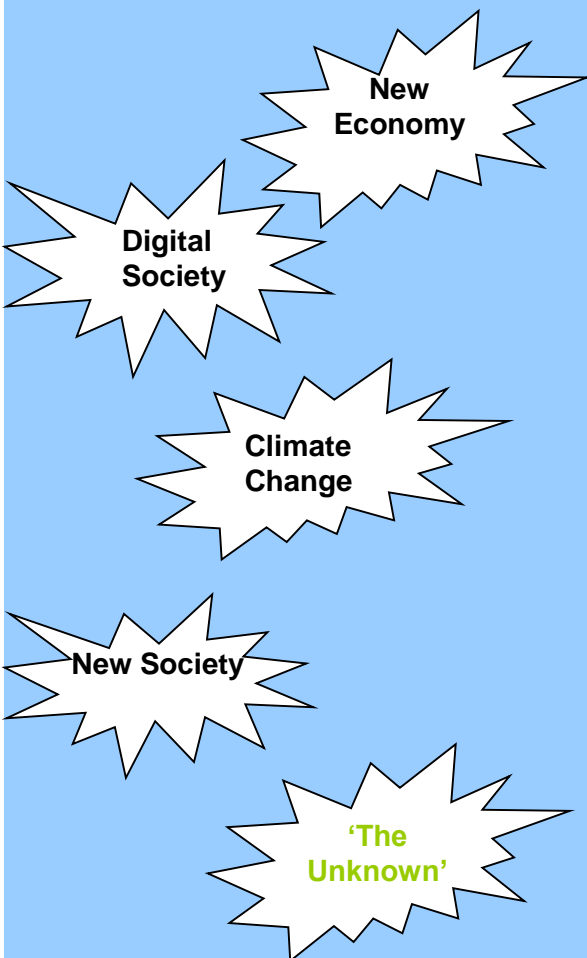
ROTTERDAM



# Preliminary Resilience Assessment

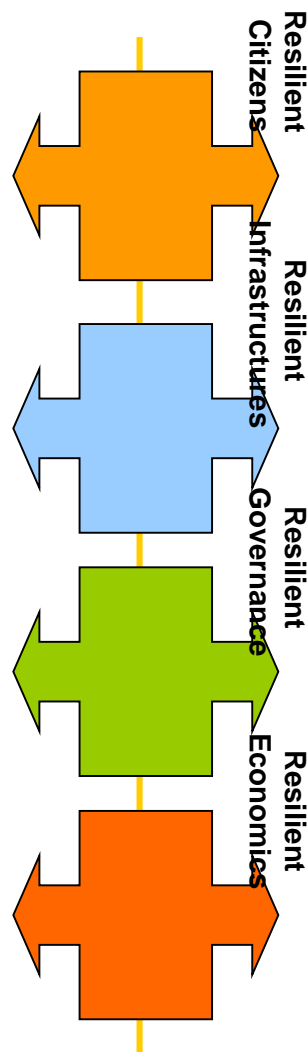


## Transitions



Most influencing external developments for Rotterdam

## City Action Areas



Dedicated action must be taken in these areas to benefit from and anticipate to the transitions

## City Focus Areas **ICLEI** Local Governments for Sustainability

- 1. Social Resilience:** How can we strengthen the skills, leadership capacity and health of citizens to respond to the change in economy, technology in society, natural environment and still unknown developments and shocks?
- 2. Next Level Climate Resilience:** How can we assess, strengthen and protect vital city and port infrastructures against the effects of climate change?
- 3. Cyber Resilience:** How can we assess, strengthen and protect vital city and port infrastructures against illegal human cyber activities?
- 4. Smart data management & application:** How can we assess and enhance the quality and management of data? How can these data be applied to support Rotterdam's action to enhance city resilience?
- 5. City Governance:** How can we assess and prepare the city governance structures for new societal and economical relationships, natural shocks, digitalization of society and unknown developments and shocks (e.g. crisis management)?
- 6. Energy transition:** What are the drivers for and consequences of a change from fossil-based to bio-based energy and what is needed in infrastructures, economic policy and society?

The focus of our action is pointed on these focus areas; each contains diverse aspects that are of the utmost importance for Rotterdam



# Community Involvement: The Rotterdam Green Roof Programme







ROMA



ROME

ICLEI  
Local  
Governments  
for Sustainability

# Rome's Resilience Strategy Development



## Resilience-building: an inclusive process

Engaging stakeholders is crucial to understand these risks and develop resilience priorities for the city.

- **Workshops** with different stakeholder groups;
- **On-line and free press survey** for citizens;
- **Focus groups** on assets and critical infrastructure.





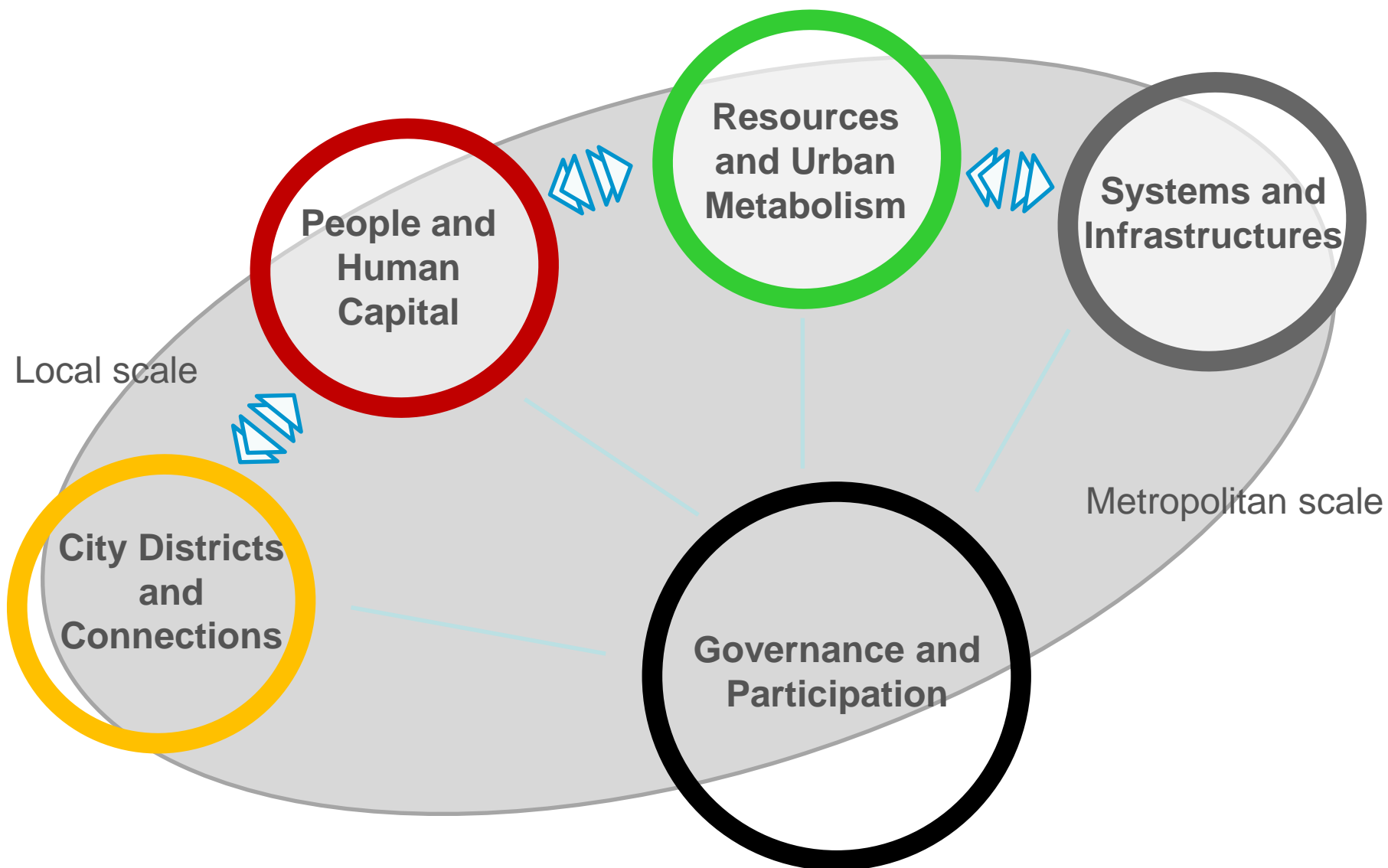
## 7 Focus groups on critical assets

### Infrastructure managers identified:

- **Shocks & stresses** related to critical assets
- **Exogenous trends** and risk scenarios for critical assets
- **Key legislation** for the different assets:
  - Mobility
  - Water Management
  - ICT
  - Cultural Heritage
  - Natural Assets
  - Safety and Security

IL SISTEMA DELLA MOBILITA'	
Focus Group del 18/05/2015	
Focus Group del 27/05/2015	
ASSET – infrastrutturali (Strade)	Stakeholder di Riferimento
Autostrade (gallerie/sottopassi - ponti/cavalcavia)	Autostrade per l'Italia S.p.A., Strada dei parchi spa, Anas spa
Strade statali (gallerie/sottopassi - ponti/cavalcavia)	Anas spa
Strade regionali (gallerie/sottopassi - ponti/cavalcavia)	Astral spa, Regione Lazio (Direzione Regionale Infrastrutture, Ambiente e Politiche abitative)
Strade provinciali (gallerie/sottopassi - ponti/cavalcavia)	Provincia di Roma (Dipartimento VII - Viabilità e infrastrutture viarie)
Strade comunali (gallerie/sottopassi - ponti/cavalcavia)	Grande viabilità (Dipartimento Sviluppo Infrastrutture e Manutenzione Urbana) (Roma Capitale), Agenzia per la Mobilità (Roma Capitale)
ASSET – infrastrutturali (Ferrovie)	
Linee AV (RFI) (gallerie/sottopassi - ponti/cavalcavia)	RFI, Trenitalia, Italo NTV spa
Linee ordinarie (RFI) (gallerie/sottopassi - ponti/cavalcavia)	RFI, Trenitalia, Italo NTV spa, Regione Lazio
Linee metropolitane (Atac) + ex concesse (gallerie/sottopassi - ponti/cavalcavia)	Atac spa
ASSET - infrastrutturali (Aeroporti e Porti)	
Aeroporto di Fiumicino	ADR
Aeroporto di Ciampino	ADR
Aeroporto di Roma Urbe	ENAC
Porto di Civitavecchia	Autorità Portuale di Civitavecchia Fiumicino e Gaeta
Porto di Fiumicino	Autorità Portuale di Civitavecchia Fiumicino e Gaeta
Porto di Gaeta	Autorità Portuale di Civitavecchia Fiumicino e Gaeta

## Rome's focus areas

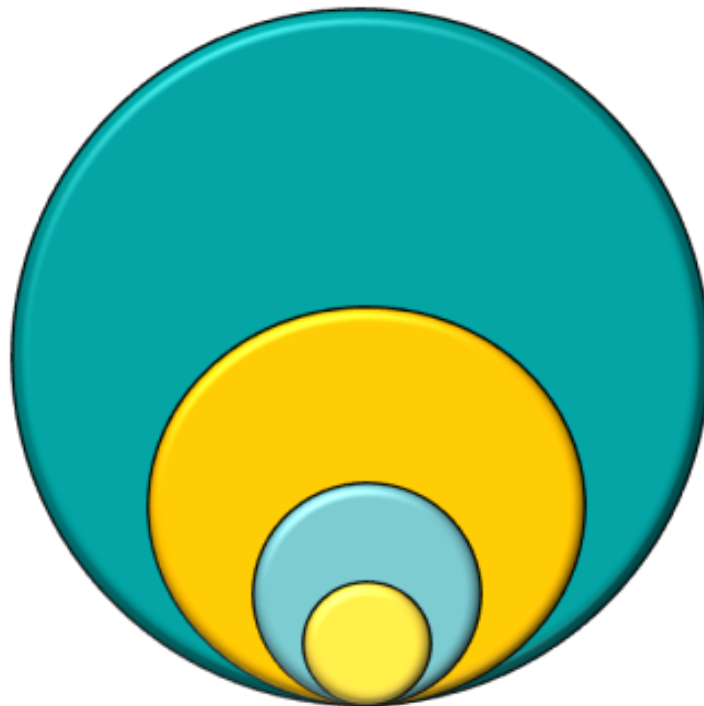






**Regardless ...  
adaptation and resilience strategies  
should aim at transformation**

# Local adaptation and resilience: embedded in the context of sustainability



Sustainability

Resilience

Adaptation/Mitigation

Disaster Risk Reduction

Source: ICLEI / Morchain & Robrecht (2012)



# UN Sustainable Development Goals



# UN Sustainable Development Goals





From air pollution to



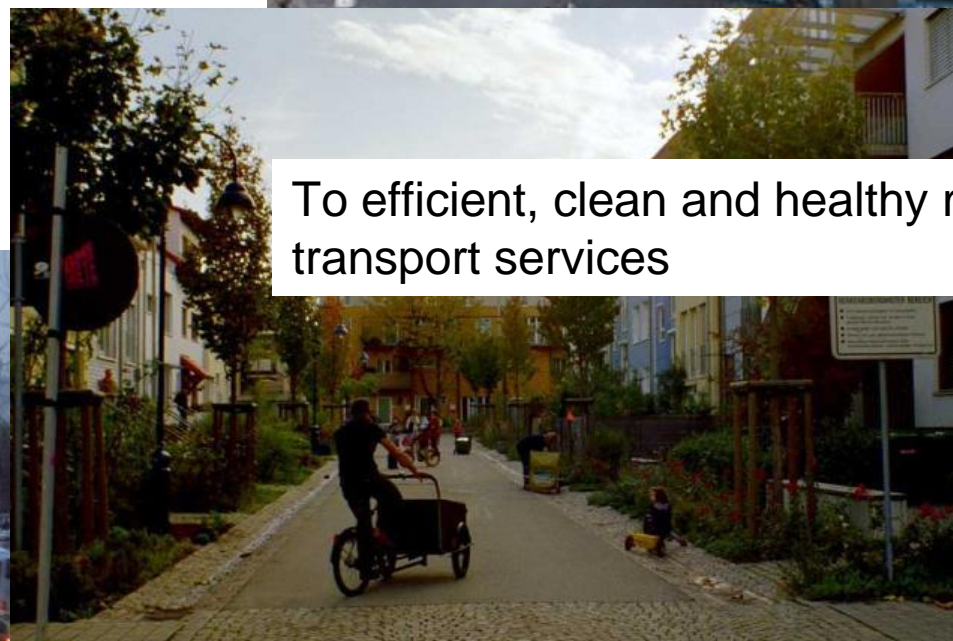
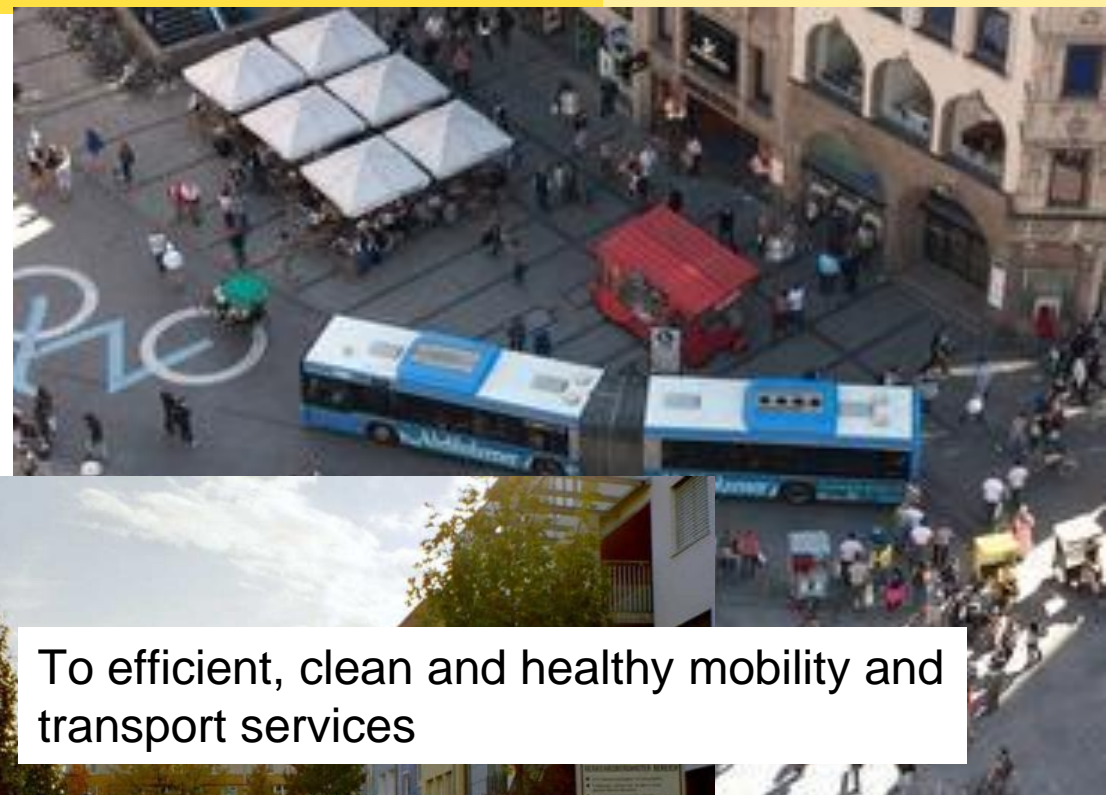
clean energies and clean air







From congestion and pollution

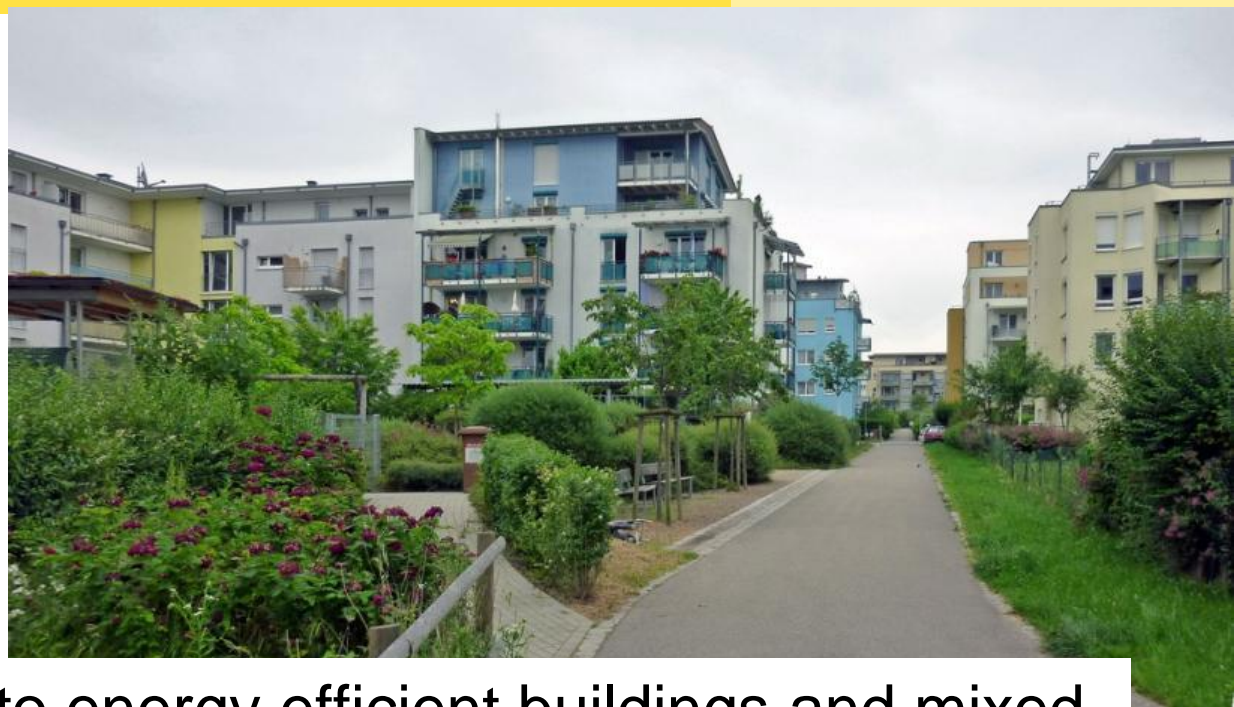


To efficient, clean and healthy mobility and transport services





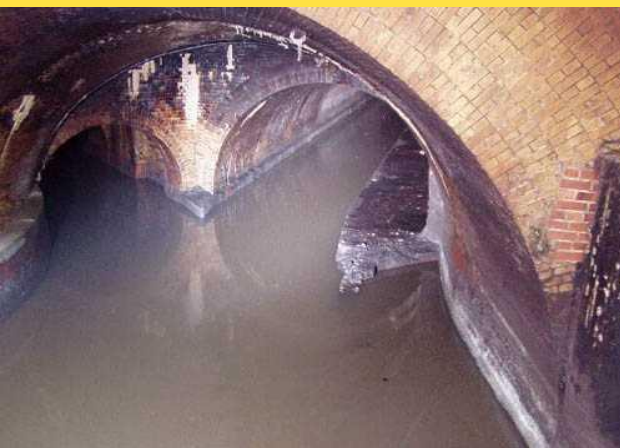
From housing industry



to energy efficient buildings and mixed development







From conventional sewerage



to sustainable urban drainage







# Dortmund, Phönixsee



Photo: Holger Robrecht



# „Water Plaza“ | Rotterdam, The Netherlands



# Economic considerations

- ... urban adaptation and transformation based on green and blue infrastructure create new local jobs
  - Rotterdam reports of several thousand regional jobs, created through climate change adaptation measures
  - The “Regionalverband Ruhr” calculates that 3700 lasting jobs are created through the Emscher renovation.
- ... “nature-based solutions” create ,spin-offs‘ – new job profiles, new business areas and models
- ... “green infrastructure” is often the most convenient alternative according to a lifecycle analysis (UNEP DHI)





**Between 2007 and 2013  
investments in infrastructure in  
Europe decreased by 60%**

# Concrete production for urban development = 5% of global CO<sub>2</sub>-emissions



Quelle und Bild:: Jeb Brugman



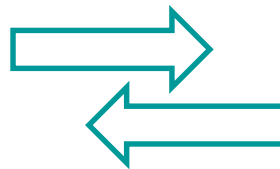
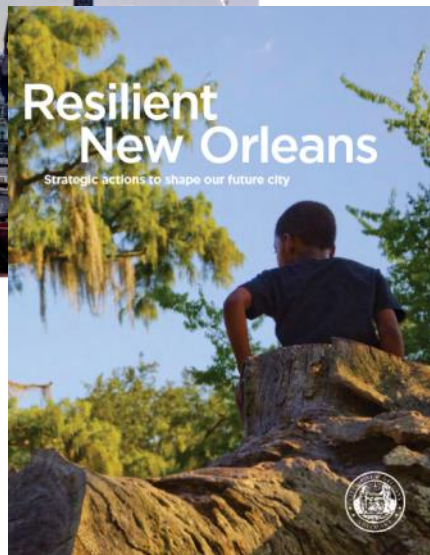


**Regardless ...  
adaptation and resilience strategies  
need support**

# „Strategy“: A document or a process?

## Rotterdam

Climate Change Adaptation Strategy





# Do we know enough?

We know much, okay, but practically spoken ...

- how and what to start with?
- which information at which stage?
- what can we replicate from other cities and how?
- how can we gain knowledge from other stakeholders?

Image from clip: We know enough about climate change; <https://vimeo.com/39053686>

# Typical questions in local adaptation

- What impacts are to be expected?
  - What are the current vulnerabilities (systems, areas, groups)?
  - Where to put priorities?
  - What risk level to accept?
  - What should be the aim of action – fixing a problem, developing an opportunity?
  - What are the options to act? – Challenge: Will measures based on past experiences balance future climate impacts? Can measures be replicated in different circumstances (eg. Green roofs in cold climate AND hot climate, locally adapted ‘tree canopies’)
  - What are the costs and benefits when acting?
  - How can success of action be monitored and evaluated?
- And, certainly ...

Image from clip: We know enough about climate change; <https://vimeo.com/39053686>



# How to live with climate change

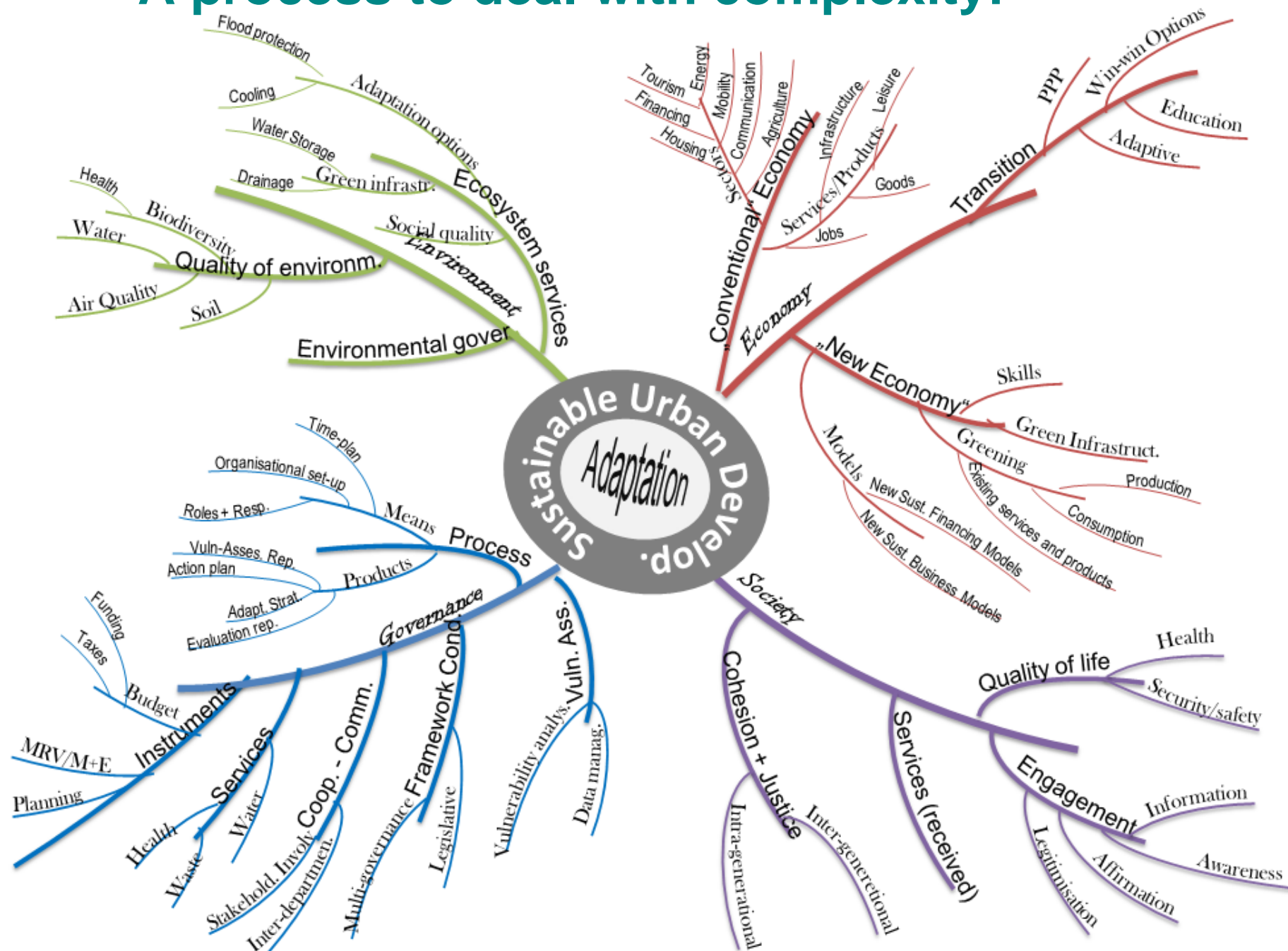


The  
Economist

NOVEMBER 27TH–DECEMBER 3RD 2010

[Economist.com](http://Economist.com)

# A process to deal with complexity!





# Climate adaptation needs structure ...



# Appropriate climate services will support...

- technical staff in city administrations and policy makers to collect and understand data and to deal with uncertainty
- understanding of key vulnerabilities on a local / regional basis
- understanding of barriers and limits of adaptation to also manage expectations
- urban planning and management by including capacity development programmes, guidance, standards
- decision-making by providing tools, methods, measures and examples of practical experiences
- appropriate, locally adapted solutions
- understanding of financing options and the role of insurance

Image from clip: We know enough about climate change; <https://vimeo.com/39053686>



# Support available to cities

- ✧ Localmanagement.eu
- ✧ Research organisations (e.g. Tecnia, Newcastle University, Manchester University)
- ✧ ISO and CEN/CENELEC standards (forthcoming)
- ✧ EEA Urban adaptation reports

- ✧ Climate-adapt.eu
- ✧ Localmanagement.eu
- ✧ EEA Urban Adaptation reports
- ✧ Research organisations (Fraunhofer, Tecnia et.al.)
- ✧ CEN/CENELEC standard (forthcoming)
- ✧ Private companies



- ✧ Localmanagement.eu
- ✧ Mayors Adapt
- ✧ Compact of Mayors
- ✧ Durban Adaptation Charter

- ✧ Organisational set-up: & process
  - Climate-adapt.eu
  - Localmanagement.eu
  - UKZIP
  - ISO standard (forthcoming)

- ✧ Vulnerability assessment:
  - EEA Urban Adaptation Reports
  - Kompass, Klimatolse
  - UKZIP
  - Meteorological Survey
  - Research organisations (climate services)

- ✧ Adaptation strategy & action plan development:
  - Climate-adapt.eu
  - Localmanagement.eu
  - EU Cities Adapt
  - Mayors Adapt

# Copy and paste. The beauty of peer support!





# Lead and win. The relevance of recognition



Open European Day at Bonn Resilient 'EU Cities Adapt' Final Conference - Gustav-Stresemann-Institute, Bonn, 3 June 2013

**Resilient  
Cities 2013**

**Give and take.**

## The Open European Day @ Bonn Resilient Cities

- Interactive **city-to-city exchange** on climate change adaptation
- Knowledge exchange and **open discussions** between local politicians, adaptation managers and practitioners, and key urban adaptation stakeholders
- Opportunity to **share experiences, learn from others and discuss solutions**
- Pan-European platform showcasing and disseminating urban climate change adaptation activities

**Save the date:  
05. July 2016**

<http://resilient-cities.iclei.org/bonn2014/open-european-day/>

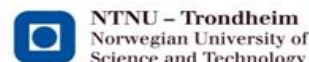




# RAMSES

- supporting policy-making with scientific evidence

- **Develops methods and tools** to quantify expected climate change risks and benefits and costs of specific adaptation measures
- **Takes the stock of existing adaptation activities** in several case cities in Europe and the world
- **Engages with stakeholders** to ensure the research is policy relevant and enables the design and implementation of adaptation strategies in the EU and beyond
- *first project results available at:*  
[www.ramses-cities.eu/resources](http://www.ramses-cities.eu/resources)



URBES x Green Surge – University o... x

greensurge.eu

GREEN SURGE

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- Working Packages
- Meeting and events
- Contacts
- Links

Involving 24 partners from 11 countries,  
and several of Europe's leading researchers.

**Green Infrastructure and Urban Biodiversity for Sustainable Urban Development and the Green Economy**

The GREEN SURGE project is a collaborative project between 24 partners in 11 countries. It is funded by the European Commission Seventh Framework Programme (FP7).

GREEN SURGE will identify, develop and test ways of linking green spaces,

**Update**

17-18 November 2014, Edinburgh

Dienstag, 11. November 2014

98%

17:58



# RESIN


## – co-creating standards to urban adaptation

- Links existing approaches to climate change adaptation and disaster risk management to develop an overall approach for all major elements of the urban system;
- Renowned research organisations and 4 core cities co-create the RESIN methodologies and tools;
- The RESIN online decision support tools facilitate the decision-making process and dealing with uncertainties in complex environments involving various stakeholders.

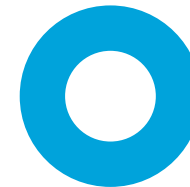



# Smart Mature Resilience

## – developing a monitoring system for resilience

 Resilience relies on functioning critical infrastructures and dynamic social interactions

A holistic approach is needed to enhance resilience in European cities



 The SMR project develops a resilience maturity model to assess and enhance cities' resilience. The project results will advise the decision-making process towards enhanced resilience in Europe



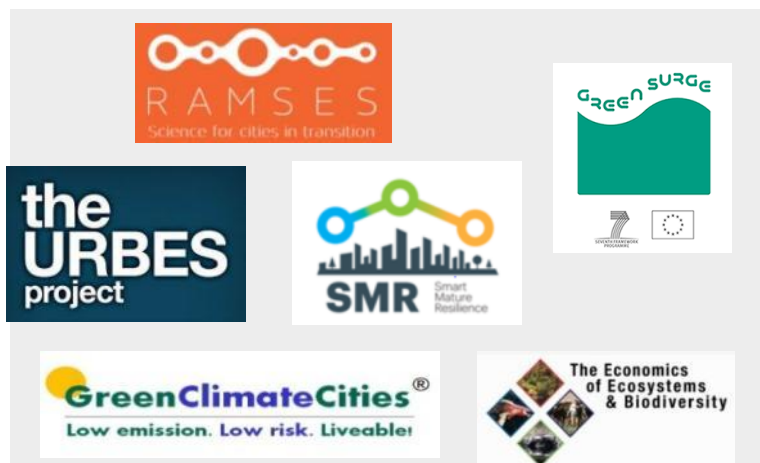
website (coming soon): [www.smr-project.eu](http://www.smr-project.eu)



Funded by the  
Horizon 2020 programme  
of the European Union



# Platforms of support by ICLEI



## Projects and services



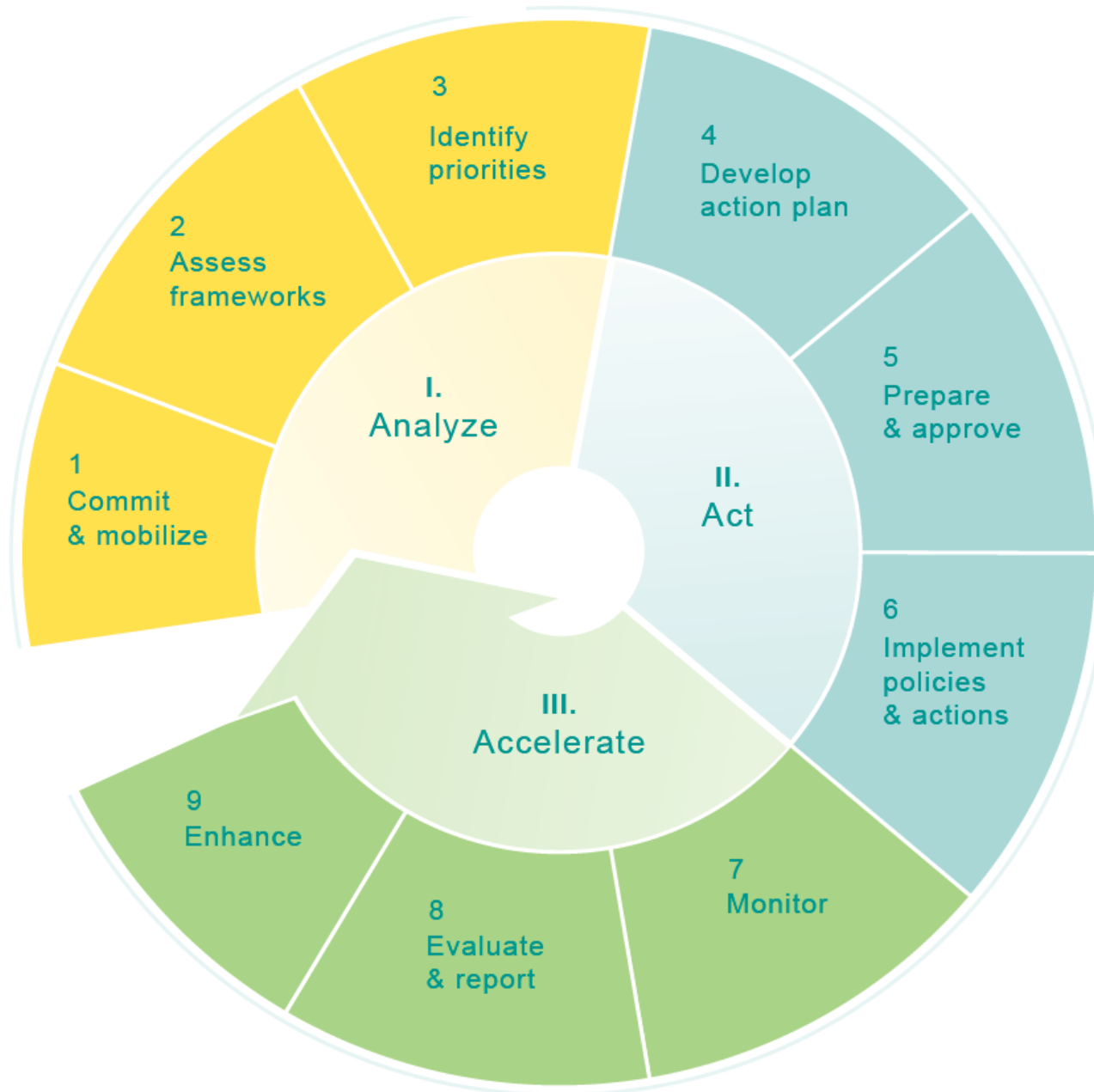
## Tools and guidance



## Advocacy and commitment



## Networking and exchange



**Integrated climate  
change response  
based on a  
3x3x3 STEP  
methodology**

**<http://www.iclei.org/our-activities/our-agendas/low-carbon-city/gcc.html>**





**Regardless ...  
adaptation and resilience strategies  
need financing**







photo: Holger Robrecht



# Financing local Adaptation and Resilience

- **City of Düsseldorf:** “Baumpaten“
- **City of Gothenborg:** “Green Bonds“
- **City of Copenhagen:** Using waterbills for developing green and blue infrastructure



- **Open questions:**  
Which models can attract investment in local adaptation and resilience?  
How to attract community investment?





# How would information make the city resilient?



... and can we integrate nature-based, smart and resilient solutions to sustainable urban development to avoid lock-ins and biased investments?

Image from clip: We know enough about climate change; <https://vimeo.com/39053686>

# What remains to be done?

- **Public management & nature-based solutions**
  - Integrated Urban Management
  - Standards
  - (Professional) education & peer exchange
- **Transformative actions beyond adaptation**
  - Integration of climate, smart, resilient & sustainable
  - Green & Blue infrastructure solutions
- **Co-creation of new business and financing models**
  - Integrated solutions for adaptation & resilience
  - Platforms, Demos & Business cases

... and to kindly invite you...

photo: Holger Robrecht





**TAP**

**Transformative  
Actions  
Program**

**ICLEI**  
Local  
Governments  
for Sustainability

**21<sup>st</sup> Conference of Parties to the UNFCCC (COP21)**

**« Espace Générations »**

**30 November – 11 December 2015**

**Paris - le Bourget, France**

**“TAP2015 – The Local Government Pavilion”**

*A Pavilion by and for local and subnational governments, raising ambition, awareness and visibility of real and potential local climate action at COP21*

**Hosted by City of Paris and City of Bristol, European Green Capital 2015**

**MAIRIE DE PARIS** 



**BRISTOL**  
**2015** EUROPEAN  
GREEN CAPITAL

**Coordinated by ICLEI – Local Governments for Sustainability**



## 8<sup>TH</sup> EUROPEAN CONFERENCE ON SUSTAINABLE CITIES & TOWNS

BASQUE COUNTRY | BILBAO | 27 - 29 April 2016



# ICLEI - Local Governments for Sustainability



**Thank you !**

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