



# EUROPEAN CONFERENCE ON CLIMATE FINANCE FOR TERRITORIES

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# The challenges of adapting infrastructure

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Large investments will be needed to build, maintain and replace infrastructure.

- Maintaining and upgrading ageing infrastructure stock
- Socio-economic & climate drivers of increasing demand for infrastructure

OECD economies	Emerging economies
<b>EU:</b> € 1.5tn for 2010-2020 (EU Commission, 2011)	<b>China:</b> \$ 9tn for 2008-2017 (OECD, 2007)
<b>USA:</b> \$ 1.7-3.6tn for 2010-2020 (ASCE, 2013)	<b>India:</b> \$ 2.7tn for 2008-2017 (OECD, 2007)



# Bringing together funding and financing

<b>Funding</b>	<b>Financing</b>
Charges to beneficiaries – e.g., water tariffs,	Bonds: municipal, private, green, project
Revenues from general taxation – local and national	Lending: commercial, public (e.g., EIB, CDC)
Transfers – EU funds (Cohesion, ERDF), philanthropy, ODA	PPPs
Self-supply – private investment reducing the need for public infrastructure	



# Examples of city-level adaptation

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- Working with nature
  - Copenhagen Cloudburst Management Plan
  - Toronto Green Roofs
- Preventing future climate impacts
  - Ex-post: NY Home Buyout Plan
  - Ex-ante: London Thames Barrier



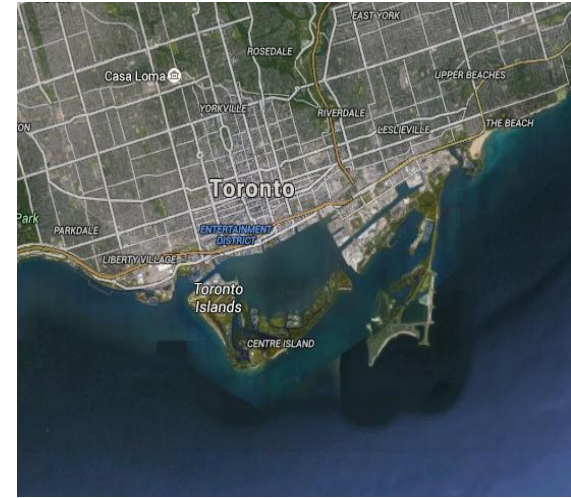
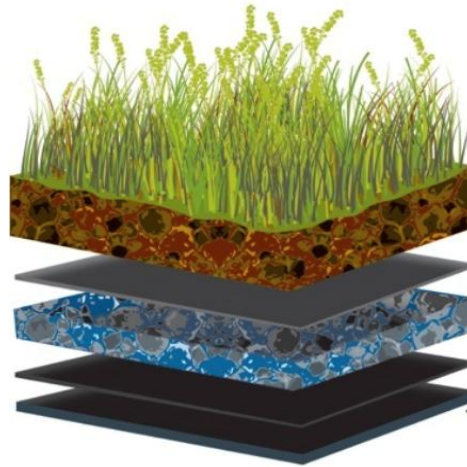
# Copenhagen Cloudburst Plan



- Use of green and blue spaces to reduce need for protective infrastructure
- Economic benefits: damages avoided, positive effect on real estate prices & local taxes
- Co-benefits: cleaner air, more recreational areas and improved quality of life



# Toronto green roofs



- All residential, commercial and institutional buildings over 2000 m<sup>2</sup> required to provide 20-60% living roofs (April 2012)
- Doubling in price but tripling roof's lifetime + reduced annual utility costs for heating and cooling + quality of life benefits
- Reducing urban heat island effect & stormwater runoff



# New York Home Buyout Plan

Hurricane Sandy (Oct. 2012)



- \$400 million buyback offering full pre-storm fair market value + additional incentives (with cap)
- New York State initiative on a voluntary basis
- Open to Owners of homes in 1-in-500 year floodplain where damages >50% of property value



# London Thames Barrier



- 520-metre-long band of 10 gates protecting 125 km<sup>2</sup> of central London against a 1-1000 flood to the year 2030
- Building in robustness: engineers planned for 8 mm/year sea-level rise (currently: 6 mm/ year)
- Increasing risk & Thames Estuary 2100: maintenance costs and upstream plans





# Strengthening the business case for climate resilient investment

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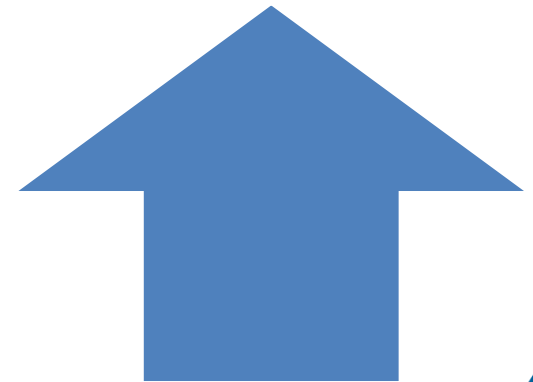


## Reduce costs

- Reduce financing costs (e.g. green bonds)
- Use flexible approaches and avoid lock-in
- Increase efficiency of asset management
- Reduce unnecessary red-tape & policy-driven uncertainty

## Increase (realised) benefits

- Design to achieve co-benefits (multi-functionality)
- Align tariffs to costs
- Fiscal & regulatory instruments – e.g. land-value capture
- Account for value of flexibility





Latest publication (July 2015)

## Climate Change Risks And Adaptation: Linking Policy And Economics

1. Risks in a changing climate
2. Approaches to climate change risks in OECD countries
3. Overview of costs and benefits at the regional and national level
4. Framework for risk-based approaches to informing adaptation planning
5. Financing adaptation in OECD countries
6. Tools to mainstream adaptation into decision-making processes





# THANK YOU

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