Making Copenhagen resilient by adaptation to Climate change

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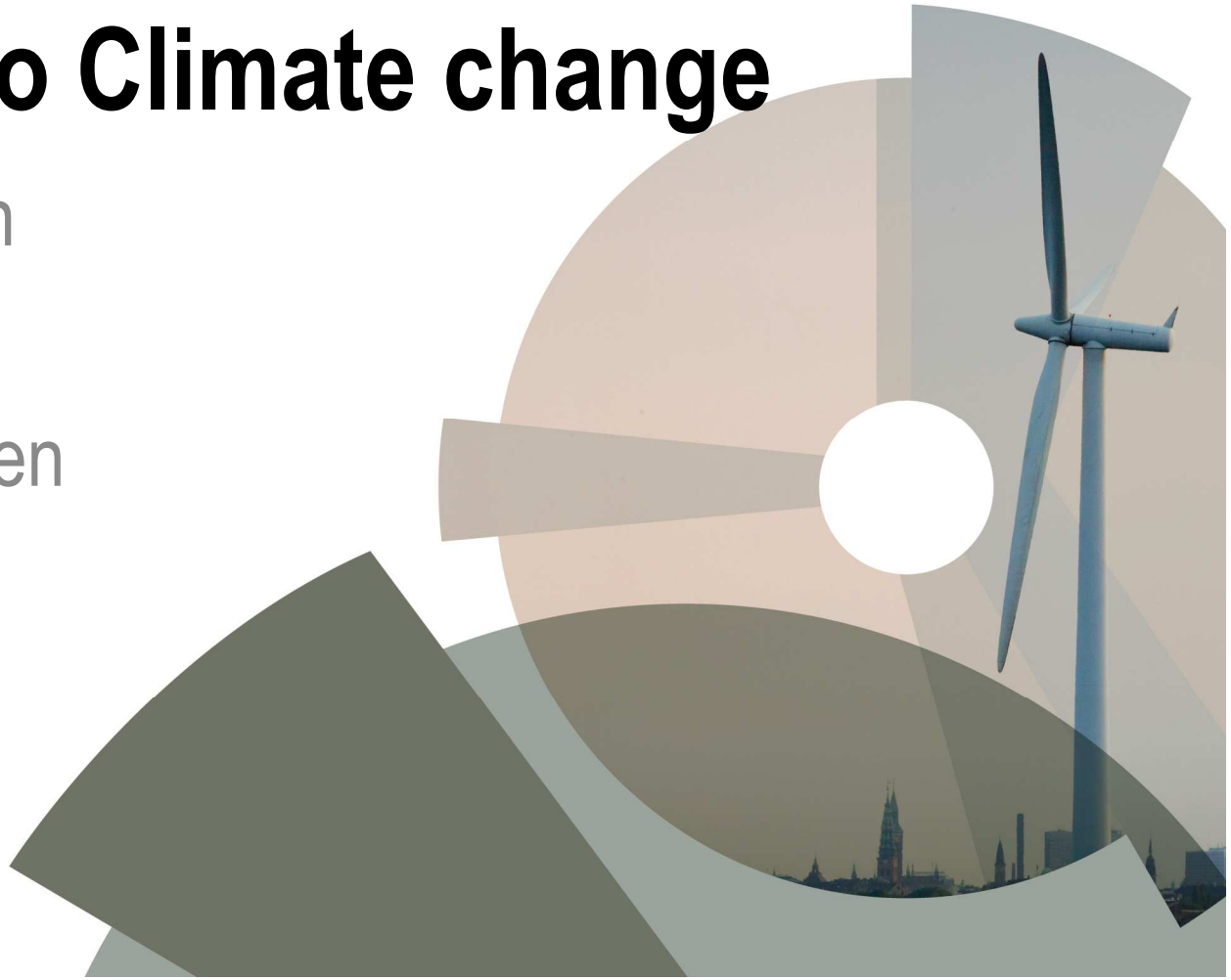
Project manager

City of Copenhagen



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Context

Climate mitigation plan (COP15, 2010)

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Climate adaptation plan (August 2011)

Cloudburst management plan (2012)

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Climate adaptation plan

Hazards and risks were identified:

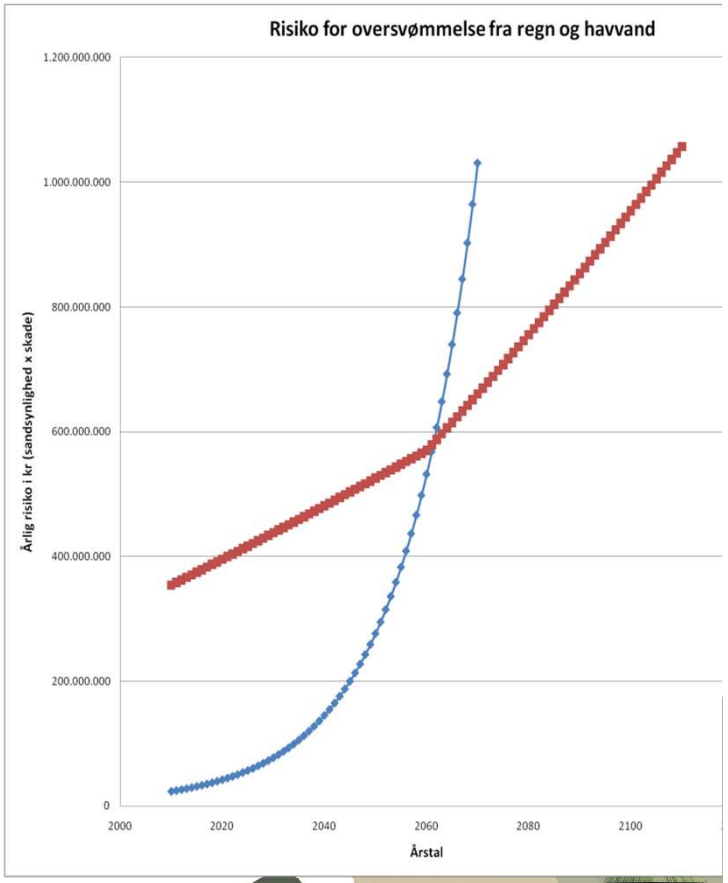
» Rising sea level.

  » Not a problem until ~2040

» Increasing amounts of rain and increasing intensity of rain

  » Allready a problem today

» Urban Heat Island-effect



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Why make a Cloudburst-management plan?

» July 2. 2012 showed, that the climate of the future is already here

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Why make a Cloudburst-management plan?

» July 2. 2012 showed, that the climate of the future is already here

» Losses for 5 billion DKK (almost 1 billion US Dollars) in insurance compensation alone. Insurance has become a political issue

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August 14. 2010
Juli 2. 2011
August 15. 2011

» This is why

August 14. 2010
Juli 2. 2011
August 15. 2011

» This is why

August 14. 2010
Juli 2. 2011
August 15. 2011

» This is why

August 14. 2010
Juli 2. 2011
August 15. 2011

August 14. 2010
Juli 2. 2011
August 15. 2011

“Blue spot” modeling

Figur 2 Oversvømmelser ved en 20-årsregn i 2010.

20-year event

Figur 3: Oversvømmelser ved en 100-årsregn i 2010.

100-year event

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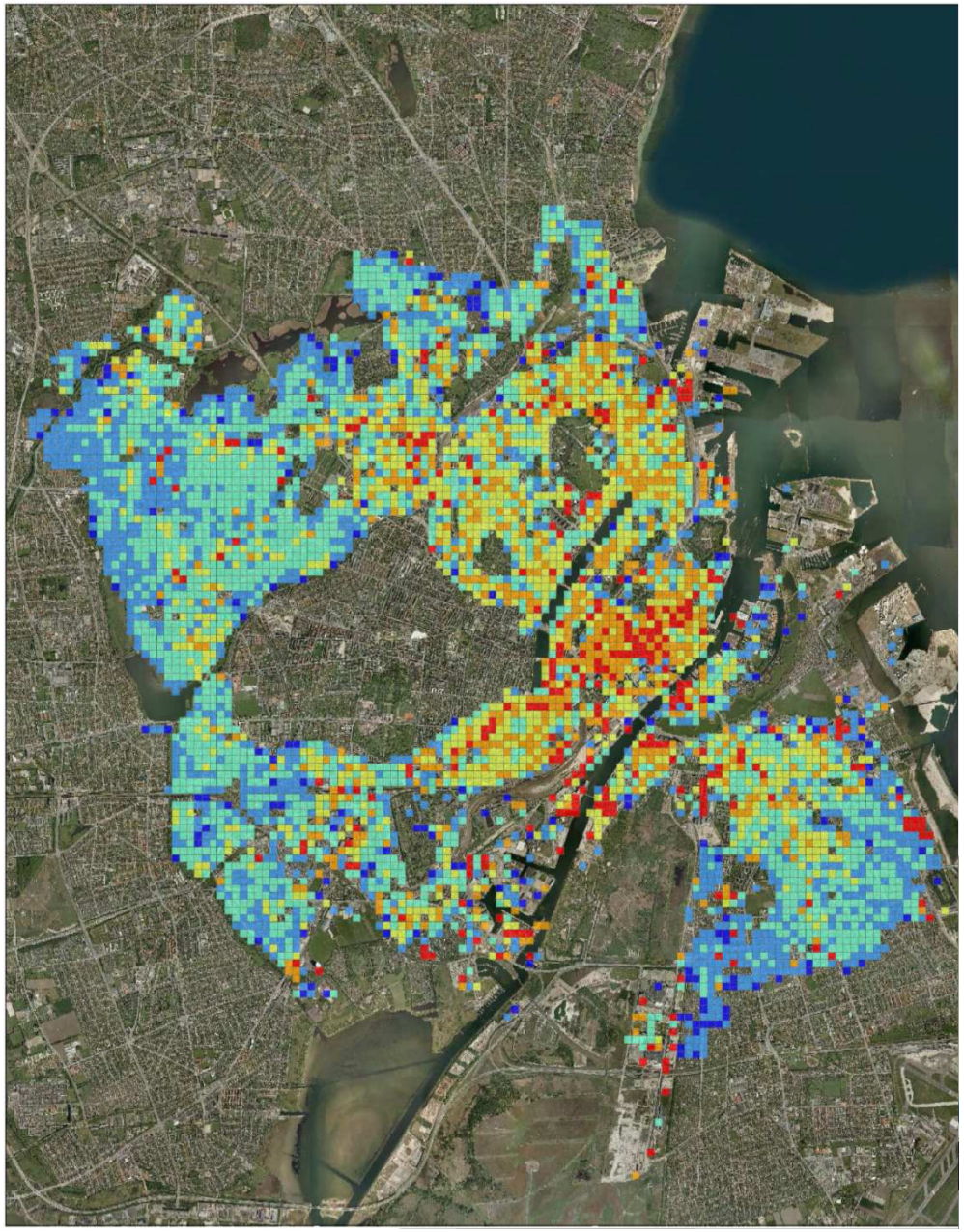
Risc assessment

Risc = Probability * Losses



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The aim of the Cloudburst-management plan

- To make CPH resilient to cloudbursts within 20 years.

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The aim of the Cloudburst-management plan

- To make CPH resilient to cloudbursts within 20 years.
- To reduce flooding risk

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The aim of the Cloudburst-management plan

- To help politicians in deciding on:
  - Which level of resilience is best in CPN

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The aim of the Cloudburst-management plan

- To help politicians in deciding on:
  - Which level of resilience is best in CPN
  - The best methods to reach this goal

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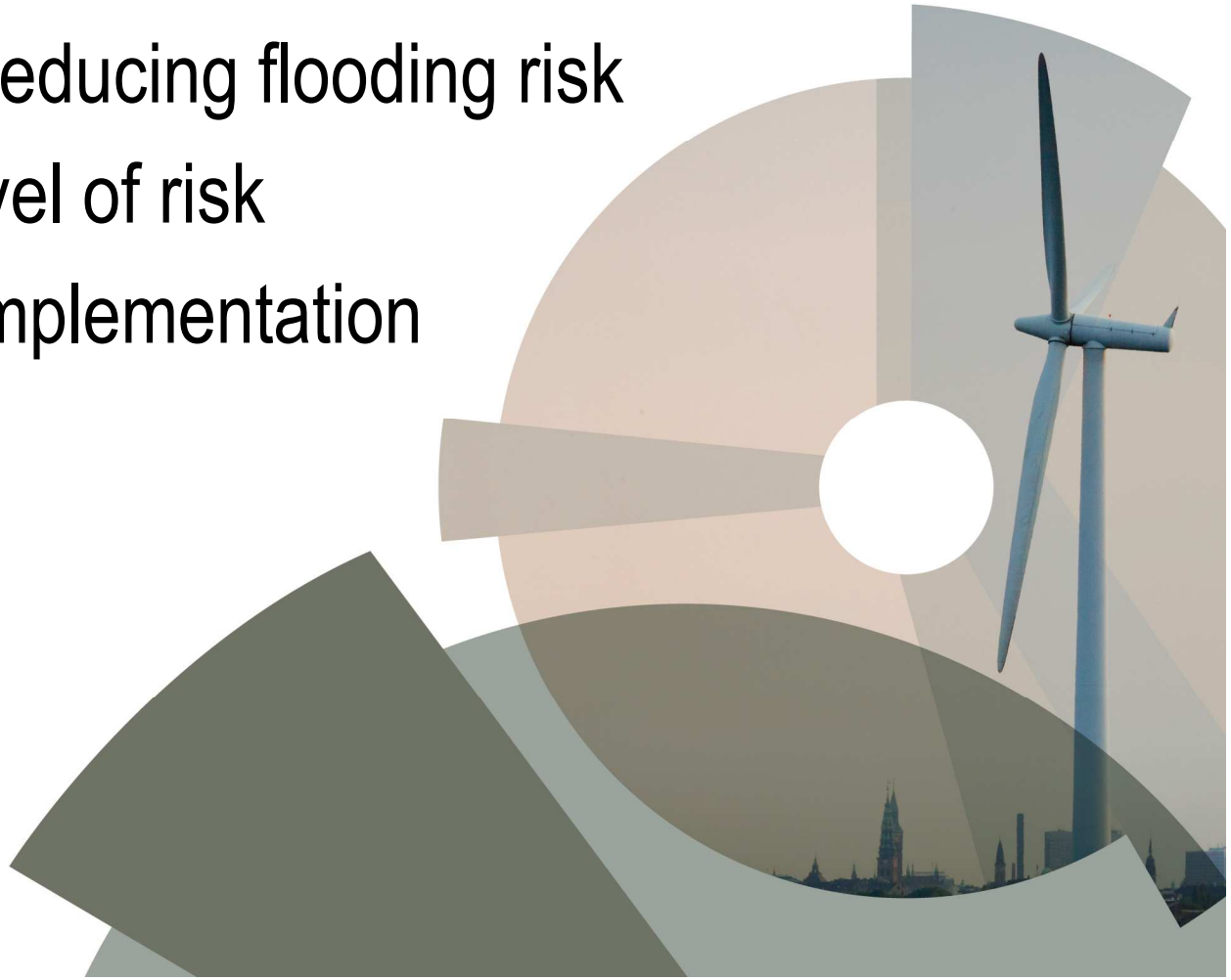
Cloudburst-management Plan

1. Methods of reducing flooding risk
2. Accepted level of risk
3. Prioritizing implementation



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Methods of reducing flooding risk

- » Detentioning of storm water
  - » Squares, sports fields, parks etc.
- » Conveying storm water to the harbour
  - » Existing watercourses
  - » New Cloudburst Water Courses
- » Solutions on the surface are preferred. Added value

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Methods of reducing flooding risk

» We have become wiser since Copenhagen Climate adaptation plan, august 2011.

» 250 swimming pools a 500 m3/minute

» Detentioning of water can only cover up to 10 %

» Conveying water to the harbour covers the rest

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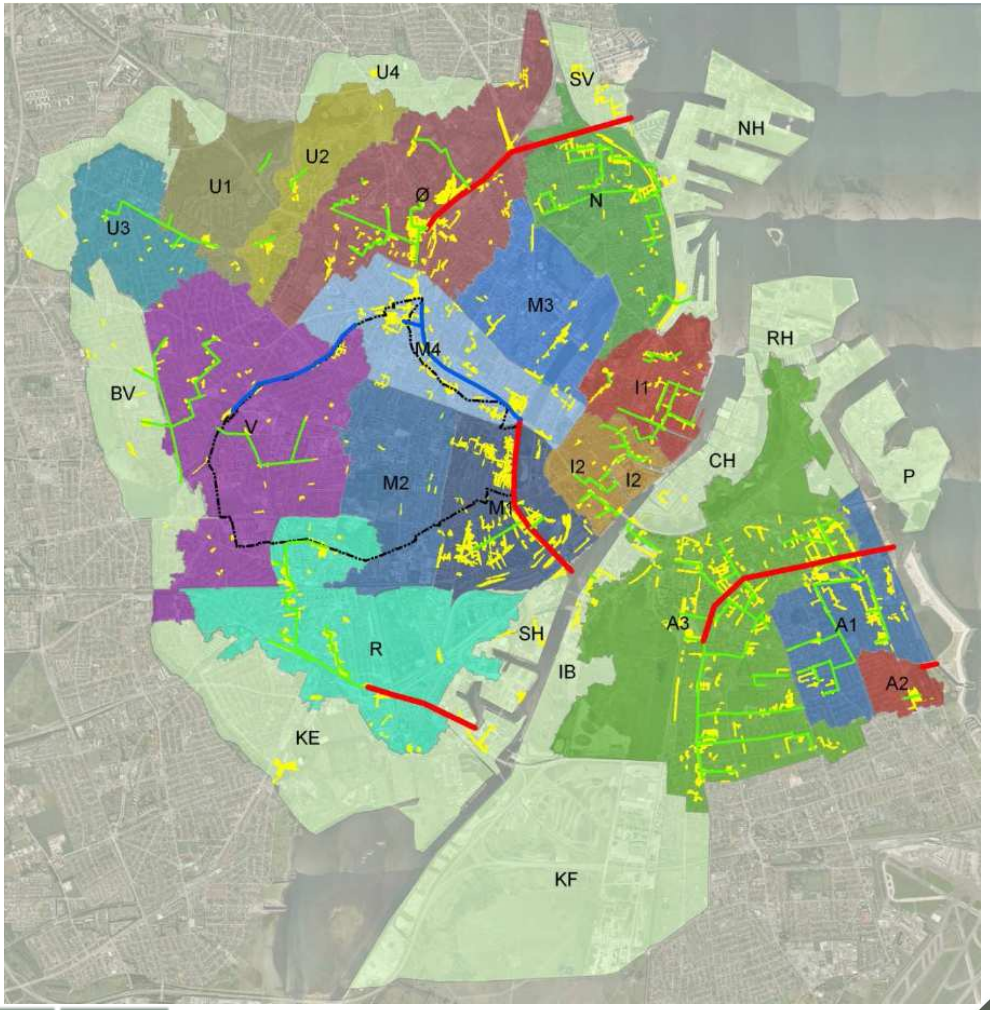
Methods of reducing flooding risk



Flooded areas

Tunnels

Pipes

Ditches

Everywhere else: Water transport on roads

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Level of accepted risk

- Two focus points for accepted risk:
  - How much water can be accepted?
  - How often may this incident occur?
- Cost/benefit-analysis.

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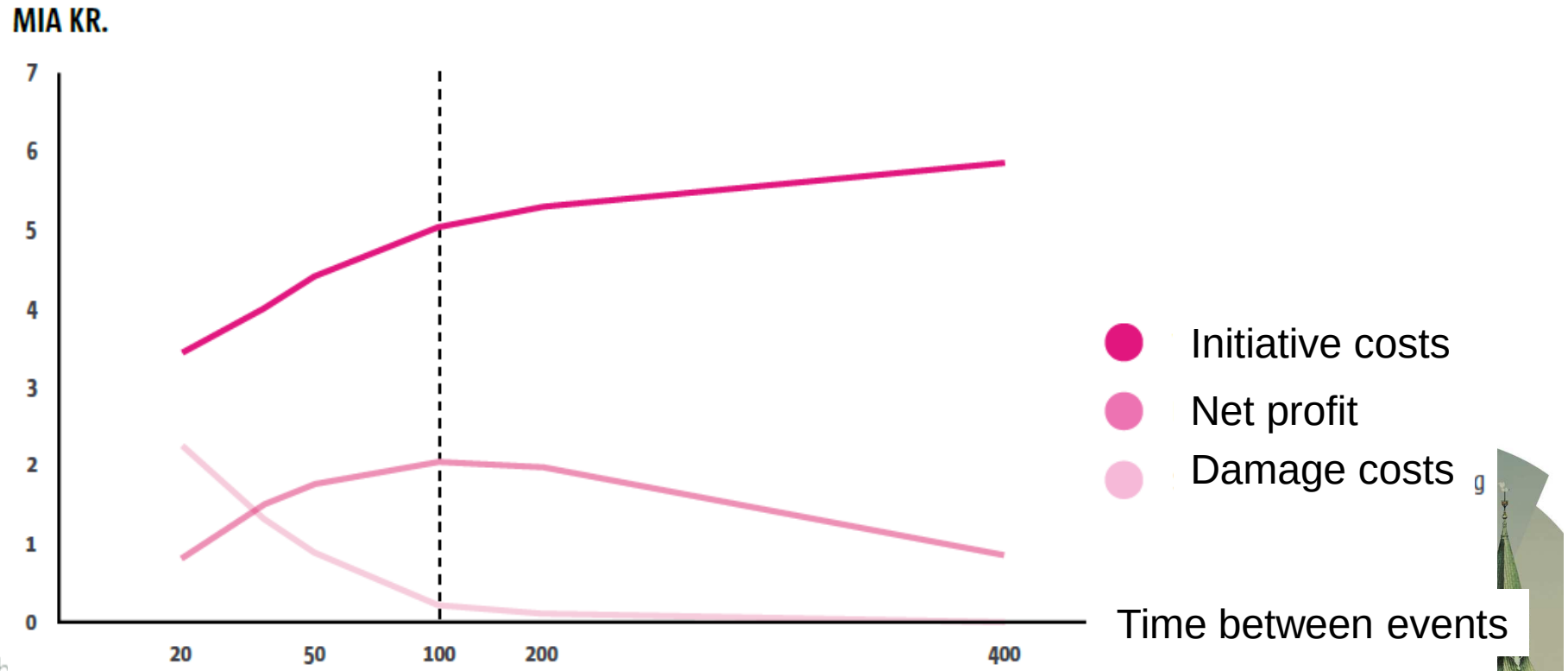
Level of accepted risk

Cost/benefit-analyse. Economics



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Level of accepted risk

In Copenhagen we have chosen:

» Maximum 10 cm water on the ground

» Once every 100 years (average)

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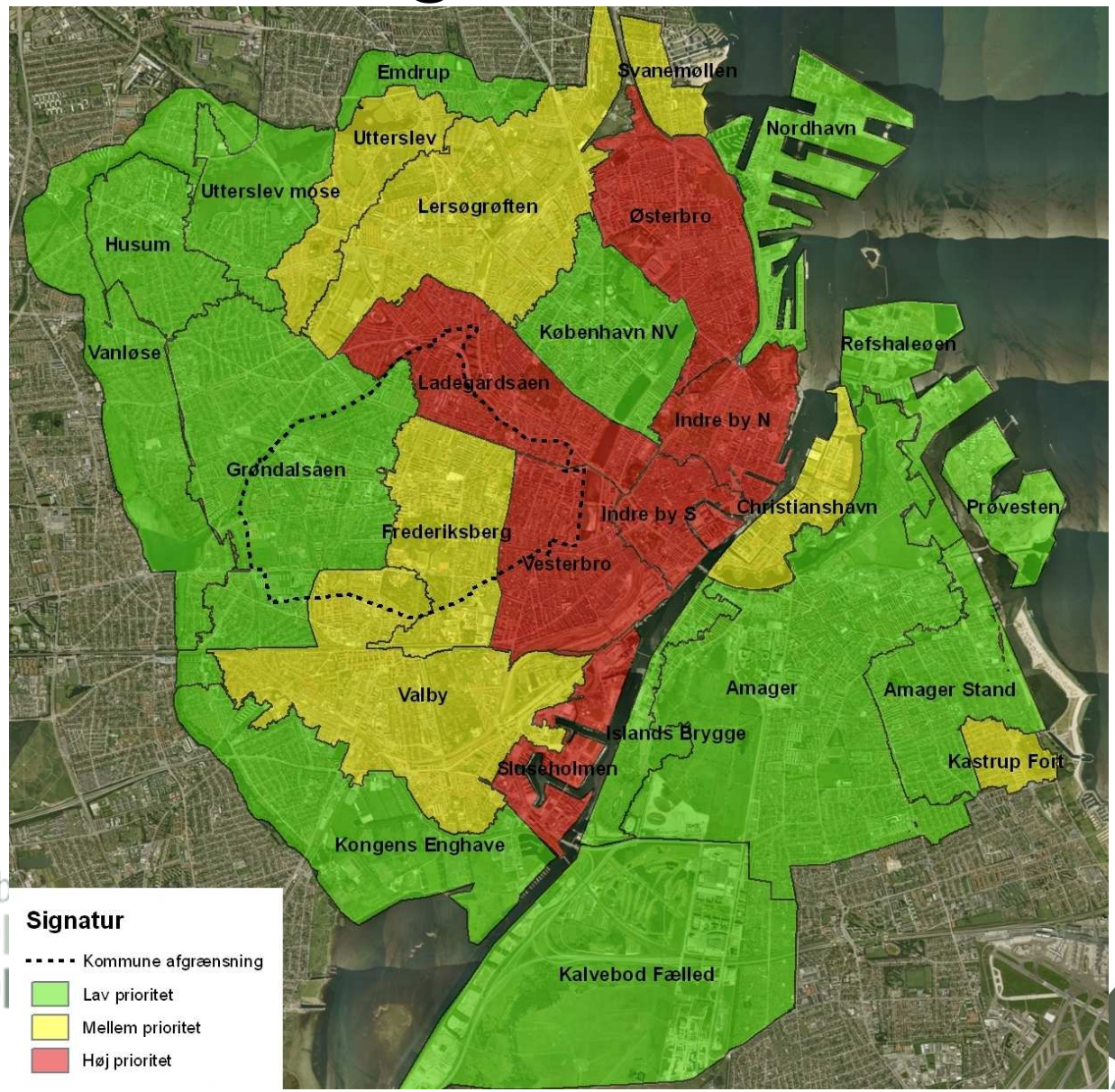
Prioritizing of the catchment areas



Further actions

- The plan is up for political approval
- Each of the 26 catchment areas gives rise to separate projects, where measures and methods will be scrutinized in detail

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Thank you

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