

The background is a dark blue gradient with various white and light blue silhouettes and graphics. On the left, there is a tree silhouette. In the center, there is a bar chart with four bars of increasing height. To the right of the bar chart, there is a silhouette of two people standing and talking. Further right, there is a circular graphic with a magnifying glass effect over a bar chart. In the upper right, there is a floor plan or site plan silhouette. The overall theme is urban planning and data analysis.

# MUNICIPALITY OF OSLO COMPREHENSIVE RISK AND VULNERABILITY ANALYSES AT MUNICIPAL LEVEL

GURO KJERSCHOW



TRANSFORMATION OF THE CITY



# THE BLUE GREEN CITY

# SMART - SAFE - GREEN

General environment protection is well integrated in municipal policy and plans





# WHAT HAS BEEN DONE – CLIMATE CHANGE ADAPTATION

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1. Climate Change Adaptation Strategy (2014-2030) City Council Decision – adopted May 2015: Surface water and urban flood, landuse, public health
2. Networks: Norwegian Environment Agency (MD), Association for the Municipalities (KS), ICLEI, Compact of Mayors
3. Surface water management strategy, action plan and cross sectorial working group
4. Climate change adaptation included in thematic projects and networks
  - Underground project - underground infrastructure
  - Business for Climate network

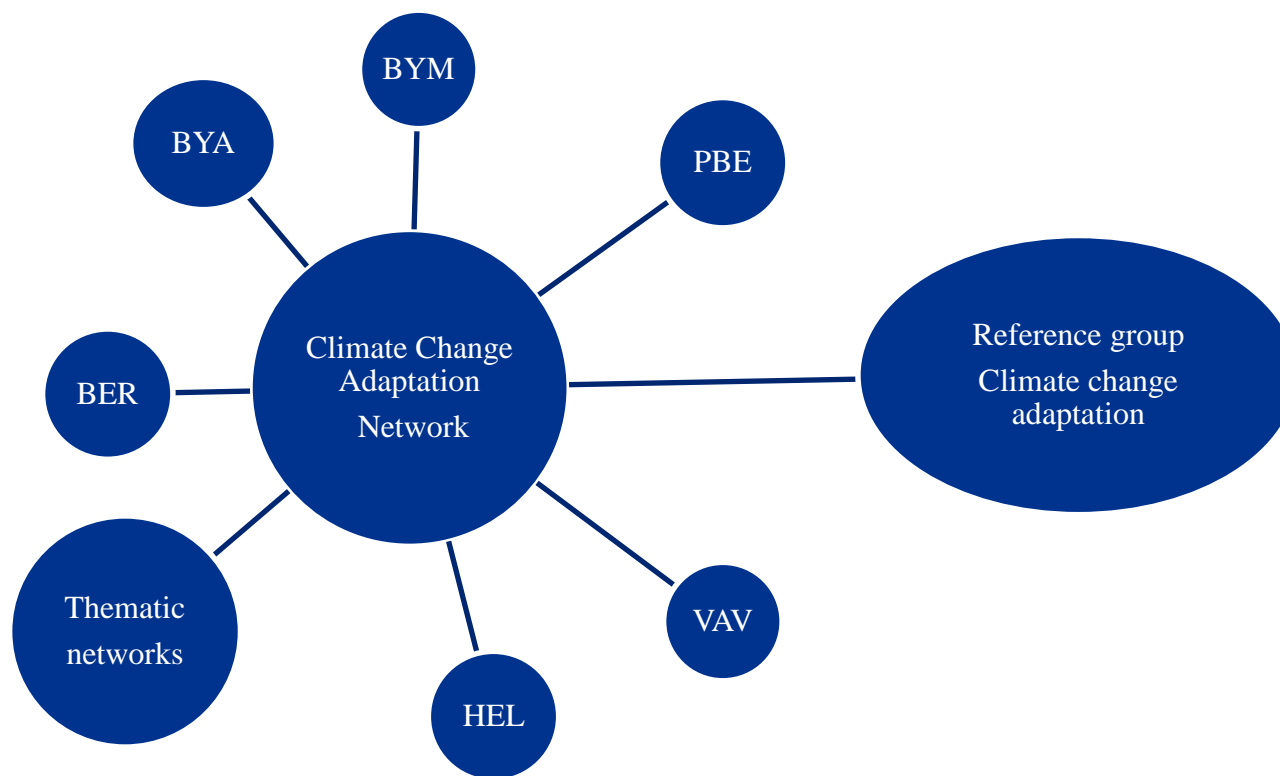


“Neither adaptation nor mitigation fit neatly into the traditional silos that structure city governments. To be effective, climate change planning requires a comprehensive and integrated cross-sectoral approach, with actors working across boundaries”

Guiding Principles for City Climate Action Planning, HABITAT (2015)



# NETWORK APPROACH





## NEXT STEPS

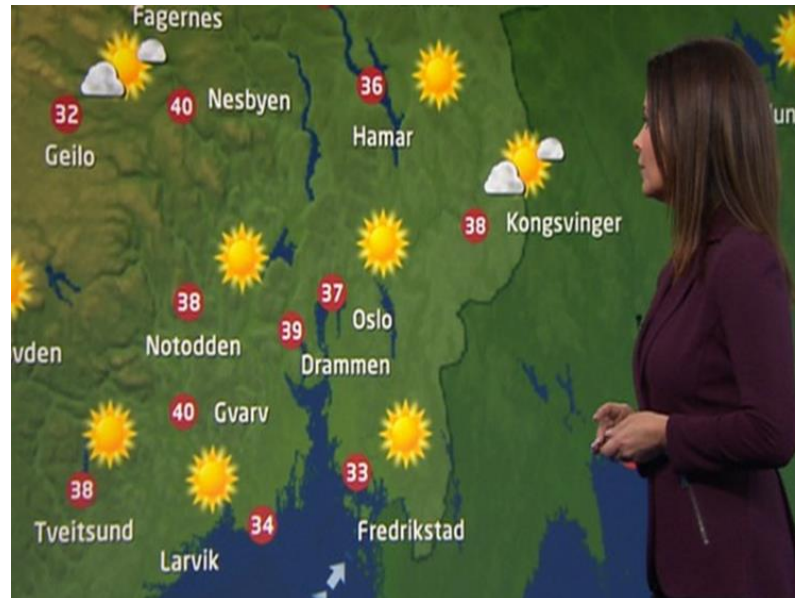
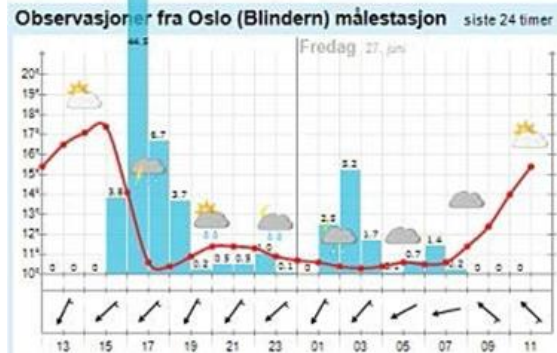
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1. Formalized network approach and structure – a coordination mechanism: information sharing, participation, synergies
2. Holistic action plan for the municipality: common goals, coordinated efforts, capacity building
3. Baseline study: indicators, basis for ROS assessments, data collection, monitoring and review, reporting etc
4. Information sharing/web page: what you can do, what the municipality does to make Oslo more resilient
5. Increased knowledge: climate change projections, cost benefit assessments,
6. Improved integration of climate change into plans and budgets



# KNOW YOUR RISK – WHAT DO WE KNOW?

RISK = Hazard X Vulnerability  
Risks today and in future





# KNOW YOUR RISK – WHAT DO WE KNOW?

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## Risk and vulnerability assessments (RVA)

### 1. Emergency response planning (preparedness)

- Holistic risk and vulnerability assessment by Agency for Emergency response – to be revised, more focus on climate change in a long time frame

### 2. Municipal master plan (construction)

- Risk and vulnerability assessment by Agency for Planning and Building services together with national authorities: storm surge, urban flood, rock fall, land slides
- Zone mapping

# SURFACE WATER MANAGEMENT – STRATEGY, PLAN & WG

## Goal

Storm water management in Oslo shall use **open and local solutions** to:

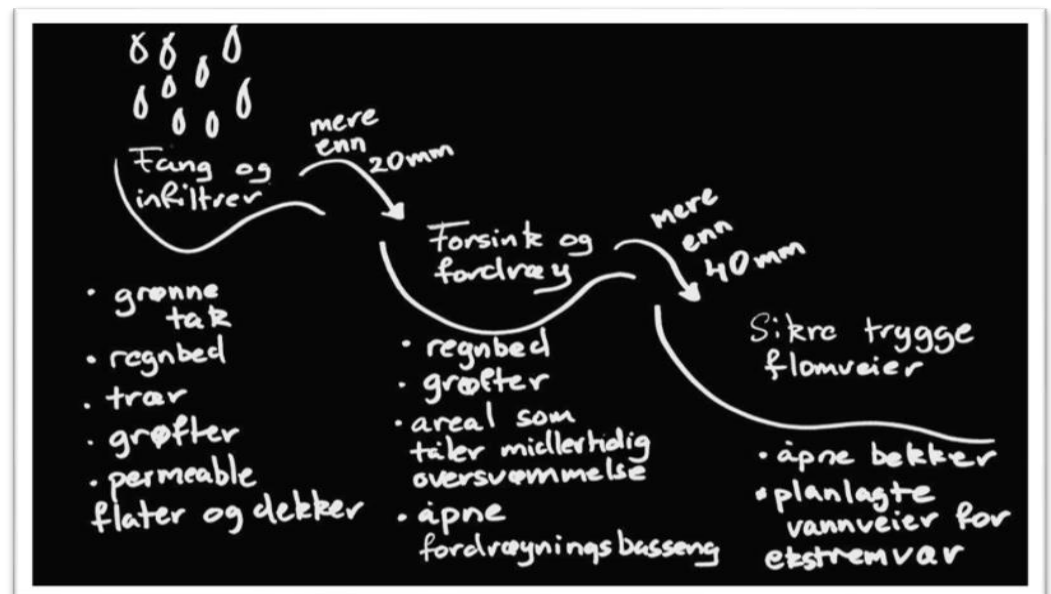
- *Meet climate change* and minimize damage and disadvantages for people, buildings, property and infrastructure
- *Safeguards the environment* and good ecological and chemical state in water-bodies
- Utilize *storm water as a resource* in the city-landscape

## Approach

Small rain - catch and infiltrate

Medium rain - collect and retain

Large rain/cloudburst - safe floodways



# SURFACE WATER MANAGEMENT – ORGANIZATIONAL APPROACH

## Participants

Water and wastewater agency (6+PL)

Urban environment agency (3)

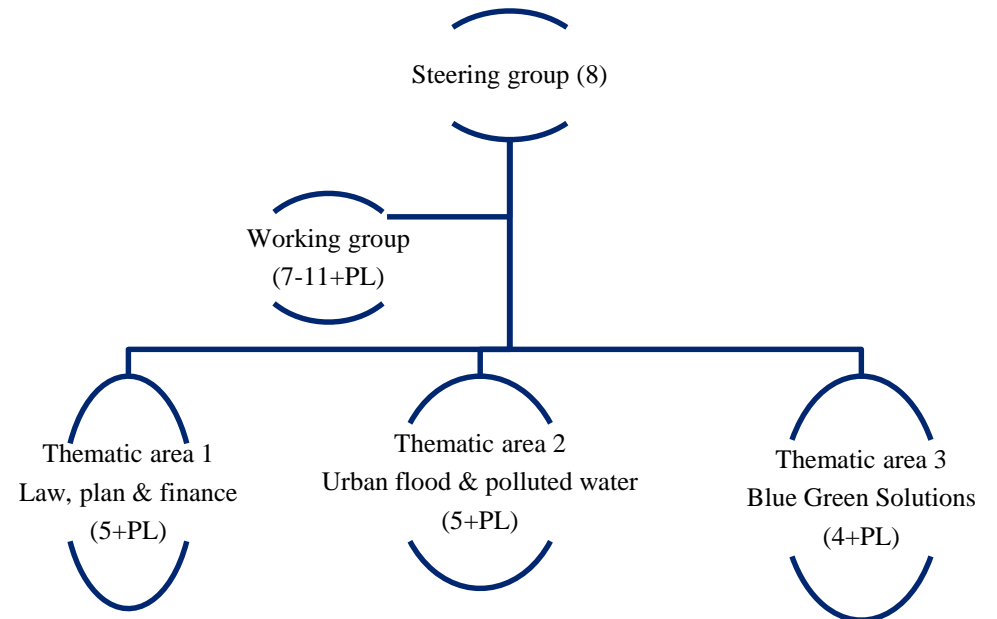
Emergency response agency (1)

Planning and building agency (5)

Estate and city renewal agency (2)

Omsorgsbygg KF (1)

Byantikvaren (1)





# SOME CHALLENGES

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From silo thinking to system thinking: physical, ecological, economic, social

To integrate new components in already overstretched workload

Political engagement and anchoring

Holistic risk and vulnerability assessment

- both risk reduction and preparedness
- In short and long term
- How small hazards have big impact over time
- How hazards reinforces each other
- Emphasis on vulnerability and solutions
- System thinking
- Cost benefit



# PLANNING FOR CLIMATE ACTION

Should adaptation and mitigation be included in same strategy and plan?

Urban flows – urban resilience – supply chain approach for resilience building