# ENERGY (Lot 2)

**use-cases and examples from the**

# City of Amsterdam

# Anja Reimann

Project Lead AI4Cities
*City of Amsterdam*

- working to bring innovation to Amsterdam

- working in the Chief Technology Office of Amsterdam

- working where technology meets business meets the city

  P: +31 (0) 614825085
  E: a.reimann@amsterdam.nl
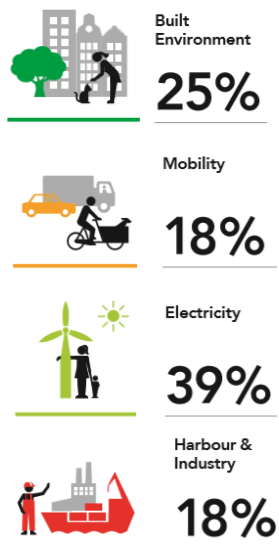
# Mimi Eelman

Strategy on Energy transition for Amsterdam
*City of Amsterdam*

- working to promote co-creation in innovation driven sustainable energy projects

- working in engineering department of Amsterdam

- working where public, commercial and social interests meet to create a comfortable sustainable living environment
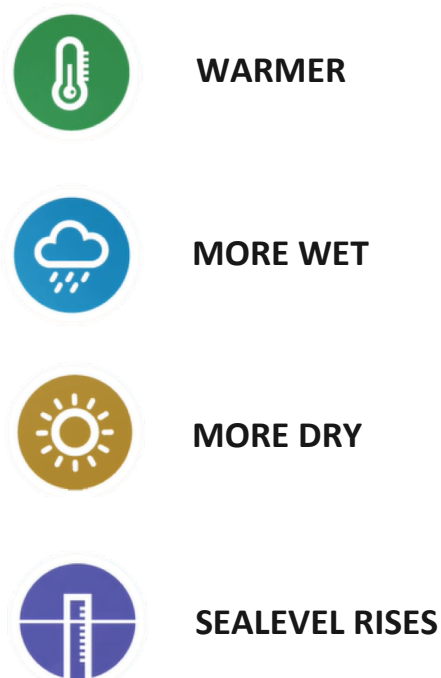
  P: +31 (0) 613973745
  E: mimi.eelman@amsterdam.nl

# AI4CITIES

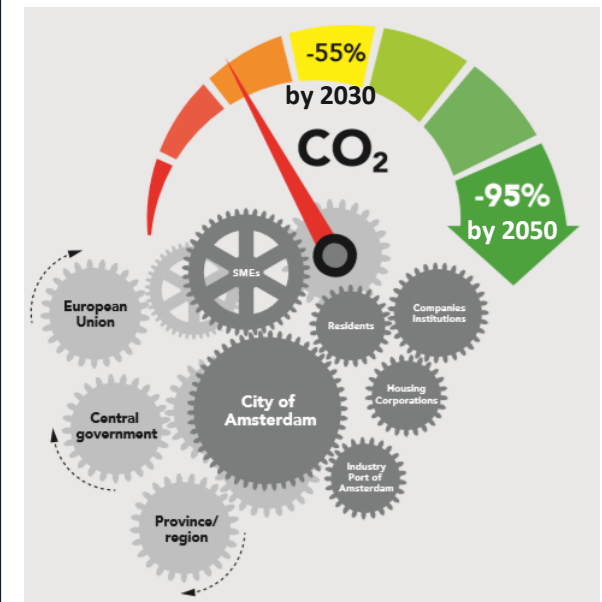## Where are we now ?

Total emissions
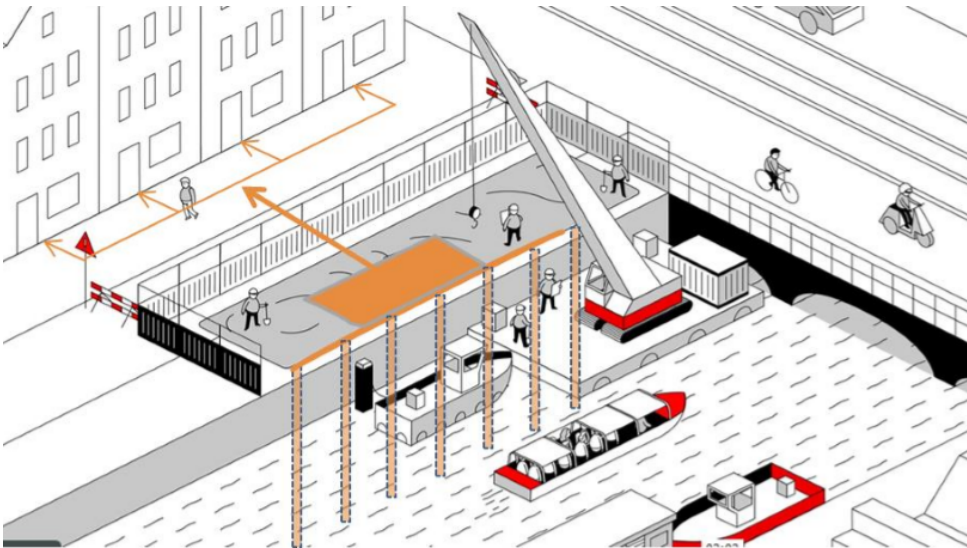5.000 kton
$CO_2$ equivalents
**100%**

Built Environment
**25%**

Mobility
**18%**

Electricity
**39%**

Harbour & Industry
**18%**

## If we do nothing

WARMER

MORE WET

MORE DRY

SEALEVEL RISES

## Where we want to be!

-55% by 2030
$CO_2$
-95% by 2050

European Union · Central government · City of Amsterdam · SMEs · Residents · Companies Institutions · Housing Corporations · Industry Port of Amsterdam · Province/ region

Check out our Roadmap Amsterdam Climate Neutral 2050!

# Quay walls as an 'Energy Factory'

**1** **What is the challenge?**

- 200 km of quay and 850 bridges must be renovated

- Install heat poles in the quay walls to win aqua thermal energy from surface water

- Upscaling from pilot to large roll-out

**2** **What is the potential impact?**

- 200km of quay wall to be replaced, potential amount of ca. 0.45GJ / m² of water surface

- Providing around 12.000 houses with energy in the historical canal area

**3** **How can we use AI here?**

- Smart sharing and integration of energy

- optimization of the energy system based on the requested use and the available heat + the load on the local electricity grid

# BRAKE!





**1** **What is the challenge?**

- extract (brake) energy from the overhead line via a battery pack

- absorb and reuse energy that is otherwise lost

**2** **What is the potential impact?**

- 7,3 million kWh / year

- 3.500ton $CO_2$ / year

**3** **How can we use AI here?**

- dealing smartly with large fluctuating energy flows

- e.g. at stations, where significant energy demand arises

# Rethinking the Harbor


Copenhagen


Amsterdam

**1** **What is the challenge?**

- Transforming the harbor into a sustainable battery

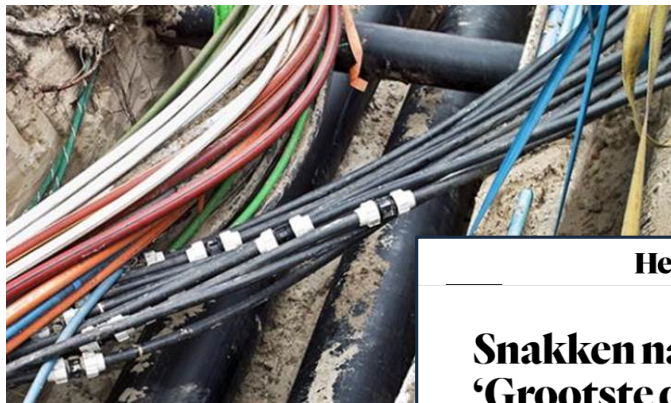- Rethinking the usage of former Hemweg (STEG) industrial energy plant

**2** **What is the potential impact?**

- Multi-usage of the area with fun and coolness factor

- Innovative energy systems

**3** **How can we use AI here?**

- How do you get the Amsterdammer to adopt the area for themselves?

**AI4CITIES**

# From spaghetti to fast track cable system



**Het Parool**

## Snakken naar regen: 'Grootste droogte in ruim 40 jaar'

Alle waterbeheerders in Nederland snakken naar flinke regenbuien in juni, want het is veel en veel te droog. Beken en sloten vallen droog, het grondwater zakt ver weg en de waterkwaliteit neemt af. En de zomer moet nog beginnen.

**Maarten van Ast** 24 mei 2020, 16:57



**1** **What is the challenge?**

- Amsterdam is a historical city and a leading data center hub (glas-fiber network) → vast amounts of cables and vulnerable network

- Smart use of the existing cable infrastructure

**2** **What is the potential impact?**

- 500 million EUR per year spent on fighting the drought

**3** **How can we use AI here?**

- Connecting the different systems and "usage moments"

- Weather predictions in relation to network capacity

- Smart monitoring and managing the assets