

New approaches to urban climate-responsive design



Call for abstracts for a special issue International Journal of Biometeorology

“new methods in thermal perception analysis: addressing phenomenological and psychological aspects”

Guest editors: Marialena Nikolopoulou and Sanda Lenzholzer

Seoun Sangga, Seoul (Yesol Park)



Fig.4.4 Site photo - Seun sangga complex

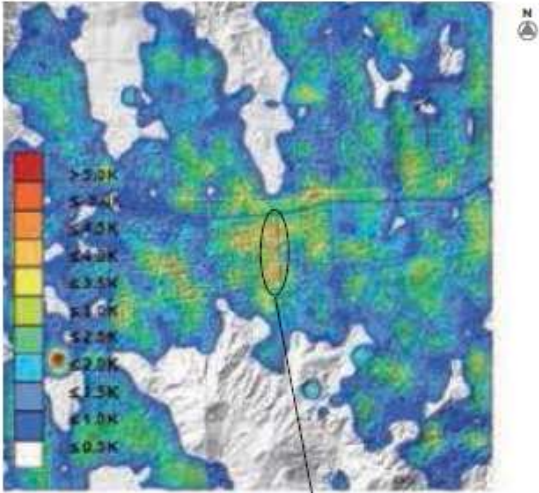


Fig.4.5 Air temperature of the study site and surrounding area
the air temperature of surrounding Seunsangga buildings is particularly higher

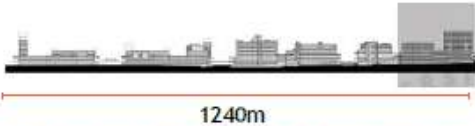


Fig.4.6 Megastructure - Seun sangga complex consists of 7 buildings



Seoun Sangga, main concept

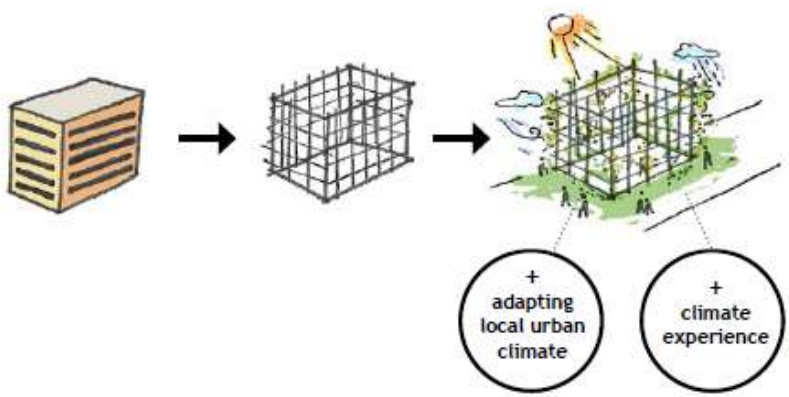
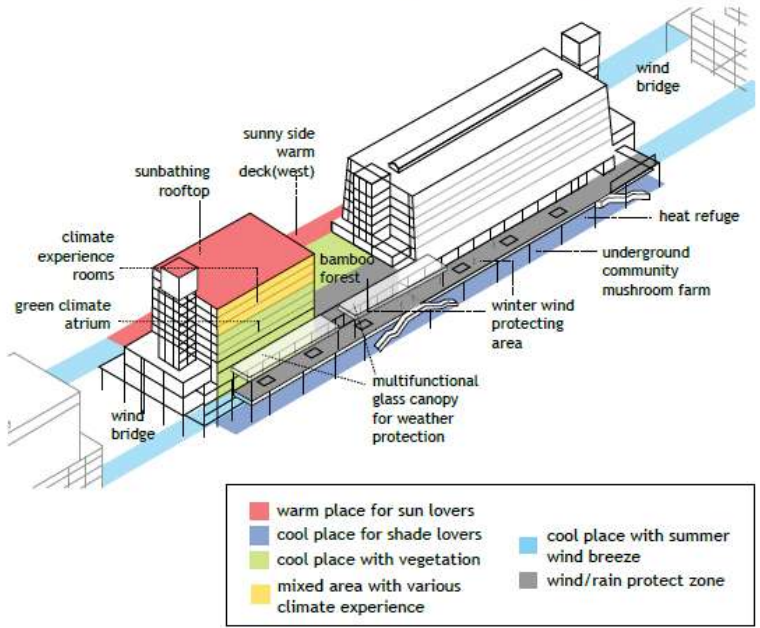


Fig.4.11 Programme and climate experience in the park



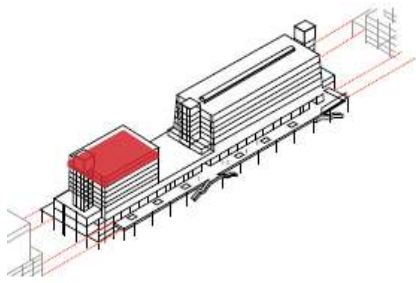


Fig.4.33 Impression D:
Climate Experience Rooms
- Rain Room

Impression D shows the rain room that use harvested rainwater for generating novel climate experience. In the rain room, the installed system with steel jets sprays innumerable tiny drops of harvested rain water to create rain shower effect. During the heat of summer, the rain room will be a popular space for visitors as a heat refuge.



people who feel weary from extreme heat visit Rain room

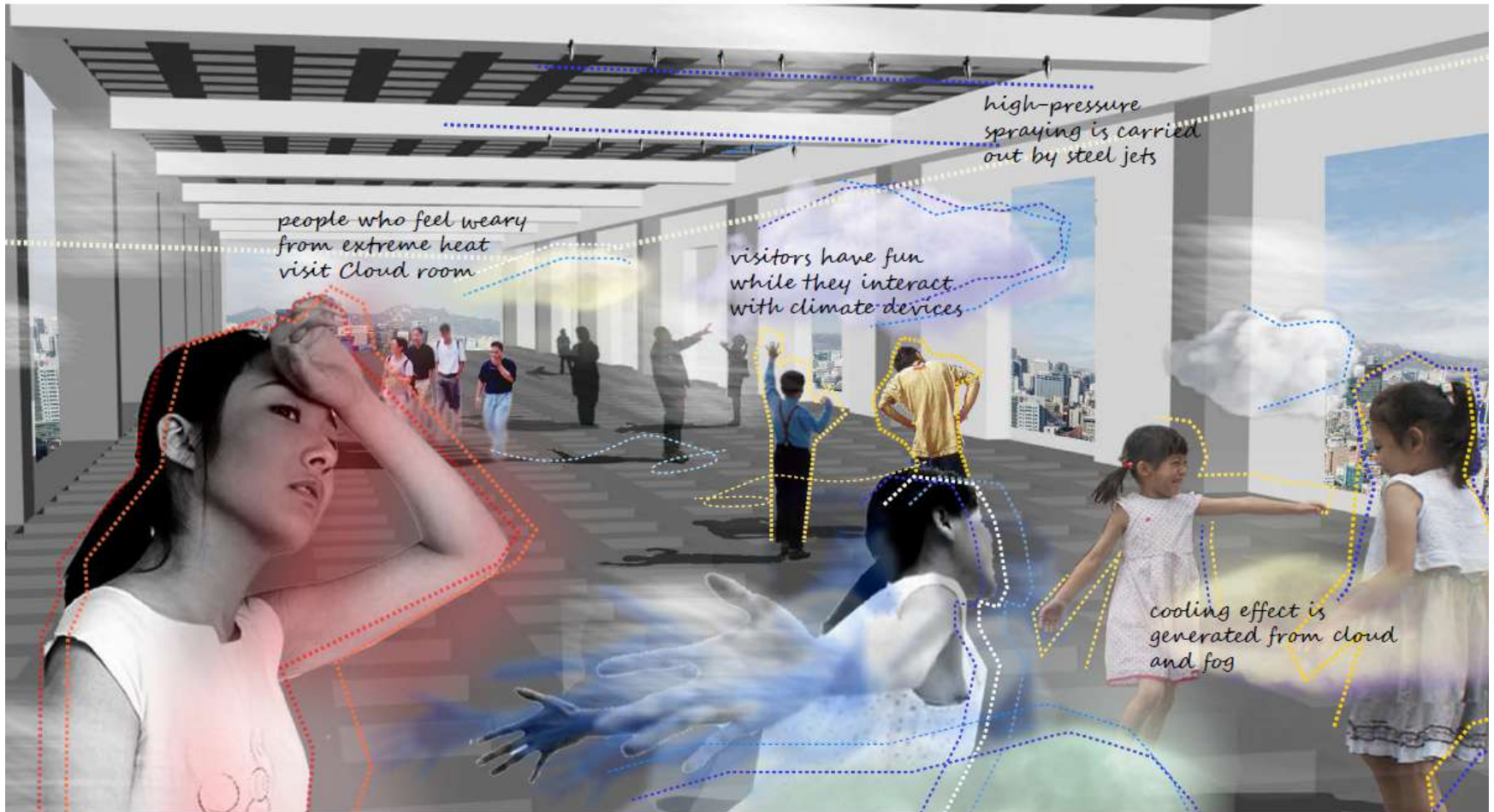
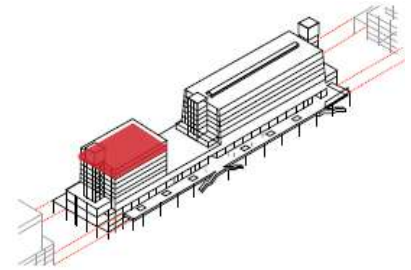
rainfall wall

visitors feel cool while they interact with devices for rain shower effect

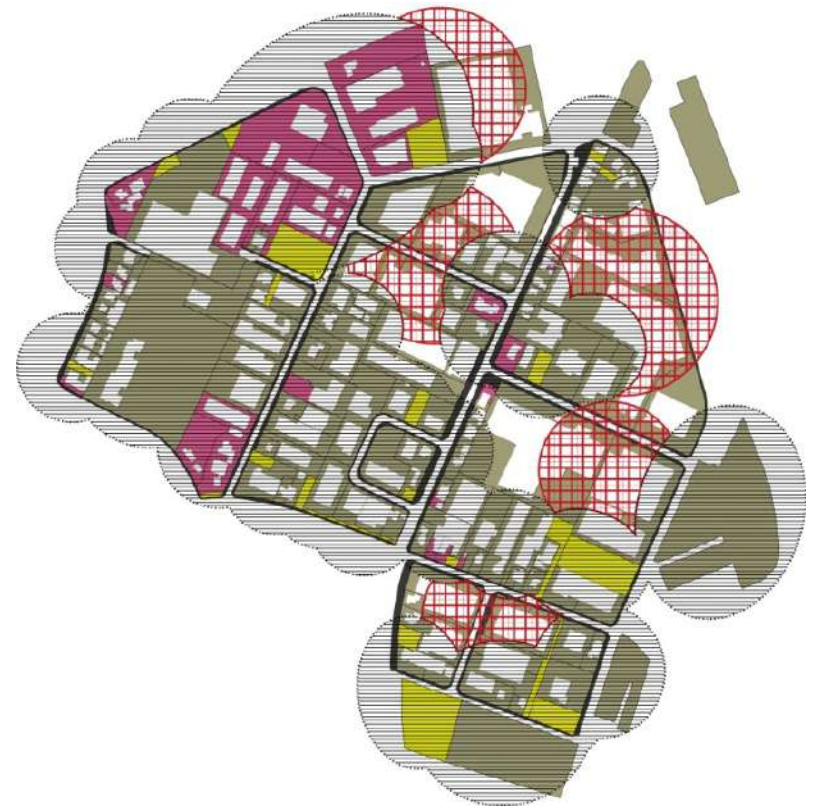
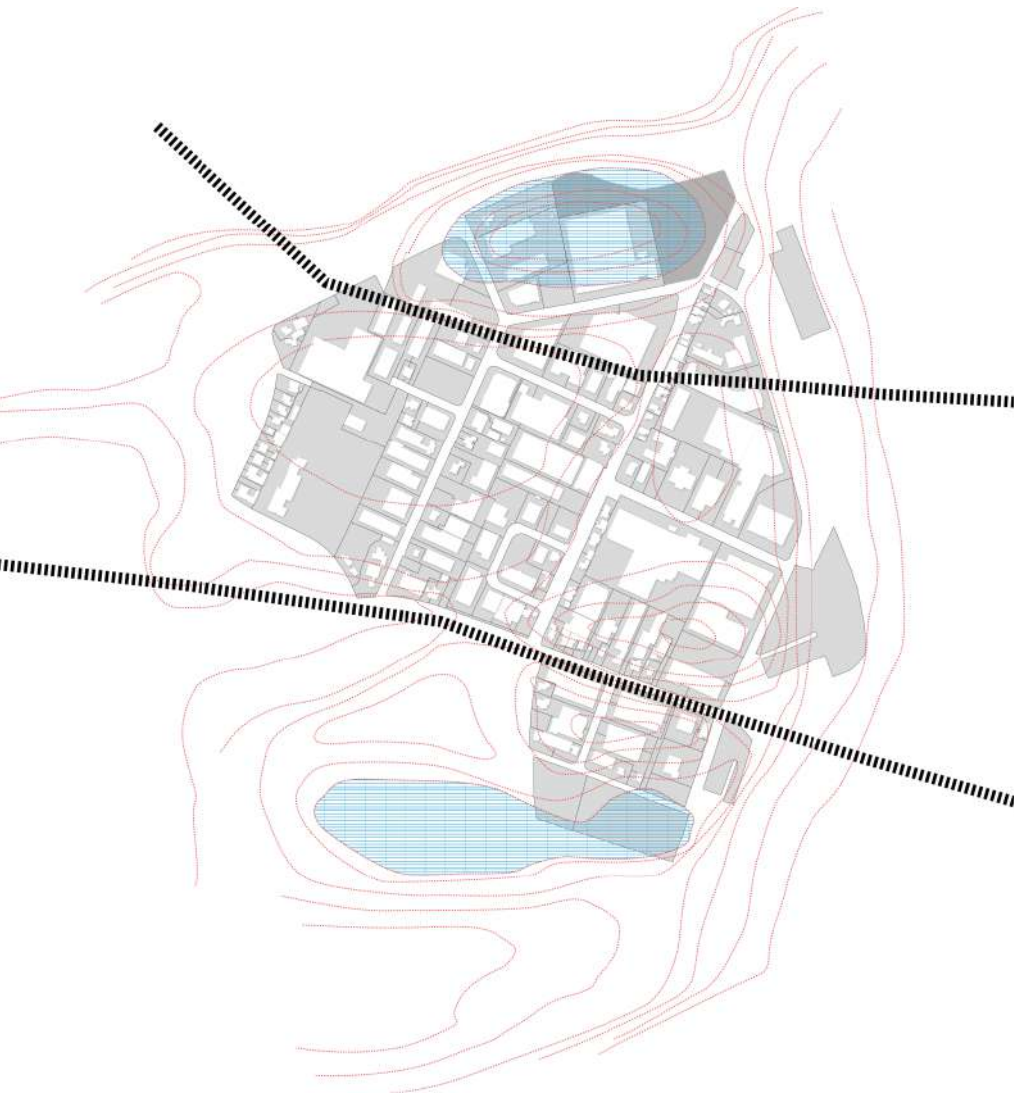
installed steel jets create rain shower effect

Fig.4.34 Impression E:
Climate Experience Rooms
- Cloud/Fog Room

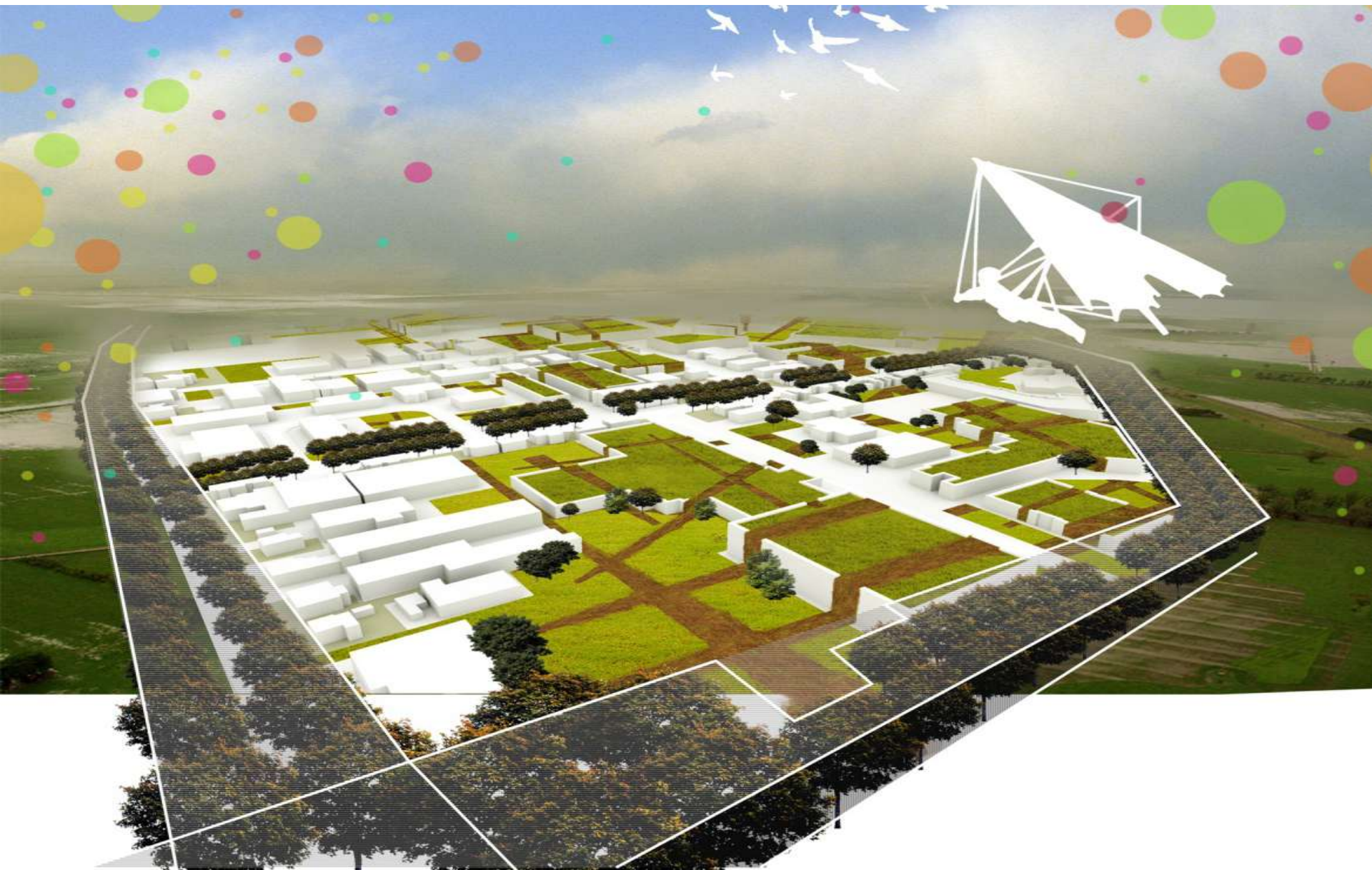
Impression E shows how the original space in old building is transformed into cloud/fog room. In common with rain room, steel jets are controlled by computers to adjust the strength of the spray and to create the fog mass. Visitors visually and physically learn about the short and long-term benefits of adaptation measures while they interact with enjoyable climate elements in this room.



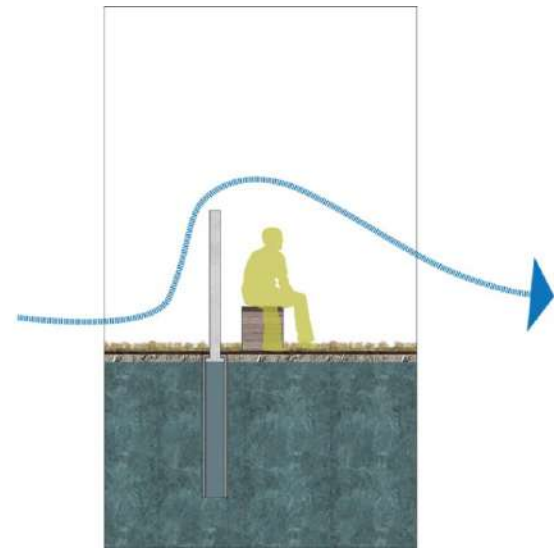
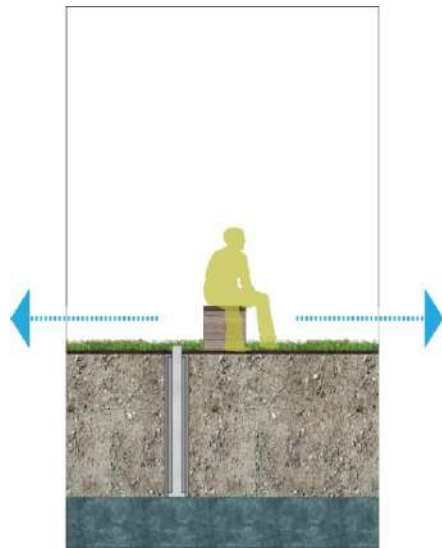
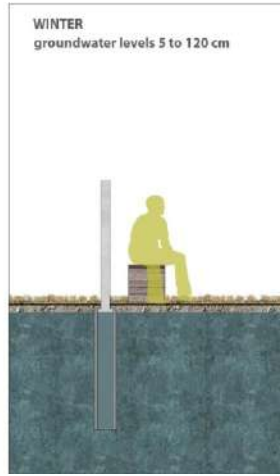
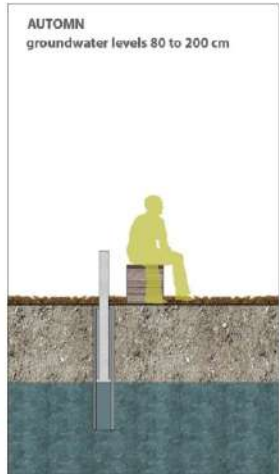
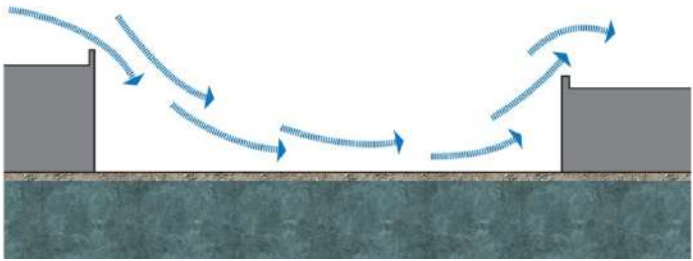
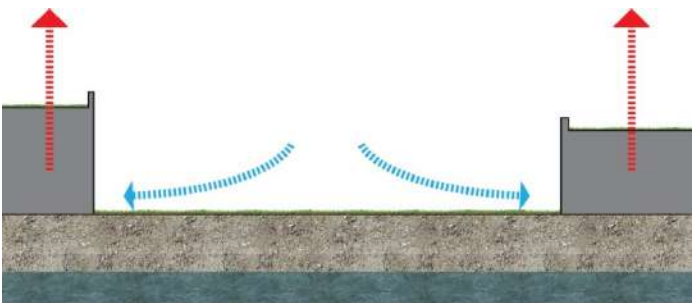
Water and heat in Latenstein, Tiel (Dariusz Reznek)



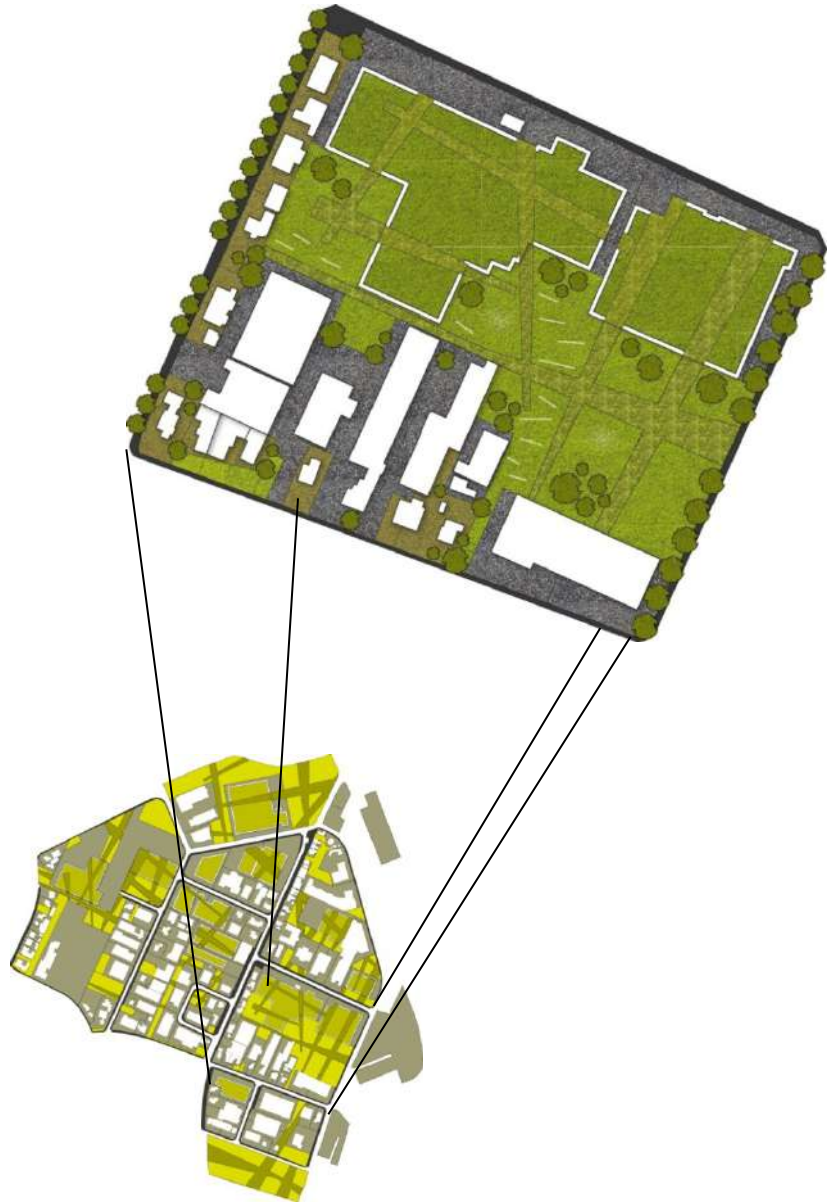
Total plan



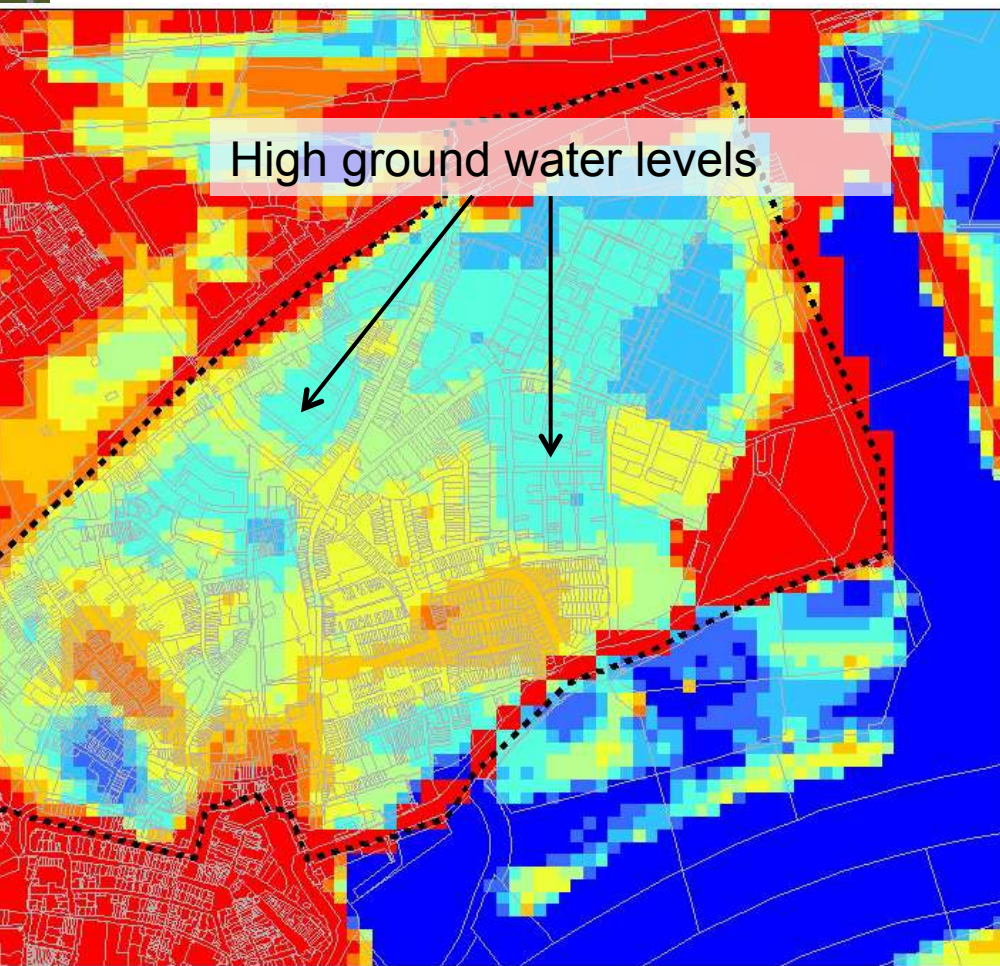
Dynamics of water and wind in different seasons and the 'climate buoy'



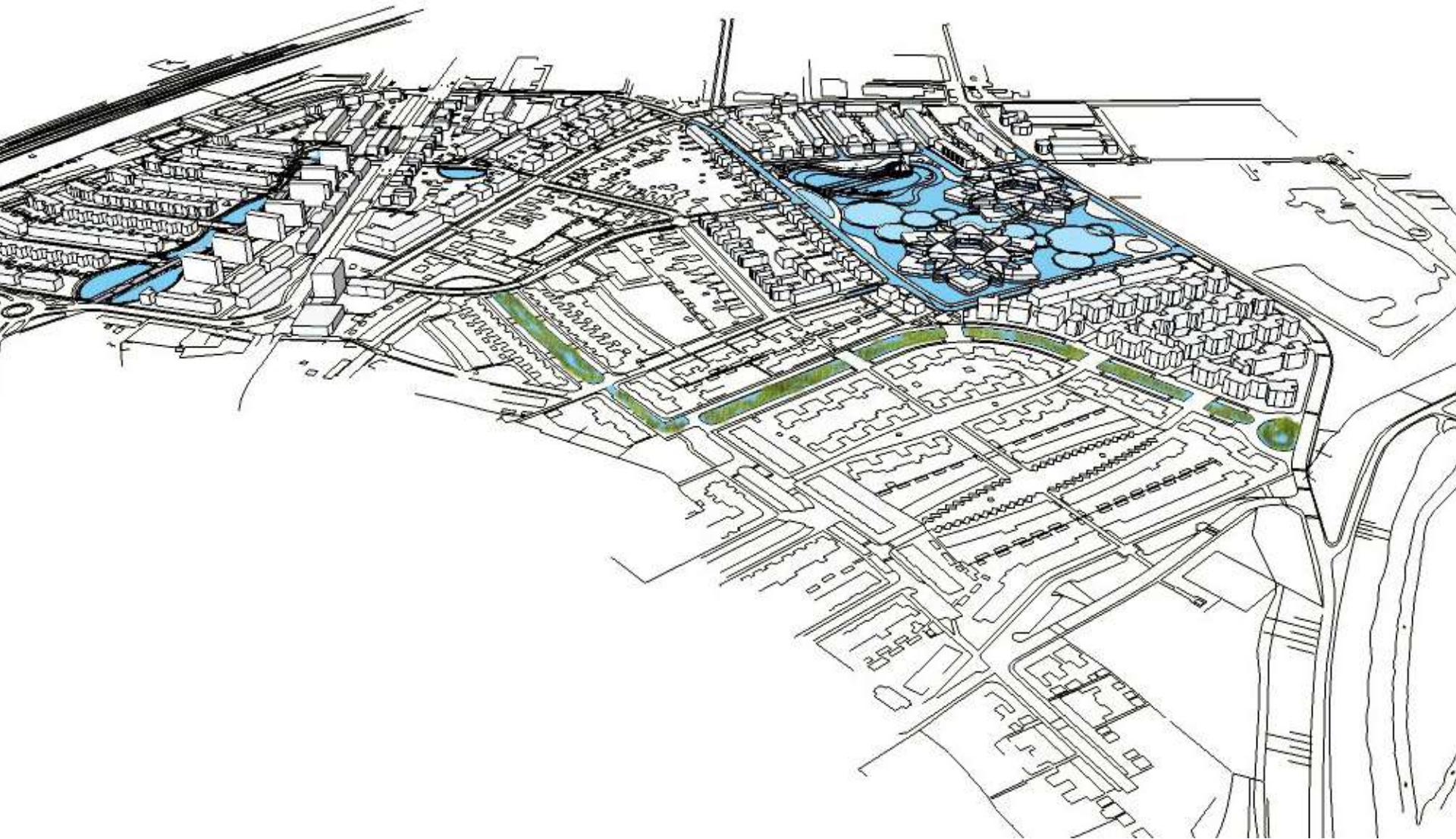
Local plan



Heat and seepage water problems, Tiel Oost (Ya-Ping Chang)

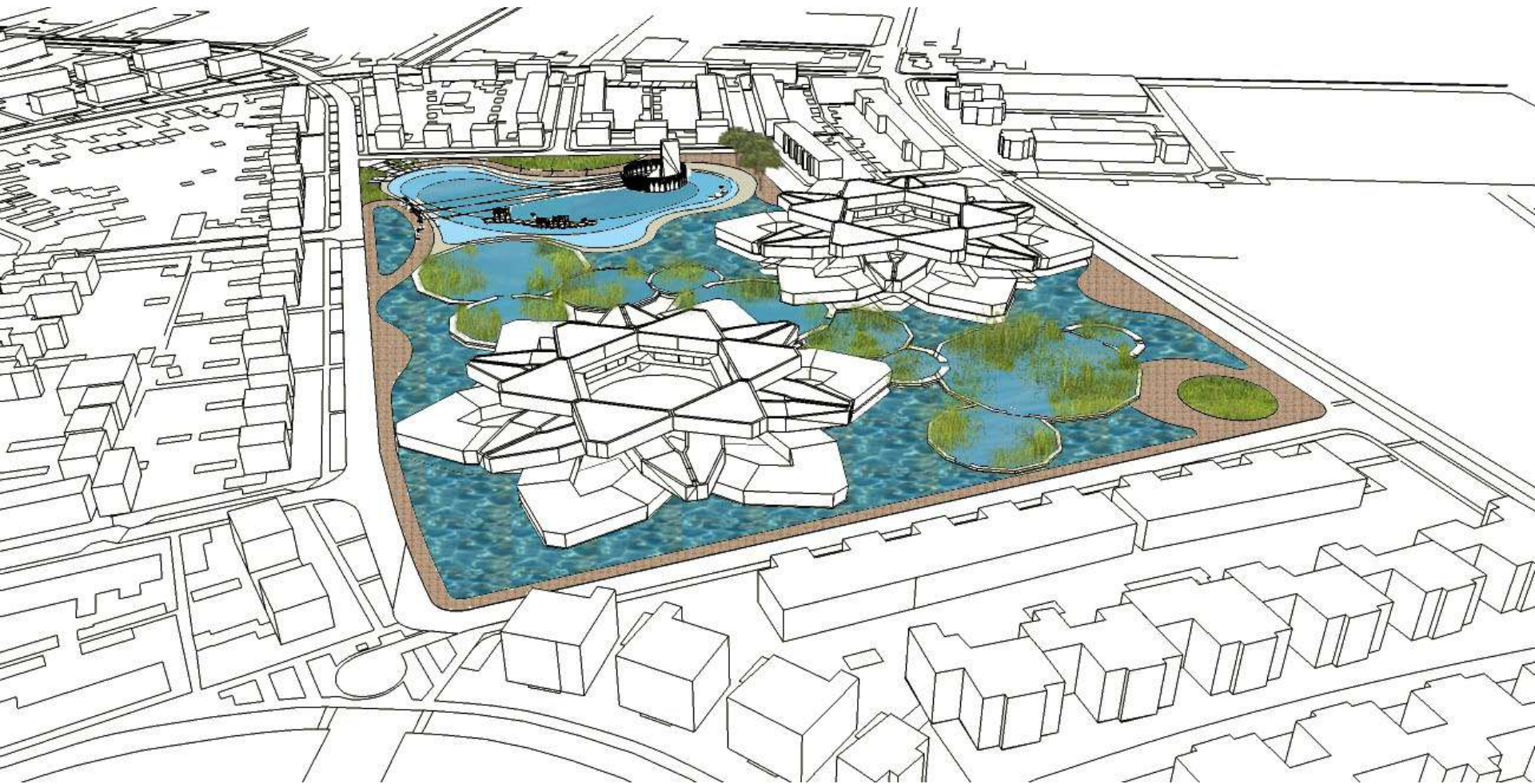


Overview of all interventions

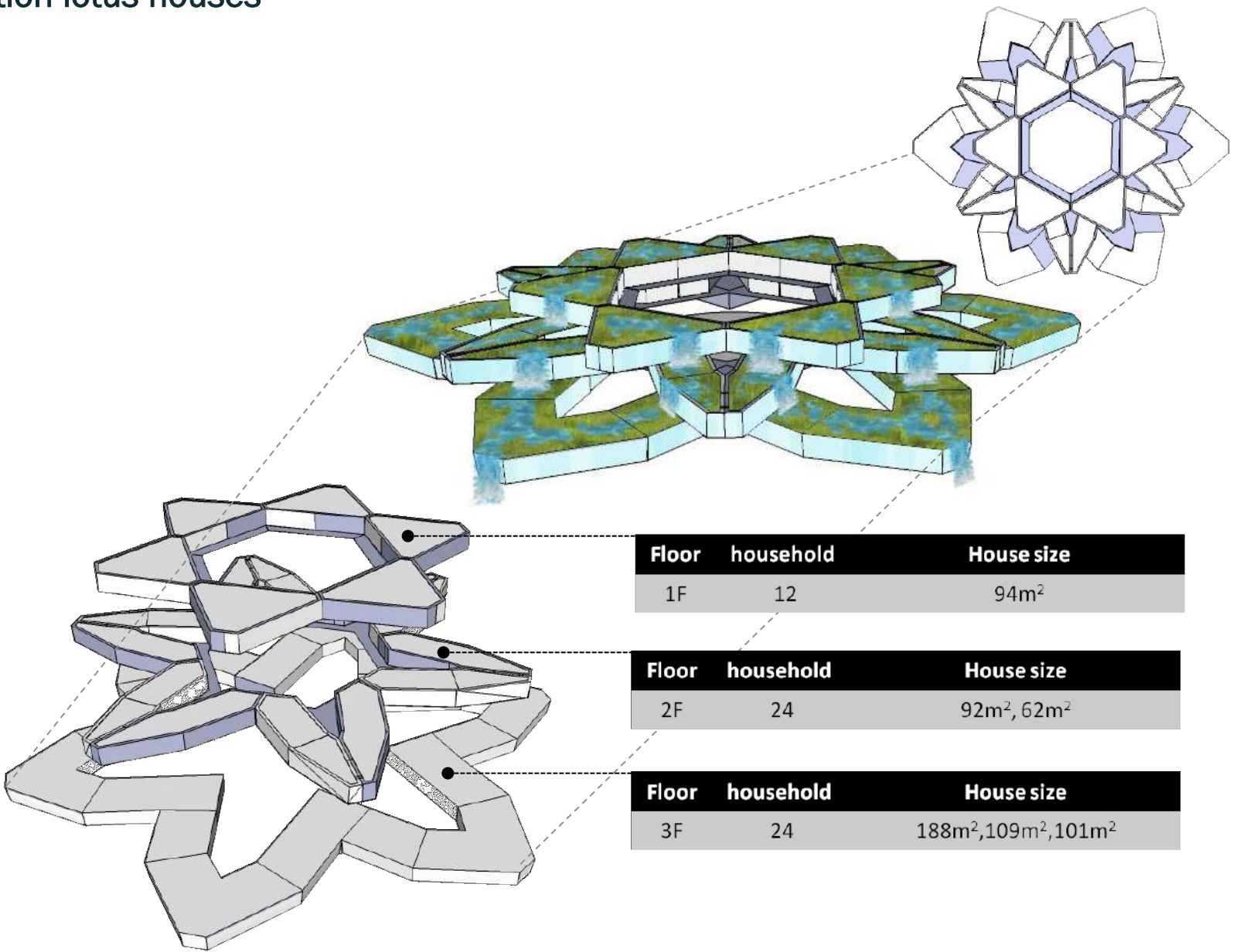


Dr. Dipl. Ing. MA (AA) Sanda Lenzholzer
Associate Professor Landscape Architecture
Principal Investigator AMS

The water square and the lotus houses



Function lotus houses



Floor	household	House size
1F	12	94m ²

Floor	household	House size
2F	24	92m ² , 62m ²

Floor	household	House size
3F	24	188m ² , 109m ² , 101m ²

Functions passive waterjet-installations



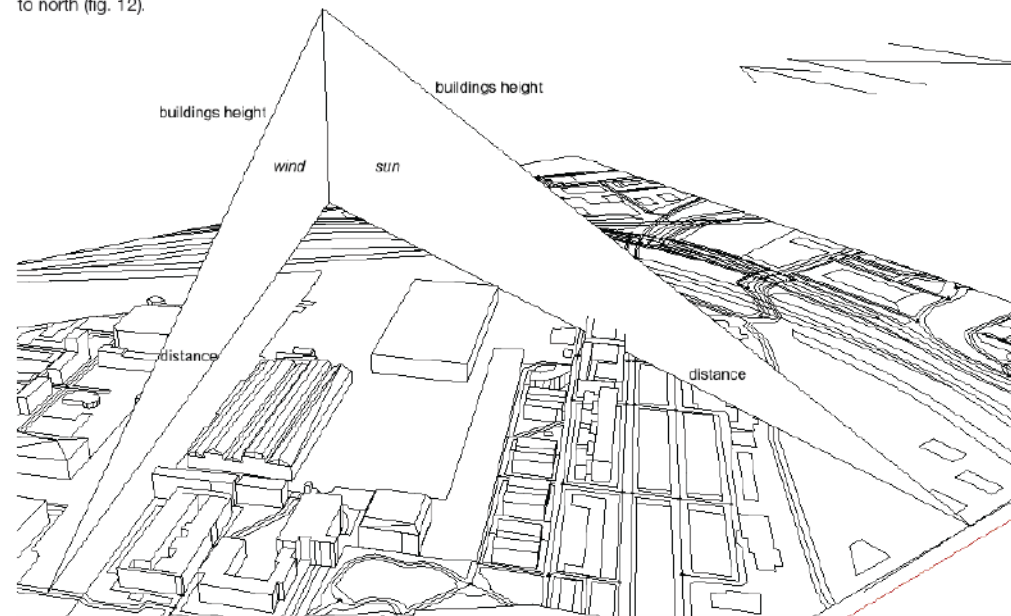
Using energy fluxes of urban climate as renewable energy



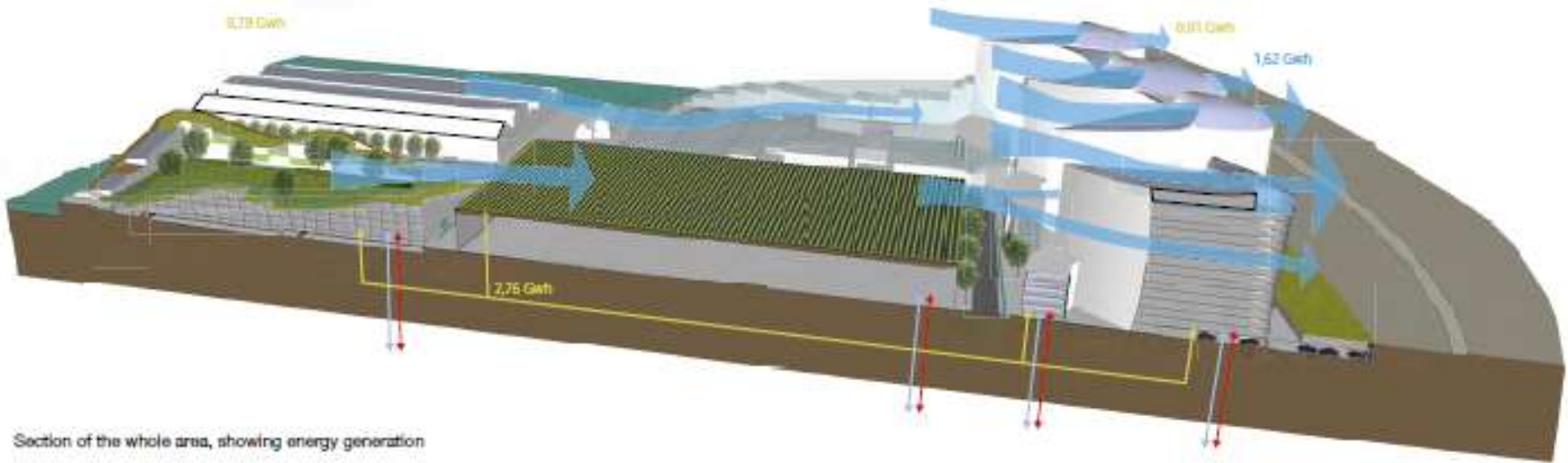
Oostenburg Amsterdam



to north (fig. 12).

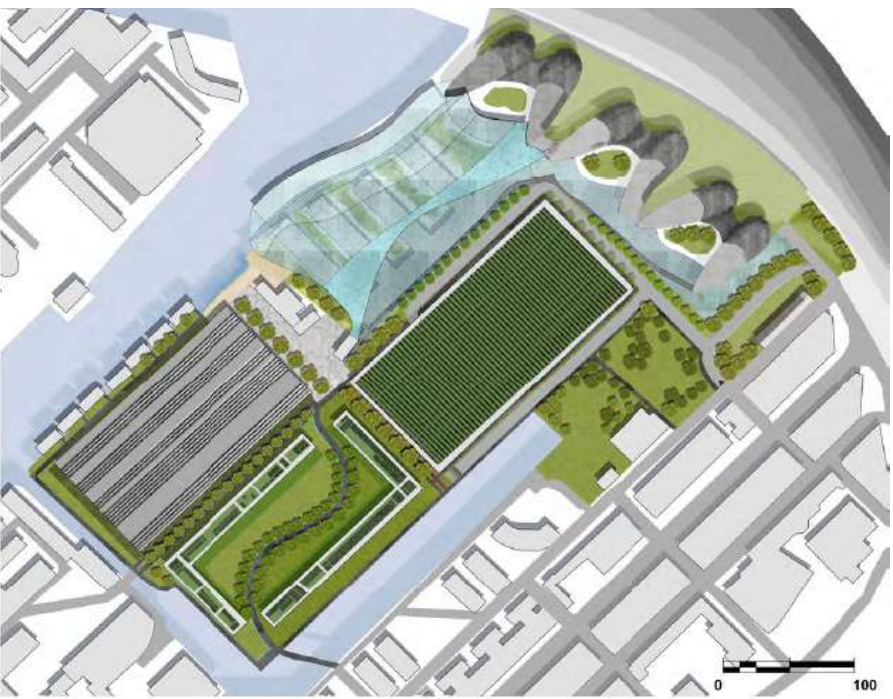


'Wind wall' project

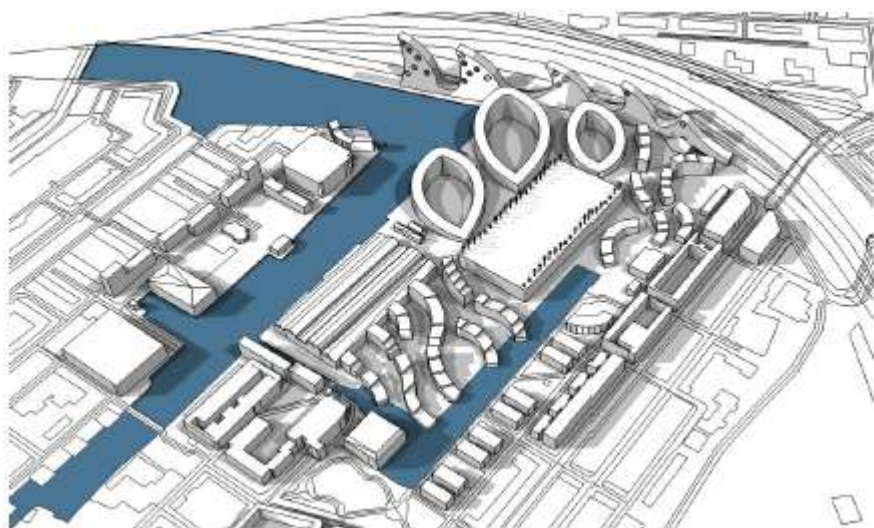


Section of the whole area, showing energy generation

Masterplan and visualisations 'wind wall'



Design proposal: 'Waves of energy'



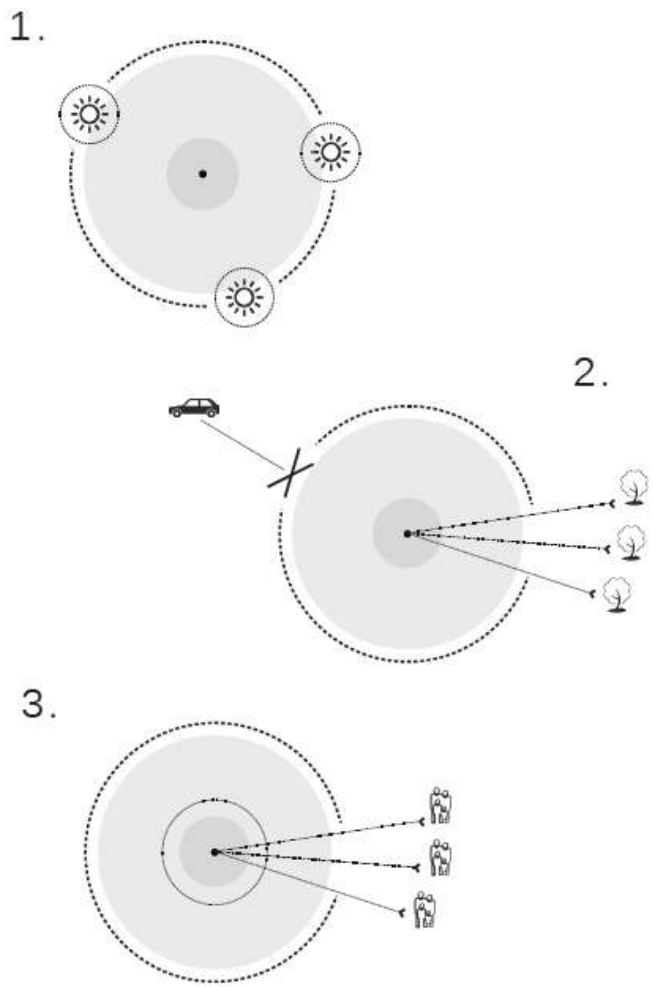
View from the trains



Climate proof Spijkerkwartier, Arnhem



'Dressed in green'



DESIGN PRINCIPLES

convert to renewable energy sources
utilizing sun exposure in addition to minimizing energy losses

minimizing urban heat island effect
increasing amount of vegetation in addition to depaving

strengthening & redefining the neighbourhood identity
getting people involved in addition to localizing systems

STREETSCAPE & HUBS

'Dressed in green'

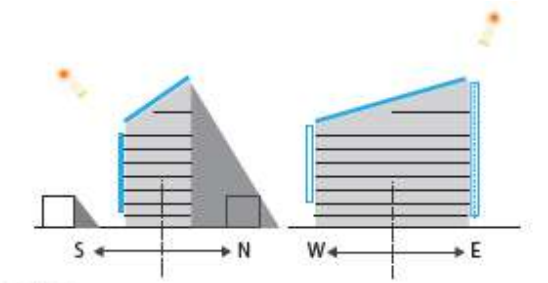


mid-day situation - 13:30 h

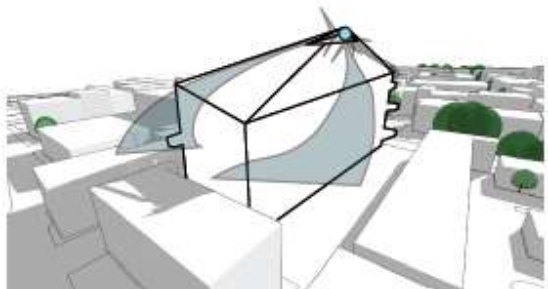


afternoon situation - 16:30 h

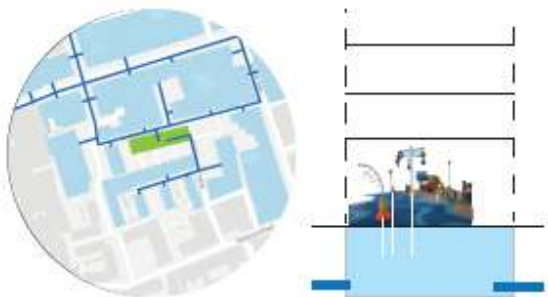
'Dressed in green'



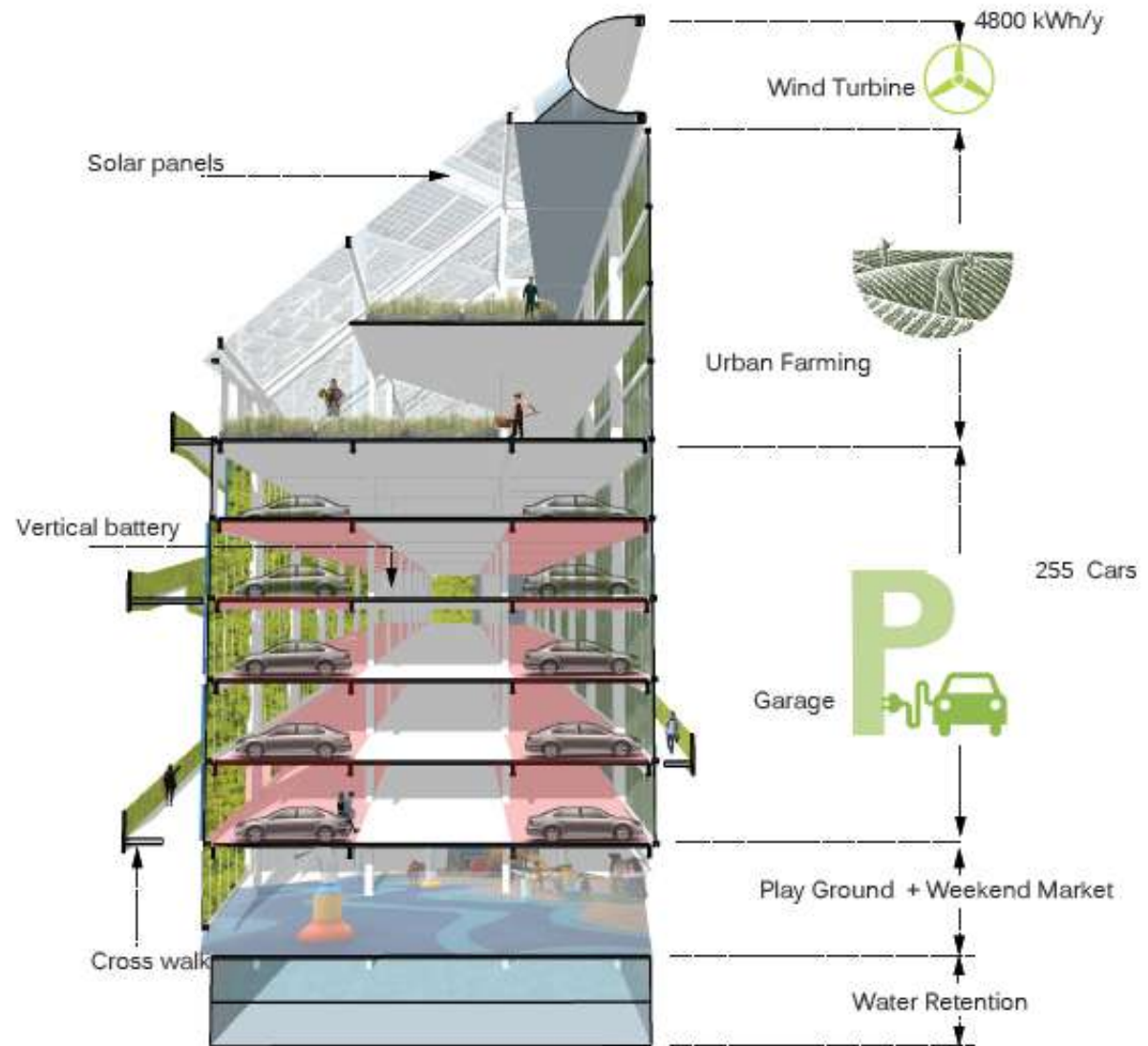
solar



wind



water



'Dressed in green'



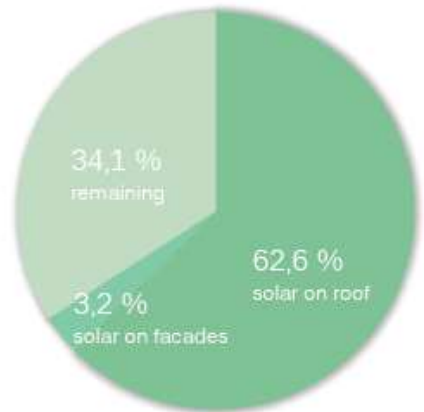
'Dressed in green'



1. PET during day-time
> before design intervention



2. PET during day-time
> after design intervention



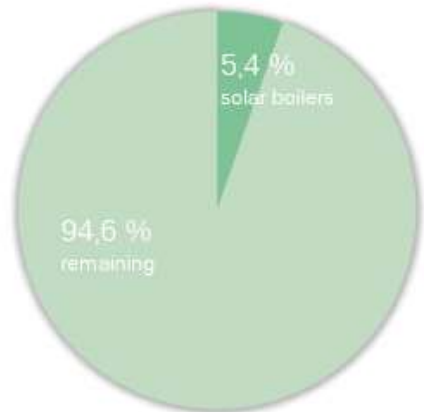
1. percentages of electricity use



1. PET during night-time
> before design intervention

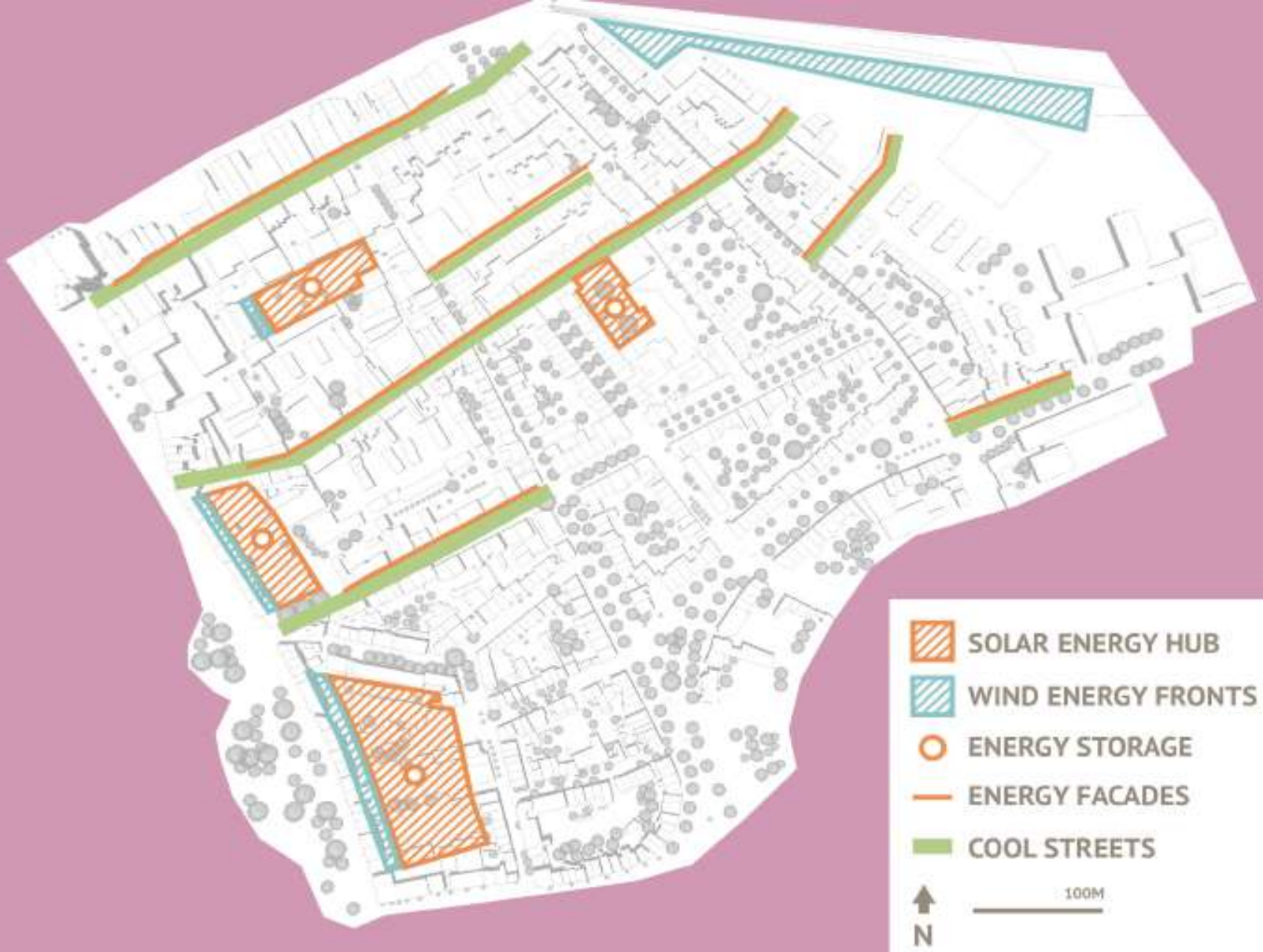


2. PET during night-time
> after design intervention

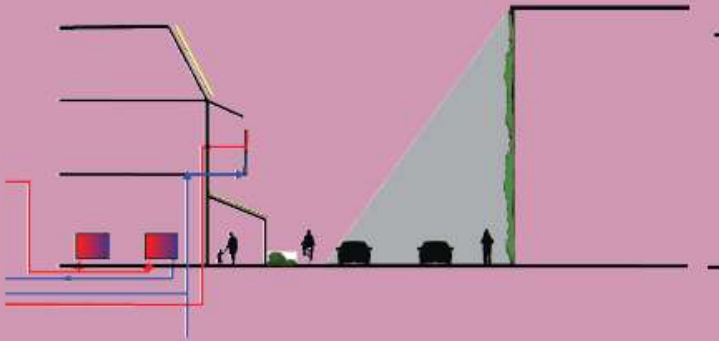


2. percentage of gas use

'Crystalhood'



MORE THERMAL COMFORT IN THE STREET



- GREEN WALLS
- SOLAR BOILERS
- BIOSWALES
- SEMIPERMEABLE SURFACE
- MORE SPACE FOR WALKING & CYCLING

THE HUB



- SOLAR ENERGY ROOFS
- WIND TURBINES
- PARKING
- SOCIAL ACTIVITIES
- GREEN PUBLIC SPACE
- OFFICE SPACES

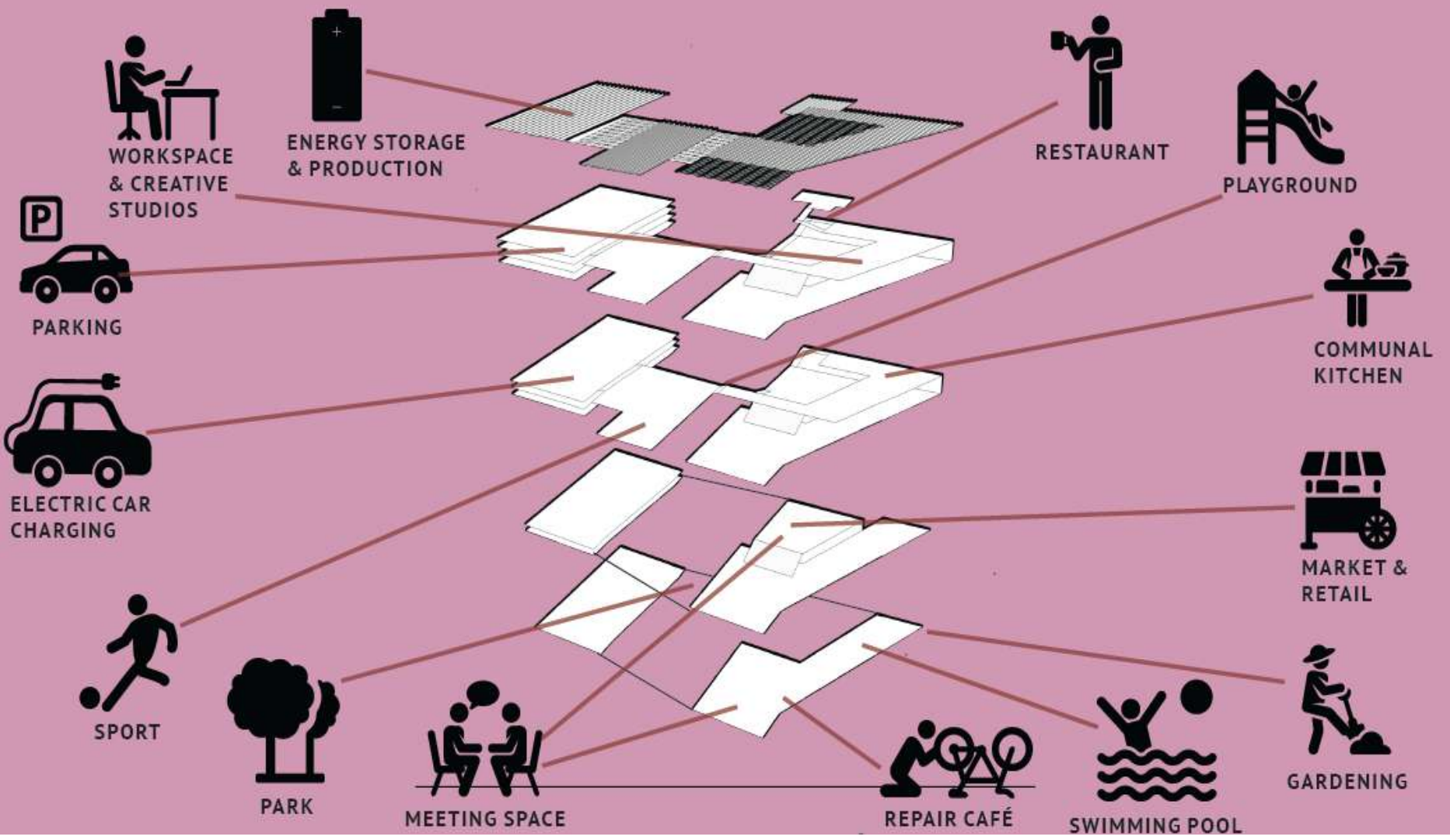
'Crystalhood'



'Crystalhood'



THE CRYSTALHOOD: WHAT'S UNDER THE HOOD?



'Crystalhood'



VANDAAG
1 P.V. FRIET
Vindt Amos kort
Mantelstuk met een
6,50 7,80
4,30 vindt 18,00

'Crystalhood'

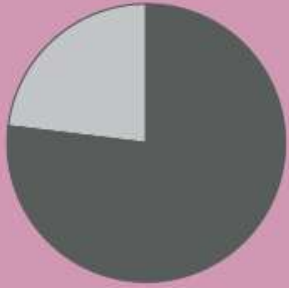


'Crystalhood'



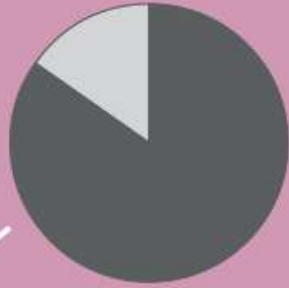
WIND

30% of total energy



PV-PANELS

15% of total energy



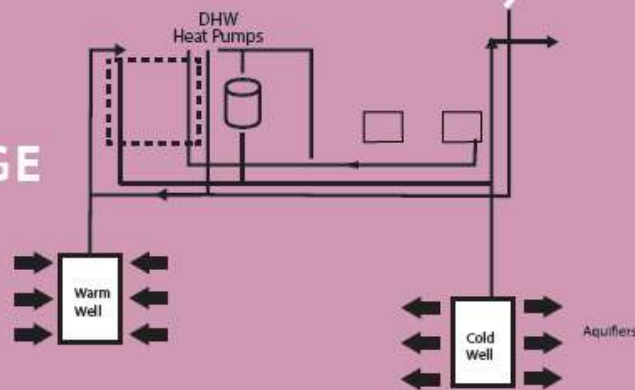
SOLAR BOILERS

5% of total energy



BATTERY

HOT/COLD
AQUIFER STORAGE



- Integrate the knowledge of different disciplines together in design of future cities
- Design is needed to make people aware
- Design can induce changes in attitude and foster action

...Again, remember our call for abstracts