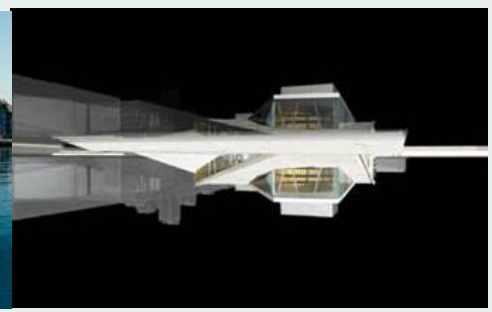
The ECO-Culture project

Jens Ole Hansen

Project Coordinator

COWI A/S





EU 6th Framework Programme

ECO-Culture: Demonstration and dissemination of ECO-concepts for high-performing European cultural buildings

The Opera House, Oslo

The Royal Danish Playhouse Theatre, Copenhagen

The Library etc., Amsterdam

ECO-Culture Partners

- COWI A/S (coordinator)
- The Royal Danish Theatre
- Ecofys bv
- City of Amsterdam
- Erichsen & Horgen AS
- Statsbygg

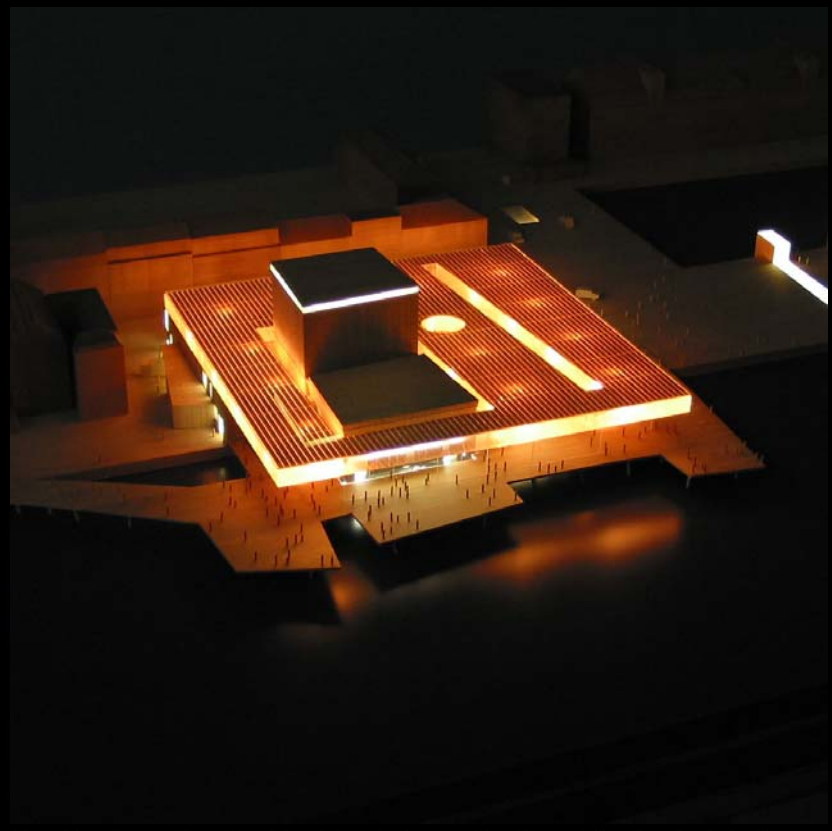
Design methodology of “Energy Concepts”

Personal statement

“The energy performance of a building is determined when the architect has concluded his first draft”

ECO-Culture overall energy objectives

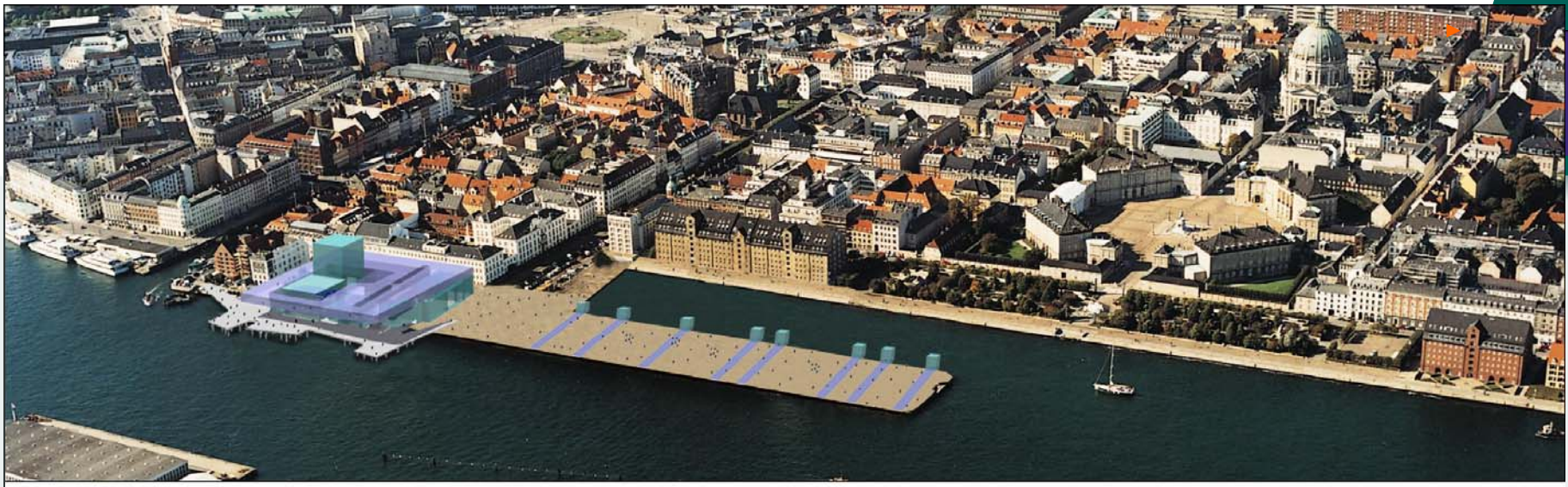
- To reduce the cooling energy consumption and CO2 emission by 75-80%
- To reduce the heat consumption and related CO2 emission by 35-50%
- To reduce the energy for ventilation and related CO2 emission by 35-50%
- To use renewable energy sources:
  - sea water
  - ground water
  - solar energy
- To use intelligent control for maximised utilisation of the used technologies

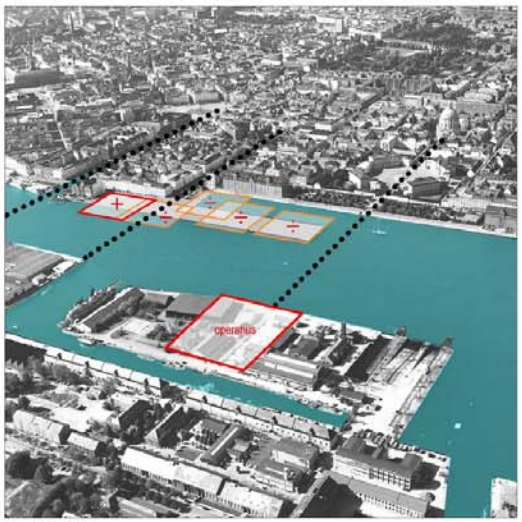


DET KONGELIGE TEATER

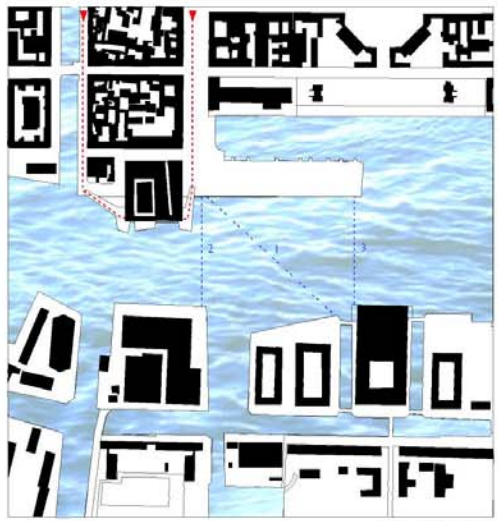
NYT SKUESPILHUS PÅ KVÆSTHUSBROEN

LUNDGAARD & TRANBERG APS





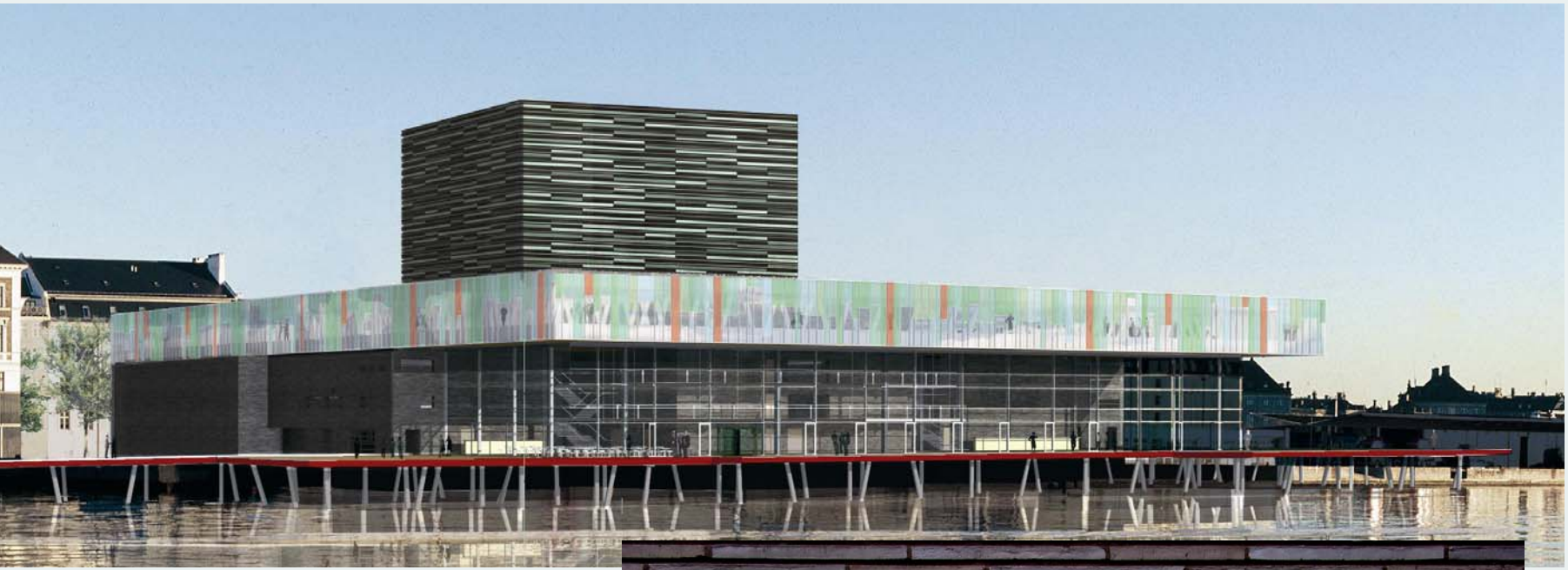
PLACERING



CIRKULATION

HOVEDIDÉ:

LUNDGAARD & LENE TRANBERG ApS

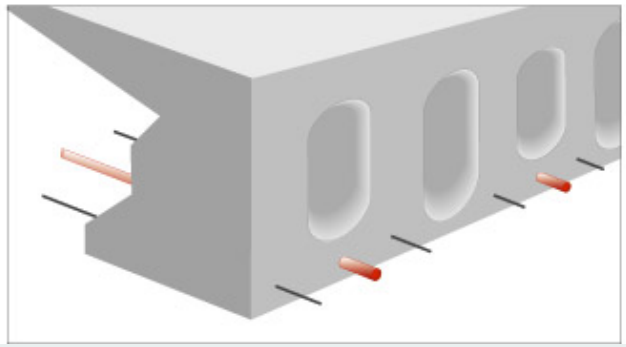



tagetage
tt-dæk
kantine
12
SKUESPILHUS PÅ KVÆSTHUSBROEN
LUNDGAARD & TRANBERG ARKITEKTFIRMA A/S
Udbudsprojekt
Hovedprojekt
Sag nr.: 354
Originalformat A3
Dato: 2004.03.26
Rev. dato:
Init./Godk./Kontr.:
MAH / HS
Emne: Interørperspektiv af kantine
Tegning nr./Rev.: A-6.411

ECO-Culture energy saving measures

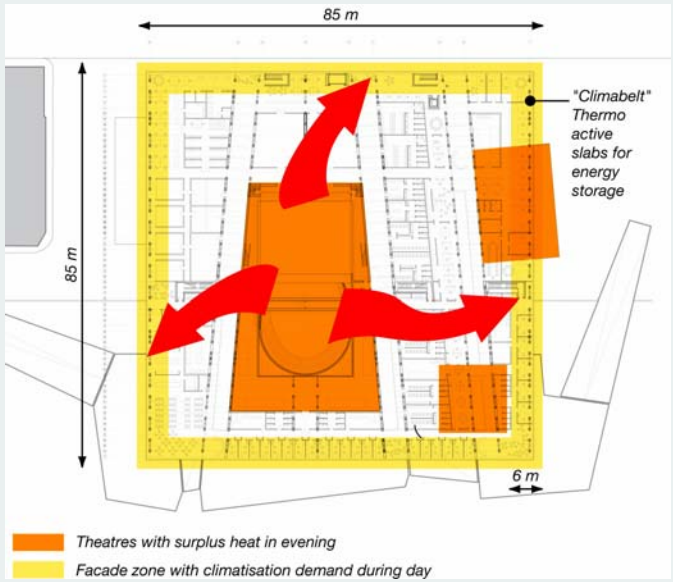
- TABS: Thermo-active building systems -concrete slabs for energy storage
- Seawater heating and cooling
- Ventilation
- BeMS (Building energy Management System)

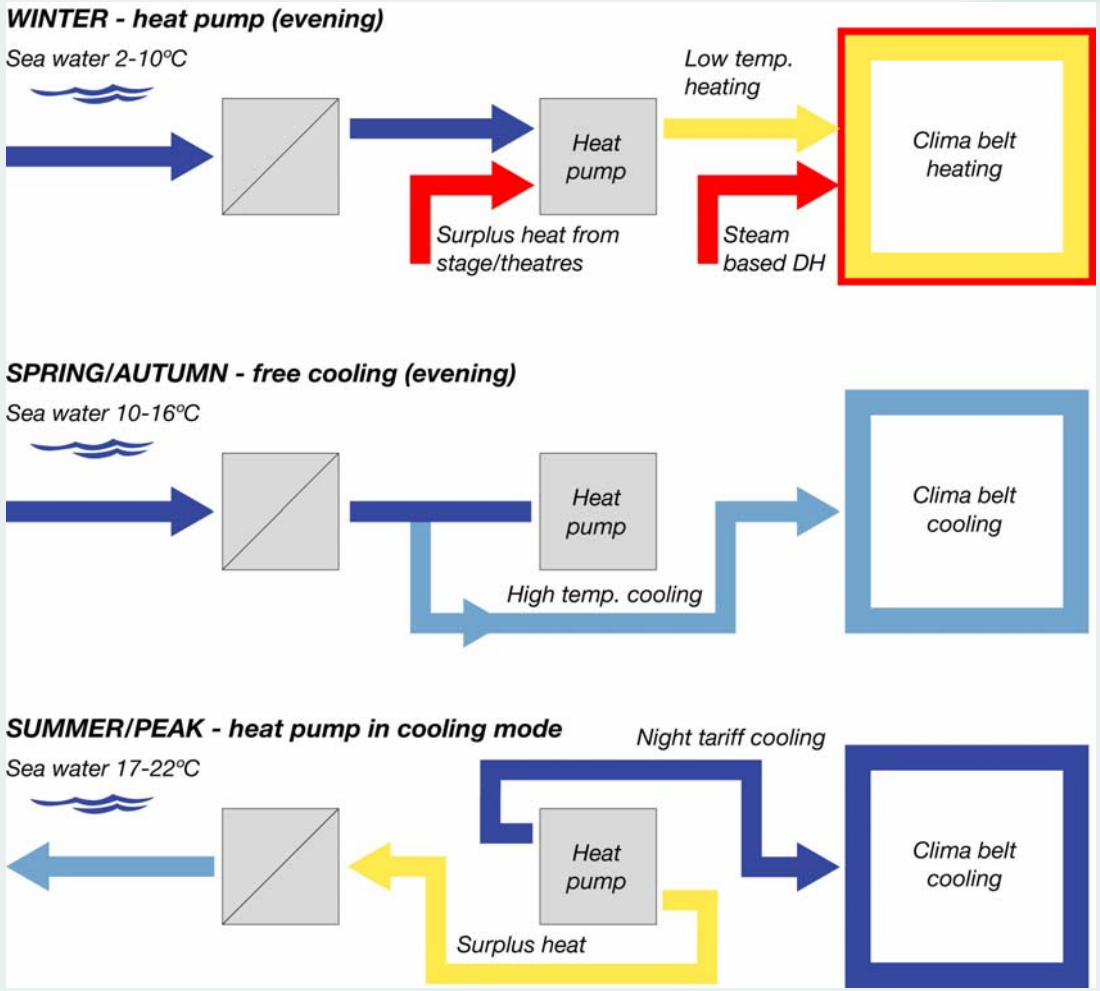
TABS - Thermo active building systems



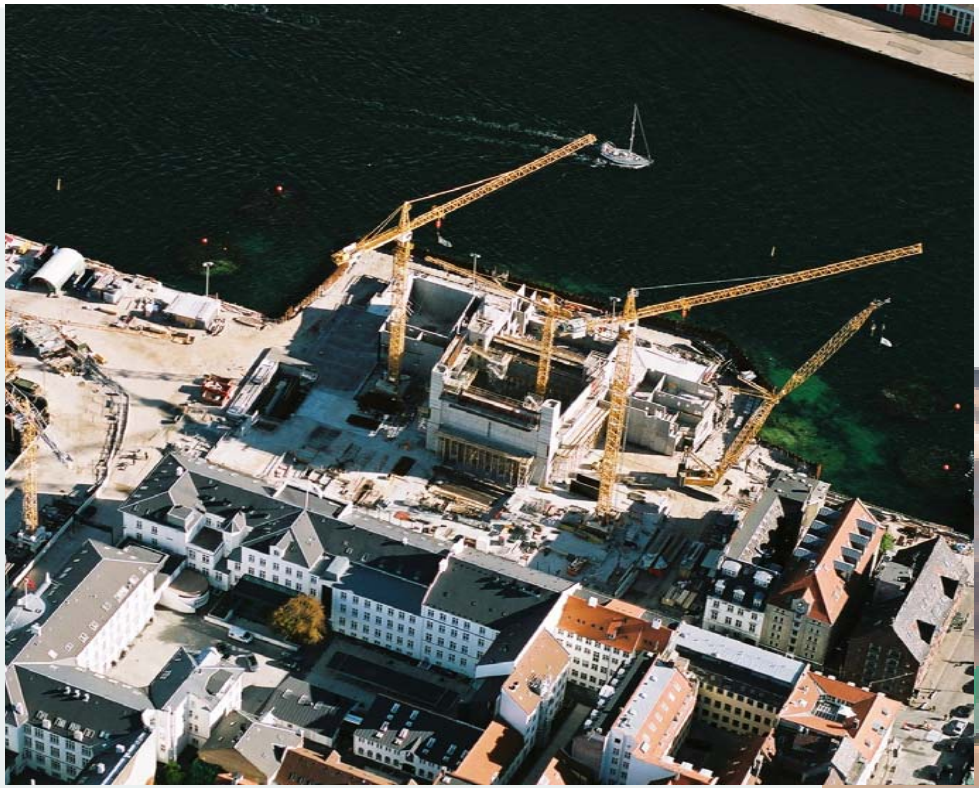
- Tubes embedded in the concrete
- Low-temperature heating, 25-35°C
- High-temperature cooling, 16-20°C
- Easy use of renewables
- Energy storage

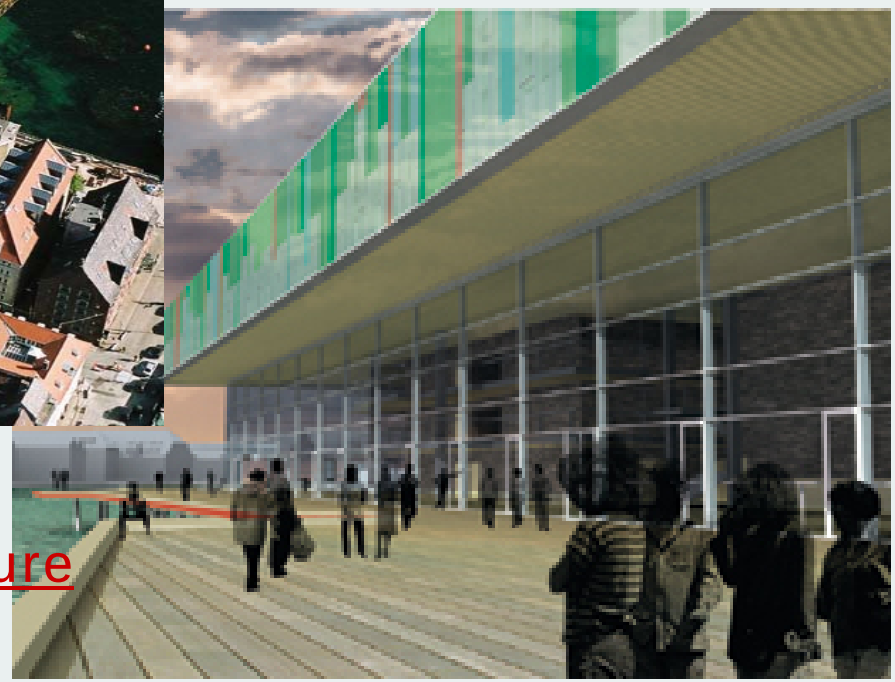
Seawater heating/cooling using heat pump





Opening in 2008





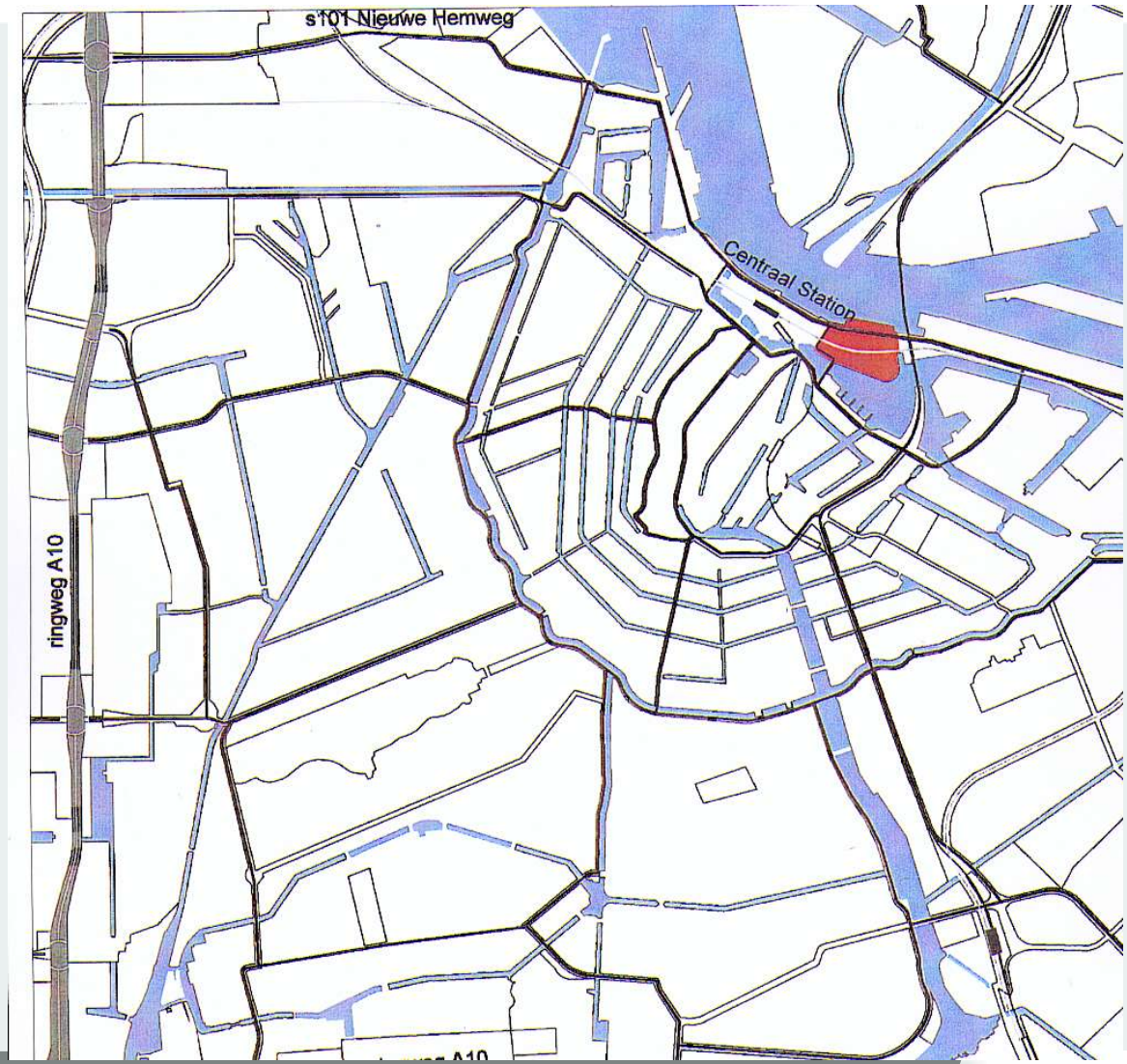
www.skuespilhus.dk

www.cowiprojects.com/ecoculture

www.ecobuildings.info

Amsterdam Central Public Library, The Netherlands

Oosterdokseiland

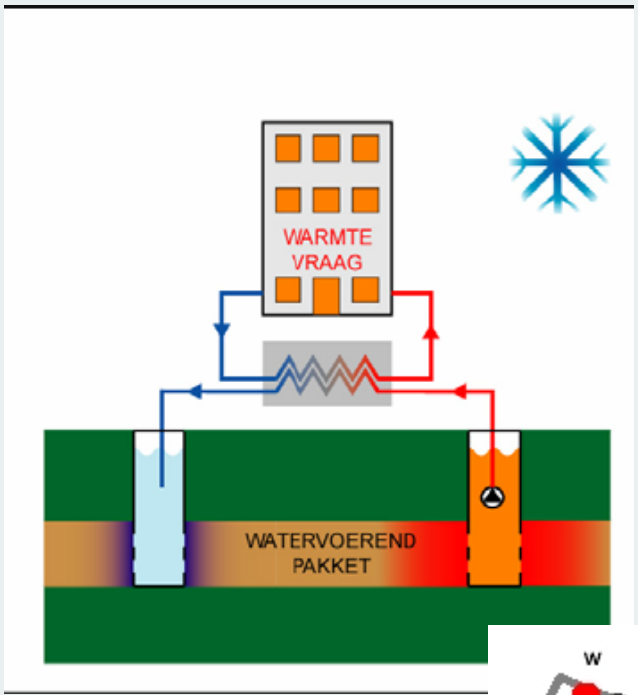


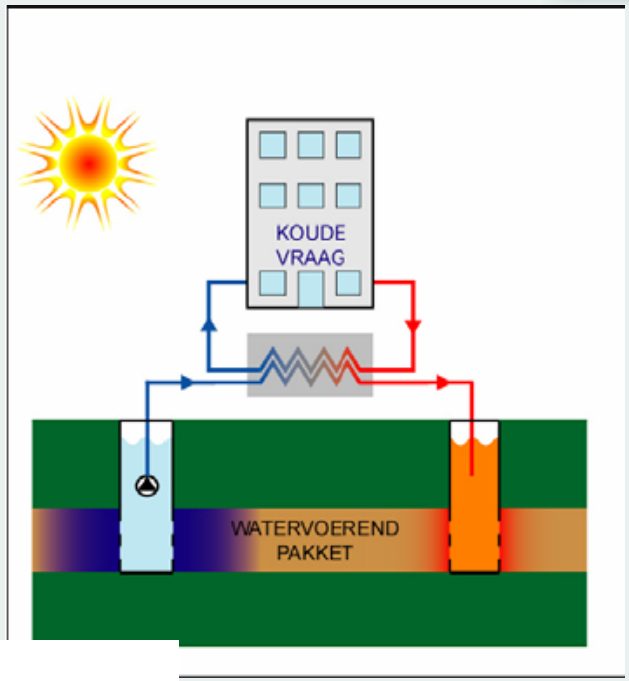
eco buildings

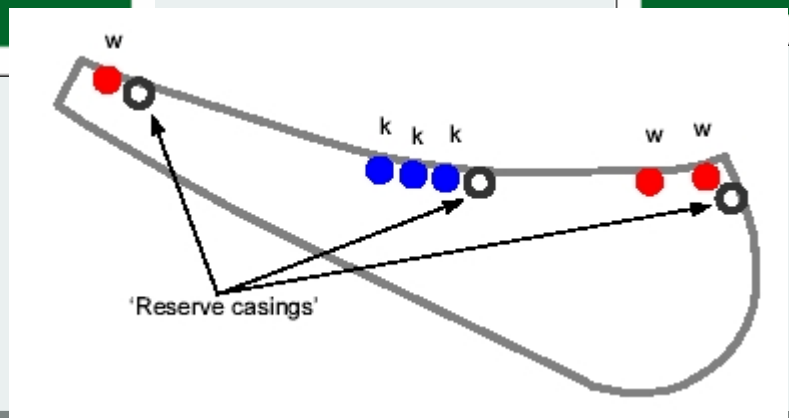
Demonstration technologies

- Energy storage with aquifers for heating and cooling;
- Advanced ventilation system;
- Building Energy Management System;
- Low-energy lighting, 11 Watt/ m^2
- Solar facade and roof

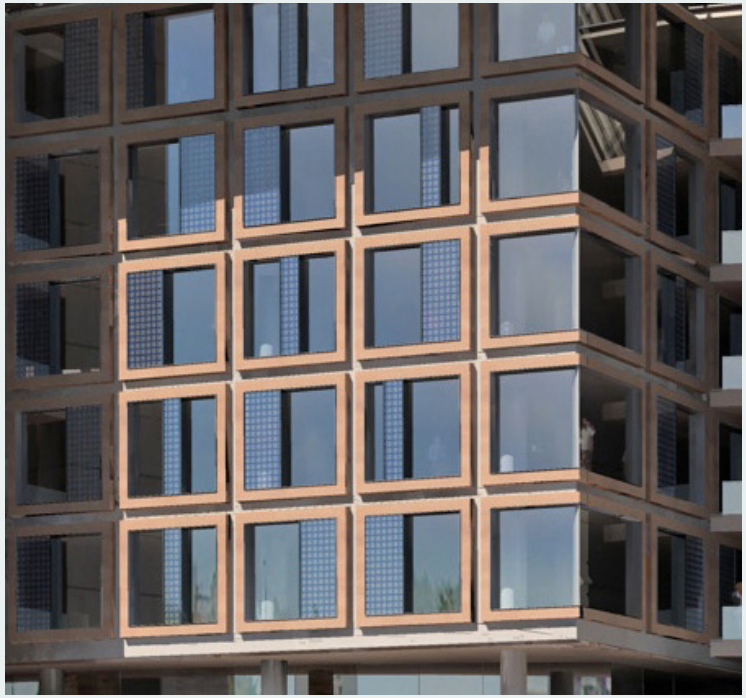
Energy storage with aquifers for heating and cooling





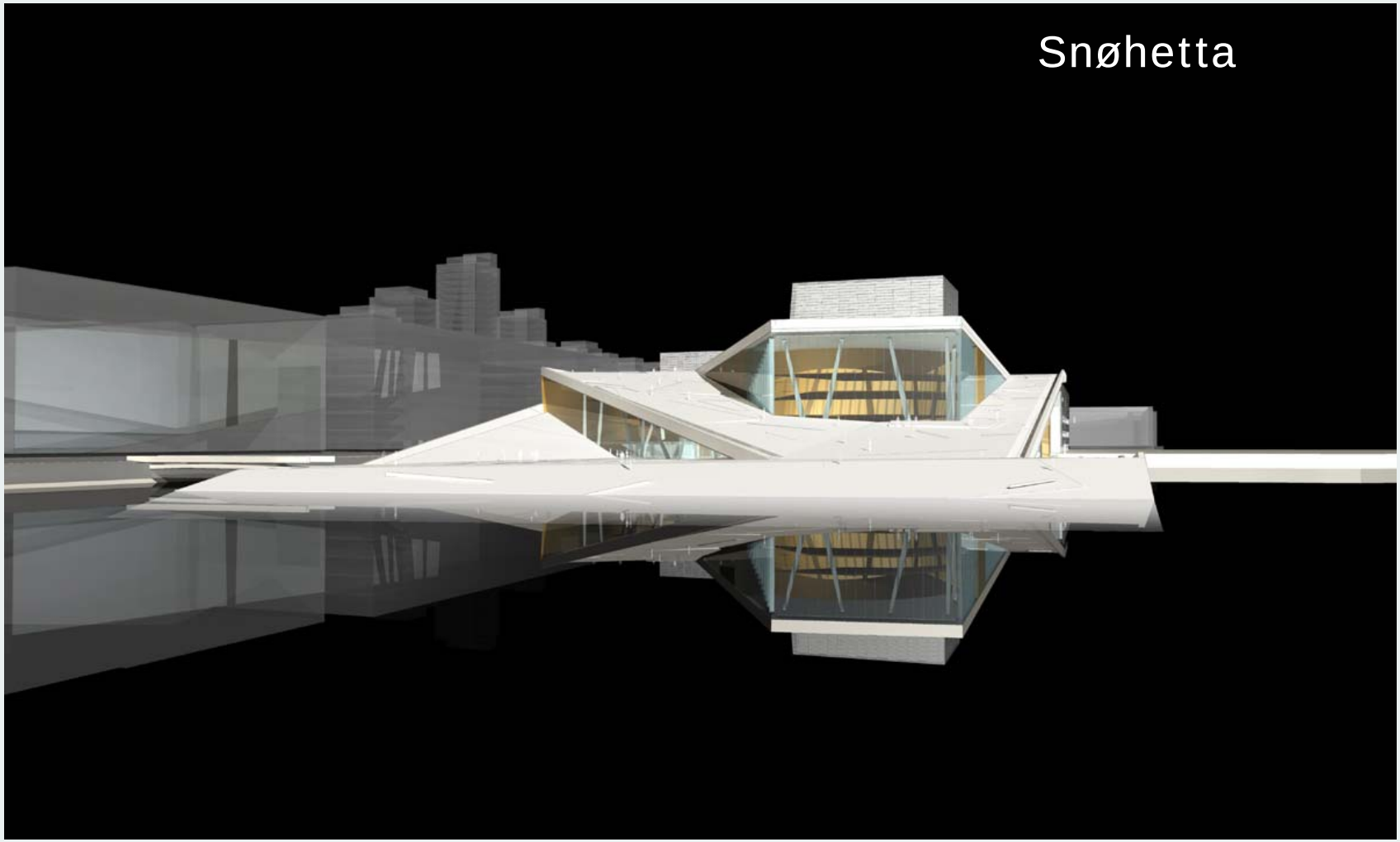


PV facade



Opening in 2007

Opera House, Oslo



Flyfoto over Bjørvika

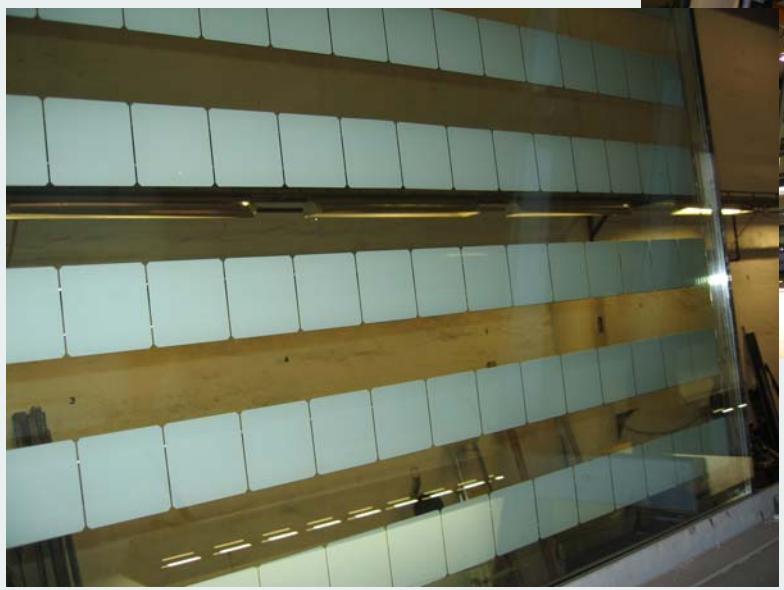
STATSBYGG

Controlled & Energy efficient distribution of ventilation, including humidity control:

- Demand controlled ventilation
- Energy-effective distribution air and water systems
- Demand controlled humidification

A south façade with solar cells :

- Solar cells as a part of the shading of the south facade



Opening in 2008

- www.statsbygg.no/opera