Learning Objectives

Urban Management & Development in Copenhagen
Carbon Neutrality: Cambridge Energy Master Plan
Green Mobility
Living with Water
Community Engagement in Development

1. Gain an understanding of planning in Denmark and Germany from a historical & technical perspective.
2. Explore the energy mix in Denmark & how Energy Master Planning is being implemented locally.
3. Take away ideas & inspiration for development, design & planning adapted to climate & sea level rise.
FINGER PLAN
CITY OF COPENHAGEN – THREE CASES

Water

Energy

Mobility
CASE 1: CLOUDBURST MANAGEMENT

Main priority:
Lead rainwater away from streets and basements across the city
Seven water catchments developed with consultants, experts and local committees
AN EXAMPLE:
SANKT JØRGENS LAKE
CASE 2: ENERGY- COPENHAGEN CO2 NEUTRAL BY 2015
SOME PROGRESS HAS BEEN MADE ALREADY BUT WE EXPECT MUCH MORE

GDP, energy consumption and CO2 emissions in Denmark 1990-2013

Source: Statistics Denmark and the Danish Energy Agency
TRANSFORMATION OF THE ENERGY SYSTEM

Electric power infrastructure 1985
- Centralized CHP
- Decentralized CHP
- Wind turbine
- Interconnector (AC)
- Interconnector (DC)

Only CHP plants with capacity over 0.5 MW are shown.

Electric power infrastructure 2009
- Centralized CHP
- Decentralized CHP
- Wind turbine
- Offshore wind turbine
- Interconnector (AC)
- Interconnector (DC)

Only CHP plants with capacity over 0.5 MW are shown.
COPENHAGEN DISTRICT HEATING SYSTEM

Challenge
Utilisation of all available heat sources in the Copenhagen region in the most efficient way

What we did
Main consultant for more than 30 years
Planning, design, implementation, optimisation

Effect
One of the largest city-wide district heating systems in the world
Supplies low-carbon heat to one million people
THE HIDDEN BACKBONE OF THE LIVEABLE CITY

- Surplus biomass for CHP plant
- Surplus straw for CHP plant
- Offshore wind farm
- Large building
- Residential building
- Harbour, unloading of biomass
- Wastewater treatment and biogas plant
- Solar heating plant and heat storage
- Distant building w/solar PV
- Outskirt building w/heat pump, solar PV and wind turbine
- CHP plant fuelled by gas, straw, wood, city waste + heat storage
- District heating/cooling plant + cold water storage
- Electricity
- District heating
- District cooling
CASE 3: MOBILITY
SUPER CYCLE HIGHWAYS
URBAN MANAGEMENT DEMANDS POLITICAL COURAGE, LONG-TERM PLANNING AND CLEAR PRIORITIES

- Clear goals, general strategies and financing
- Public-private collaboration
- Co-creation with citizens
- Integrated approach to enhance results