

# FORD SITE ENERGY STUDY TAG MEETING SEPTEMBER 2014



# AGENDA

- 1. Background & Experiences**
- 2. Work program**
- 3. Findings**
- 4. Questions?**

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- 1. BACKGROUND & EXPERIENCES**
2. WORK PROGRAM
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**RAMBOLL**



**RAMBOLL**

## RAMBOLL IN BRIEF

- Independent engineering and design consultancy and provider of management consultancy
- Founded 1945 in Denmark
- 10,000 experts
- 200 offices in 21 countries
- Significant presence in Northern Europe, India and the Middle East
- EUR 1 billion revenue
- Owned by Ramboll Foundation

- Services across the markets:
  - Buildings
  - Transport
  - Environment
  - Energy
  - Oil & Gas
  - Management Consulting

# ENERGY



- Among top 10 energy consultancies in Europe
- 45 years of experience in planning, design and implementation of energy solutions
- Expertise on full spectrum of technologies
- Expertise ranging from production over transmission to distribution
- Special competencies: Offshore wind, waste-to-energy, power and district heating

- Revenue (m€): 100
- FTEE (2013): 700
- Sector focus:
  - Wind energy
  - Waste-to-energy
  - Thermal power
  - District energy
  - Power transmission
  - Asset management
  - Renewable energy
  - Energy strategy

# SPECIAL COMPETENCIES

Offshore wind



Waste-to-energy



Thermal power



District heating



Within these four areas, we provide a one-stop shop of services based on unique know-how and experience gained from a large number of projects, unmatched by other consultancies

# Technical Advisory Group Presentation

2014-09-05



# Company History



Krifcon Engineering P.C. is a boutique consulting engineering firm founded in 2010 by Flemming J. Kristensen.

Krifcon is based out of New York City, but works globally.

Projects are located in:

- USA
- Canada
- Denmark
- Germany
- Japan

# Expertise

- Client/Owner's Representation
- Engineering management
- Project management
- Design management
- Sustainability and Energy efficiency
- Resource conservation
- Energy optimization of buildings and systems
- Indoor Environmental Quality
- Peer Review/Audits.

**COPENHAGEN** - CARBON NEUTRAL BY 2025  
- EUROPEAN GREEN CAPITAL 2014

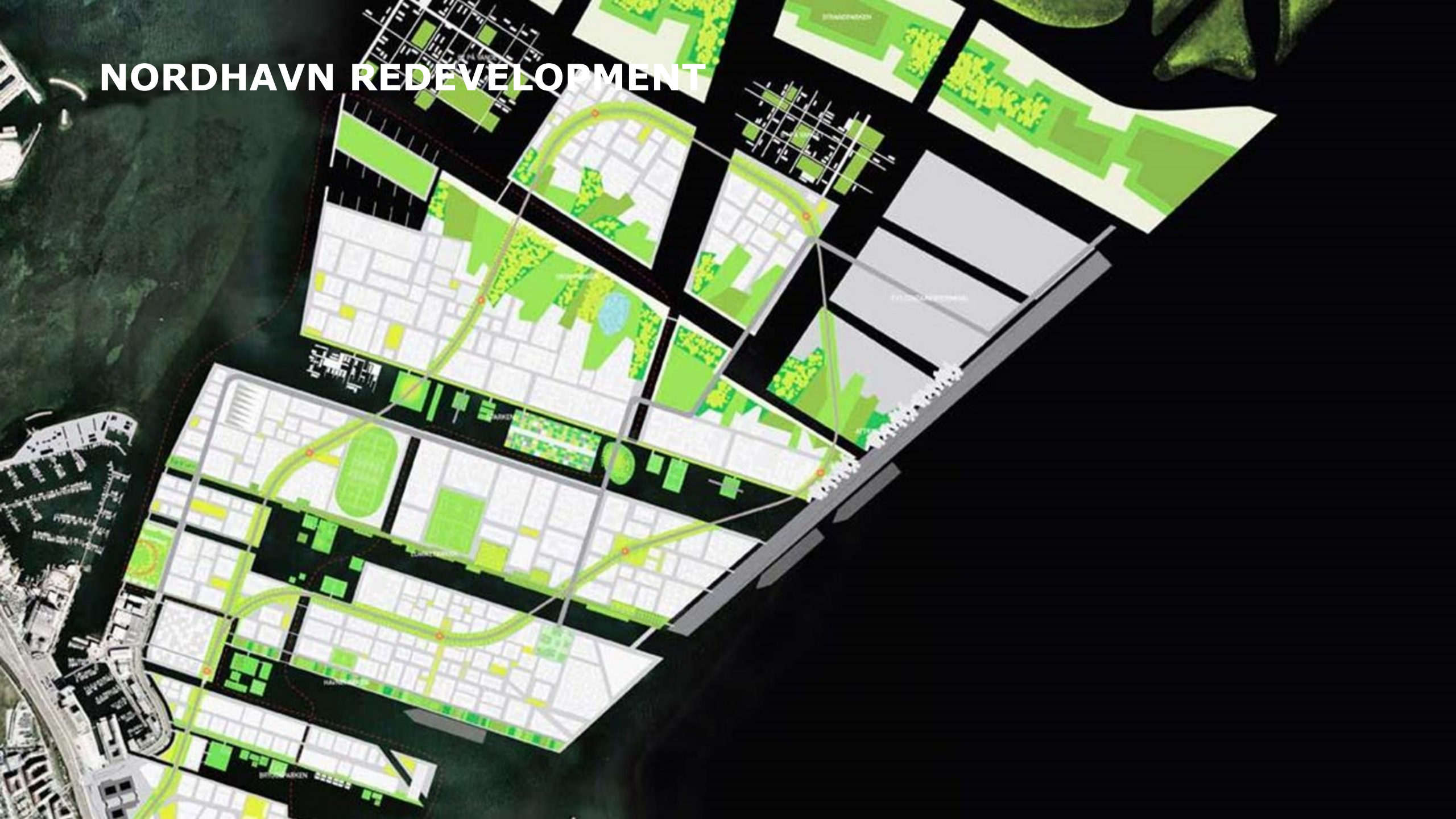


# CARLSBERG CITY



Rendering: luxigon

# NORDHAVN REDEVELOPMENT



# ENERGY PLANNING LONDON



Rendering: luxigon

# CHICAGO LAKESIDE DEVELOPMENT

An aerial rendering of the Chicago Lakeside Development project. The image shows a dense urban area with modern buildings, green spaces, and a large marina with many sailboats along the lakefront. The development is situated on a peninsula or a large island, with a road and a bridge connecting it to the mainland. The water is dark blue, and the sky is a deep blue. The overall scene is a vision of a vibrant, modern community.

Centered around a design for living differently. Lakeside's vision for the nearly 600-acre site includes plans for a connected and accessible community, next generation infrastructure, innovative architecture and lakefront access, all surrounded by a vibrant mix of residential, retail and commercial space, a new high school and a 1,500 slip marina.

# I. THE (MAIN) TEAM



Pernille M Overbye  
PMO



Flemming J Kristensen  
Krifcon



Jakob Bjerregaard  
JAKB



John Flørning  
JNF



Søren V. Knudsen  
SORK



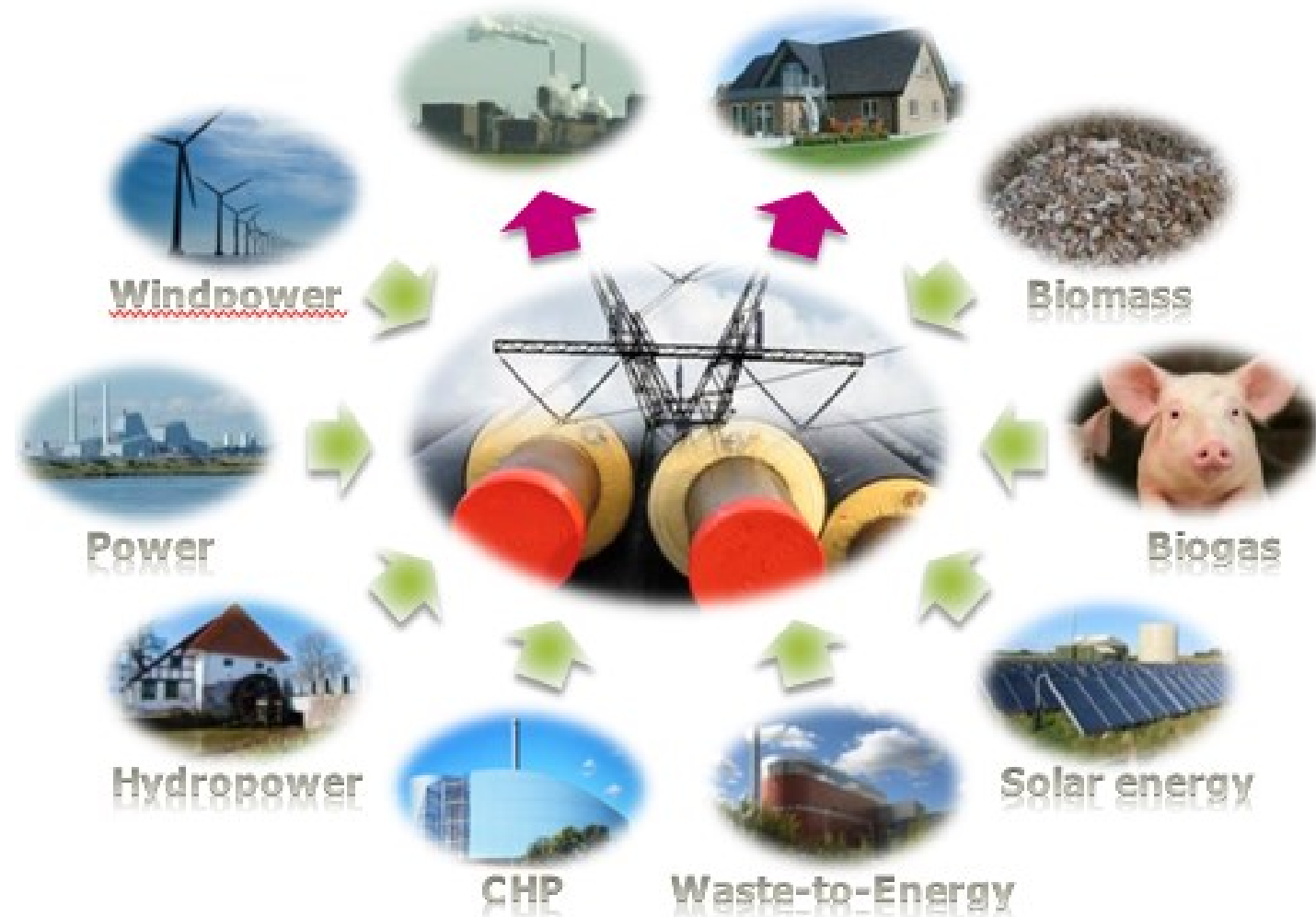
Anthony Riddle  
ANRID



Patrick D Thomsen  
PDT



## VII. INTEREST IN PROJECT



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# WORK PROGRAM

	2014			2015					
Item	July	August	September	October	November	December	January	February	March
Energy Design Concept	[Green bar spanning July 2014 to February 2015]								
Site specific conditions	[Green bar spanning July and August 2014]								
Best practice in car use alternatives			[Green bar spanning September and October 2014]						
Best practice in buildings			[Green bar spanning September and October 2014]						
Opportunities in energy design			[Green bar spanning September, October, and November 2014]						
Available technologies and DE design		[Green bar spanning August and September 2014]							
Energy mix, storage and pricing		[Green bar spanning August, September, and October 2014]							
Design concept					[Green bar spanning October 2014 to March 2015]				

# WORK PROGRAM

	2014						2015		
Item	July	August	September	October	November	December	January	February	March
<b>Project reviews</b>									
Status meetings	◆	◆	◆	◆	◆	◆	◆ ◆		
TAG meetings			◆		◆		◆		
Public meeting					◆				
Developer and builders' panel meeting							◆		
<b>Final report</b>								◆	
<b>Final presentation</b>									◆

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# THE SITE



## BROWNFIELD



# THE STEAM PLANT




















# THE STEAM DUCT





# SMART ENERGY SYSTEM



-  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
-  Industry with process energy and surplus heat
-  Electricity
-  District heating
-  District cooling
-  Gas

# MEANS AND GOALS

## POSSIBLE MEANS

- Design standards
- Micro grid
- Onsite production
- District energy
- Solar energy
- Storage
- Electrification

## GOALS

- Inspirational project
- Competitiveness
- Security of supply
- Sustainability
- Energy efficiency

# RES PRODUCTION TECHNOLOGIES

Technology	Biomass CHP	Heat pumps	Solar thermal	Solar PV	Wind turbines (off shore)	Hydro power
Environmental Sustainability	If residual wood can be found locally	Good, but dependent on the power mix	100%	100%	100%	100% but no new capacity
Competitiveness	High cost with size of site demand	Dependent on power prices	Good if centralised and w. storage	Distributed = high unit cost	Good (if large scale)	Good
Security of supply	Adds to security of supply	Balances power system	Only supplemental	Only supplemental	None	Positive
Other	Supply chain?	Access to power markets?		Too much PV	Off-site production	Potential green-washing

# CONVENTIONAL PRODUCTION TECHNOLOGIES

Technology	Gas CHP	Electrical boiler	Compression cooling	Gas boiler
Environmental Sustainability	Clean fuel	Dependent on the power source	Dependent on the power source	Clean fuel
Competitiveness	OK	Good for peak	Good	Good
Security of supply	Dependent on gas supply	None	None	Dependent on gas supply
Other				

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