

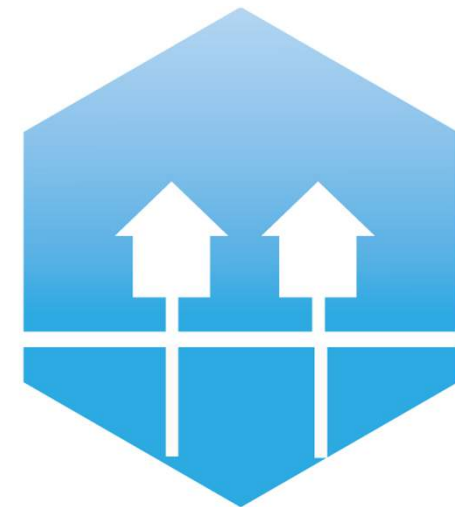
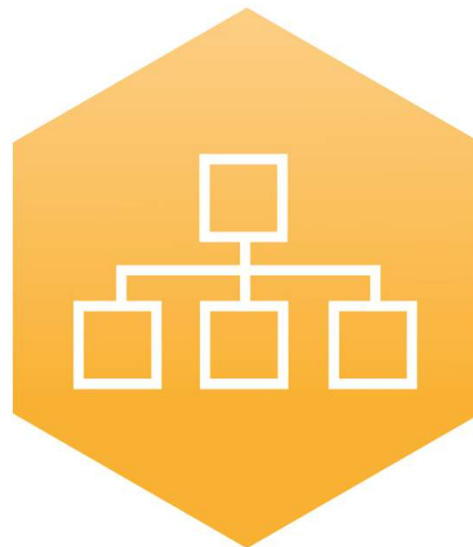
International Conference on Smart Energy Systems and 4th Generation District Heating  
Copenhagen, 25-26 August 2015

# DISTRICT HEATING

AN IMPORTANT KEY TOWARDS A GREEN FUTURE AND A NEW EXPORT ADVENTURE

**ANDERS ELDRUP**

*CHAIRMAN OF THE BOARD  
GRØN ENERGI*



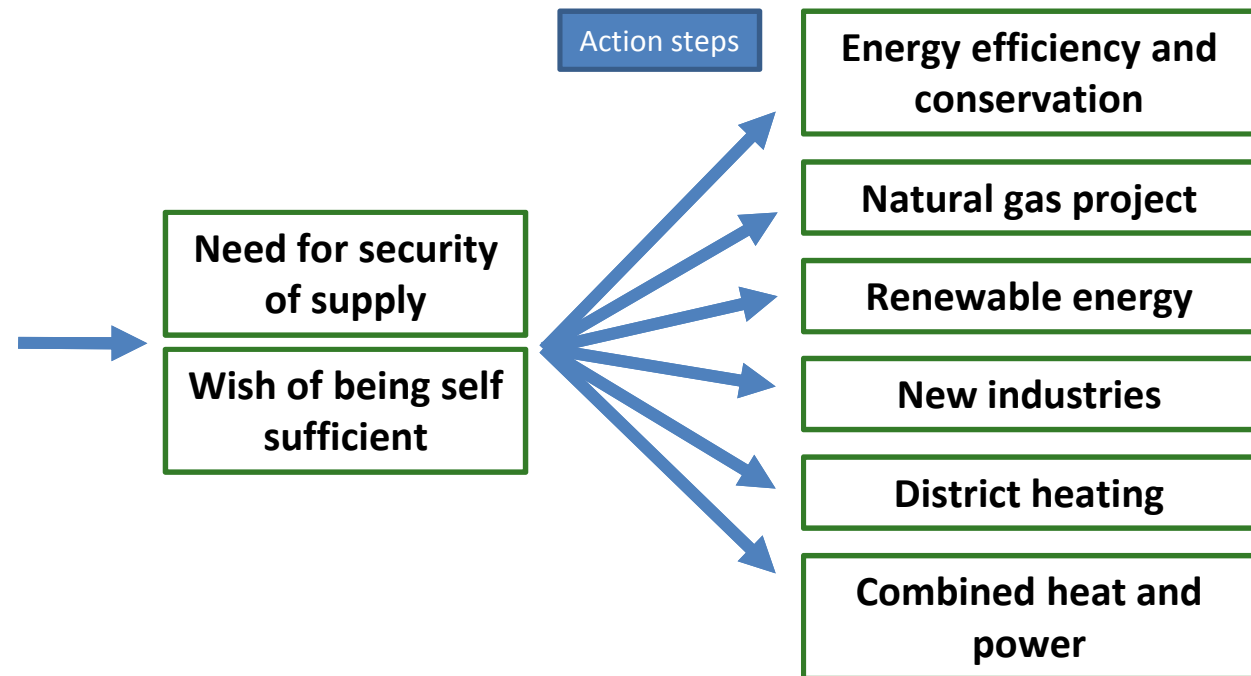
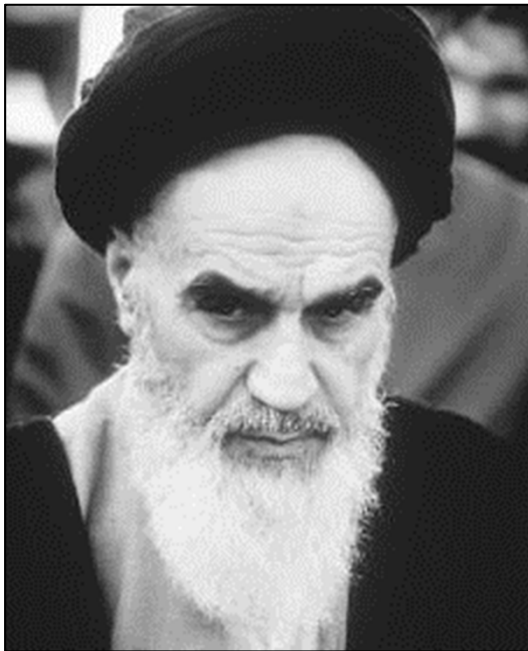
**AALBORG UNIVERSITY**  
DENMARK



# THE STORY OF DISTRICT HEATING IN DENMARK



Energy crises 1973 and 1978



**AALBORG UNIVERSITY**  
DENMARK

International Conference on Smart Energy Systems and  
4th Generation District Heating, Copenhagen, 25-26 August 2015

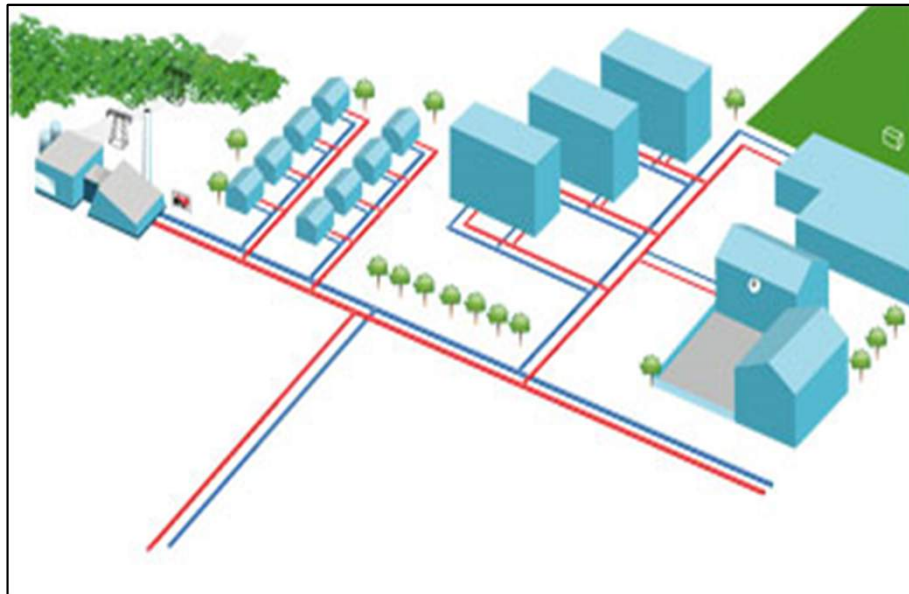


# DISTRICT HEATING IN DENMARK – A BIG SUCCESS LIKE WIND



**2015**

64 % of households receives district heating



**2020**

~ 70 % of households receives district heating



**AALBORG UNIVERSITY**  
DENMARK

**2015**

40 % of electricity consumption from wind power



**2020**

~ 50 % of electricity consumption from wind power

International Conference on Smart Energy Systems and  
4th Generation District Heating, Copenhagen, 25-26 August 2015



# THERE ARE STILL SOME MAJOR CHALLENGES



**DK is no longer self-sufficient + major need for import in the EU**



**Incoherence between power production and heat consumption**



**Little export of district heating solutions**



**AALBORG UNIVERSITY**  
DENMARK

International Conference on Smart Energy Systems and  
4th Generation District Heating, Copenhagen, 25-26 August 2015



# THE EU ENERGY UNION – A MOVE AWAY FROM FOSSIL FUELS



Today

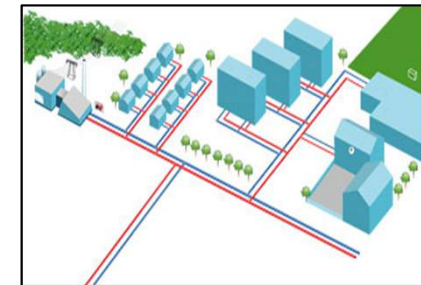


EU Energy Union



Less dependency on imported energy  
More focus on renewable energy, energy efficiency,  
energy savings, efficient markets...

Tomorrow



**AALBORG UNIVERSITY**  
DENMARK

International Conference on Smart Energy Systems and  
4th Generation District Heating, Copenhagen, 25-26 August 2015





# DISTRICT HEATING CAN PROVIDE THE SOLUTIONS



**Storages**



**Combined heat  
and power**

**Electric boilers**



**Heat pumps**



**AALBORG UNIVERSITY**  
DENMARK

International Conference on Smart Energy Systems and  
4th Generation District Heating, Copenhagen, 25-26 August 2015



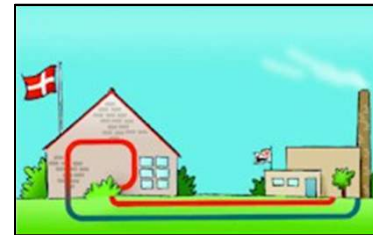
# DENMARK AS A MODEL FOR A COHERENT ENERGY SYSTEM



Denmark is first mover



High share of  
renewable energy



High share of district  
heating



Energy efficient  
buildings



**AALBORG UNIVERSITY**  
DENMARK

International Conference on Smart Energy Systems and  
4th Generation District Heating, Copenhagen, 25-26 August 2015



# STORAGE CAPACITY IN DANISH DISTRICT HEATING - 65 GWH

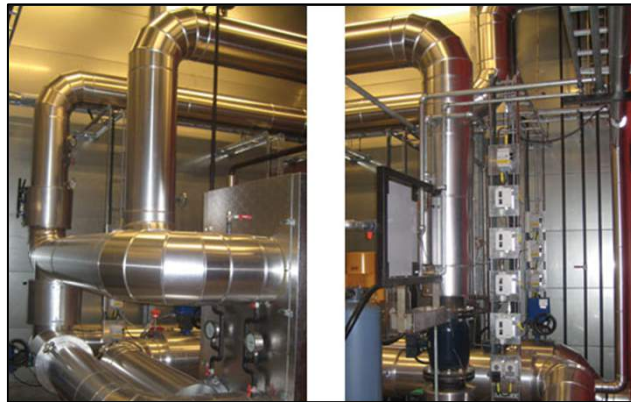


**Wind power**

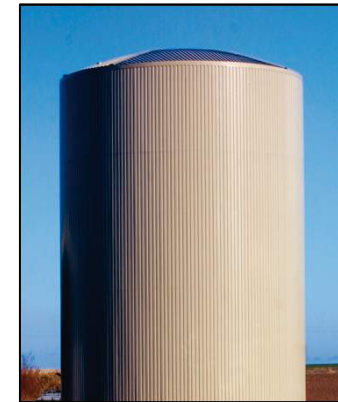


Installed capacity: 4.800 MW

**Electric boilers/heat pumps**



**Thermal storages**



Total storage capacity: 65 GWh



**~ 13 hours of full load operation to fill storage**

**~ storage capacity of 1.000.000 electric vehicles**



**AALBORG UNIVERSITY**  
DENMARK

International Conference on Smart Energy Systems and  
4th Generation District Heating, Copenhagen, 25-26 August 2015





# EXPORT OF COMPONENTS → EXPORT OF SYSTEMS



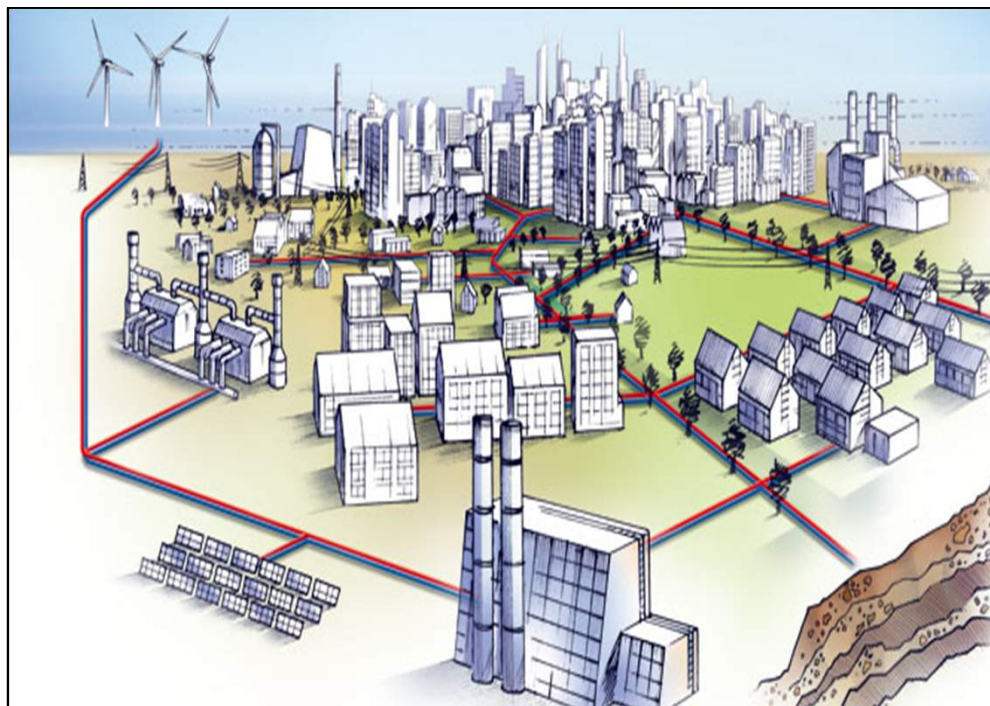
## Today

Sale of components



## Tomorrow

Sale of district heating systems

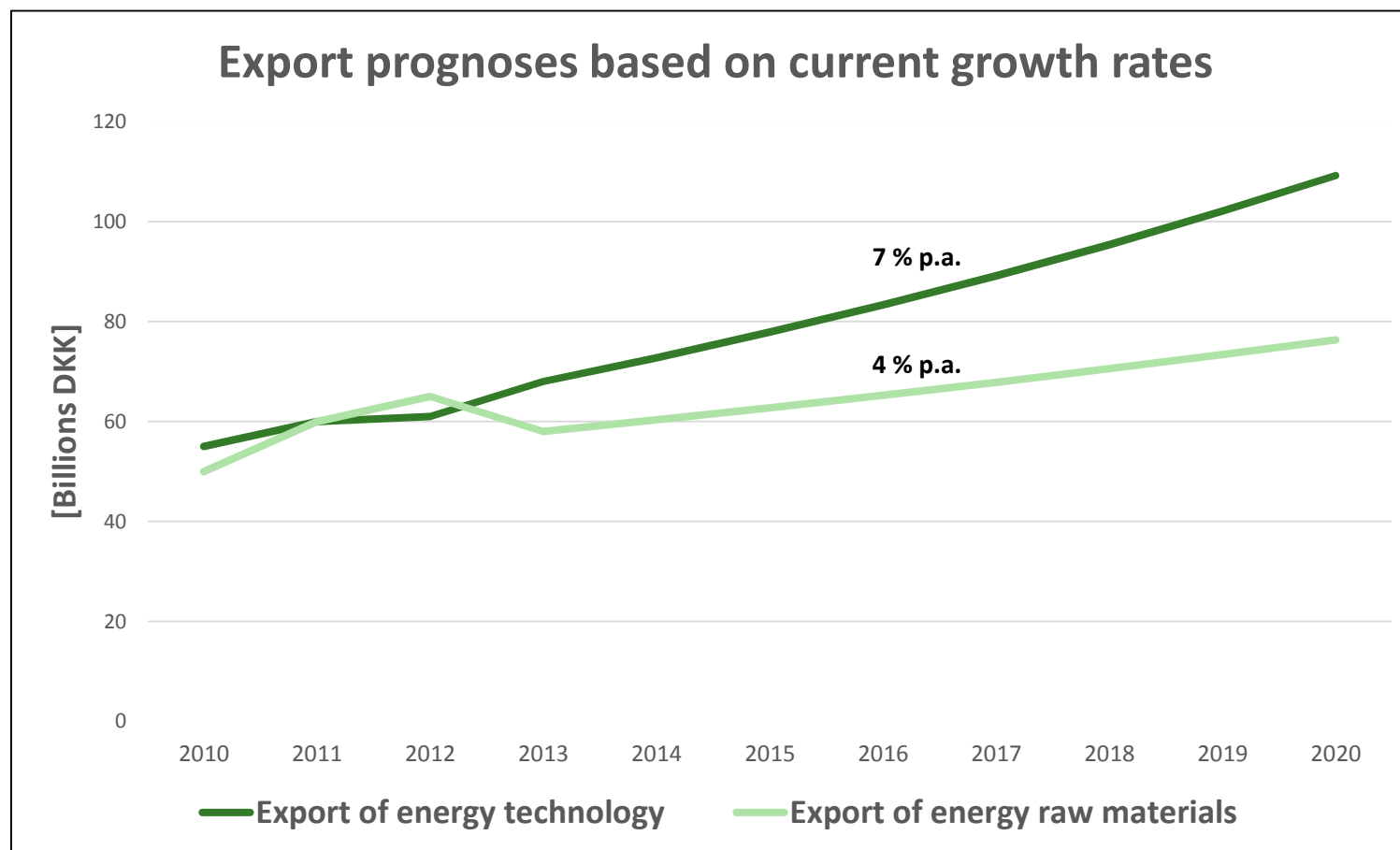


**AALBORG UNIVERSITY**  
DENMARK

International Conference on Smart Energy Systems and  
4th Generation District Heating, Copenhagen, 25-26 August 2015



# GREAT EXPORT OPPORTUNITIES



**AALBORG UNIVERSITY**  
DENMARK

International Conference on Smart Energy Systems and  
4th Generation District Heating, Copenhagen, 25-26 August 2015



GRØNER ENERGI

# HOW TO GET THERE



<b>1. Handling of authorities and politicians</b>	District heating needs to be on the political agenda
<b>2. Project development</b>	Need for risk capital for project development
<b>3. Planning and system design</b>	Need for companies to finance the planning and design
<b>4. Hardware and system delivery</b>	Need for companies with experiences in contracting
<b>5. Operation and maintenance</b>	Need for partners in ESCO-projects
<b>6. Financing</b>	Need for access to risk capital
<b>7. Ownership</b>	Need for project owners



# QUESTIONS?



**AALBORG UNIVERSITY**  
DENMARK

International Conference on Smart Energy Systems and  
4th Generation District Heating, Copenhagen, 25-26 August 2015

