

**3-DAY COURSE WITH SITE VISITS**  
**JUNE 2017, COPENHAGEN DENMARK**  
- your access to world class knowledge and experience



# DISTRICT HEATING, THE CHOICE FOR CITIES OF THE FUTURE

- IN-DEPTH INTRODUCTION



ENERGY AND  
CLIMATE  
ACADEMY

IN  
COOPERATION  
WITH



DBDH



# DISTRICT HEATING, THE CHOICE FOR CITIES OF THE FUTURE - IN-DEPTH INTRODUCTION

3-day course with site visits to the most modern utilities and with internationally experienced lecturers

## Purpose

To give the participants an in-depth introduction to modern District Heating systems, and how to start and implement a project.

## Background

Heating of buildings are the single biggest consumer of energy in the world. In order to improve energy efficiency, District Heating has proven its value for many years. Since the first Danish system was built in 1903 in Copenhagen, the Danish society and Danish companies has gained knowledge and experience in planning, building and operating District Heating systems in all scales.

Today, 63% of all Danish residential homes are connected to District Heating – not only for space heating, but also for domestic hot water.

## The value creation

District Heating systems basically make use of heat produced in central locations and distribute it through pipelines to a large number of end users. Thus, heat that has no or very low value in one place, e.g. industrial surplus heat and heat from electricity production, can be transformed into high

value energy, and used in places where there is a high demand for heat, such as small towns or large urban communities. An example could be supplying heat from an industrial area to several residential areas. By applying District Heating, large scale conversion towards renewable energy for the heating sector can be realized in a cost effective and future-proof way.

## Description

In this course we will focus at the core elements in District Heating, and experienced lecturers from the industry will take the participants through the development of District Heating.

District Heating is a complex and multifaceted system, where various stakeholders, economy and environmental issues play a vital role. The course will address these areas as well as planning, different energy sources, pipe systems, technology and operation of a District Heating plant.

## Site visits

As a part of the courses we will visit various sites and companies, where the participants will meet managers and employees that have their daily work in the District Heating industry.



## Participants

The course is designed for participants from public and private companies, organizations, cities and regions that want a thorough introduction to District Heating.

- Politicians
- Planners
- Advisers
- Engineers
- Lawyers
- Economists
- Technicians
- Managers

## Requirements

The course requires an open mind and curiosity towards technical systems and processes, but does not require a specific knowledge about District Heating.

## Content

- History and development of District Heating
- Planning
- Business models
- Energy sources
- The modern piping system
- Operation and optimization
- Interchanges / end user installations / meter data
- The future
- Getting started with your own District Heating project
- Implementation
- Future systems
- Site visits

Program: Day 1	Day 2	Day 3
<p><b>09.00: History and development of District Heating in Denmark and Europe</b></p> <ul style="list-style-type: none"> <li>• Historic background - From 1st generation to modern 4th generation</li> <li>• Role of cities and national government</li> <li>• The Danish business / ownership model</li> <li>• Economy</li> <li>• Rules and regulations</li> </ul> <p><b>What is District Heating – a technical introduction</b></p> <ul style="list-style-type: none"> <li>• Production</li> <li>• Transmission/distribution</li> <li>• Consumer connection</li> </ul> <p><b>Planning and development</b></p> <ul style="list-style-type: none"> <li>• Stakeholders</li> <li>• Requirements</li> <li>• How to get started – a quick overview</li> <li>• Planning tools – Energy Pro/Termis</li> </ul>	<p><b>Modern efficient piping systems</b></p> <ul style="list-style-type: none"> <li>• Today's district heating pipes</li> <li>• Alarm systems</li> <li>• Heat loss</li> <li>• Low temperature</li> </ul> <p><b>Assumptions for the choice of the right pipe system</b></p> <ul style="list-style-type: none"> <li>• Laying of network</li> </ul> <p><b>Network operation and optimization</b></p> <ul style="list-style-type: none"> <li>• Storage</li> <li>• Multiple fuel sources</li> <li>• Temperature optimization flow/return</li> <li>• Control and regulation</li> <li>• Peak load optimization</li> <li>• Long term investments and contracts</li> <li>• Renovation planning</li> </ul>	<p><b>District Heating in the future</b></p> <ul style="list-style-type: none"> <li>• Integration with electricity and other fluctuating renewables</li> <li>• Sustainability targets</li> <li>• Energy efficiency</li> <li>• 4th generation District Heating – low temperature</li> <li>• Cascade systems</li> </ul> <p><b>Business models</b></p> <ul style="list-style-type: none"> <li>• Different models - different results</li> <li>• Commercial ESCO solutions</li> <li>• Municipal lead systems</li> <li>• Consumer owned systems</li> </ul>
<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>
<p><b>How to produce District Heating today and in the future</b></p> <ul style="list-style-type: none"> <li>• Classic fuel sources</li> <li>• Sustainability</li> <li>• Sources of the future</li> <li>• Flexibility and economy</li> <li>• Transmission and distribution</li> <li>• Temporary mobile heat supply, e.g. container solutions</li> <li>• Annual demand – duration curves</li> </ul>	<p><b>End users – the customers</b></p> <ul style="list-style-type: none"> <li>• Metering and billing</li> <li>• End user installations</li> <li>• Optimization of installations</li> <li>• Save money for the customer</li> <li>• District Heating in low energy buildings</li> </ul>	<p><b>Implementing a new District Heating system - How to get started</b></p> <ul style="list-style-type: none"> <li>• Make a plan</li> <li>• Model for development of District Heating – step by step</li> <li>• Stakeholders</li> <li>• Risk sharing</li> <li>• Targets, aims and results</li> <li>• Feasibility studies</li> <li>• Design studies</li> <li>• Business models</li> </ul> <p><b>Make your own first draft plan</b></p>
<b>Site visit</b>	<b>Site visit</b>	<b>Conclusion and evaluation</b>
<p><b>Dinner</b> For participants only. Get to know each other</p>	<p><b>Dinner / networking</b> With invited companies and utilities</p>	<p><b>16.00: End of course</b></p>

## The Lecturers

The lecturers are all experienced specialists from leading universities, organizations and companies from the District Heating Industry. They have an extensive international knowledge from projects all over the world. At the site-visits you will meet highly skilled personnel that works with District Heating at a daily basis.

## Social events

There will be two networking dinners where you will have the opportunity to meet colleagues and exchange experience and build network.

## Registration and information

**Venue:** Copenhagen, 6-8 June. Next course 23-25 October

**Price:** 2,950 €, excl. VAT. The price includes: Tuition, materials, all meals and accommodation during the course, transportation to sites and networking dinners.

**Registration:** [www.energyandclimateacademy.com](http://www.energyandclimateacademy.com)



ENERGY AND  
CLIMATE  
ACADEMY

IN  
COOPERATION  
WITH



Energy and Climate Academy is an independent, private academy offering post graduate education in cooperation with leading universities, companies and organizations.