



The IEA District Heating and Cooling programme

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Contents

- **Who are the IEA?**
- **What is District Heating & Cooling?**
- **The IEA District Heating & Cooling programme.**



International Energy Agency

- **Established in 1974**
- **Within framework of Organisation for Economic Co-operation and Development (OECD)**
- **Currently 26 member countries**
- **Comprehensive programme of energy co-operation including research and policy analysis**
- **Research programmes ('implementing agreements') include District Heating and Cooling.**



International Energy Agency - mission

- **Energy security** – improving the world's supply and demand structure by developing alternative energy sources and increasing efficiency of energy use
- Integrated policies furthering **environmental protection** and **economic growth**



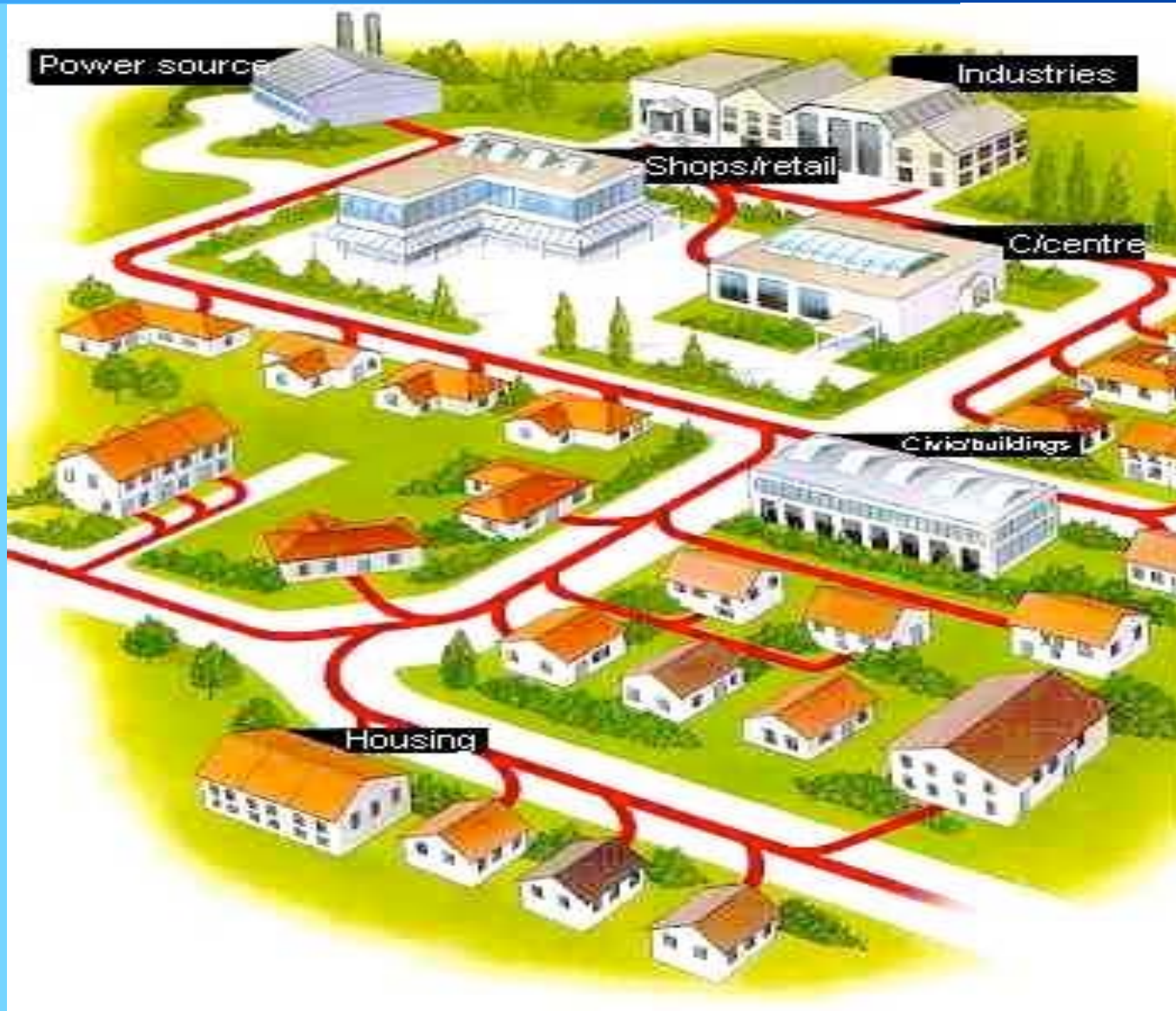
What is district heating?

- **A network of buildings heated from centralised energy source**
- **In the UK ‘district heating’ is often called ‘community heating’**
- **This presentation uses the term ‘district heating’**



DHC systems...

- **connect many thermal users to few energy sources...**
- **via a piping network...**
- **using energy efficient fuel sources including CHP, industrial waste heat, energy from waste, biomass, geothermal.**





DHC Systems are one of the most significant ways to:

- **maximise the efficiency of the thermal electricity generation process by providing a means to use the waste heat**
- **share heating - and cooling - loads**
- **achieve fuel flexibility - opportunities for CHP, renewables and emergent technologies.**



DHC Systems are **not yet fully recognised as** one of the most significant ways to:

- maximise the efficiency of the thermal electricity generation process by providing a means to use the waste heat
- share heating - and cooling – loads
- achieve fuel flexibility - opportunities for CHP, renewables and emergent technologies.



Five basic heat sources for DHC

CHP

Biomass/ biogas

Geothermal

Waste heat from refuse incineration

Waste heat from industrial processes

The fundamental idea of DHC is to use local fuel or energy resources that would otherwise be wasted in order to satisfy local customer energy requirements



Modern district heating – the preferred choice for homes and businesses

- **Modern schemes provide reliable, high quality energy services**
- **New housing developments in Scandinavia eagerly await their connection**
- **In the UK developers can be reluctant but Barratts connected Park View and The Dell to Southampton District Energy Scheme**
- **Businesses like the reliable, flexible supply; no need for heating/cooling services; green image.**



DHC Systems make sense for a sustainable future

- **Trend towards urbanisation offers a growing market: DHC best when HC demand density high**
- **DHC important for CHP potential: commercial, institutional and residential buildings offer a more stable long-term load than industry**
- **Role in energy security:**
 - heat networks are fuel flexible, use locally available energy, and heat that would otherwise be wasted;
 - heat driven chillers reduce peak power demand.
- **Sustainability: DHC can support rapid integration of lower carbon fuels/technologies.**



District heating market share

- **23 million people in EU-15 live in homes heated by district heating**
- **Denmark 51%**
- **Finland 48%**
- **Germany 12%**
- **Netherlands 3%**
- **UK 1%.**

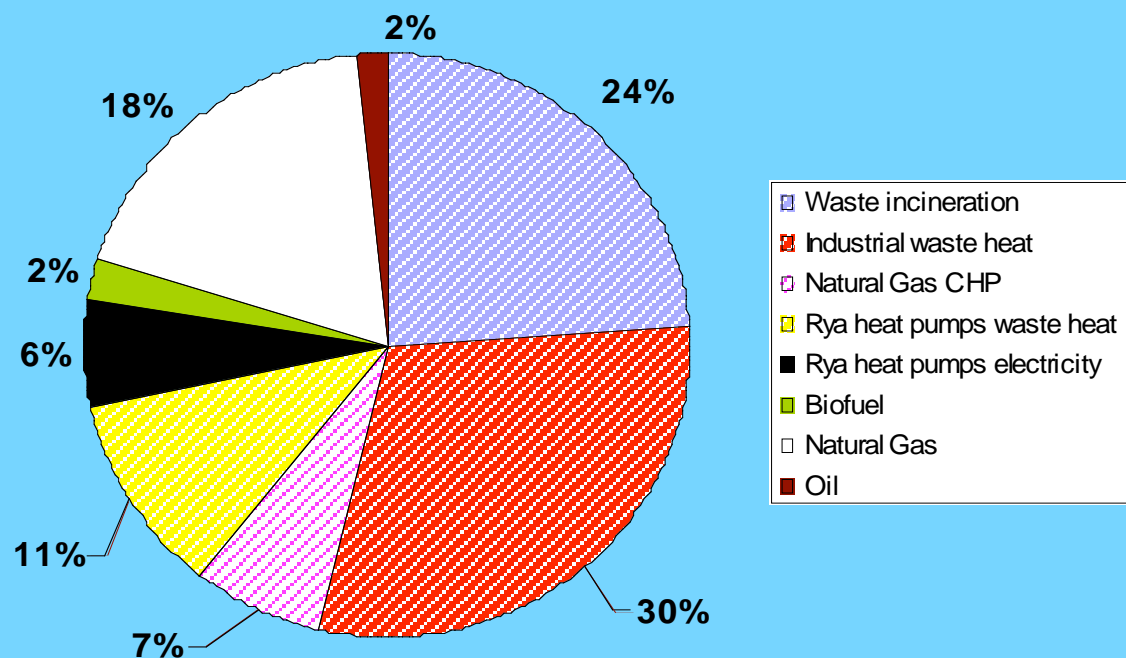


Examples of low carbon energy in DHC systems

- **Mannheim: CHP**
- **Berlin: Biomass**
- **Paris: Geothermal**
- **Copenhagen: Energy from waste**
- **Malmo: Solar**



Gothenburg: a city-wide network





Integration of low carbon energy in UK District Heating schemes

- **Aberdeen: CHP**
- **Llanwddyn: Biomass**
- **Sheffield: Energy from waste, CHP**
- **Slough: Biomass, CHP**
- **Southampton: Geothermal, CHP**
- **Woking: CHP, Fuel Cell, PV**



Globally...

- **Annually district heating systems consume 11 – 12 EJ heat...**
- **... about 5% of total energy demand in industrial, residential, public, and commercial sectors**
- **Globally DHC/CHP systems reduce carbon emissions by 3 – 4 %**
- **Across Europe DHC/CHP saves estimated 1.3 – 1.4 EJ per annum.**



Policy background

EU: *Building Directive – new developments over 1000m² should consider DH, CHP, renewables*

CHP Directive

Energy Services Directive

UK: *Kyoto commitment*

CHP Strategy and target

Renewables targets

Local targets



The DHC/CHP Implementing Agreement Mission Statement

To conduct highly effective Research and Development as well as policy analysis of District Heating and Cooling systems (including the integration of CHP) with low environmental impact through international collaboration.



Participant Countries

Canada

Denmark

Germany

Finland

Korea

Netherlands

Norway

Sweden

United Kingdom

USA



Annex VII projects

- **Strategies to manage heat losses technique and economy**
- **A comparison of distributed and large-scale CHP/DH**
- **Two-step decision and optimisation model for centralised or decentralised thermal storage in DHC systems**
- **Dynamic heat storage optimisation and demand side management**
- **How standards and insulation properties influence the competitiveness of district energy**
- **Improvement of operational temperature differences in district heating systems**
- **Biofouling and Microbiologically influenced corrosion in District Heating Networks.**



Further information

IEA DHC: Range of research documents on technical and institutional aspects of DHC; policy paper to assist decision makers; at

www.iea-dhc.org



Keep in touch

Your business card:

‘Reports’

‘Network’

Workshop at 15:30:

‘Building networks for sustainability:
community heating’



1000 cities can't be wrong

Graz Innsbruck Linz Salzburg Wien Bourgas Plévène Plovdiv
 Roussé Slivène Sofia Varna Brno Praha Ålborg Århus København Odense Tallin Tartu
 Espoo Helsinki Oulu Tampere Turku Vantaa Grenoble Lyon Metz Nantes Nîmes Paris
 Rennes Strasbourg Aachen Augsburg Berlin Bochum Bonn Braunschweig Bremen
 Bremerhaven Cottbus Darmstadt Dortmund Dresden Duisburg Düsseldorf Erfurt
 Erlangen Essen Frankfurt am Main Freiburg Fürth Gelsenkirchen Gera Göttingen Halle
 Hamburg Hamm Hannover Heidelberg Ingolstadt Kaiserslautern Karlsruhe Kassel
 Kiel Köln Krefeld Leipzig Leverkusen Lübeck Ludwigshafen Magdeburg Mainz
 Mannheim München Münster (Westf) Neuss Nürnberg Oberhausen Offenbach-am-Main
 Potsdam Regensburg Reutlingen Rostock Saarbrücken Schwerin Stuttgart Ulm Plzen
 Wiesbaden Witten Wolfsburg Wuppertal Würzburg Zwickau Budapest Debrecen Győr
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 Enschede Heerlen Kerkrade Leiden Maastricht Nijmegen Rotterdam Gravenhage Tilburg
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 Helsingborg Jönköping Linköping Malmö Norrköping Ostrava Orebro Stockholm Umeå
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