# ecoheatcool

## A EUROHEAT & POWER INITIATIVE

Project co-financed by European Commission under Intelligent Energy for Europe Programme

## Overview

Huge heat losses appear in the European energy balance. From the annual energy supply of 78.9 EJ[1] in EU-25, EFTA and applicant countries, around one third is lost in conversion processes in power plants, oil refineries, and industrial processes.

Parts of these losses can be retrieved and distributed by district heating and cooling schemes, delivering simple, reliable and comfortable heating and cooling in urban buildings and therefore supporting Europe's potential for higher energy efficiency.

District heating systems provide the necessary heat load for high-efficiency CHP plants and, at the same time, enable the large scale use of renewable energy sources (RES), excess heat from waste incineration or from industrial processes.

District cooling is emerging as a similar energy efficient tool by offering solutions tailored to local conditions.

### The ecoheatcool project:

- analyses the heating and cooling demands in Europe with a view to provide comprehensive, aggregate information about the whole heating and cooling market and its dynamics in Europe
- analyses and makes visible possibilities for district heating and cooling
- provides a tool for assessing the primary energy efficiency of district heating systems from conversion to delivery to the final customer
- assesses the implications of increased district heating and cooling supply in relation to European policy objectives provides recommendations for strategies to encourage the development of sustainable heat and cold supply options.

[1] EJ stands for $10^{18}$ Joule

The project covers 32 European countries: EU 25, the applicant countries Romania, Bulgaria, Croatia and Turkey and three EFTA countries: Iceland Norway and Switzerland.

Initiated in January 2005, the project will be finalized at the end of 2006. 15 partners are involved, including three European/ international associations as well as nine national CHP/DH associations, an energy conservation agency, a university and a consultancy company.

Four subject reports will be published:

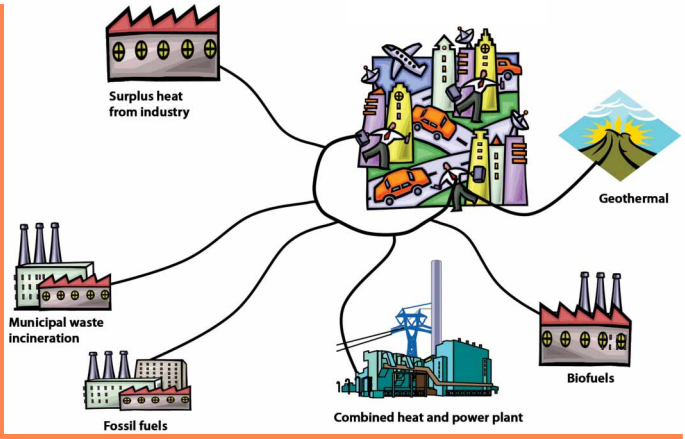
- a general comprehensive report regarding heating and cooling demands across 32 countries;
- guidelines for assessing the energetic and ecological performance of district heating and cooling systems;
- a report outlining the contribution of district heating and cooling to declared EU policy objectives;
- recommendations for political action.

The project is structured in nine Working Packages.

Other stakeholders as well as representatives of the European and international institutions (European Commission, European Parliament, EUROSTAT, IEA, Energy Charter…) will be consulted throughout the project duration.

## Main project areas

The heat market represents the largest single user of total energy consumption (40%) in Europe with buildings registering the highest share (40%). Moreover the demand for cooling both for comfort cooling in households and in the tertiary sector is steadily increasing. In spite of the relevance of the sectors within the total energy consumption, a lack of sound aggregate information regarding heat and cooling markets persists in Europe.




# Heat and Cold Market

## Heat demands

The project aims at describing the total European heat market and rendering it more transparent. The project makes use of the existing statistics that provide information on primary energy supply and final energy consumption by carrying out at the same time a correlation between different information sources. The heat demand assessment involves the consideration of elements such as:

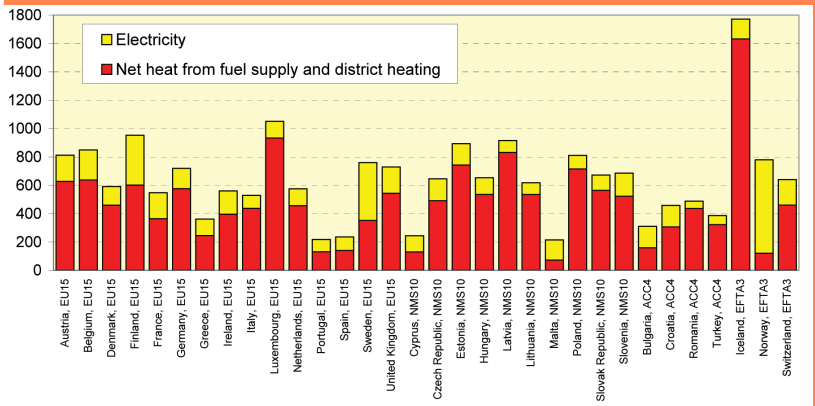
- coverage: *industrial and domestic* sectors and overall country's estimates
- development of a new heat index which will be used in combination with specific heat demands and data regarding urban and rural population for assessing the domestic heat demands;
- evaluation of differences in final energy demands between Central and Eastern European countries and old EU member states and possible implications from the resulting trends
- analysis and explanation of similitude between the heat demands in Northern and Central Europe
- heating costs and prices
- heat market energy supplies: fuel, electricity, heat, equipment suppliers

## Cooling demands

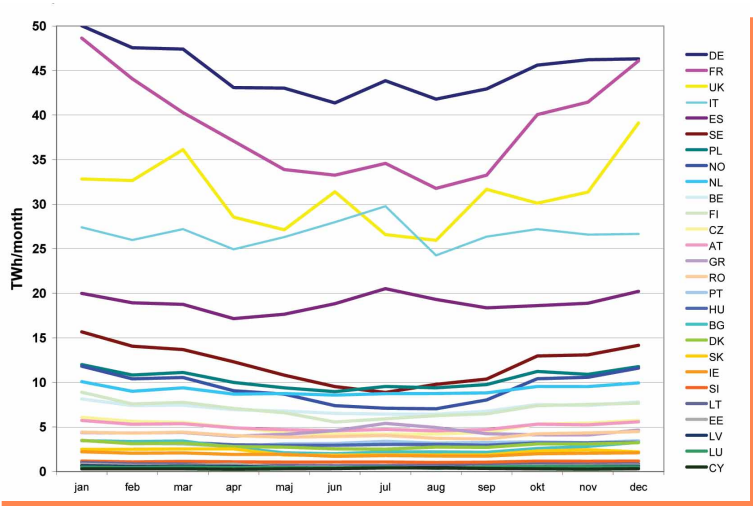
The report on cooling demands will cover the *domestic* sector only. The assessment involves the use and crosschecking of elements such as demand profiles, a new cooling index, specific domestic cooling demands, building stock, electricity demands and estimations from market reports regarding equipment sales.

The electrical power demand increased by 50% in EU 15 during 1985-2003 and peaks tend to shift from the winter to the summer period (see graph below). The reason for this trend is often the increased need for comfort cooling. A qualitative assessment of the dynamics for cooling demands might be considered. The assessment of the cooling market covers aspects such as market description, equipment and cooling suppliers, cooling costs and prices.

## Residential end use of net heat and electricity, MJ/m$^2$




Source Chalmers University, ECOHEATCOOL project WP1




Source Capital Cooling ECOHEATCOOL project –WP2

## Monthly electrical demand in 2003

### District heating and cooling efficiency

The Guidelines for assessing the energy efficiency of district heating/ district cooling systems are developed with a view to benchmarking individual systems and enabling comparison with alternative heating/cooling options. The methodology is based on the calculation of primary energy factor (PEF), encompassing all savings from the energy conversion to the delivery to the final customers. Additional to savings, the guidelines give consideration to environmental criteria.

### District Heating potential

Based on specific country information a European perspective will be developed. It involves:

- assessment of possibilities for more DH from: *CHP, waste to energy plants, industrial waste heat, geothermal, biomass, solar heat*
- estimation of the DH potential in Europe
- evaluation of barriers and opportunities for DH in Europe
- assessment of the impact related to increased use of heat supply sources such as CHP, waste from incineration and industrial heat, RES expressed as: higher security of supply, higher energy efficiency, lower $CO_2$

## District Cooling potential

- estimation of densities range for district cooling compared to total market
- benchmark of sufficient demand densities with existing DC markets
- assessment of possibilities with more District Cooling based on various options: heat driven, free cooling etc
- estimation of district cooling potential in Europe
- assessment of increased use of District Cooling expressed as: higher security of supply, higher energy efficiency, lower $CO_2$

## Recommendations strategies

Based on the output of heat and cold market reports, and on the evaluation of possibilities for DHC across Europe, the recommendations will cover aspects such as:

- Development of new district heating and cooling schemes across Europe
- Upgrading/benchmarking of existing district heating schemes across Europe
- Promotion of CHP and the use of clean fuels in urban areas
- Increasing the share of renewable energy sources in the heat market
- The use of waste incineration for local heating
- The use of industrial waste heat

An evaluation of the socio-economic and environmental benefits resulting from the implementation of the DHC strategy will be carried out.

## Project Dissemination activities

- four project workshops
- two major Euroheat & Power conference sessions: Congress, Berlin, 6-7 June 2005: Conference, Brussels, 22 June 2006
- six project meetings
- project webpage and four newsletters
- three progress reports, an interim report, a final report


## Project partners

### Project partners

Euroheat & Power, Chalmers University of Technology, Capital Cooling Europe, Danish District Heating Association, Finish Energy Association, German District Heating Association, Italian District Heating Association, Austrian Association of Gas and District Heat Supply Companies, Swedish District Heating Association, European Renewable Energy Council, Norwegian District Heating Association, Confederation of European Waste to Energy Plants, French District Heating and Cooling Association, Czech District Heating Association, Polish National Energy Conservation Agency

**Contact**

**Norela Constantinescu** **Euroheat & Power**, Avenue de Tervuren 300, B-1150 Brussels

T + 32 (0) 740 21 10 F +32 (0) 740 21 19

**norela.constantinescu@euroheat.org**

**www.ecoheatcool.org** **www.euroheat.org**