14 January 2010

Euroheat & Power's contribution to the Commission consultation on the future 'EU 2020 strategy'

'In developing a new vision and direction for EU policy , we need to recognise that conserving energy, natural resources and raw materials, using them more efficiently and increasing productivity will be the key drivers of the future competitiveness of our industry and our economies'

'Creating a competitive, connected and greener economy. The EU should compete more effectively and increase its productivity by a lower and more efficient consumption of non -renewable energy and resources in a world of high energy and resources prices, and greater competition for energy and resources..

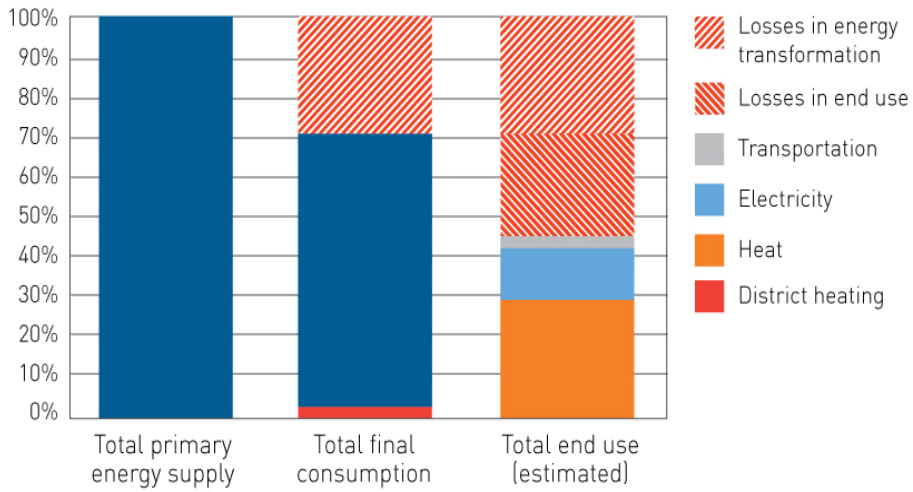
'By 2030 the EU will have to replace half of its existing electricity plants . If we take the right strategic investment decisions now , two third of our electricity generation could be both low carbon and more secure by the early 2020s. (...) Improving energy efficiency will also be vital as it is the cheapest way to reduce emissions and, at the same time, to increase the energy independence of Europe .'

(source: Commission working document 'consultation on the future EU 2020 strategy pages 3 and 9)

INEFFICIENT ENERGY SYSTEMS...

The Commission's working pape r recognises that energy efficiency will be one of the way to improve Europe's competitiveness and set economies on a virtuous path of growth and sustainability. The current European energy system is indeed very inefficient. The European balance clearly shows that more than half of the energy contained in primary fuels is lost in conversion and transformation processes on the way from source to and in end -use - vented as waste heat .

Figure 1 The European energy balance



On the other hand, 37,8 %[1] of the final energy demand in the EU is related to heating purposes: space heating, warm water preparation and low temperature industrial processes. Today, this demand is mainly covered with imported fuels[2] (gas and oil) or low-efficiency electricity.

These energy losses have a significant financial value. It can be estimated that this value roughly corresponds to the current total energy import of the EU.

With the available amounts of heat losses, Europe has no shortage of heat for space heating, warm water preparation and low temperature industrial purpos es. The problem of the heat market is neither a problem of energy availability nor carbon content, but organization and investment.

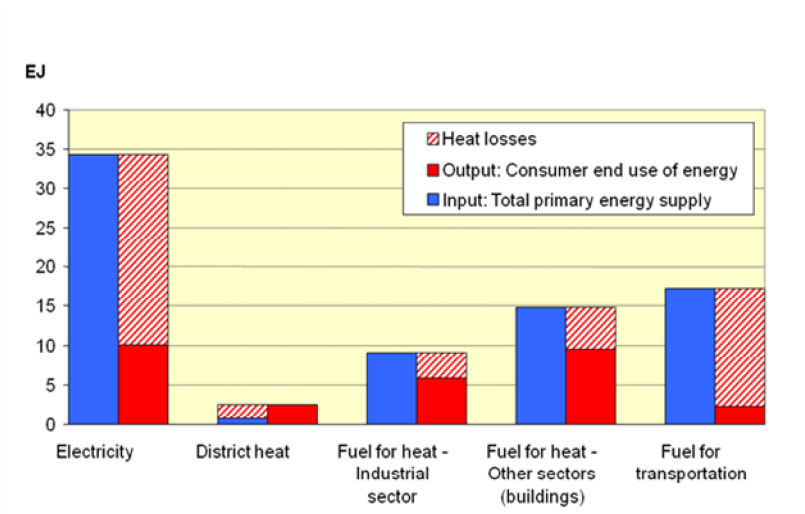
KEEPING THE MONEY HERE!

The fundamental idea of district heating (more in the annex I) is to recover heat that otherwise wo uld be wasted – i.e. turn losses into useful energy via the district -heating infrastructure. Furthermore DH

[1] Ecoheatcool, 2006
[2] Imports of fuels amount to € 350bn/year according to the Commission's second strategic energy review, 2008

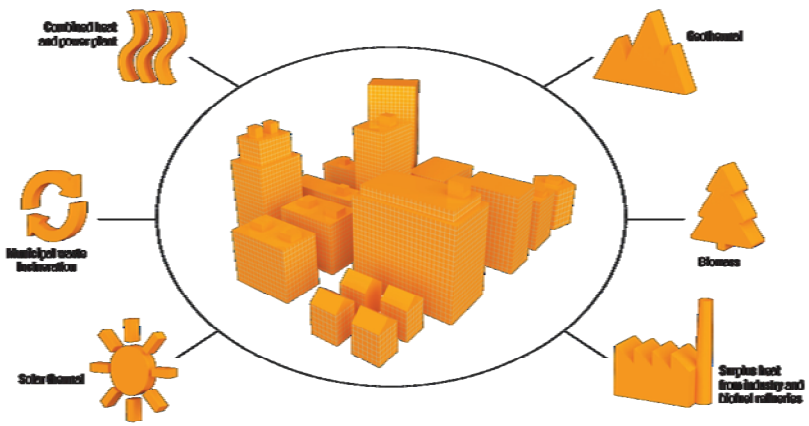
can make an efficient use of renewable energy sources (biomass, geothermal, solar) including those which otherwise would be difficult or expensive t o use. Figure 2 below shows that the district heating sectors, via the extensive use of cogeneration and renewable sources, is the only sector whose output is higher than the primary -energy input.

Figure 2 Efficiency of competing sectors



Hence, district heating is a key infrastructure to a more efficient energy system and a more competitive European economy - a catalyst for change.

Figure 3 Local projects, European benefits



An international project, co -funded by the Commission, has found that if district heating, which makes up 10% of the heat market, was to be doubled, benefits would be huge in terms of increased security of

supply (4,5 EJ), energy efficiency (2,1 EJ) and emissions reductions (- 400 millions ton/year) – source: international project www.ecoheatcool project, 2006/ see annex I.

District Cooling

While making the existing system more efficient, the EU also needs to address new demands and comfort expectations which are emerging, such as the demand for cooling. In the EU today, cooling demands are typically met with electricity, and makes for 8 % of the electricity consumption. With demands for cooling growing at a frantic pace, this new pattern should be met in the most efficient way.

District cooling provides an alternative to electric air -conditioning, which enables to cut use of expensive peak-demand electricity - an alternative that is 5 to 10 times more efficient.

A GREEN 'NEW ENERGY DEAL'

How to turn the energy sector into one of the pillars to spark a new industrial revolution, similar to the one in the 19th century, but this time based on green and sustainable technologies? How to break away from centralized generation, and use the window of opportunity offered by the necessity to replace a large share of current energy generation capacity? Climate change cannot be stopped by individuals and the European economy will not be set on a growth path only with the actions of individuals! The green 'new energy deal' needs systemic solutions and energy -efficient infrastructures! District heating and cooling are such solutions.

District heating is indeed a modern flexible interface which can rapidly adapt to our ever -changing environment. What it needs to grow is a stable policy framework and a coherent set of laws that account for possible synergies between sectors – not the present segmentation of policies which tends to cut reality into pieces and hide the overall picture. The success of district heating has happened in countries where voluntary policies have laid the ground for an efficient use of resources in relation with local demands.

Investing in district heating networks is investing in local jobs and participating to the further development of European companies which are world leaders on global energy efficiency markets.

- Ø See annex for best practices and success stories.

EUROHEAT AND POWER I NPUT TO THE NEW APPROACH FOR 2020

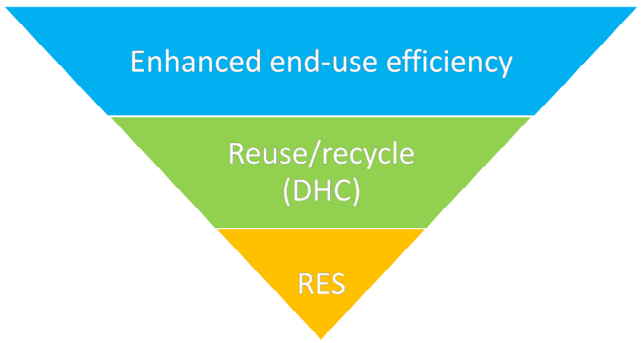
Wider deployment of district heating and cooling (DHC) in Europe

- Launch a master plan for DHC in Europe (cf. "Heat Plan Denmark"). to lay the foundations for phasing out and replacing the direct use of fossil fuels and electricity for heating by 2050 or earlier
- Support investment efforts to promote DHC in European cities, with particular attention to local governments as key actors in developing new infrastructures.

Comprehensive approach to energy problematics

- Establish clear hierarchies in energy use similar to the hierarchy in waste management (avoid - reuse - recycling/valorisation - substitution by renewable energies). Future European initiatives should foresee to provide an integrated system approach towards end -use efficiency, supply efficiency and renewable energies.

Figure 4 Setting priorities to support resource -efficient processes.



Supply efficiency and taxation

To achieve higher efficiencies in electricity generation through heat recycling, a range of mechanisms should be envisaged such as:

- Internalisation of CO_2 costs for installations outside of the ETS perimeter (i.e. installations below 20 MW) as a way to develop a comprehensive European policy on CO2.
- Introduction of measures to further incentivise the development of CHP at EU level.

Buildings policies

- Extension of the concept of 'nearly zero energy buildings' to 'nearly zero (primary) energy district' with due consideration of district...
- Use of EN standards using p rimary energy factors to assess/benchmark buildings so that energy-performance measures and the use of renewable energy sources are considered as complementary.

Master plan for DHC - Infrastructure investment in sustainable cities

Over 70% of the European population live in urban areas. Investments in energy infrastructure targeting these areas – such as district heating and cooling grids – will therefore have a big impact on competitiveness, energy security and emissions.

Today, financing stands out as a major barrier to the expansion of district heating and energy efficiency. Too often, investors do not dare venture into energy efficiency and stick to routine because the good old systems are still very rewarding! In the case of our sector: with large inf rastructure investments, some forms of partnerships with public authorities are often crucial for the deployment, modernisation and long-term development of DH systems.

In view of the barriers for investments in DHC, the EU, governments and authorities sh ould promote investment in CHP and DHC by providing an adequate framework for investment subsidies, planning, promotion and authorisation. Euroheat and Power suggests the following measures:

- Policies on infrastructures shall give as much importance to infrastructures that diversify supply routes as to those that actually avoid and cut imports such as district -heating infrastructures.
- Measures at EU level should further highlight the role of local communities in the necessary mapping of heating and cooling loads, evaluation of available supply options, planning and implementation of projects.
- A framework for public financing or guarantees should be supplied as well as other innovative forms of funding. Initiatives such as ELENA should be further pursued on larger scale, in cooperation with relevant institutions (EIB).
- In the recycling of funds from the ETS, priority should be given to projects involving heating and cooling infrastructures that have a pilot character and can serve as models for replication in other parts of Europe.

More can be found on the contribution of district heating for the 2020 and 2050 horizons: http://www.dhcplus.eu/Documents/Vision_DHC.pdf .

Euroheat & Power is the international association representing the combined heat and power (CHP), district heating and cooling (DHC) sector in Europe and beyond. Euroheat & Power unites 23 national CHP/DHC associations and has individual members (utilities, equipme nt suppliers and research institutes) in more than 32 countries.

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ANNEX 1: DISTRICT HEATING AND COOLING – A NEGLECTED OPPORTUNITY

The European energy balance clearly shows that more than half of the energy contained in primary fuels is lost in conversion and transformation processes on the way from source to and in end -use - vented as waste heat.

On the other hand, 37,8 %[3] of the final energy demand in the EU is related to heating purposes: space heating, warm water preparation and low temperature industrial processes. Today, this demand is mainly covered with imported fuels (gas and oil) or low -efficiency electricity. The final demand for heat in buildings can be reduced, especially in new buildings.

The fact that over 70 % of the European population live in cities and 69 % of all energy demand occurs in urban areas offers great opportunities to meet heating demands with relevant infrastructures.[4] The same way there are infrastructures to deal with water supply/sewage, communications and transport, the economy of scale and gained efficiency with district heating are very high. District heating is the urban infrastructure of ch oice to substitute inefficient electric heating and replace oil/gas with use of surplus heat and renewable.

The density of inhabitants in urban areas offers opportunities to invest into heating infrastructure such as there are already well established infr astructures for water supply, sewage, transport etc that delivers huge benefits in urban areas. This opportunity should be seized in a more systematic manner!

With the available amounts of heat losses available at EU level – as displayed in figure 1, the continent has no shortage of heat for space heating, warm water preparation and low temperature industrial purposes. The problem of the heat market is neither a problem of energy availability nor carbon content, but organization and investment.

Figure 1 clearly calls for a system approach, a cost -benefit approach to energy saving measures and increased supply chain efficiency. Greater integration of energy conversion facilities (with their unavoidable losses) and heat supply infrastructure would offer huge opportunities to save primary energy.

Together with the development of renewable energy, surplus heat has to be seen as the EU's greatest potential source of indigenous energy. At a time, where the EU contemplates huge investments in networks for diversifi cation of energy imports and end -of pipe measures, equal emphasis should be given to substituting imported energies with investments in local heat infrastructure. The current crisis should be seen as an opportunity to focus on solutions that reduce expendi ture for energy imports, create local employment and bring welfare to the domestic industry.

While interest in promoting CHP and DHC is not new, significant challenges remain, highlighted by the fact that European CHP investment has remained stagnant for t he past decade and DHC has grown only modestly. A variety of barriers still exist for CHP/DHC largely because the economic, policy and regulatory structures established over decades to manage the development of traditional energy systems are not always wel l suited for decentralised generation.

[3] Ecoheatcool, 2006
[4] European Commission

Short term possibilities - district heating

Already today, district heating and cooling plays a significant role in the supply of heating and cooling in the European Union. While having an overall market share of less than 10 percent, it is particularly widespread in North, Central and Eastern Europe, where market shares often reach 50 percent and more. In several capitals (Copenhagen, Hamburg, Helsinki, Stockholm, Paris, Budapest, Bucharest, Riga etc.) a large share of inhabitants are supplied with district heat. And there is strong growth in Austria, Northern Italy and France. In total, over 5000 mostly city-wide schemes connect citizens to a variety of sustainable heat sources. On average, over 80 per cent of heat supplied by district heating in Europe originates from renewable energy sources or heat recovery (from electricity production or other energy transformation processes, for example in industry) [5].

The Ecoheatcool study co-financed by the European Commission [6] under the IEE program confirms the possibility of saving an extra 404 million tons of CO_2 annually (additional to the 113 million tons/year avoided today) in the time horizon 2020 by doubling and improving district heating across 32 European countries. At the same time, higher energy efficiency will reduce primary energy supply by 2,6 % (2003) or 2,1 EJ (50,7 Mtoe)/year (equal to primary energy supply of Sweden). Higher security of supply will reduce the import dependency to 4,5 EJ (105,4 Mtoe)/year (equal primary energy supply of Poland).

Doubling the share of DHC (2003) would correspond to an average annual growth rate of 5 % and require an estimated investment of €150 bn for 1,95 EJ heat sales (40% for infrastructure/ 60 % various heat generation facilities, be it 75 €/GJ).

In terms of cost-effective GHG reduction potential in the short term, CHP and DH are - alongside renewable energy and end-use efficiency - core elements of the toolbox to deal with the climate challenge and the need to reduce the use of fossil fuels. [7]

Long term possibilities

The European electricity industry has committed itself to move towards a carbon-neutral electricity sector by 2050[8]. To the extent that thermal electricity production continues, it will be of paramount importance that carbon neutrality is not gained to the detriment of fuel efficiency.

In this perspective, "recycling" unavoidable heat losses to cover heat demands will make a significant contribution to improving both the efficiency of electricity production and phasing out fossil fuels (and related greenhouse gas emissions) in the heating/cooling market.

With the right political framework and structural investments, scenarii envisaged by the ecoheatcool project hold the prospects of an even more rapid decarbonisation of the heating and cooling

[5] IEA Energy Balances 2008, cf annex

[6] www.ecoheatcool.org

[7] Federal environment ministry, Germany, lead study renewable energies: http://www.erneuerbare-energien.de/files/pdfs/allgemein/application/pdf/leitstudie2008_zusf_en.pdf

[8] Declaration by European Electricity Sector Chief Executives, Eurelectric 2009

markets while preserving high standards of c omfort and maintaining customer prices at acceptable levels.

A new promising infrastructure: district cooling

While making the existing system more efficient, the EU also needs to address new demands and comfort expectations which are emerging, such as the demand for cooling. In the EU today, cooling demands are typically met with electricity, and makes for 8 % of the electricity consumption. With demands for cooling growing at a frantic pace, this new pattern should be met in the most efficient way.

District cooling provides an alternative to electric air -conditioning. An alternative that is 5 to 10 times more efficient. Assuming that 25 % of Europe's cooling demands were met by district cooling by 2020, this would save 50 to 60 TWh of electricity and a void 40 to 50 million tonnes of CO2 annually.

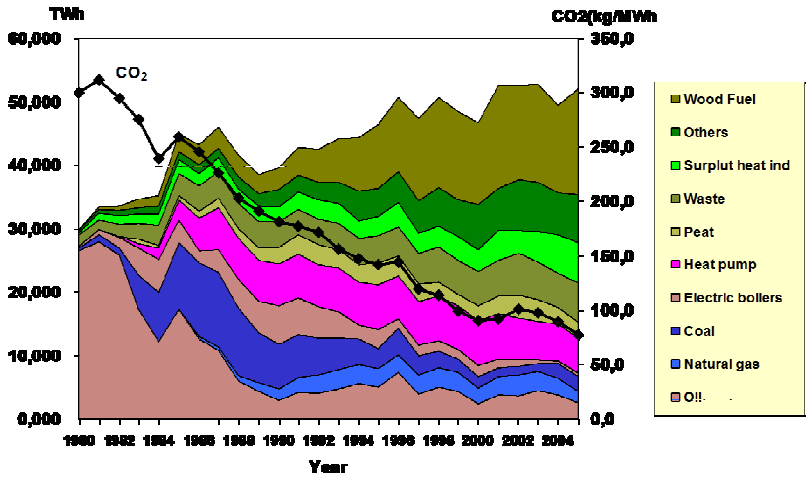
These are some success stories on which the EU could further built to define policies to meet 2020 targets.

ANNEX II: GOOD PRACTISES

Denmark has proved that predictable policies and long-term goals can trigger a new energy system. Denmark is the most efficient economy of the EU, with the lowest energy intensity, while providing a very high standard of living to its citizens. The challenge was met in Denmark by moving away from a centralised system relying on condensing power plants. A key mover in transforming the Danish energy system was actually district heating and CHP, which allowed to increase efficiency of fuels and use of local fuels such as renewable energy sources. To the benefits stemming from energy efficiency, an effect of these policies was to generate jobs and wealth because of a new economic sector associated to energy efficiency.

Sweden is another example where district heating is playing a key role in current policies to turn the society oil-free by 2020. As displayed in the graph below, the strong growth of district heating in Sweden in the last two decades has made it possible to //decarbonise the heat market.

Figure 5 Improving resource-efficiency and cutting emissions: district heating delivers!
In Sweden, the share of district heat has now reached over 50% on the residential market. The picture below shows that the share of renewable and recycled heat have steadily progressed while emissions dropped.



Source: Swedish district heating association, 2008

All over Europe there are many cases of best practices with district heating and cooling. Here are three examples of Copenhagen (Denmark), Boras (Sweden) and Dunkirk (France) and Barcelona (Catalonia).

The Copenhagen District Heating System

The District Heating System of Copenhagen, owned by the municipality of Copenhagen, is operated by Copenhagen Energy Ltd., a non-profit public owned limited company with approximately 190 people working in its District Heating division.

The Copenhagen district heating system is operated as a part of the very large coherent district heating system in greater Copenhagen, covering Copenhagen and 15 smaller municipalities.

The DH network:

The Copenhagen district heating system itself is a 1.500 km double-piped net that covers more than 98% of the demand for heating in the municipal of Copenhagen, providing heat for more than 30.000 customers (approx. 500.000 inhabitants). The heat supply is mainly based on CHP plants and waste incineration. The system covers a building stock of roughly 35.5 millions m^2.

This high degree of district heating is backed by a legal and cultural framework in favor of a district heating solution. Environmental standards and energy planning requirements are the dominant drivers for a high degree of combined heat and power production in Denmark. The heat supply act from 1979 enabled municipalities to define certain areas for district heating and make it mandatory for owners of real estate to connect to district heating in these areas.

The system was initiated in the mid 1920s. The system has developed in two tracks, partly in the form of a water-based DH system and partly in the form of a steam-based system. The main part of the steam-based network in Copenhagen was build before 1950 and it has not been expanded since 1980. Copenhagen Energy has started to convert the steam-based system to a water-based system. The conversion, worth 350 million EUR, will be finished in 2025, contributing to reducing heat losses and reaching even higher efficiencies and better economy for the CHP production. The project will save more than 1,100 PJ of primary energy and reduce CO_2-emissions by more than 125,000 tons/year.

Concerning the heat production configuration, the main part of district heating for Copenhagen is delivered from 10 CHP plants with the total capacity of app. 2,000 MW heat. The system is very flexible: it receives its heat supply from many different units with different technical data using different fuels, it has a high level of security of supply and is less vulnerable to fluctuating world market prices.

In 2009 a new CHP plant at Amager was commissioned: AMV1, being the first plant in Denmark with requirement of a minimum percentage of biomass-based CHP production. The subsidies for biomass-based electricity production, the lack of energy taxes on biomass-based heat production and the CO_2-quota costs on coal-based production will make the costs of biomass-based CHP production at AMV1 lower than coal-based production. Thus AMV1 will be a mainly biomass-fired CHP plant, with coal as a backup fuel.

Energy and environmental achievements

The high share of CHP is lowering primary energy use. The heat consumption was 17.400 TJ in 2008, with the fuel mix of Coal (19%), Biomass (9%), waste incineration (24%), oil (7%) and gas (41%).

The CHP-based DH system in greater Copenhagen lowers the CO_2 emission of the heat production compared to individual oil- and natural-gas boilers substantially by 40-50 %.

Next to the energy efficiency inherent to the DH system, Copenhagen Energy and the municipality of Copenhagen do even more for increasing energy perfo rmance, e.g. of existing buildings. This includes energy saving services as well as the Climate+ initiative, which is a network for companies who want to reduce their CO2-emissions. They also work together on the realization of sustainable city planning using the best heating options for new building stock meeting the strictest requirements set out in the Danish Building regulation.

Besides that, much effort is also put into economic the optimization of heat production, district heating net optimization aiming at ensuring low heat losses, low energy consumption for pumping and a sound operation of the network. A temperature optimization method has been introduced as well as a pilot project on remote metering that covers 1800 major customers. Remote metering is also used for the monitoring of substations, aiming at detection of malfunctions and improvement of the performance of the substation. Next to this, Copenhagen Energy is also running projects in the field of geothermal heat and solar district heating. Another project focuses on the exploitation of District Cooling in Copenhagen in a pilot district. The system will be fully implemented during 2010 -2013 and will supply customers with approx. 22.000 GWh of cold per year.

BORAS – TURNING THE CITY FOSSIL -FUEL FREE

Borås is Sweden's 13th largest municipally, with a population of 64,000 in Borås City, and over 100,000 throughout the municipality. Borås Energi och Miljö AB (BEM) is a municipally -owned company that handles refuse and the production of district heating, cooling and electricity in the municipality. BEM runs a number of facilities and services, all of which contribute to the reduction of greenhouse gas emissions.

Borås city is a pioneer working in harmony with the biological cycle, and they conside r combustible household waste as a valuable energy resource - energy that otherwise would be wasted. Recyclables are separated and brought to one of the company's recycling centers. When the remaining refuse arrives at the Sobacken waste management plant, t he combustible waste is used as fuel for generating e.g. district heating, while the biodegradable waste is converted into biogas.

District heating

BEM has several different district heating plants. The main unit, Ryaverket, is a combined heat and power plant. It has two biofuel boilers, two waste boilers and two generators. There is also an electrical heater plus two propane/biofuel/oil -fired boilers used as back -ups.

The biofuel boilers are grate -fired steam boilers. The biofuels mainly compr ise forest fuel, i.e. fuel made from left-over materials from the forestry industry. Flue gases are cleaned by electrical filters connected to each boiler. Ash from the boilers is used as a forest fertilizer. Construction at Ryaverket began in 1965 and over the years the plant was modified to achieve a more eco -friendly production. In the beginning, production was mainly based on fossil oil and a small percentage of waste. In 1984 the two large oil -

fired boilers were converted to burn solid fuel (biofuel, 7 5%, and coal, 25%). A dryer was installed in 1994 to increase efficiency and allow boilers to be run on biofuel alone.

District-heating grid

District heating is distributed via underground pipes to homes and other properties in Borås and is used partly to heat water circulating through radiators, and partly for heating tap water.

Construction of the Borås district heating grid began in 1959. Today there are around 300 km of district heating piping. There were 3,992 customers at the beginning of 2009, comp ared to 1,892 at the beginning of 2000. Approximately 35,000 inhabitants rely on district heating.

In addition to the large district heating grid in the centre of Borås there is also a smaller grid in the small community of Fristad (located about 15 km no rth of Borås). The district heating in this grid is supplied by its own hot water plant with four biofuel boilers and two oil -fired boilers used as back -up.

District cooling

In 1996 BEM built a district cooling grid to provide its customers an eco -friendly, economically-viable alternative to air conditioning. Today it produces up to 7 MW of district cooling via the central grid. District cooling is produced mainly at Ryaverket. There are two absorption chillers run by water from the district heating grid instead of electricity; only small amounts of electricity are needed for pumps and fans etc. Brine is used to transfer the heat between the different medium. There are also three machines using conventional technology where cooling is produced by the use o f electricity, and there is a small conventional cooling unit used as back -up on another site in the district cooling grid. The district cooling grid supplies industries, offices, shopping centers and the local hospital with cooling.

Benefits of district h eating and cooling

As all emissions are concentrated in one place for treatment by organizations with the necessary expertise and equipment, the result is a more advanced, efficient flue gas cleaning and pollution control.

Ryaverket is a combined heat an d power generation plant, which makes it more energy efficient than individual heating systems due to simultaneous production of heat and electricity. This provides a stable heating/cooling system that requires less effort from the customer.

The benefits from district cooling are largely the same as those from district heating. District cooling also avoids the problem of environmentally harmful CFCs often found in air conditioning units.

Developments: An accumulator tank construction project for the BEM d istrict heating grid will be completed in the autumn of 2009. The accumulator will reduce the requirement for fossil fuel as it can be charged when the demand for heat is low and discharged when demand is higher, resulting in a reduction in the requirement for support heating. Another benefit is that the accumulator enables an increase in the generation of electricity of about four per cent. The Ryaverket production plant

comprises several different boilers connected to the same grid, which means that backup is always available, and that the plant, viewed as a single production unit, never suffers an outage.

Dunkirk – using surplus heat from industry

Dunkirk is France's largest North Sea port. The city's district heating network, built in 1985 as an answer to the oil crisis in the 1970's, was designed as an alternative to fossil fuel solutions, supplied primarily by recovered byproduct heat from local industrial processes. The network currently delivers nearly 140,000 MWh a year to 105 customers through an approximately 40-km distribution network that covers a large portion of the Dunkirk urban community. The Concession holder is Energie Grand Littoral (EGL), a Dalkia France subsidiary.

The network's main source of heat is recovered heat from the ArcelorMittal plant, France's largest steel mill that accounts for approximately 1.5% of the country's total energy consumption. With the help of large hoods placed over two cooling beds of the sinter strands, hot air is drawn through an exchanger where it heats water that is then distributed via the network. A capture hood on the Nr. 3 sinter strand to recover 20 MW of heat was brought on stream in early 1986. In April 2008, a hood was installed on the cooling bed of the No. 2 sinter strand, which increased heating capacity by 8 MW.

The additional production sources include a number of heating plants located at various points along the network. Three of these additional heating plants are backed by a cogeneration unit.

Regarding the heating network's energy mix, more than 61% of the production comes from recovered heat from the two sinter strands (100.143 MWh) and nearly 20% from the cogeneration units (31.569 MWh). The other auxiliary heating plants generate the additional 19% (30.920 MWh). The percentage of recovered energy in the network is currently up to 90%, 70% of which is pollution-free industrial byproduct energy.

Continuous improvements of the network's performance

The Dunkirk heating network has been evolving to become even more energy efficient and environmentally friendly over the last years. By the end of 2000, EGL had invested a total of € 37 million in the network, including approximately € 9.6 million in renovation work.

Between 1990 and 2003, the distribution network was replaced by a thermal-efficient, pre-insulated pipeline, resulting in a gradual, significant decrease in network losses that represent today 10.4 % of annual heat output. In 1993, two cogeneration units at the Dunkirk hospital and the Paul Asseman swimming pool were added to the system, equipped with high performance gas boilers and renovated in 2007 with the installation of new, more efficient motors leading to higher efficiency performance. And, in 2004 the construction of a new 9 MW gas/domestic fuel oil heating plant equipped with a 4 MW cogeneration unit in the Glacis neighborhood began.

Contribution to a sustainable development

With the help of these continuous improvements, the percentage of recovered energy has risen to 90%. The recovery of industrial heat enables annual savings of 26.000 tons of CO_2 compared with a gas-fired solution and replaces 2.500 tons of heavy fuel oil with a pollution-free energy source. It also makes the heating network more cost competitive.

On the basis of that success, the City of Dunkirk and Dalkia (EGL) are considering expanding the network by around 20% by 2012. One of the key projects within that strategy is the „Grand Large“project as part of a large-scale urban renewal program. The Dunkirk urban community decided to develop an attractive, relatively densely populated neighborhood (around 1,000 housing units) offering a quantitative and qualitative alternative to suburban living that takes all environmental, economic and social aspects into account. Individualized district heating with an appropriate pricing system to individualize the costs combined with solar heating is one major part of the environmentally friendly solutions. On the technical level, a specific module will be used to distribute heat to each housing unit so that consumption can be measured on an individual basis.

By combining the continuous improvements of the past with the innovative projects to come in the future, the heating network is an essential component of the region's environmental policy, and enables the community of Dunkirk to maintain and enhance the region's reputation as a leading industrial area.

Barcelona – developing a sustainable supply of cooling

Over the last decade in Spain, the growth of individual systems for cooling has been very high leading to additional demand for peak electricity capacity and deterioration of urban environment. The city of Barcelona has taken the lead in the supply of an efficient supply of cooling.

In 2002, a first system started operations in Spain, and now many more systems are delivering cooling on a commercial basis to customers.

The biggest Spanish system is operating in Barcelona, and covers the new urban centre called Forum area, where a major international event – Universal Forum of Cultures - was held in 2004. In 1999, the City Council of Barcelona, in the frame of a strategy on urban development, realized that district heating and in particular cooling systems present important advantages:

- Improved energy efficiency with use of heat that would be otherwise wasted.
- Reduction of environmental impact as compared to conventional air-conditioning systems. The district-cooling system enables to decrease GHG emissions, and also it improves significantly environmental and health conditions
- Creation of added value in terms of new services developed for modern tertiary activities (offices, hotels, information technology and other knowledge-based business) - increasing the attractiveness of the city for investors

The first system started in 2004 to supply clients in the newly reconstructed area called Forum.

The network is over 10-km long, supplies many customers in the area. The main source of energy is steam generated in the solid urban waste treatment plant, located next to the installations. The cooling business is run by Di striclima whose main shareholders are Cofely Spain, AGBAR and TERSA.

The district-cooling system is reducing both primary energy consumption and CO_2 emissions by 50% compared to use of air-conditioning based on electricity.

More good practises can be found on www.districtenergysummit.com