Ecoheat4cities

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Policy Guidance Paper

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More information at **www.ecoheat4cities.eu**

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I. Objective of the guidance paper

The objective of this paper is to provide guidance to national and EU policymakers on how the ecoheat4cities label criteria can be used for the purposes of securing coherence in legislative measures such as green taxation, white certificates, building codes, defining the eligibility for support schemes, securing the effective use of structural/cohesion or other funds.

Recommendations for EU policy makers are formulated around four themes:

- Calculation methods for environmental performances of heating systems
- Relationship between energy and building regulations
- Taxes, support and market chain
- Planning and evaluation.

It draws on and complements policy recommendations from previous projects, such as the ecoheat4eu project which was also supported by the IEE programme. The methodology and tools referred to in this paper can be downloaded from

www.Ecoheat4cities.eu

II. Executive Summary

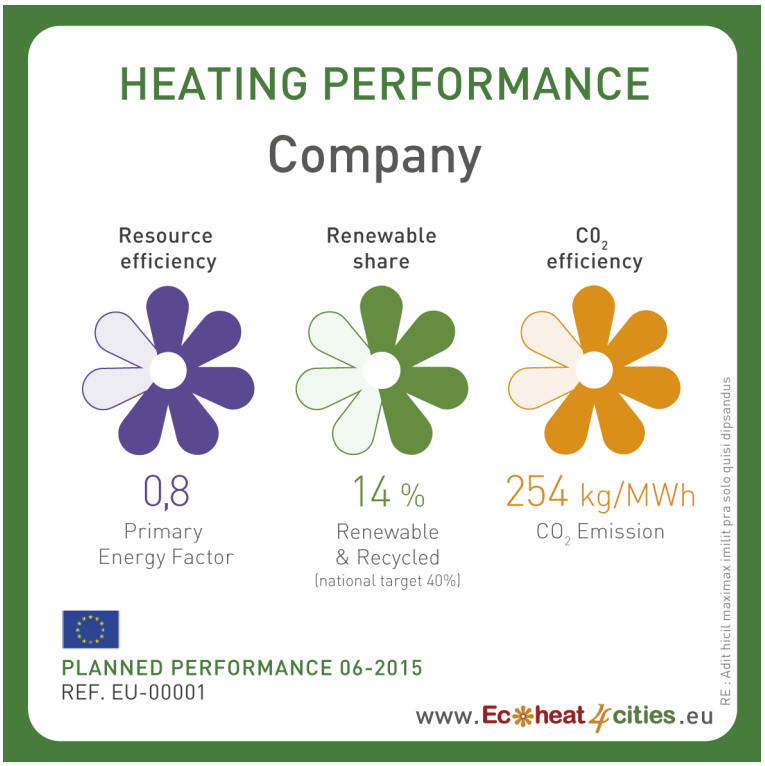
District Heating and Cooling (DHC) plays an important role in the transition from fossil to renewable energy. By using surplus heat from industrial processes, electricity production and waste as well as renewables, district heating reduces the need for fossil fuels to meet heating and cooling demands. The potential for using more district heating in Europe is high. However, up to now there were no method to compare different types of DHC together and to compare them to individual options. The strategic scope of the Ecoheat4cities project was to stimulate the development of environmentally friendly District Heating and Cooling by establishing a green labelling scheme that allows for comparison.

The labelling criteria and methodology of the green labelling scheme have been developed based on a thorough assessment of existing and future policies, standards, directives, certifications and other documents with criteria addressing environmental performance of district heating. All criteria found during the assessment were comprehensively analysed in order to find the best performing criteria to be included in the labelling scheme.

The three criteria that were found to best meet the objectives of the labelling scheme are

- primary energy use,
- carbon dioxide (CO2) emissions and
- share of renewable and recycled energy.

The labelling methodology encourages the use of district heating of high environmental performance. It is mainly based on existing standards to ensure the best possible harmonization with the policy framework in Europe and allowing for comparison between district heating networks in Europe as well as with different heating alternatives. Strongly coupled to the EU 20-20-20 targets it is expected that the foreseen labelling scheme contributes significantly to the achievement of the EU targets for reduction of primary energy use, greenhouse gas emission reduction and increased use of renewable energy.



III. District Heating and Cooling: Contributing to a low-carbon, secure and affordable energy system

The current EU energy system is not efficient. While heat dominates end-use, about one third of the energy content of primary fuels is lost in energy conversion processes (electricity production, industrial processes) in form of heat.

The fundamental idea of District Heating is to use heat that otherwise would be wasted (surplus heat from electricity production, from industrial processes or waste incineration) or renewable energy sources (biomass, geothermal, solar) to provide comfort to buildings (space heating and cooling, warm water preparation) and heat to various processes (industrial processes, hospitals).

Substituting fossil fuel use for heating and inefficient power generation with CHP, heat recycling and renewables by utilising DHC provides the following benefits

For society:

- Strongly reduced fossil fuel consumption by using waste heat from power plants, industries or waste incineration,
- Therefore also strong reduction of greenhouse gases emissions
- Flexibility in choosing and combining local heat sources (e.g. biomass, geothermy or sun)
- More easy to retrofit and to change heat source to renewable, because it is centralized.

For city and local community

- Opportunity to achieve efficiently local climate policy (energy savings and CO2 targets): Conversion from fossil fuels to renewables is more easy and cost-effective with a centralized energy conversion plant than with a lot of individual boilers, the owners of which have to be persuaded to switch to more sustainable options.
- Opportunity to achieve sustainability in areas difficult to retrofit, like historical buildings and old city centres, where it is generally difficult or not cost effective to apply building measures like high level insulation.
- Opportunity to use and flexibility in choosing and combining local energy resources (e.g. biomass, geothermy or solar) and local waste heat (e.g. from incineration plants or industry)
- Greater ability to control local environmental emissions (air quality)
- Retention of capital in local economy en enhanced employment by creating or extending a district heating & cooling company.

For customers:

- Safe (no combustion emissions in house, no combustion devices), highly reliable (very low outage times, about 1 hour per 12 years in modern systems) and as comfortable as other options.
- Reduced space requirements: no boiler is needed, only a domestic substation, that is much smaller than a boiler.
- Almost no maintenance: the domestic substation consists of a simple heat exchanger and requires very little maintenance.
- Generally – but not always- lower investments than for an individual boiler or a heat pump.

For further information on possibilities with District Heating and Cooling in tomorrow's decarbonised energy system, see also the study "Heat Roadmap Europe 2050" on www.heatroadmap.eu.

IV. Meeting the aims of the Energy Efficiency and Renewables Directives: Renewable and surplus energy in District Heating systems

On average more than 80% of the District Heat generation in Europe is based on renewable energy and recycled heat from various processes, such as CHP, waste incineration or industrial surplus heat. This share has been constantly increasing over the past years.

The relevance of further integration of surplus heat and renewable energies in existing systems varies between the different parts of Europe and ultimately from system to system. In terms of efficiency, CO_2 reduction and enhanced security of supply, the integration of additional renewable and surplus heat sources should primarily be considered where direct use of fossil fuels for heating can be substituted.

Many international[1] and national sources (i.e. local Sustainable Energy Action Plans, National Renewable Action Plans) indicate that there is both economic and environmental potential in replacing individual heating systems with District Heating. As heating and cooling demands are concentrated in urban areas, the expansion and creation of new District Heating networks is an important tool to fulfill the aims of both the Renewable Energy Directive and the Energy Efficiency Directive. A new boost to the development of District Heating and Cooling could notably be brought about by:

- utilisation for energy purposes of waste downstream of the reduction, reuse and sorting process;
- utilisation of biomass from agriculture / forestry;
- utilisation of waste biomass in agricultural and industrial areas;
- utilisation of geothermal resources;
- utilization of biogas[2]
- utilisation of solar thermal[3]

Furthermore, there is an increasing number of new District Heating schemes operating with solar thermal heat in both Nordic and Southern European countries. Yet, the integration of solar thermal heat in existing schemes needs to be handled with care. The EU co-funded project "Solar District Heating Take-off" concludes that "where the summer load in the District Heating system comes from waste incineration, waste heat from industries or from Combined Heat and Power plants producing cheap heat and are expensive/difficult to close down, the idea of integrating solar thermal can be eliminated. Normally solar heat cannot compete with heat production prices lower than 3 € cents/kWh in Northern Europe and 2 € cents/kWh in Southern Europe".

1 IEA Energy Technology Perspectives (IEA, 2012), Heat Roadmap Europe 2050 (www.heatroadmap.eu)
2 www.biogasheat.org
3 www.solar-district-heating.eu

V. Heating and cooling markets: Governed by diversity

District Heating systems are local by nature. They differ not only as regards the legislative and structural order (centralised or decentralised energy policy and system, taxation philosophy, level of fossil fuel and electricity prices, historical development of DHC and market shares, tradition of business models and ownership attitudes), but also as regards the local conditions (i.e. climatic conditions, urban density, local availability of fuels, renewable and surplus heat sources, infrastructure limitations).

Heating demands have been met in many different ways in Europe. The different European heat markets are therefore highly diversified, offering many different solutions in order to satisfy customer demands. In some countries, the use of natural gas in local boilers dominates. In other countries, District Heating systems dominate the low temperature heat market.

As a holistic energy system, District Heating interacts with many other regulated areas in energy production, supply and consumption. Hence it is particularly vulnerable to legislative inconsistencies between these areas. As a consequence, legislation influencing heat markets needs a comprehensive approach which at the same time allows for sufficient flexibility to take into account the respective local or in the best case regional conditions.

For the European level, the challenge is to define European policies that can coherently be translated into national energy policies. It must impose measures that are sufficiently binding yet flexible enough to give leeway to local projects to optimally draw on local conditions and synergies („intelligent systems") under cost-effectiveness considerations.

VI. Calculation methods for energy and environmental performances of heating systems and buildings: Key to designing consistent and effective policy measures

- A higher degree of uniformity in the calculation methods used in different energy directives (e.g. Energy Efficiency Directive, CHP directive, Ecodesign) would increase their reliability and comparability.

- Methods using energy consumption at the building's gate (e.g., electricity consumption, gas or heat consumption) must be avoided. As they don't take into account the ways electricity and heat are produced, they are not a good measure for the use of non-renewable energy and do not incentivise efficient energy production. That is why "Primary Energy Thinking' should be promoted. Figure 1 illustrates the difference between energy consumption at the buildings' gate and Primary Energy Use. Figure 2 gives an example.

- In view of the numerous advantages of District Heating a fair evaluation of cogeneration based and renewable based District Heating is needed when implementing energy Directives and the Energy Performance in Buildings Directive. The method developed in the framework of the Ecoheat4cities projects is well defined and well defendable and could be used as the standard method to calculate the performances of District Heating and individual heating options.

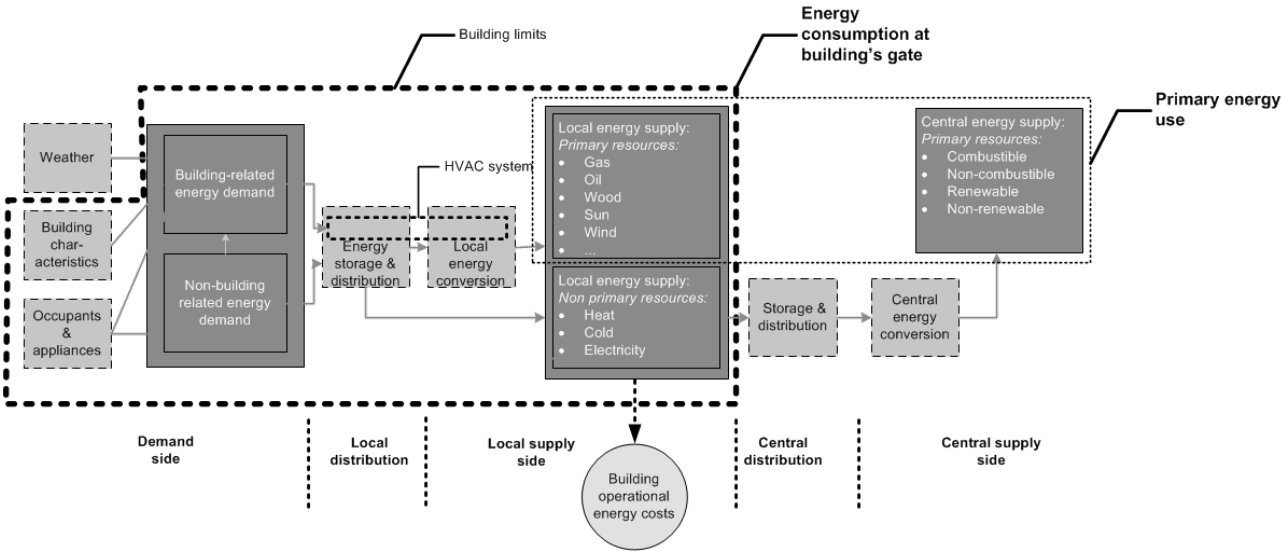


Figure 1: The energy chain: Energy demand, Energy consumption at building's gate and Primary energy use

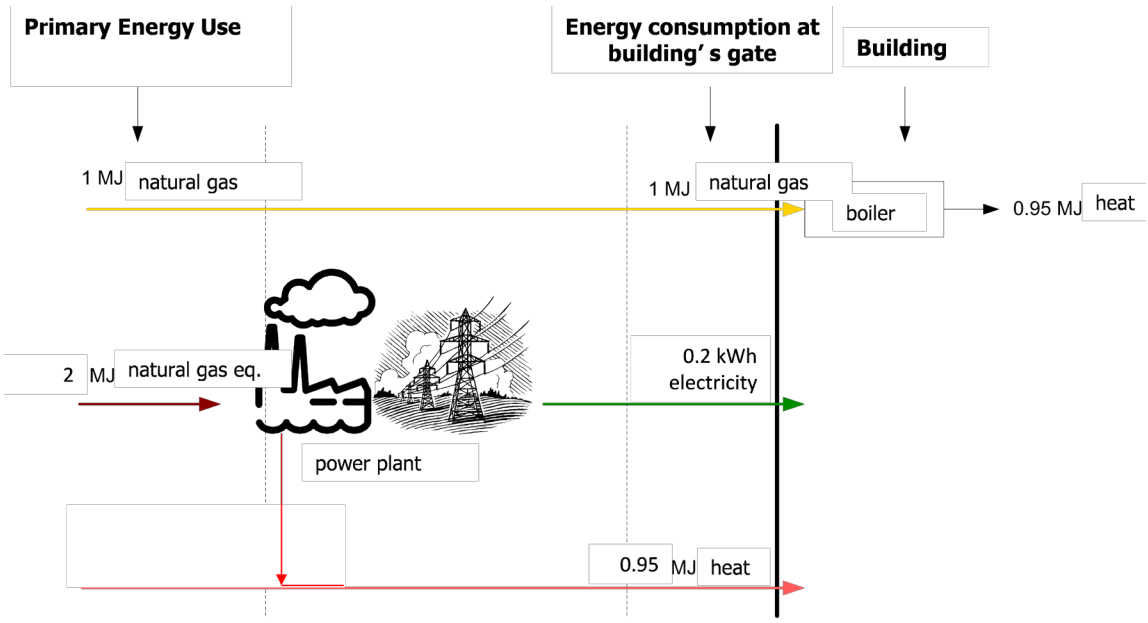


Figure 2: Energy consumption at building's gate and Primary energy use. If 0.95 MJ heat and 0.2 kWh electricity are needed in a building and a gas boiler is used for heating, the total primary energy use is 3 MJ. If district heating based on CHP is used, only 2 MJ primary energy use is needed, a saving of 33%. These savings are not reflected in the energy consumption at the building' s gate (0.2 kWh electricity in both cases and 0.95 MJ heat for district heating instead of 1 MJ natural gas – an apparent saving of only 5%).

▷ District Heating based on Combined Heat and Power or the use of otherwise wasted heat is a powerful way of using energy rationally (and is therefore a powerful way to maximize energy savings and emission reduction). The rational use of energy (also called exergy approach) should be supported by EU policies and considered as indicator for the successful implementation. The rational use of energy can be captured by applying the three Re's:

1. Reducing the heating demand
2. Recycling as much as possible waste heat
3. Replacing fossil fuels by renewable resources

VII. Energy performance assessment: Key to result-oriented use of funds (Environmental State Aid, Cohesion and Regional Funds)

Whenever public funding is involved, authorities and the general public have a legitimate interest to ensure that the envisaged effort bears the desired effect. This applies also and in particular to spending under EU supervision (such as state aid) or from the EU budget (such as cohesion and regional funds). Being able to assess the effects of projects – new developments, expansion, modernization – both before and after implementation is therefore crucial. In a report made public on 14 January 2013, the Court of Auditors of the EU states that cohesion policy investments in energy efficiency are not cost-effective, in other words that they have not been designed to result in the greatest energy savings over the shortest period of time and at the best cost. The Court had examined 24 projects in the Czech Republic, Italy and Lithuania, the countries that received the most EU funding for such projects in 2007-2013.

In their suggestions, the auditors say the European Commission, which manages cohesion funds, should ensure that projects undergo a in-depth needs assessment, and must be adequately monitored.

The Ecoheat4cities method and label come in handy in this context. They allow for assessment of District Heating and Cooling projects based on a harmonized set of input data both in the design and implementation phase of projects. Based on common principles they also provide sufficient room and flexibility to take into account the local circumstances. The clear advantages for all parties involved: enhanced transparency and credibility, faster application and approval procedures.

VIII. Supporting District Heating and Cooling: General Recommendations to Policy-makers

European Energy Strategy & National energy policy

Acknowledge the major benefit (higher energy efficiency) of District Heating and Cooling in the national energy policy. This will give the essential national policy support for applying proper supporting measures for District Heating and Cooling.

General vs. specific measure

Consider whether you want a general solution for a community problem (as energy inefficiency) or you want to support district heating systems directly through financial measures. Since natural gas and fuel oil are the major energy commodities used for heating in Europe, taxes on CO_2 emissions or fossil energy at a sufficiently high level would be the general support measures for all future alternative heat supply. Then District Heat has to compete with other non-fossil heat supply.

Other general measures are the specific national climate change investment programs, where District Heating and Cooling can be supported, if the programme aims are fulfilled.

Direct financial support

Direct financial support can be applied for stimulation of District Heating system expansions in Refurbishing, Expansion, and New development countries, but might be less appropriate in Mature district heating markets.

The comparison of heating and cooling options shows the advantages of CHP and the advantages od decarbonizing technologies: use of refuse, waste heat, biomass, heat from the ground or solar heat (see Figure 3). These technologies can be supported by specific subsidy programs to help overcome the problem of the often very high front-end investments.

When applying more general support measures as fossil fuel taxation and climate change investment programs, mature District Heating systems will also benefit if they fulfill the general program aims.

Financial support character

Consider the support effectiveness between initial investment grants and annual supports as feed-in tariffs, CHP bonuses or green certificates. Investors put a higher risk reduction value in upfront investment grants, since annual support later can be changed or completely removed by another parliament composition. Hence, annual financial support has a long term political risk (stop-and-go policies).

Eligibility for funding

Keep it simple. Procedures for granting subsidies should be simple, transparent, non-discriminatory, and, above all, fast. The ecoheat4cities method and comparison tool allows for easy comparison of individual heating options and District Heating.

Market control

As the fundamental idea of DHC is to replace the use of (expensive, fossil) fuels by investment in infrastructure (allowing to "recycle" surplus heat and to use renewable energies), separation of the market chain is mostly not recommended.

Disruptive regulatory changes could lead to a situation where crucial investment in new networks, in the modernization of District Heating systems or installation of renewable heat supply generation is postponed or even cancelled. This is even more true as certain forms of mandatory access (i.e. feed-in regimes) to the heat supply infrastructure or its connected customers could result in higher District Heating prices and hence a competitive disadvantage for District Heating compared to its competitors.

Limit market control measures only when District Heating and Cooling systems have reached a strong and dominant position in the heat market, thus creating weak competition from competing heat and cold supply.

Heat planning

Consider to add heat planning to other community planning activities as waste management, traffic, water, sewage, and land use planning. The ecoheat4cities comparison tool provides guidance for effective planning and allows quantifying benefits.

Planning perspective

The District Heating and Cooling benefits will be bankable with proper waste planning, location planning of energy-intensive processes, and building regulations. District Heating and Cooling providers will then take active parts in developing these plans.

Market distortions

Erase distortions. District Heating and Cooling sometimes loose competitiveness from market distortions. For example, many DHC systems are subject to carbon charges, whereas individual alternatives such as oil and gas burners are not. Other examples are direct subsidies to for households (i.e. subsidized or capped gas or electricity tariffs) or subsidized purchase prizes for individual appliances.

Sector dimension

Consider which sector dimension (planning, generation, distribution, demand, or organisation) to support. Generation measures dominate, but distribution measures are appreciated by District Heat providers, since the financial risk in distribution are reduced.

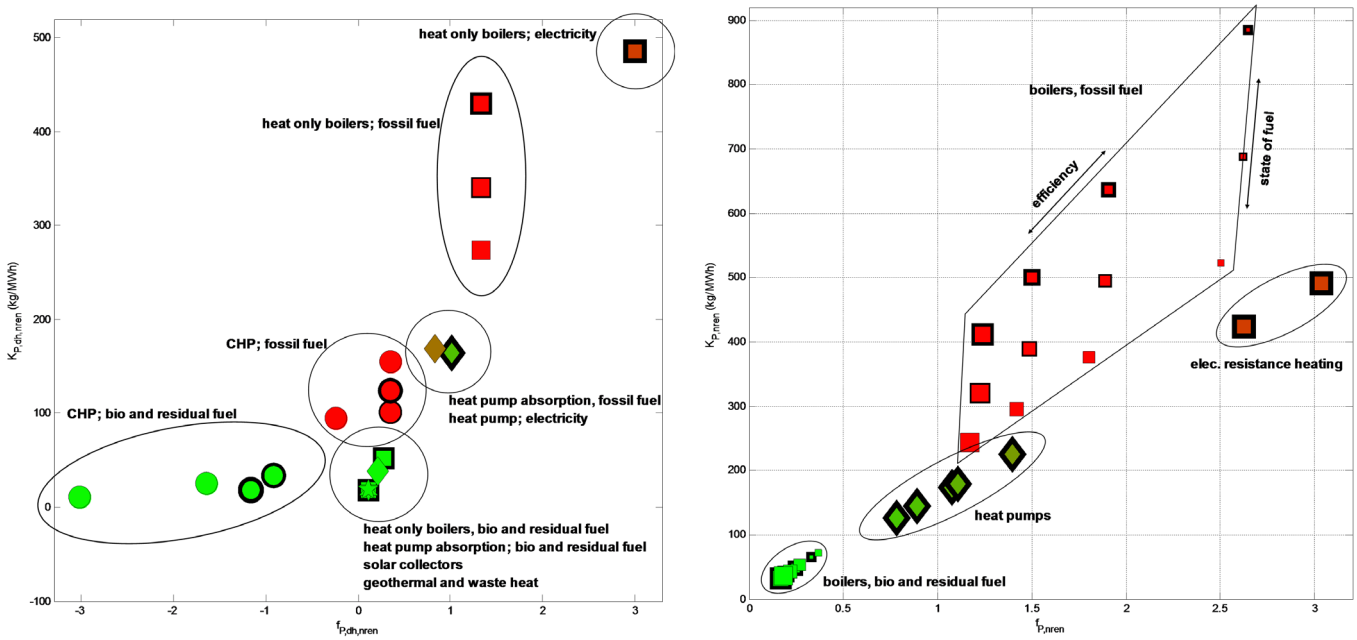


Figure 3: Comparison of the performances of different types of DHC (left) and individual options (right). He performances are measured in terms of label criteria f (primary energy factor) and K (CO2 emissions). The lower they are, the higher the performances.

IX. Implementing European Directives: Do's and Don't's

A. Directive Directive 2012/27/EC on Energy Efficiency (repealing Directives 2004/8/EC on CHP and 2006/32/EC on Energy Services)

The Directive stipulates:

- An absolute ceiling for the EU's primary energy demand by 2020 (no more than 1474 Mtoe primary energy or 1078 Mtoe final energy by 2020);
- An obligation for Member States to set their own indicative national energy efficiency targets, express their targets in primary or final energy2, and take account of the Union's objectives;
- Definitions of ''efficient District Heating and Cooling' (a district heating or cooling system using at least 50% renewable energy, 50% waste heat, 75% cogenerated heat or 50% of a combination of such energy and heat'), of 'efficient heating and cooling' (options that reduce the use of primary energy in a cost-effective way compared to a business-as-usual scenario) and 'efficient individual heating and cooling';
- An obligation for Member States to set up an energy efficiency obligation scheme;
- An obligation for Member States to prepare a comprehensive assessment of the potential for high efficiency CHP and efficient DHC
- An obligation for Member States to adopt policies for local and regional levels that encourage the due taking into account of the potential of using 'efficient heating and cooling systems', including the potential identified in the comprehensive assessment
- A cost-benefit analysis to be carried out at the level of individual installations for:
  1. New and 'substantially refurbished' power plants, above 20 MW, to assess the possibility of cogeneration
  2. New industrial installations or 'substantially refurbished' to assess costs of developing CHP and of connecting the installation to a DHC network.
  3. A new DHC network or in an existing one 'new energy production installation with a total thermal input exceeding 20 MW is planned or an existing such installation is to be substantially refurbished, in order to assess the cost and benefits of utilising the waste heat from nearby industrial installations'.

The energy saving obligation scheme shall ensure that energy distributors and/or retail energy companies designated as 'obligated parties by member states achieve a cumulative end-use energy savings between 2014 and 2020. Article 7(2) provides flexibility in the implementation with the possibility to use the following option to adapt the target or realize savings including by allowing 'energy savings achieved in the energy transformation, distribution and transmission sectors, including efficient District Heating and Cooling infrastructure (…) to be counted against the amount of energy savings required under paragraph 1' Flexibility is limited to no more than 25 % of the targeted savings, but the provision is an entry to a system approach, and should allow to capture the benefits of District Heating and Cooling when a) new customers are connected and b) generation plants and distribution infrastructure are modernized/improved.

By the end of 2015, Member State shall also prepare a comprehensive assessment of the potential for high efficiency CHP and efficient DHC which shall take account of studies under Directive 2004/8/EC. This exercise should be repeated every 5 years. Member States shall be exempted from this obligation if they have already carried out an 'equivalent assessment'.

Within the frame of the Comprehensive Assessment, Member States shall prepare a Cost Benefit Analysis (CBA) at territorial level to identify the economic potential that covers cost-efficient solutions for meeting heating and cooling demands. The CBA 'shall be capable of facilitating the identification of the most resource and cost-efficient solutions to meeting heating and cooling requirements'(Article 14(3)) and will concern high-efficiency cogeneration, efficient DHC and 'efficient heating and cooling' (Article 2(42)) that can be considered as an alternative to the baseline scenario.

When the Comprehensive Assessment/Cost Benefit Analysis identifies a potential 'whose benefits exceed the costs', then 'MS shall take adequate measures for efficient District Heating and Cooling and high efficiency CHP to be developed and/or to accommodate the development of high efficiency cogeneration and the use of heating and cooling from waste heat and renewable energy sources.' If no potential, Member States may exempt installations from obligations.

RECOMMENDATIONS:

- As the objective of the Directive is to achieve primary energy savings, implementation measures should be conceived from a primary energy perspective;
- The Ecoheat4cities method and comparison tool can be used to quantify savings under the savings obligation scheme as well as provide guidance for the comprehensive assessment;
- Member States should thoroughly assessment of the heating and cooling markets and potential for all DHC strategic heat sources: CHP, municipal wastes, industrial surplus heat and renewables (biomass, geothermal, solar)
- Member States should spell out clearly what 'adequate measures' they intend to take to realize the potential and address barriers
- The Comprehensive Assessment should set a clear hierarchy: DHC as the default way for heating/cooling in urban areas when there is proven potential;
- The Comprehensive Assessment should cover the extension of existing networks, the development of new networks and look into the potential for savings stemming from the modernisation of existing networks – i.e. draw a list of measure to turn existing DHC, that do not qualify as 'efficient DHC', into efficient DHC (Annex VIII, point e). The Ecoheat4cities label can be used to document the savings effect of modernization measures;
- The Comprehensive Assessment and Cost-Benefit Analysis should use robust input data, consider a long-time horizon (more than 10 years) and look into the articulation between the development of DHC as a future-proof infrastructure and the objectives of a low-carbon energy sector;
- All assessments should be linked to implementation of the Directive 2002/91/EC on the energy performance of buildings – i.e. development of city-wide/eco-district as a way to increase building performance
- The Comprehensive Assessment should include comparison of the potential for using renewables in DHC/CHP as compared to individual applications
- The Comprehensive Assessment should cover all benefits including new synergies between DHC and the development of intermittent renewables (e.g. balancing of wind power)
- The need to mobilize investors to finance new DHC infrastructures should be ad dressed under 'adequate measures', in particular a link is necessary with the new objectives of the European Union in terms of regional development and infrastructures.

B. Directive 2010/31/EC (succeeding Directive 2002/91/EC) on the Energy Performance of Buildings

The Directive stipulates:

- A common methodology for calculating the integrated energy performance of buildings on the basis of primary energy;
- Minimum standards on the energy performance of new buildings and existing buildings that are subject to major renovation;
- Systems for the energy certification of new and existing buildings and, for public buildings, prominent display of this certification and other relevant information. Certificates must be less than five years old;
- Regular inspection of boilers and central air-conditioning systems;
- At least all new public buildings to be nearly zero energy buildings by 31/12/2020, and all new buildings from 2020

The Directive is applicable to new buildings and existing buildings subject to major renovation, as well as to elements having a significant impact on the energy performance when they are replaced / upgraded. According to the Directive, the common calculation methodology should include all the aspects which determine energy efficiency and not just the quality of the building's insulation. Notably this integrated approach should take into account the positive influence of heating and electricity systems based on renewable energy sources; electricity produced by CHP, district or block heating and cooling systems, etc. Responsible for setting the minimum standards based on the methodology above are the Member States.

The EPBD defines a nearly Zero-Energy Building as follows: [A nearly Zero-Energy Building is a] "building that has a very high energy performance… [ ]. The nearly zero or very low amount of energy required should to a very significant extent be covered by energy from renewable sources, including renewable energy produced on-site or nearby."

Respecting these principles is of primary importance for ensuring that District Heating and Cooling can be considered as options to fulfill the aims of the Directive which ultimately is to save primary energy. However, many Member States have adopted a final energy approach only, thereby prioritizing building-specific solutions (i.e. insulation, glazing, etc.) over eco-districts. This is a barrier to the development of District Heating.

Today, best practice examples in translating the primary energy approach of the Directive into national laws are Finland and Germany. In these countries, building codes set primary energy efficiency standards for new buildings and different sources of heat have different coefficients. The higher the coefficient the more difficult it is to achieve the standards. In Finland, the "ranking" of the coefficients (primary energy factors) is as follows: electricity 2.0; fossil fuels 1.0; district heat 0.7; renewables 0.5. In Germany, higher values for electricity reflect the high share of coal-based condensing power in the system, whereas the energy performance of each District Heating system can be certified and taken into account specifically. In both countries, a requirement exists that certain percentage of the used energy ought to be from renewable sources. DHC based on CHP/surplus heat and/or renewable energy is automatically considered to fulfill this criterion ("compensation measure").

RECOMMENDATIONS:

- The use of primary energy factors as set out in the standards related to the Buildings Directive should be binding and consistent. The Ecoheat4cities method should inspire both the European and national calculation method for the energy balance.
- The concept of almost zero-energy buildings should not be limited to only onsite considerations. The opportunities of eco-districts should be taken into account.
- District Heating and Cooling based on sustainable sources should be recognized as "compensation measures" for fulfilling RES-obligations.
- Research funding is needed to secure technology improvement and higher cost-effectiveness in relation to the connection of low-energy buildings do District Heating and Cooling.

C. Directive 2009/28/EC on the Promotion of Renewable Energies

The Directive provides a framework for achieving the EU's 20% renewable energy target by 2020. It requires Member States to take action in the electricity, heating and cooling, and transport sectors.

With regard to District Heating, the Directive specifies that

- It is appropriate for Member States to consider mechanisms for the promotion of District Heating and Cooling from energy from renewable sources.
- Member States shall recommend to all actors, in particular local and regional administrative bodies to ensure equipment and systems are installed for the use of electricity, heating and cooling from renewable energy sources and for District Heating and Cooling when planning, designing, building and renovating industrial or residential areas.
- Member States shall, in particular, encourage local and regional administrative bodies to include heating and cooling from renewable energy sources in the planning of city infrastructure, where appropriate.
- By 31 December 2014, Member States shall, in their building regulations and codes or by other means with equivalent effect, where appropriate, require the use of minimum levels of energy from renewable sources in new buildings and in existing buildings that are subject to major renovation. Member States shall permit those minimum levels to be fulfilled, inter alia, through District Heating and Cooling produced using a significant proportion of renewable energy sources.

The project confirms that urban planning is a key instrument, also with a view to reconciling and exploiting synergies between energy efficiency measures and the use of renewable energy sources. Furthermore, feed-in tariffs for electricity from biomass are seen as a beneficial instrument, if they contain a "heat component" rewarding combined heat and power production. The fact that the Directive seems to restrict the eligibility of District Heating and Cooling as a measure to fulfill the renewable buildings obligation to systems "using a significant proportion of renewables" is reported by a number of stakeholders as an unfair treatment of systems using primarily surplus heat from electricity and industrial processes, especially as compared to the treatment of heat pumps.

RECOMMENDATIONS:

- When implementing the Directive Member States should duly consider the requirement to take into account efficiency criteria and favor CHP operations.
- Capacity caps for renewable support measures should be removed.
- Competence in municipalities is needed regarding heat planning, the high initial investment, and knowledge on DH.
- Feed-in tariffs for CHP electricity from biomass should include a component that specially rewards heat recovery.
- National waste planning (in accordance with the waste framework Directive) is recommended as it allows to better exploit the contribution of municipal waste to the renewable targets.
- The European Commission should clarify that both energy efficiency measures and renewable energies are considered as equivalent whenever the fossil energy savings effects are comparable.
- When monitoring the impact of the Directive the European Commission should assess the costs and effects of support mechanisms for grid-based solutions as compared to individual renewable technologies.

X. Conclusions

The adoption and implementation of the so-called 2020 package of Directives has had positive effects on the way Member States value and promote District Heating and Cooling schemes. However, Directives and their national implementation partly provide contradictory signals and insufficiently reflect the need for their synergetic application at local level.

- The methodology used to calculate the label offers serious possibilities to be used as standard in Energy Directives and EPBD and to therefore get a step further into harmonization of procedures and fair assessment not only of District Heating but also of individual heating solutions in comparison. The fact that the method is European, but also accepts national annexes is an advantage.
- The label and underlying method provide useful tools to ensure consistent and effective implementation of existing and future Directives.