

Ecoheat4cities

December 21

2012

The Ecoheat4cities project project team initiated a European labelling scheme for District Heating and Cooling (DHC) which will be further developed by the international Association for DHC, Euroheat & Power. The objective of the label is to enable cities to better implement climate and energy strategies, thereby contributing to European Union policy objectives. This report provides an overview on the main outcomes of the project work, including guidance for cities/urban planners and policy-makers.

Final Publishable Report

This report was elaborated in the framework of the Ecoheat4cities project supported by the Intelligent Energy Europe Programme.



Ec*heat 4 cities

Project coordinated by Euroheat & Power

More information at www.ecoheat4cities.eu

Authors:

Euroheat & Power,

Sabine Froning and Ingo Wagner

Based on input from the project team

Contact Person:

Sabine Froning, Euroheat & Power, Cours St. Michel 30 (bât. Securex)

+32-2-7402110, sf@euroheat.org

Contents

1.	Executive Summary.....	4
1.1.	Objectives.....	4
1.2	Results.....	5
1.3	Activities and impact after the end of the project.....	7
2.	Overview of the project.....	8
2.1	Key project data.....	8
2.1.1.	Project leader: Euroheat & Power.....	8
2.1.2.	Project partners.....	9
2.2	Project Background and objectives.....	11
2.2.1.	Cities: Time to talk about green heat!.....	11
2.2.2.	Companies: Getting credit for green heat!.....	11
2.3	Project progress.....	13
2.4	Overview of results.....	15
2.4.1	An operational green label.....	15
2.4.2	Time to talk about green heat: Guidance for cities.....	23
2.4.3	Getting credit for green heat.....	25
2.4.4	Creating visibility: Outreach and marketing materials.....	27
2.4.5	Want to know more? Useful background materials.....	29
2.5	Communication with other projects and organizations.....	31
2.6	Examples of labeling reports.....	33
3.	Main lessons learned.....	35
4.	Find out more.....	37



1. Executive Summary

1.1. Objectives

The aim of the Ecoheat4Cities is to support the recognition, development and application of sustainable District Heating and Cooling (DHC) systems. The establishment of a voluntary green energy label that measures energy efficiency, use of renewables, and CO₂ emission savings of District Heating and Cooling systems, will support cities, operators and investors in teaming up for heating and cooling solutions that match the objectives of European energy policy, notably the Renewable Energy Directive, the Energy Efficiency Directive and the Energy Performance in Buildings Directive.

1.2 Results

A) **An operational labeling scheme** for the performance of District Heating and Cooling systems based on three criteria: energy efficiency, renewable energy use, CO₂ emissions. The project has delivered the complete set of necessary tools. The toolbox includes:

- Technical Guidelines, defining the set of criteria and the calculation method
- Rules of Governance, laying down the structure of the labeling process, its supervision and further development;
- Online Tool for the performance calculations. The tool is put at the disposal of labeling bodies and comes with a user guide.

B) **Background documentation**, including:

- Baseline Study, analysing the European DH systems based on the three labelling criteria (primary energy, CO₂ emissions, share of renewable/recycled energy);
- Report on Best available technology/ Best not yet available technology: An assessment of the improvement potential of District Heating and Cooling Systems.

C) **Tools for the comparison of different heating and cooling options**, at the disposal of cities and potential developers. These include:

- Report on the comparison of different District Heating and individual heating and cooling options providing detailed comparison on the aspects of: Label criteria (Primary energy factor, CO₂ emissions and renewability), costs (investments and exploitation) and other criteria (among others; air quality, pollution control, safety, security of supply, opportunities for cities and end consumers)
- User Guide and Excel Design Tool for comparison of different heating and cooling options

D) **32 labeled District Heating schemes showcasing** a large variety of possibilities for sustainable heat supply throughout Europe (see also chapter 2.6). At the time of writing this report, further label applications were underway. The "International District Energy Climate Awards" – www.districtenergyaward.org will serve further promotion of the labeling method and provide visibility to the label as such.

E) **Guidance for national and EU policy-makers** 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 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.

The document draws on, updates and complements policy recommendations from previous projects, such as the ecoheat4eu project which was also supported by the IEE programme. It provides guidance on general principles (primary energy thinking vs. final energy approach), on the use of the label criteria for evaluating the eligibility for funding projects, and on the implementation of three key Directives:

- Directive 2012/27/EC on Energy Efficiency
- Directive 2010/31/EC on the Energy Performance of Buildings
- Directive 2009/28/EC on the Promotion of Renewable Energies

F) **Marketing materials** at the disposal of DHC companies and cities, including:

- Brochure "Green comfort for sustainable cities"
- Guidelines for companies

Highlighting the key messages and results of the project, they have served as a perfect introduction for engaging with the target groups.

G) **High level of awareness** for the labeling scheme throughout the DHC sector in Europe, achieved by means of websites, project leaflets and newsletters, workshops, presentations at numerous conferences and meetings. As project leader and representative branch organization, Euroheat & Power is committed to continuing the labeling scheme and has established the International Labelling Board.

Grön värme i staden?
Vi hjälper dig att värdera den...



Ec*heat 4cities

www.ecoheat4cities.eu

1.3 Activities and impact after the end of the project

The label is expected to significantly contribute to enabling the DHC sector to demonstrate performance in relation to EU energy policies and local climate strategies and thereby increase the acceptance and uptake of the technology. The label and guidelines, as well as the poster tool and marketing materials will enable both DHC companies and cities to plan for and communicate on sustainable energy infrastructure and take pride in the results delivered.

Euroheat & Power's Board of Directors has confirmed its decision to continue the labeling scheme and set up an International Labeling Board to oversee the implementation. Euroheat & Power will continue to promote the labeling scheme to its members. The first meeting of the Labelling Board is scheduled for March 2013.

The developed methods and tools are also instrumental in the ongoing standardization processes in relation to calculations under the EPBD. Euroheat & Power has liaison status with CEN TC 228 and will closely cooperate as regards the revision of the District Heating and Cooling standard with a view to ensure full consistency.

Ecoheat4cities has also inspired the evaluation process in the 3rd edition of the International District Energy Climate Awards (www.districtenergyaward.org).

Close cooperation exists with an international project funded under the IEA Implementing Agreement on DHC/CHP.



**DANISH
TECHNOLOGICAL
INSTITUTE**



2. Overview of the project

2.1 Key project data

2.1.1. Project leader: Euroheat & Power (EHP)

As internationally recognized branch organization, Euroheat & Power unites the District Heating and Cooling sector in and outside Europe. The association works in partnership with numerous organisations in the renewable energy and energy efficiency sectors as well as with local communities. Euroheat & Power is committed to maintaining and further developing the ecoheat4cities labeling scheme after the end of the project.

www.euroheat.org ;

www.dhcplus.eu ;

www.ecoheat4cities.eu

Contact: sf@euroheat.org

2.1.2. Project partners

German District Heating (AGFW)

AGFW is the independent German Energy Efficiency Association for District Heating, Cooling and CHP. AGFW, has approximately 400 members, including District Heating utilities, industrial companies, manufacturers and research institutes. AGFW represents the interests of 92 % of the total connected District Heating load in Germany (about 57,000 MWth).

www.agfw.de

Contact: i.weidlich@agfw.de

Danish Technological Institute (DTI)

The Danish Technological Institute is a self-owned and non-profit institution. It develops, applies and disseminates research- and technologically-based knowledge for both the Danish and International business sectors.

www.dti.dk

Contact: Christian.Holm.Christiansen@teknologisk.dk

Lithuanian Energy Institute (LEI)

The Lithuanian Energy Institute was established in 1956 (as the Institute of Physical Technical Problems of Energy). Today it is the largest energy research institution in Lithuania with a staff of over 300.

www.lei.lt

Contact: ykv@mail.lei.lt

Building Research Establishment (BRE)

BRE is an independent and impartial, research-based consultancy, testing and training organization, offering expertise in every aspect of the built environment and associated industries. BRE helps government, industry and business to meet the challenges of our built environment. Today's need to combat climate change, and the significant economic and social issues we now face, are no exceptions. Its services include consultancy, creating safe and healthy, high quality, cost effective buildings, communities and businesses.

www.bre.co.uk

Contact: WiltshireR@bre.co.uk

Delft University of Technology (TUD)

TUD has participated with both the Faculty of Architecture
Department of Building Technology Juliana-
laan 134, 2628 BL, Delft, the Netherlands,
and OTB Research Institute for the Built Environment, Department of Sustainable Housing Management and Quality Assurance.

www.tudelft.nl

Contact: L.C.M.Itard@tudelft.nl

Swedish District Heating Association (SDHA)

The Swedish District Heating Association is the national association in Sweden for District Heating, District Cooling and combined heat and power. It consists of 135 member companies, all of which distribute or produce DHC. In addition they have a large number of affiliated members, notably the manufacturing industry and technical consultants.

www.svenskfjarrvarme.se

Contact: erik.larsson@svenskfjarrvarme.se
anna.land@svenskfjarrvarme.se



2.2 Project Background and objectives

The objectives of the Ecoheat4cities project were to:

A) Support the implementation of the Directive on the promotion of the use of energy from renewable sources (2009/28/EC) as regards its DHC related components by greater municipal and public acceptance of the systems;

B) Promote understanding and acceptance sustainable District Heating among the EU's citizens and their local representatives and authorities;

C) Establish more and improve DHC. Monitor and encourage renewable energy and efficiency developments in the DHC sector;

D) Trigger locally integrated and increasingly cost-effective solutions for buildings, energy efficiency, renewables and infrastructures by facilitating sustainable urban planning and eco-districts through guidance documents, training and workshops;

Critical for the achievement of these objectives are two stakeholder groups: cities and DHC companies.

2.2.1. Cities: Time to talk about green heat!

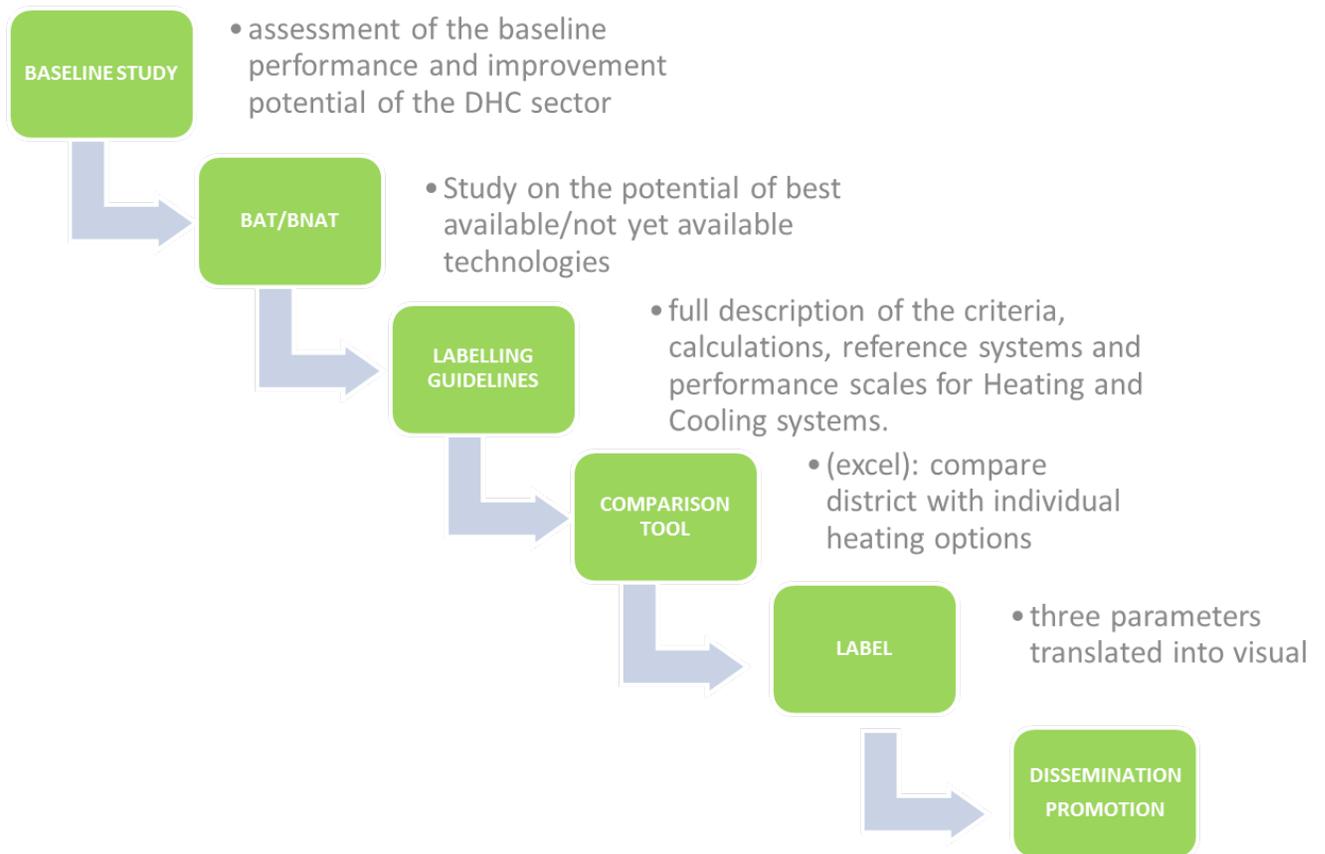
Cities are the decision makers and end users of DHC. The ambition of ecoheat4cities is to guide them in making evidence-based sustainable energy choices. The label encourages them to see the merits of DHC, to take pride in it and boast about the superior energy and related environmental nature of their cities' heating and cooling systems.

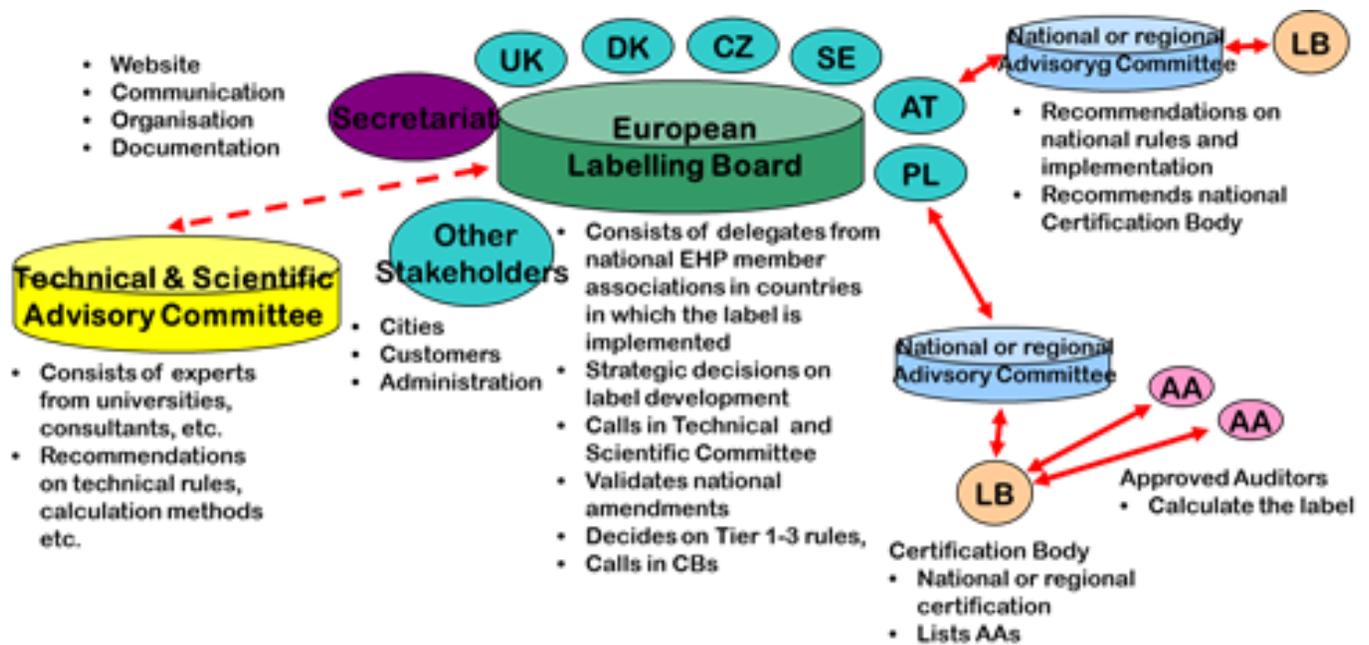
2.2.2. Companies: Getting credit for green heat!

District Heating and Cooling companies are responsible for operating systems, improving them in line with the energy and climate goals adopted by the European Union and expanding the share of District Heating in Europe. Looking to the future, DHC companies will need to seriously consider how they can decarbonise their heat networks in the same way that electricity companies are evaluating how their grids can supply electricity without continuing to use fossil fuels. The new labeling scheme has an important role to play in helping companies demonstrate that actions taken in support of this objective result in tangible improvements and reduced environmental impact.



2.3 Project progress





2.4 Overview of results

2.4.1 An operational green label

Labelling governance

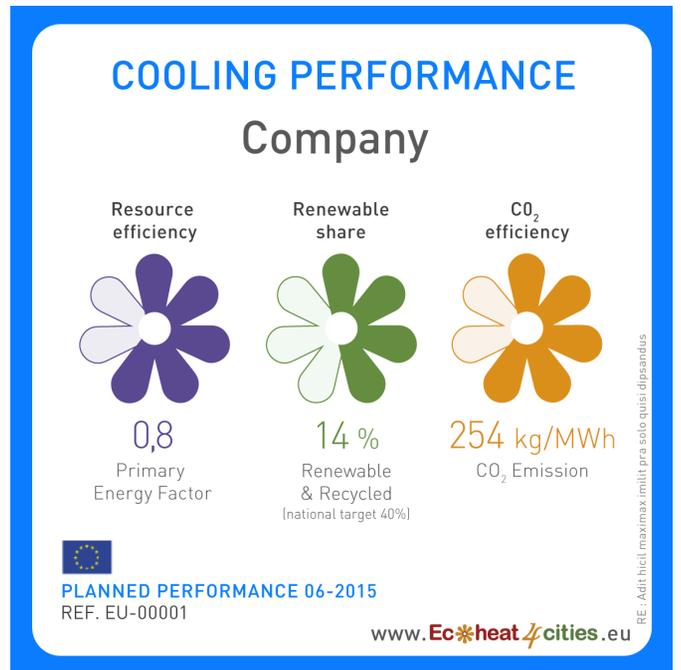
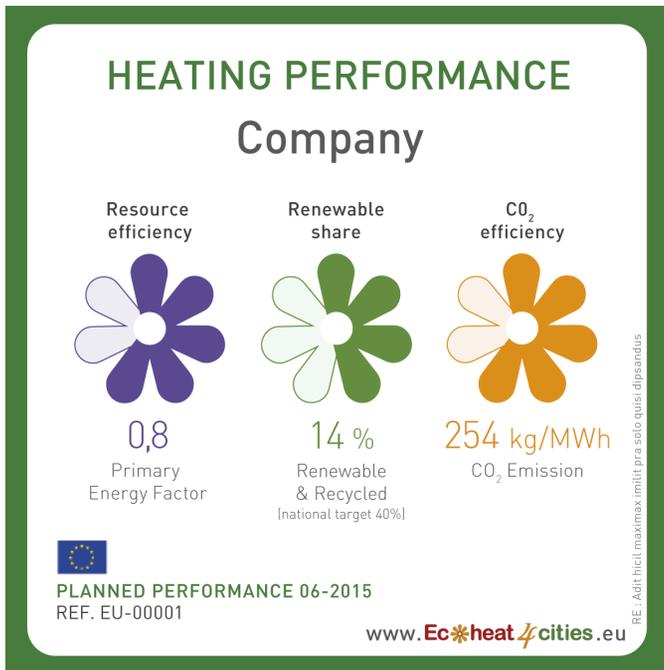
The rules of governance include procedure concerning

- the bodies governing the Ecoheat4Cities labelling
- the Ecoheat4Cities labelling process
- the Ecoheat4Cities labelling bodies

The application of the labelling scheme will be overseen by an International Labelling Board under the roof of Euroheat & Power as well as National Labelling Boards. A list of all labels granted under the scheme will be kept in a dedicated website. The following pictures provides an overview on the governance structure.

Please download the rules of governance here:

http://ecoheat4cities.eu/en/upload/web/Ecoheat4cities_Rules%20of%20Governance_Dec%202012.pdf



Guidelines for technical performance assessment of District Heating and Cooling Systems

Out of many aspects which may be considered when assessing the performance of District Heating and District Cooling, the label has chosen to cover a set of three specific aspects. These aspects relate to the European Union's overall goals to save primary energy resources, to increase the share of renewable in the energy system and to reduce the emissions of CO₂ into the atmosphere.

The guidelines specify:

- indicators to express the energy performance and energy source of District Heating systems;
- a procedure to define reference values;
- a procedure for District Heating energy labelling.

They are intended to be used by:

- label certification bodies, (role of which has been defined in the "Labelling governance") and other entities eligible to conduct district heating labelling;
- District Heating planners and district heating operators to assess the performance of a planned or an existing District Heating system and thus to express this performance.

A District Heating system is characterised by energy indicators:

The energy performance of a District Heating and/or cooling system is represented by the two indicators EP

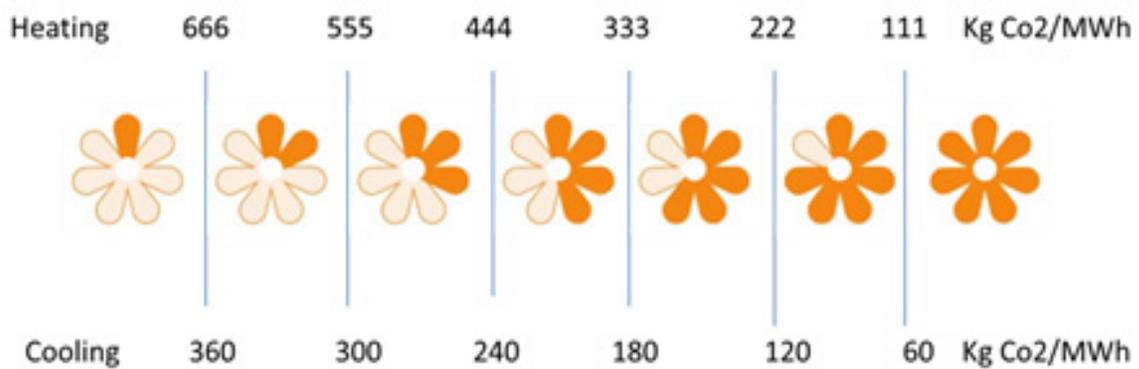
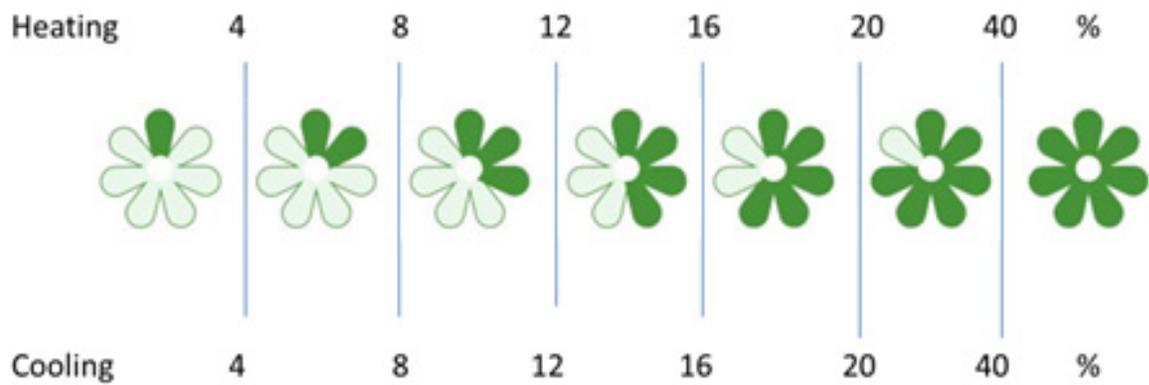
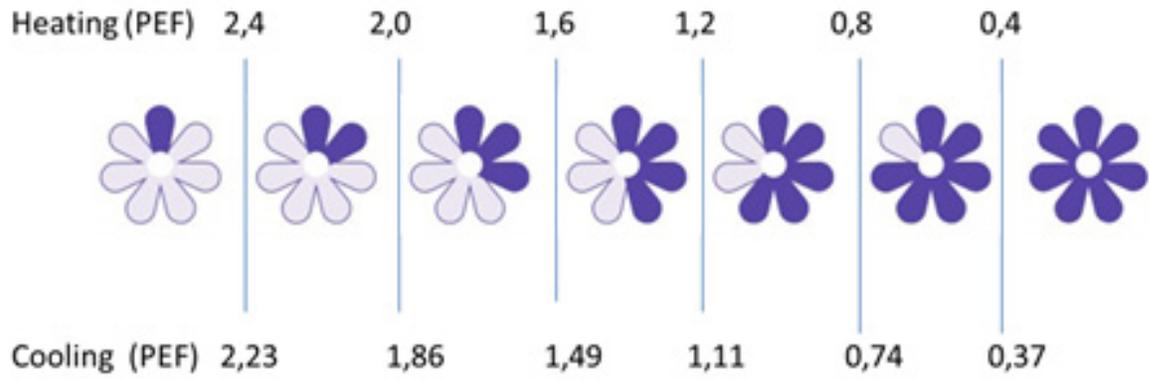
- primary energy factor $f_{P,dh}$
- emission coefficient K_{dh}

The energy source of a District Heating and/or cooling system is represented by the indicator ES

- renewable and surplus heat fraction R_{dh}

They may be complemented by additional indicators that shall be defined in a national annex.

Example: The share of cogenerated heat can be an – additional - energy source indicator. For each criterion, a scale of seven classes is provided corresponding to the seven petals of the respective flower on the label. Flowers with seven petals filled indicate best in class performance on the respective criterion.



Resource Efficiency: Based on the Primary Energy Factor (PEF). The lower the primary energy factor, the lower the primary energy input in relation to the volume of heat supplied (the scale is based on EN norms).

Renewable share: This factor values the share of renewable and surplus heat in relation to the European/national renewable target. (scale is based on EU 2020 targets in %).

CO₂ Efficiency: Based on the CO₂ emission per delivered MWh of thermal energy. The lower the value, the more the system is climate-friendly (scale is based on EN norms).

The technical guidelines distinguish between

1. using Ecoheat4Cities default labeling criteria,
- and 2. using national default labeling criteria.

The ecoheat4cities default labelling criteria apply when no national calculation rules and/or coefficients (primary energy factor of fuels, CO₂ emission coefficient of fuels, renewable and recycled energy fraction of fuels) are given in a national Annex.

The National labeling criteria apply when a national Annex is in force.

The guidelines encompass terms and definitions, symbols and abbreviation, determination of system borders, calculation rules, plausibility check, class limits for energy indicators, and specifications for the label for both District Heating and Cooling.

As of 2013, the label will be promoted and leveraged in the different European countries. For any comments and information on the labeling process, please contact Euroheat & Power.

The guidelines can be downloaded here:
http://ecoheat4cities.eu/en/upload/Extranet/WP3_Practicalities/3-10-12-technical%20guidelines%20for%20labeling.pdf



User guide and excel tool for calculating fuel inputs and outputs

To ensure consistency and facilitate the work of the labeling bodies, an online calculation tool has been developed as part of the project. With this tool, the heating performance of District Heating, District Cooling and/or District Heating+cooling systems can be assessed based on the fuel inputs, delivered heat and export of heat and electricity.

The performance assessment is based on the calculation rules and methods outlined in the guidelines for technical assessment. The user guides briefly explains the tool and how to use it.

The user guide also explains how to proceed if a national Annex is in force and how national variations in fuel data (primary energy factor, CO₂ emission coefficient, renewable and surplus heat fraction) are taken into account.

The tool has separate and independent sheets for assessing District Heating (DH), District Cooling (DC) and District Heating and Cooling (DHC) systems. In each of these sheets, the three Ecoheat4Cities performance indicators are calculated.

Download user guide here:

http://ecoheat4cities.eu/en/upload/Extranet/WP_5_Guidance_for_other/121011Short%20guide-tool%20based%20on%20inputs%20and%20outputs%20v13.pdf

and access the excel input and output tool here:

http://ecoheat4cities.eu/en/upload/Extranet/WP_5_Guidance_for_other/121011-excel%20tool%20based%20on%20fuel%20inputs%20and%20outputs%20v13.xls

In case of DH:

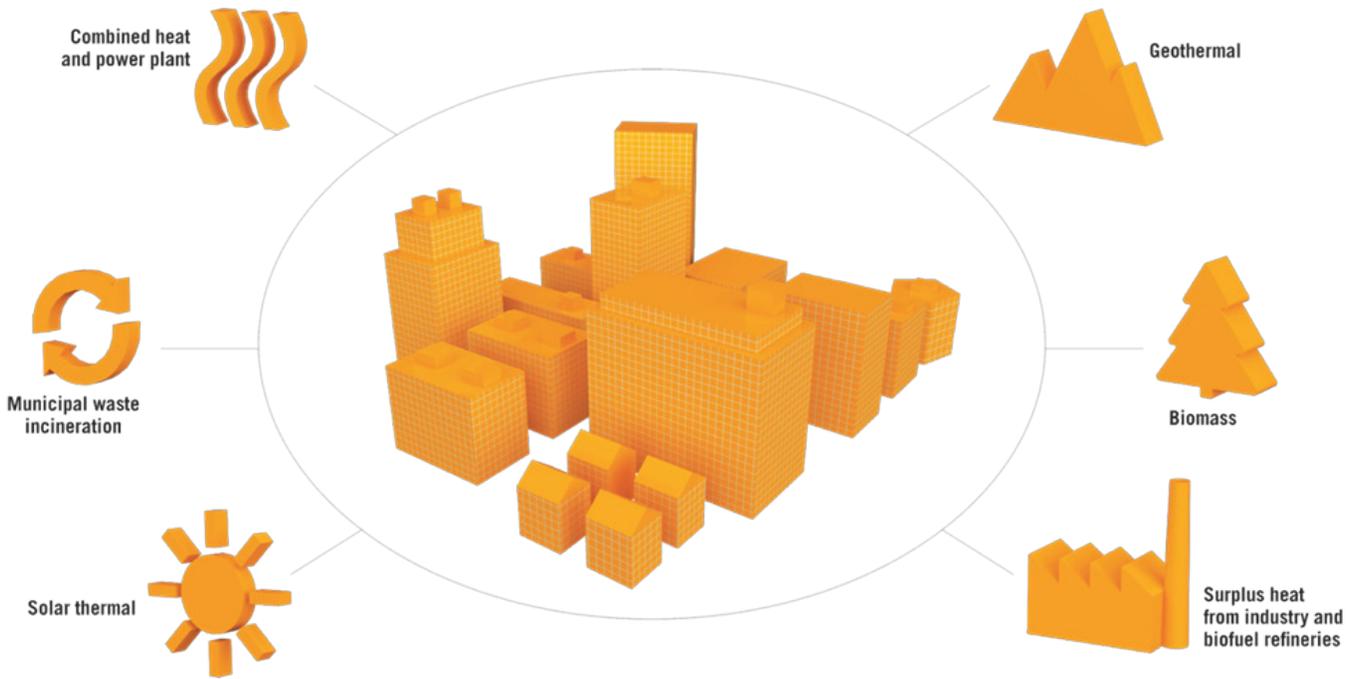
- fP,dh,nren non-renewable primary energy factor of DH
- KP,dh,nren non-renewable primary CO₂ emission coefficient of DH in kg/MWh
- Rdh ratio of heat from renewable/surplus heat carriers to the total heat

In case of DC:

- fP,dc,nren non-renewable primary energy factor of DC
- KP,dc,nren non-renewable primary CO₂ emission coefficient of DC in kg/MWh
- Rdc ratio of cooling from renewable/surplus heat carriers to the total cooling

In case of DHC:

- fP,dhc,nren non-renewable primary energy factor of DHC
- KP,dhc,nren non-renewable primary CO₂ emission coefficient of DHC in kg/MWh
- Rdhc ratio of heat+cooling from renewable/surplus heat carriers to the total heat+cooling



2.4.2 Time to talk about green heat: Guidance for cities

Comparison of different heating and cooling options

The report targets cities and urban planners and provides guidance on the relevance and applicability of the green-labelling methodology established by the Ecoheat4cities project. One of the main objectives is to provide cities/communities with the information required to choose the best route for achieving their environmental aspirations.

Communities as well as the final customer must be empowered to make well informed heating and cooling choices. In particular cities need tools allowing to make cost-effective choices between individual technologies/appliances and system solutions (DHC).

Based on the labeling method and the eco-design Directive, a methodology has been developed for comparing DHC with various heating and cooling options. In addition, a tool has been developed in Excel to easily make those comparisons.

The design tool has been developed in Excel as part of the Ecoheat4Cities 'Guidance to cities and urban planners'. With this tool, the heating performance of District Heating systems and individual heating options can be compared.

The performance assessment is based on the calculation rules and methods outlined in the Ecoheat4Cities "Guidelines for technical assessment of District Heating and Cooling systems". Further information on values and methods used in the tool can also be found in the full work report "Comparison of different heating and cooling options".

In general, the tool calculates the three Ecoheat4Cities performance indicators for a District Heating (DH) system:

- $f_{P,dh,nren}$ the non-renewable primary energy factor of DH
- $K_{P,dh,nren}$ the non-renewable primary CO₂ emission coefficient of DH in kg/MWh
- R_{dh} the ratio of heat from renewable/recycled energy carriers to the total heat

As the methodology for calculating these indicators can also be applied to individual heating systems (omitting the subscript 'dh'), it provides a means to make a performance comparison between district and individual heating systems. Furthermore, as the number of model parameters describing the heating characteristics of a district and individual system, and which are required to make the comparison, are quite limited, city planners or their advisers may assess these parameters without extensive effort. The tool enables city planners to make the comparison in an early design phase themselves.

In the actual form, a certain amount of design data on the District Heating system is needed in order to make the comparison possible. On the other hand, when data is known about an existing District Heating system, this data can be converted easily to the input data needed in the tool. Based on this methodology and the calculation tool, a preliminary comparison has been carried out on the three green label criteria: non-renewable primary energy factor ($f_{P,dh,nren}$), CO₂ emissions (K_{dh}), and renewable fractions (R_{dh}).

Additionally a methodology for comparison at cost level is presented as well as a comparison of other relevant criteria not taken into account in the label like land use, public health, CO₂ emissions, pollution control, cost-effectiveness, customer benefits, longer-term possibilities.

Please download the report here:

http://ecoheat4cities.eu/en/upload/Extranet/WP_6_Communications_Dissemination/Ecoheat4cities_Comparison%20of%20different%20heating%20and%20cooling%20options%20-final%20report%20-%20revised%20WvdS%202012-11-28.pdf

and the user guide here:

http://ecoheat4cities.eu/en/upload/Extranet/WP_5_Guidance_for_other/Short%20user%20guide%20WP5%201%20design%20tool.pdf

and access the excel design tool here:

http://ecoheat4cities.eu/en/upload/Extranet/WP_5_Guidance_for_other/Ecoheat4cities_WP5%201%20design%20tool%20v%201%2031%202012-08-22.xlsx

Fornire calore in maniera efficiente
e sostenibile per l'ambiente?

Ne puoi trarre vantaggio!

Ec*heat 4 cities

www.ecoheat4cities.eu



2.4.3 Getting credit for green heat

Guidance to DHC companies on the benefits of labeling

This document provides District Heating and Cooling (DHC) companies with guidance on the benefits of labeling and the key parameters for achieving high performance on the labeling criteria. It promotes the label by making information available on the potential advantages to DHC companies and how labeling can be used to successfully meet their customer needs.

The early sections of the document provide information on the label itself: what the label is, how it has emerged and who it is for.

The benefits of individual networks becoming labeled, such as helping connected buildings to demonstrate compliance with national building regulations, are then described.

After highlighting the three adopted labeling criteria and the 7 Class rating system, the guidance then sets out how DHC companies can get started with labeling by providing information on the preparatory work required, how to engage with the labeling body and the assessment.

The guidance then outlines the fundamental factors for improving performance and discusses specific solutions that can be adopted. It then moves on to provide a series of examples detailing how particular networks have adopted specific improvements and, as a result, improved their performance in relation to the labeling criteria.

The examples deal with a range of approaches including switching to low and zero carbon fuels, adding combined heat and power (CHP) and refurbishment of older networks.

Networks undertaking incremental improvements to obtain middle class numbers, for example Class 4, are covered as well as those adopting the most advanced technologies and renewable fuels to achieve the highest classes e.g. 1 and 2.

Finally, the document also signposts sources of information on other aspects of quality assurance not covered by labeling criteria.

Please download the document here:
http://ecoheat4cities.eu/en/upload/Extranet/WP4_Guidance_for/Ecoheat4Cities%20WP4%20Guidance%20for%20companies.pdf



Groene warmte; kent u de kansen voor uw klimaatbeleid?

Ec*heat 4cities

www.ecoheat4cities.eu

2.4.4 Creating visibility: Outreach and marketing materials

As the purpose of the label is to create awareness, uptake and acceptance, it comes with a range of marketing materials. With the support of a communication agency, a brand has been developed based on elements that have proven successful in previous campaigns, such as the "District Heating and Cooling flower".

A label designed for recognition

The label as such has been designed using the District Heating and Cooling flower with seven petals. As a result of a previous European-wide campaign, the flower is already well known in a number of countries as the symbol of District Heating. Also the color scheme for the three criteria – orange, green, purple – has been subject to thorough assessment with the support of a communication agency.

Brochure "Green comfort for green cities"

More and more communities formulate climate protection, energy efficiency or renewable targets and feel the obligation to think about a sustainable future-proof energy infrastructure for their citizens. Heating and cooling needs represent the largest share in end-use – and are today mainly covered by fossil fuels in individual appliances (oil and gas boilers). Therefore, any serious climate concept needs to integrate the dimension of heating and cooling.

With short texts and expressive imagery, the brochure provides local governments and urban planners with an introduction to the tools available to assess the merits of District Heating and Cooling, and compare them to alternatives on the basis of criteria like primary energy use, CO₂ emissions, renewability, air quality, and economic criteria.

Easy and attractive: the graphic factory

Once a label has been issued, city, system name and label are not only listed on the public website: at the same time, a poster can be created with graphic elements chosen by the respective party. Thereby, label and promotional materials can be generated in one go. Efficient and attractive, just like District Heating and Cooling!

The Ecoheat4cities final project conference

Throughout the project period, information about ecoheat4cities was provided at numerous national and international conferences. The final conference was held on 10 October 2012 as part of the DHC+ Technology Platform's "The Next DHC Generation" conference (9-10 October 2012 - Brussels).

The minutes can be downloaded here:

http://ecoheat4cities.eu/en/upload/Extranet/WP_6_Communications_Dissemination/121026_Minutes%20of%20Ecoheat4cities%20final%20conference%203.pdf

Presentations are also available on here:

<http://www.euroheat.org/Event-Presentations-147.aspx>



2.4.5 Want to know more? Useful background materials

Technical report on labeling criteria for DHC

The purpose of this first technical report on labeling criteria was to define a first set of criteria and a method of calculation for evaluating the energy and environmental performance of District Heating. It was clear that the proposed methodology must encourage the use of District Heating of high environmental performance, such as DH systems that use renewable and resource efficient energy sources, in the long run contributing to the goals of the Renewable Energy Directive.

With the voluntary labelling system in place it should be possible for customers to compare the environmental advantages of using heat from a given District Heating network with alternative heating options such as heat pumps and boilers, among others. On the basis of the technical report, a first round of DH test-labelling calculations were performed. Those test-labelling experiences provided the basis for further verifications, which in the end led to the final 'Technical labeling guidelines'.

Baseline study

In the process, an assessment of the baseline performance and improvement potential of the DHC sector has been conducted by the Swedish District Heating Association. This report analyses the European District Heating systems based on the three labelling criteria (primary energy, CO₂ emissions, and share of renewable and recycled energy). This report is based on the report "Ecoheat4Cities WP2 Green Labelling Criteria", where a method for weighing the three criteria together to end up with a final classification label is proposed. The baseline study has been calculated with the initially decided label parameters used for the first phase of test labelling. Hence it should be noted, that the final calculation method slightly deviates.

Best available technology/Best not yet available technology:

An assessment of the improvement potential of DHC, which benchmarks District Heating systems, can be downloaded here. Prepared by DTI, this document presents current Best available and Best not yet available technologies.



2.5 Communication with other projects and organizations

A reference group has accompanied the progress of the project and was consulted at a number of occasions. The reference group also engaged in communication activities, for example by disseminating information about project results, providing opportunities for presentations and exchanges at conferences etc. Such conferences also enabled the project group to directly reach out to the main target groups: representatives of local authorities and DHC stakeholders.

The work with the reference group was very successful and all partners look back to a period of profitable cooperation. Members of the reference group were:

Amorce

- association of local authorities and business in waste management, energy and DHC

Cogen Europe

- the European association for the promotion of cogeneration/CHP

Energy-Cities

- the European Association of local authorities inventing their energy future

ICLEI

- the world's leading association of cities and local governments dedicated to sustainable development

IEA CHP/DHC Collaborative

- the International Energy Agency's CHP/DHC cooperation platform

Furthermore, fruitful contacts and synergies were created with the following projects:

UP-RES

The Urban Planners with renewable Energy Skills project focusses on trainings for urban and regional planners. Therefore, partners organize country-specific short and long term training courses. Additionally, information about 30 best practice cases of renewable energy solutions which are integrated in urban planning are collected.

<http://aalto.pro.aalto.fi/fi/info/kehitystoiminta/up-res/>

Ecolife

The Ecolife project aims at the development of CO₂-neutral urban areas. In the course of the project three demonstration communities become sustainable zero carbon Eco-towns.

www.ecolife-project.eu

SDHTake-off

The Solar District Heating Take-Off project aims at the removal of barriers for Solar District Heating in Europe and at the improvement of market conditions. While building capacity on the suppliers side, DHC industries and experts cooperate with solar thermal industries and experts to prepare policy recommendations and develop support schemes for decision-makers on all levels.

www.solar-district-heating.eu

YDEEVNE FOR FJERNVARME

Brædstrup

Brædstrup



Ressourceudnyttelse	Vedvarende ressourcer	CO₂-udledning
		
0,69	7,6 %	199,1 kg/
Primær energifaktor	Vedvarende ressourcer & overskudsvarme (Nationalt mål 40%)	CO ₂ -udledning

 Gyldigt 01/2013 indtil 01/2014
Dokumentreference DK-00013

www.Ec*heat 4 cities.eu

NB: Hverken Ecoheat4cities-teamet eller Europa-Kommissionen kan gøres ansvarlig for følgerne af dette mærkes brug eller misbrug

YDEEVNE FOR FJERNVARME

Marstal



Ressourceudnyttelse	Vedvarende ressourcer	CO₂-udledning
		
0,24	99,8 %	46,6 kg/MWh
Primær energifaktor	Vedvarende ressourcer & overskudsvarme (Nationalt mål 40%)	CO ₂ -udledning

 Gyldigt 01/2013 indtil 01/2013
Dokumentreference DK-00016

www.Ec*heat 4 cities.eu

NB: Hverken Ecoheat4cities-teamet eller Europa-Kommissionen kan gøres ansvarlig for følgerne af dette mærkes brug eller misbrug

HEATING PERFORMANCE

Lerwick District Heating Scheme

Shetland Heat Energy & Power

Resource efficiency	Renewability	CO₂ efficiency
		
0.42	89 %	95 kg/MWh
Primary Energy Factor	Renewable & Surplus heat (national target 15%)	CO ₂ -emission

Valid 12/2012 until 12/2013
Reference number GB-00004

www.Ec*heat 4 cities.eu

RE: Neither the Ecoheat4cities team nor the European Commission can take any responsibility for actions arising from the use or the misuse of this label.

2.6 Examples of labelling reports

Brædstrup, Denmark

The system is supplied by a natural gas engine and boiler supplied by 8.000 m² of sun heating, expanded in 2012 to 18.600 m² in combination with bore hole storage and a big heat pump in combination with 7.500 m³ tank storage and a 10 MW electric boiler. The energy data is from 2009-2011 and was provided by the plant operator.

Result:

Primary energy factor:

class 2 = 6 petals

Emission coefficient:

class 2 = 6 petals

Renewable and surplus heat:

class 6 = 2 petals

Marstal, Denmark

The system is supplied by a 18,3 MW bio oil boiler supplemented by 18.300 m² of sun heating and a fuel oil boiler. The sun heating is expanded in 2012 to 33.300 m² in combination with a 4 MW wood chip boiler, a 1,5 MW heat pump in combination with 87.440 m³ storage and a 750 kW electric boiler. The energy data is from 2009-2011 and was provided by the plant operator.

Result:

Primary energy factor:

class 1 = 7 petals

Emission coefficient:

class 1 = 7 petals

Renewable and surplus heat:

class 1 = 7 petals

Joensuu, Finland

The system is mainly supplied with wood-chips, harvest residue and residue from sawmills like sawdust (secondary biomass). Generally all the wood based fuel would otherwise be wasted or not used. The second fuel is peat. Table 3 of the technical guidelines doesn't provide conversion factors for peat, so it is assessed with the default conversion factors of coal. Electricity is produced only in one CHP plant that incinerates both wood and peat at the same time. Biogas is surplus from a landfill. A peak load boiler uses light and heavy oil. The energy data is from 2011 and was provided by the system operator Fortum.

Result:

Primary energy factor:

class 1 = 7 petals

Emission coefficient:

class 2 = 6 petals

Renewable surplus and heat:

class 2 = 6 petals

Lerwick, Shetland Islands

The system is mainly supplied with municipal waste. This waste would be incinerated regardless of whether heat needed to be generated. The second fuel is oil. Table 3 of the technical guidelines provides conversion factors for municipal waste and heavy oil. These have been adopted as there is no UK specific annex to the guidelines at the present time. There is no electricity generation but electricity is imported for pumping. A peak load boiler uses heavy oil. The energy data is from 2011 and was provided by the system operator Shetland Heat Energy and Power (SHEAP).

Result:

Primary energy factor:

class 2 = 6 petals

Emission coefficient:

class 1 = 7 petals

Renewable and surplus heat:

class 1 = 7 petals



3. Main lessons learned

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). 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 legislation established in all these areas.

Establishing the foundation for a common European label for a local product like District Heating and Cooling in a time-frame of 2 ½ years was a huge challenge. While the Ecoheat4cities project succeeded in doing so, the longterm success of the Ecoheat4cities programme can only be secured through the firm commitment of the national DHC associations under the umbrella of Euroheat & Power to further develop and sustain the labeling scheme. At the time of writing the report, the first important steps in this direction were already taken.

3.1 A solid theoretical background

As a consequence of the above, a comprehensive approach was required which at the same time would allow for comparability while providing sufficient flexibility to take due account of the respective local conditions and elements enshrined in national legislation. The project team did not only have to carry out even more background research and analysis as initially forecasted but also re-route the methodological work repeatedly until a satisfactory approach was found. The objective was to define a label which would be sufficiently ambitious for frontrunners in the sector without being too exclusive. At the same time, the label methodology was supposed to be applicable also to other heating and cooling methods in order to enable urban planners to make sustainable choices. Therefore, the analysis was not limited to the DHC sector alone, but also to state-of-the-art of competing technologies as defined in the Ecodesign-Directive.

Lesson No. 1: Thorough and comprehensive background research and analysis are the foundation of acceptance and hence indispensable to succeed. Establishing a European-wide labeling scheme means embarking on an adventure with unknown outcome. Every single route must be explored and the pro's and con's weighed. An intense rhythm of project meetings is required to ensure complete understanding and fast decision-making on newly identified issues.

3.2 Wide stakeholder involvement and communication

The project team spend a lot of time and effort in engaging other stakeholders in the District Heating and Cooling sector in order to learn about potential reservations and barriers on the way to implementation. This allowed the team to learn about perceived problems and to solve them before the method was set in stone. Identifying first movers and critical

mass was another challenge which required huge communication work. Many stakeholders reacted positively to the label idea, but the project needed not only "passive supporters" but "actors". This decision was only taken by companies once they had full understanding of the – final – labeling method and its potential implications. Complex decision-making procedures in the companies added an extra degree of flexibility.

Lesson No 2: Wide stakeholder involvement and flexibility in the work programme to ensure all reservations are duly taken care of are essential. A solid network of acknowledged multipliers (national associations) ready to expand whatever time and effort is necessary to communicate and report back to the project team.

3.3 Keeping it simple

Reaching out to municipal stakeholders was another important aim of the project. In manifold contacts with city representatives throughout the project period, it became quickly clear that communicating complex issues in a simple way to the general public was another challenge requiring a professional approach. From the terminology to the images used, all materials were carefully designed and worded with the support of communication professionals. This interaction was crucial to strike the right balance between simplicity (narrowing down information to a minimum) and transparency (making as much information available as possibly required).

Lesson No 3: To secure acceptance by the receivers of the label, even the most complex issues need to be communicated in a simple and attractive way. The assistance of external communication experts is essential to add value to the work of the experts in the project team.

4. Find out more

Euroheat & Power	Sabine Froning	sabine.froning@euroheat.org
Denmark	Christian Holm Christiansen, DTI	christian.holm.christiansen@teknologisk.dk
Germany	Ingo Weidlich, AGFW	i.weidlich@agfw.de
Lithuania	Vaclovas Kveselis, LEI	vkv@mail.lei.lt
Netherlands	Willem van der Spoel, TU Delft Laure Itard	w.h.vanderspoel@tudelft.nl l.c.m.italrd@tudelft.nl
Sweden	Anna Land, SDHA Erik Larsson	anna.land@svenskfjarrvarme.se erik.larsson@svenskfjarrvarme.se

WWW.**Ec*****heat** 4 **cities**.eu