



„ECOHEAT4CITIES, REDUCTION OF NON-TECHNOLOGICAL BARRIERS FOR DISTRICT HEATING AND COOLING“

2012 Annual Conference Euroheat&Power

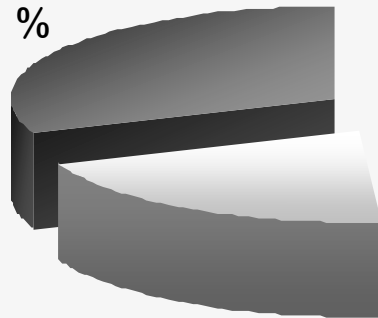
27.04.2012, Dr.-Ing. Ingo Weidlich

WÄRME | KÄLTE | KWK

» Challenges in the District Heating sector

Primary energy consumption in EU27, 2010

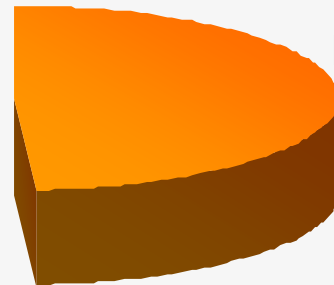
Transport
31 %



20 %

Electricity

Heat
49 %

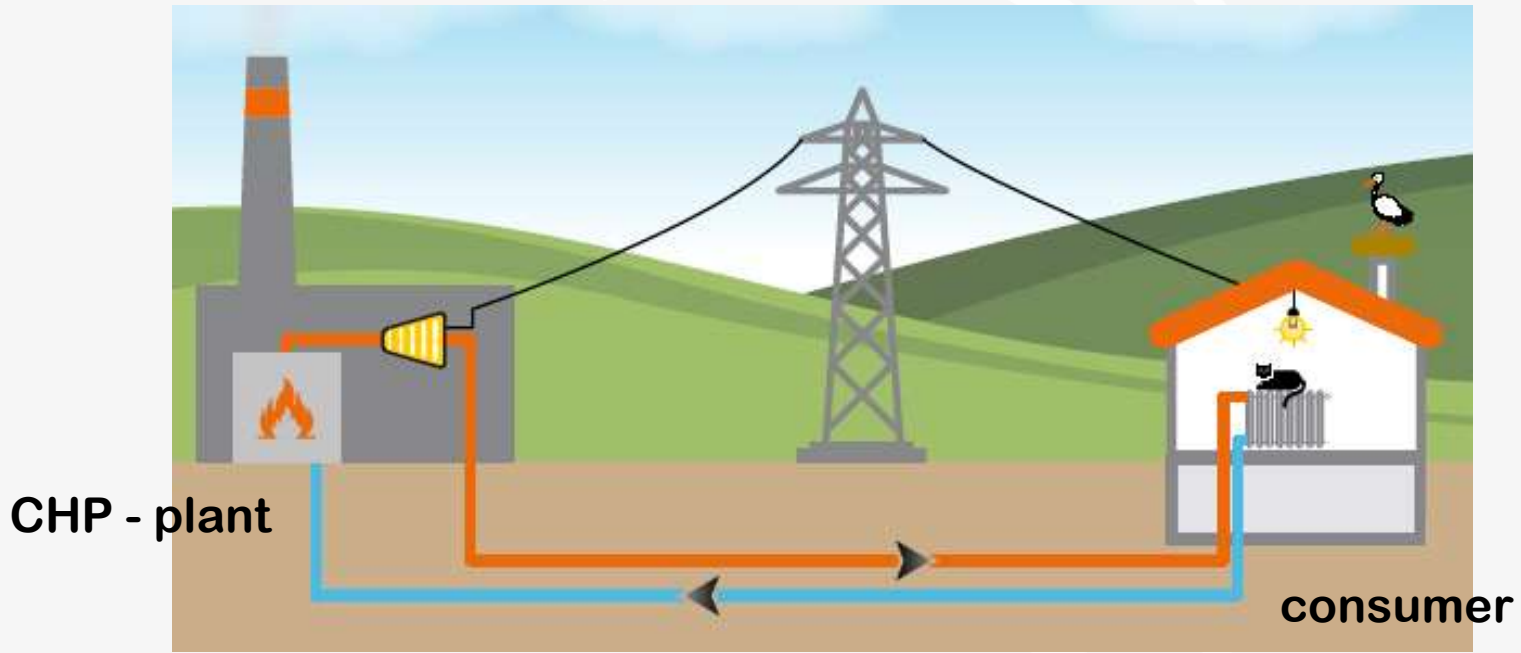


Reaching the ambitious 20-20-20 EU targets means a lot of work!

- » Increasing Energy efficiency
- » Integration of renewable energy resources
- » Reduction of Emissions

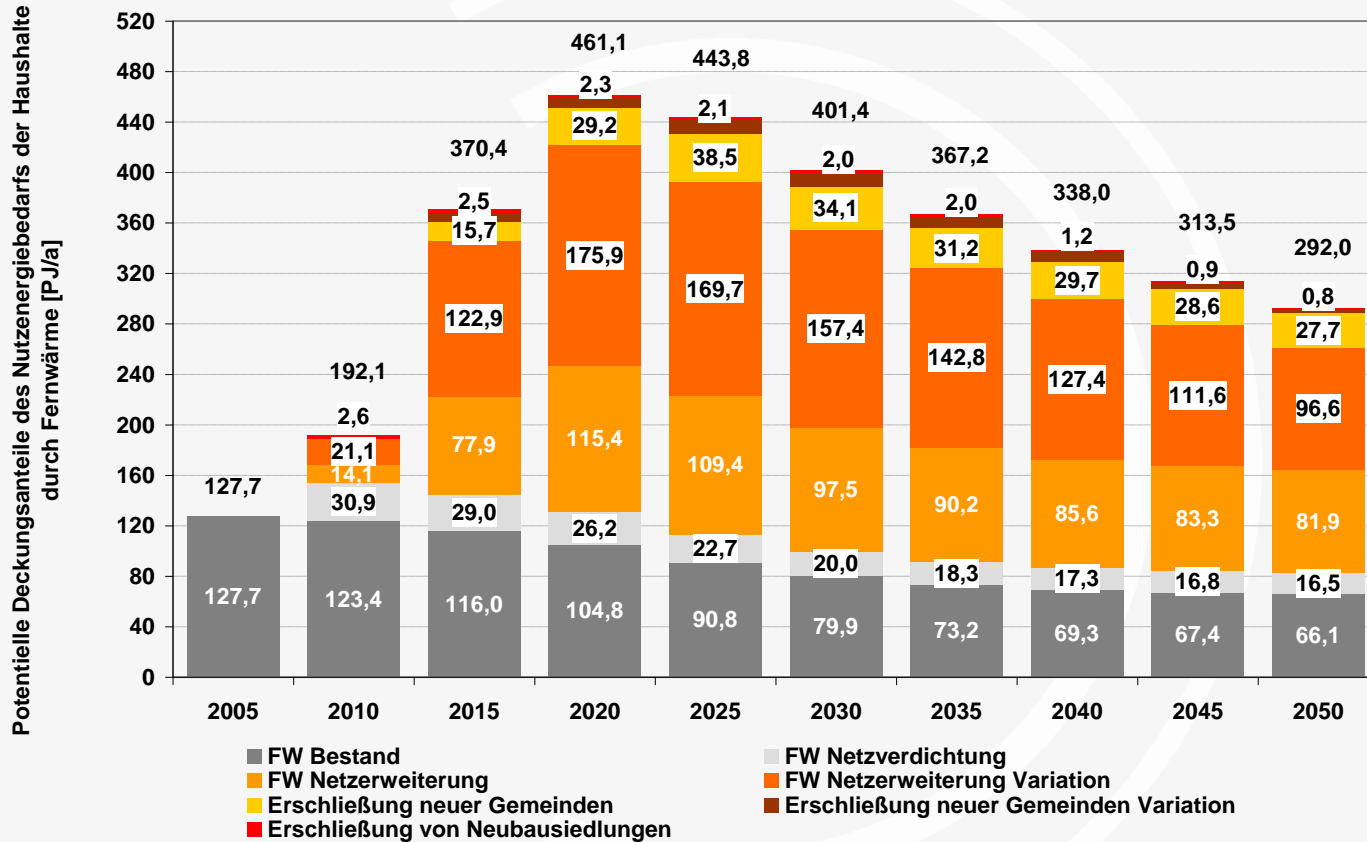
District heating and cooling is one good solution for a lot of related problems.

» One solution for the EU-Energy dilemma is District Heating



How do we reduce non technological barriers?

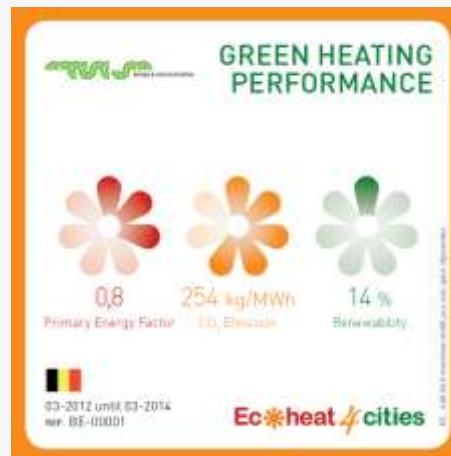
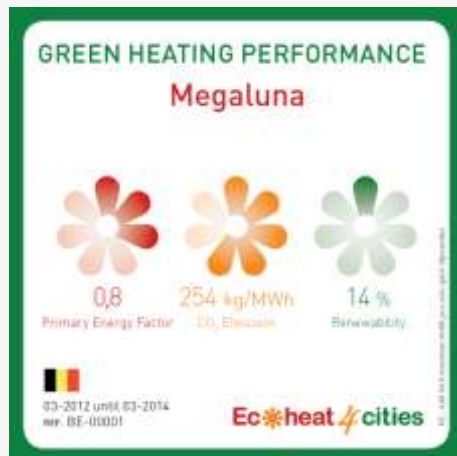
» In Germany a big potential for the expansion of DH is predicted



How can we use this great potential and how can we promote DH?

» Objectives

- » The main aim of this project is to support the extension and reinforcement of existing infrastructures that enable the integration of renewable energies coupled to resource efficiency, removing non-technological barriers to their implementation.
- » Municipal and public acceptance of DHC systems are promoted by establishing a voluntary DHC ‘green labelling’ scheme that will provide local politicians, citizens and potential investors with the information needed to make renewable energy and energy efficiency based choices.



» Main outcomes

- » **An operative voluntary DHC Green-labelling scheme in 8 countries. 50 labels in total.**
- » **Toolkit for applying the labelling scheme in all European countries.**
- » **Documentation and analysis of present overall eco-heat performance of the DHC sector in the participating countries.**
- » **Documentation and analysis of 15 labelled DHC schemes to determine the key parameters for achieving maximum resource efficiency.**

» Main outcomes

- » **Documentation of best practice in wider voluntary quality assurance in DHC in Europe;**
- » **Guidelines on the use of the quality assessment methodology for a variety of purposes, including building codes, urban project planning /architecture, eligibility for state aid, white certificates.**
- » **Wide communication and dissemination of the project outcomes to the target groups.**

» Partners

- » Euroheat & Power (*coordinator*)
- » Delft University of Technology
- » Danish Technological Institute
- » AGFW
- » Swedish District Heating Association
- » BRE
- » Lithuanian Energy Institute

*with cooperation of Czech DH Association,
Dalkia, Lithuanian DH Association a.o.*



» Structure of the project

Workpackages

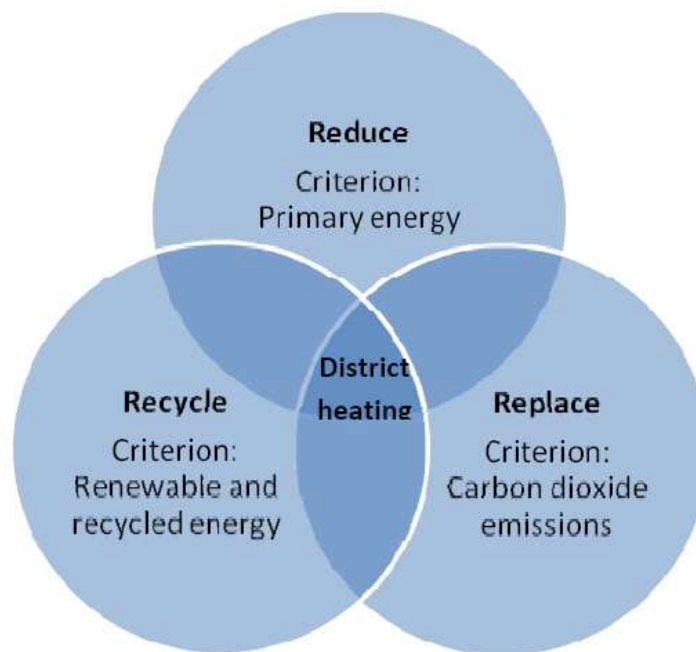
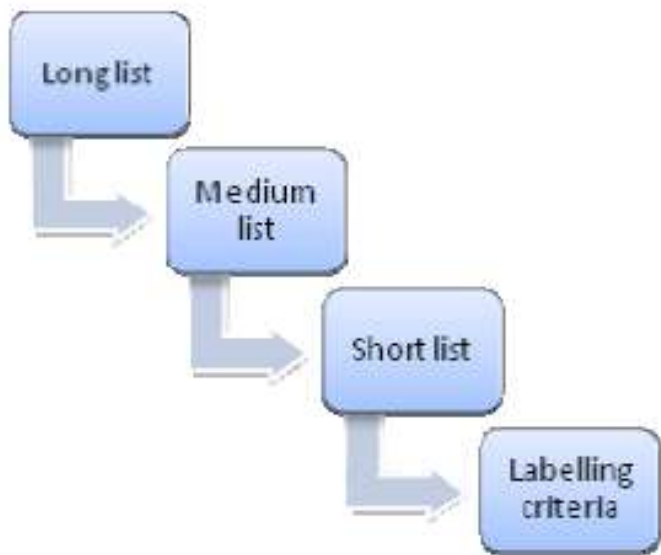
- » WP1: Management (Euroheat & Power)
- » WP2: Green – Labelling criteria (SDHA)
- » WP3: DHC Green labelling implementation (AGFW)
- » WP4: Guidance to DHC companies (BRE)
- » WP5: Guidance to cities on “Smart heating and cooling” (wider relevance of labelling criteria) (TUD)
- » WP6: Communication & Dissemination (Euroheat & Power)

Work Package 1: Management (EHP)

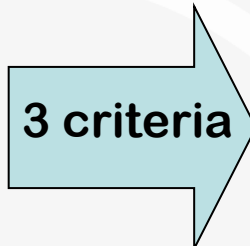
- » Contract management
- » Consortium management
- » External actor management
- » Steering Group management

» Structure of the project

Work Package 2: Green – Labelling criteria (SDHA, IVL)



WP2 report 2011



GREEN HEATING PERFORMANCE
Megaluna

0,8 Primary Energy Factor
254 kg/MWh CO₂ Emission
14 % Renewability

03-2012 until 03-2014
ref. BE-00001

GREEN LABELLING DETAILS
Threshold Criteria:
- Primary energy factors: 0,0
- Emission coefficient: 100 kg/MWh
- Renewable and Recycled Fraction 00%
Informative criteria:
To be defined

NOTES ON CALCULATION METHOD

Accessor
Organisation
Address
City
etc.
Name, First name

» Structure of the project

Work Package 3: DHC Green labelling implementation (AGFW)

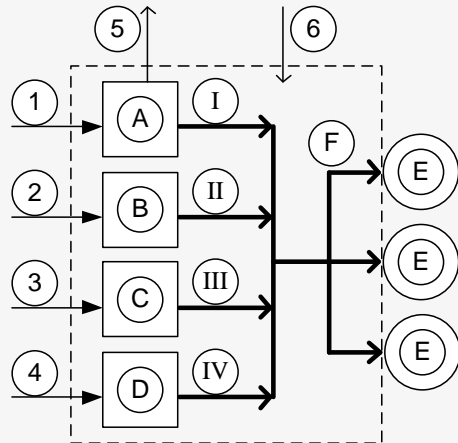


Fig.1 set-up of the reference system in Ecoheat4cities

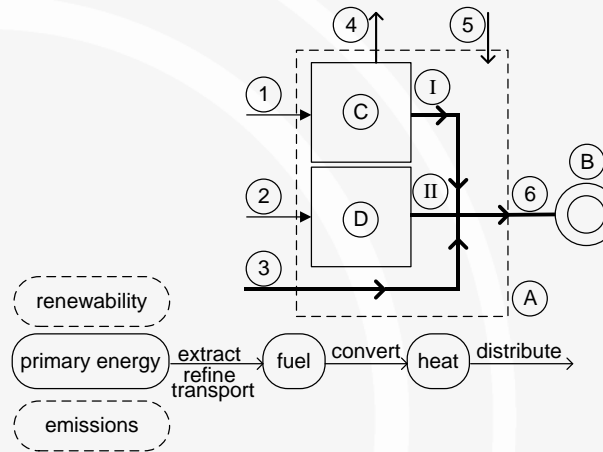
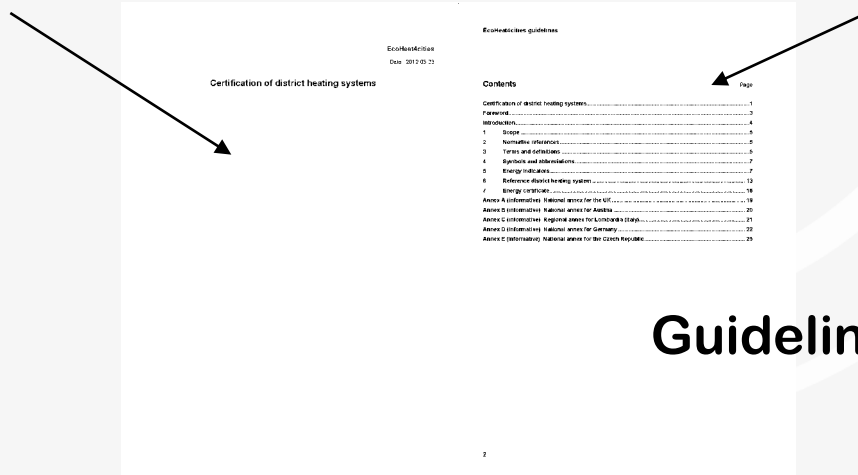


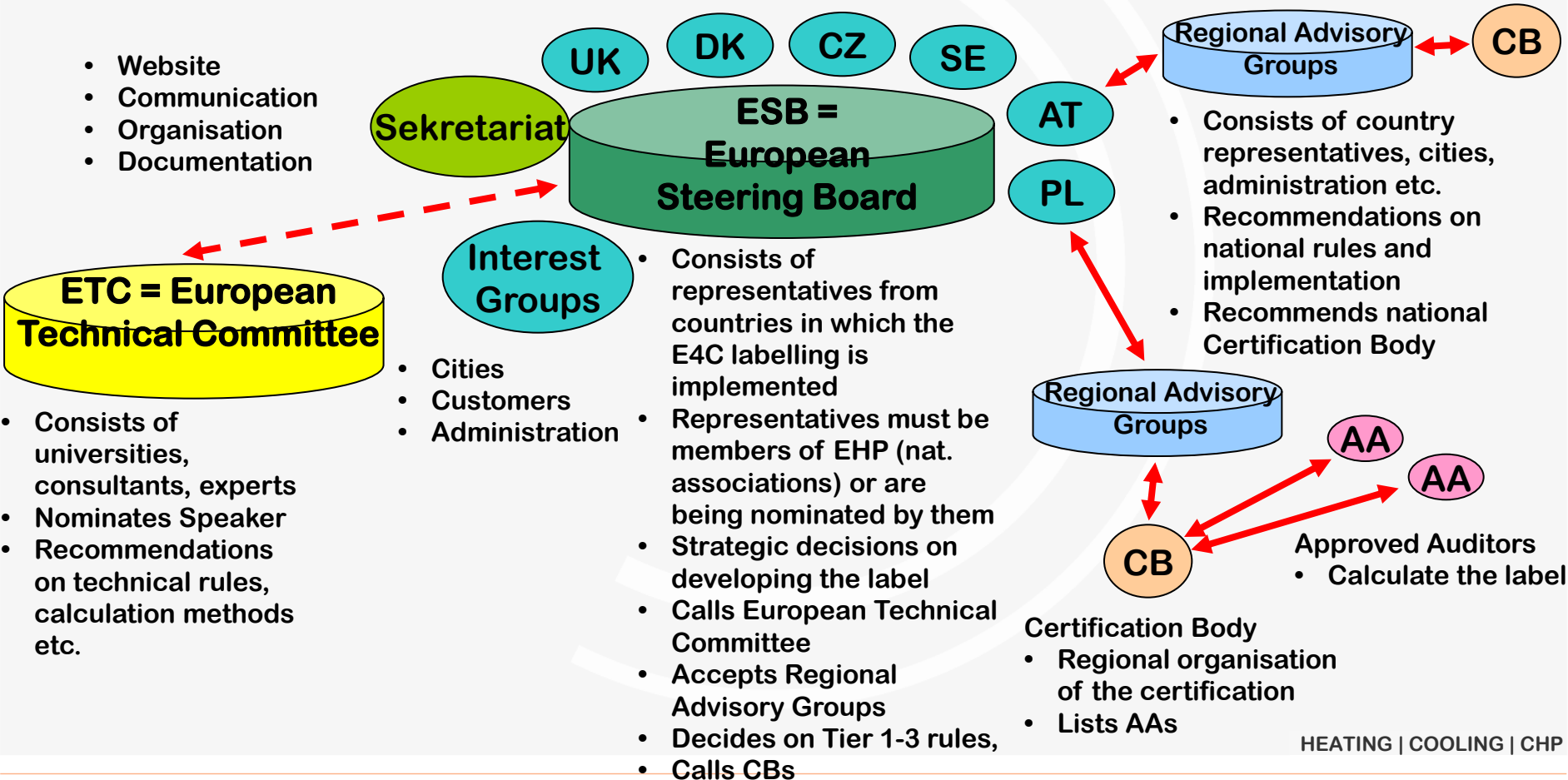
Fig.2 system boundaries for district heating energy rating in Ecoheat4cities



Guidelines for implementation

» Possible institutional structure and statutes

- » Quality control and assurance (institutional structure, accountability, rules etc.)
- » Flexibility to incorporate changing framework (ecological, legal etc.)
- » Acceptance of labeling by third parties (transparency, documentation etc.)



Work Package 4: Guidance to DHC companies (BRE)

Deliverables

- » **D4.1 Guidelines on achieving maximum performance on labelling criteria, including resource efficiency in relation to local condition**
- » **D4.2 Document for transfer of experience with quality assurance**

Work Package 4: Guidance to DHC companies (BRE)

Objective

- » Support DHC companies to understand their role achieving local national and EU targets
- » Understand how to maximise performance of DHC systems on label criteria, resource efficiency and RES utilisation
- » Transfer best practices on (energy with relevant environmental and non-environmental) quality assurance in DH from leading DHC countries to modernization and emerging DHC countries

Work Package 4: Guidance to DHC companies (BRE)

Best practice example:

Ec@heat 4 cities

7.1 Example 1: Adding steam turbine CHP to an existing scheme

CATEGORY	[Emerging/Expansion]
EXISTING SCHEME	
Type	Medium scale scheme serving part of city
Number of dwellings	2,800
Non-domestic customers	140
Heat sales	100GWh per annum
Heat sources	Waste fired
Age of scheme	23 years
IMPROVEMENTS	
Overview	As well as continuing to expand the number of heat customers connected to the scheme, the operator wished to improve its performance by adding steam turbine CHP to the existing waste fired boilers.
Controlling heat demand and metering	Each of the heat consumers is metered, enabling them to know how much heat they consume.
Substations and internals	A heat exchanger in each building is used transfer heat from the district heating to the internal building heating systems. The district heating operator has worked with customers to lower the return temperature of the network through, for example, targeting sub-stations with excess flow.
Distribution network	Heat leaves the energy centre in pre-insulated pipes at a flow temperature around 120°. The maintenance of a high temperature differential enables a high volume of thermal energy to be transported relative to the pipe sizes.
Heat production	The scheme uses heat produced during the incineration of municipal solid waste to generate steam which is used to drive a steam turbine operating in combined heat and power (CHP) mode. The CHP is able to generate around 20MW of electricity and 60MW of heat. The CHP supplies approximately 80% of the heat for the district heating. During periods when the CHP is down for maintenance, gas boilers are used to supply heat.
Management	The network is monitored by an array of alarm panels distributed across the city in plant rooms.
PERFORMANCE	
Primary energy factor (E _p)	-0.54
CO ₂ emission factor (E _c)	65gCO ₂ per kWh
Renewability (R ₀)	83%
Label	To be determined
Other benefits	Customers benefit from a competitively priced reliable heat supply. The use of local resources also means money is retained within the local economy rather being spent on imported fossil fuels.

Work Package 5: Guidance to cities on “Smart heating and cooling” (wider relevance of labelling criteria) (DTU)

Tasks

- » 5.1 Comparison of different heating and cooling options
- » 5.2 Guidance on how to use the label parameters and selected criteria for “smart heating and cooling” action in cities
- » 5.3 Conclusions for national and EU policymakers

» Structure of the project

Work Package 5: Guidance to cities on “Smart heating and cooling” (wider relevance of labelling criteria) (TUD)

Guidelines will be elaborated and describe how the label criteria and other aspects identified under 5.1. can be applied for purposes of establishing energy hierarchies in terms of smart city planning.

The conclusions will show how the label criteria and the aspects covered by 5.1 can be used for the purposes of:

- » white certificates**
- » green taxation**
- » evaluating the eligibility of DHC projects for support schemes**
- » evaluating the effect of using cohesion/structural funds for RES and EE projects**

» Structure of the project

Work Package 5: Design Tool (TUD)

The screenshots illustrate the Design Tool (TUD) interface, showing project configuration, detailed heating data input, and resulting distribution and individual space/water heating data tables.

» Structure of the project

Work Package 6: Dissemination and Communication (EHP)



Forschung und Entwicklung AGFW

IEE Projekt Ecoheat4cities

Ec*heat 4 cities

The main aim of the project is to support district heating and cooling and the use of renewable energy services coupled to an overall decrease of primary energy consumption. ECHOHEAT4CITIES addresses non-technological barriers through providing municipal and public acceptance of district heating and cooling systems by establishing a voluntary green energy (heating and cooling) labelling scheme that encourage local politicians, citizens and potential investors with the information needed to make renewable energy and energy efficiency based choices.

The scheme is being designed to encourage district heating and cooling companies to market the performance of their products from a primary resource perspective (combined effects of RES use and energy efficiency) and for European consumers - including public and private purchasers - to easily identify them as eco-heating and cooling options.

Moreover, the project provides guidance on smart heat planning in cities / possibilities for DHC in the context of green public procurement and draw attention to existing best practice schemes on energy with relevant environmental and general quality standards for DHC in Europe. The Guidelines developed during the project are not region-specific, but only adjusted to different needs in these. The Green-labelling scheme has a pan-European scope and can, similarly, be applied in each country.

Strategic long-term objectives are: Enabling and direction of the expansion of DHC towards increasingly sustainable and future-proof systems through comprehensive guidance on the most effective solutions regarding RES selection, RES integration and energy efficiency. Contribution of DHC to reducing the EU's report dependencies. Complete de-carbonization of the heating and cooling sector at the latest by 2050. Once the labelling scheme is running and mature, the industry could reach a voluntary agreement that could bring the whole sector to increase the energy and related environmental performance, for example by increasing the average level of performance.

Fig.1 set-up of the reference system in Ecoheat4cities

Fig.2 System boundaries for district heating energy taking in Ecoheat4cities

www.energieeffizienzverband.de



- » **Next Meeting: 29./30.05.2012 Frankfurt**
- » **E4C statutes to be discussed and fixed**
- » **Workshops in the participating countries**
- » **From test labelling to real labels**
- » **Future of the label**

» Outlook

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