Ecoheat4eu

www.ecoheat4.eu

Executive Summary Report

This report was elaborated in the framework of the Ecoheat4EU project funded by the Intelligent Energy Europe Programme.

INTELLIGENT ENERGY EUROPE
FOR A SUSTAINABLE FUTURE

Ecoheat4EU Project Partners

The Ecoheat4EU project was led by Euroheat & Power and supported by the Intelligent Energy Europe Program. The **project partners** were:

EUROHEAT & POWER	(BE)	*Euroheat & Power*	TEPLÁRENSKÉ SDRUŽENÍ	CZ	*Association for District Heating in the Czech Republic*
HÖGSKOLAN HALMSTAD	(SE)	*Halmstad University*	habitech IL DISTRETTO ENERGIA AMBIENTE	IT	*Trentino Technological Cluster*
AGFW	DE	*GFW Project Company for rationalization, information and standardization*	LEI	LT	*Lithuanian Energy Institute*
bre	UK	*Building Research Establishment*	Dansk Fjernvarme	DK	*Danish District Heating Association*
SNCU	FR	*French District Heating and Cooling Association*	Finnish Energy Industries	FI	*Finnish Energy Industries*
aiguasol	ES	*Aiguasol*	COGEN ROMANIA	RO	*COGEN Romania*
Svensk Fjärrvärme	SE	*Swedish District Heating Association*	nfv Norsk Fjernvarme	NO	Norwegian District Heating Association
RPS	IE	*RPS*	EIHP Energetski institut Hrvoje Pozar	HR	Energy Institute Hrvoje Pozar

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1 Introduction

This document is a summary of the actions and outcomes of the 'EcoHeat4EU' project supported by the European Commission's Intelligent Energy Europe programme.

Modern **District Heating and Cooling (DHC)** systems can significantly contribute to the achievement of national and European Union energy policy objectives. Amongst many other benefits, they facilitate the efficient use of energy and allow for large-scale integration of renewables in urban areas. Both these major benefits generate lower carbon dioxide emissions.

One of the crucial pre-conditions for maximising the benefits of DHC is that consistent, effective and **non-discriminatory legislative framework**s are in place. However, this is not always the case, due to the difficulties associated with the cross-cutting nature of DHC systems.

The EcoHeat4EU project was devised with the aim of summarising the legislative frameworks and identifying well-balanced **legislative mechanisms to foster the development of modern DHC** throughout Europe, especially in the fourteen countries targeted by the project. The EcoHeat4EU project was performed between June 2009 and June 2011 and has been supported by the Intelligent Energy Europe programme.

This project involved 14 countries utilising a shared approach to gathering information from in-country stakeholders, analysing, comparing and discussing findings and finally presenting country-specific **recommendations**. For some of the countries, the country-specific recommendations were further developed and presented in the form of **national roadmaps**.

Bearing in mind the EU's 20:20:20 targets and its target of 50% reduction in CO2 emissions by 2050, District Heating & Cooling has a lot to offer. This project shows that committed uptake of DHC and CHP, in the 14 countries studied, could deliver an impressive **6% reduction in total CO2 emissions** in the EU **by 2030**.

Assuming that these 14 are a representative cross-section, as intended, this equates to one seventh of the EU's ambitious target being achieved by DHC technologies alone.

Fuel security concerns can also be hugely abated by District Heating and Cooling which can deliver a **12% reduction in primary energy imports**. The importance of this should not be overlooked at a time when the EU's own energy production is in decline and world competition for energy is expected to grow at an ever-increasing rate.

Finally, as if this was not enough, the committed support for DHC advocated in this report would result in **a lasting energy efficient infrastructure** which can continue to adopt and absorb new technologies and surpluses. A DHC network can accept heating or cooling from any source, whether existing or as yet inconceivable, and efficiently deliver energy within any city to the EU's citizens and their ever evolving pursuits.

2 Information collection and collation

2.1 Information Collection

The central aim of this work package was to gather and define the data required for the completion of the latter parts of the project and collect that information in each of the target countries. The 14 target countries were Germany, UK, France, Spain, Czech Republic, Lithuania, Italy, Ireland, Romania, Croatia, Norway, Denmark, Finland and Sweden.

The main information source was the project partners themselves complemented by the consultation of 10 or more key stakeholders in each of the national DHC sectors. These consultations were carried out as a mixture of live interviews, phone conversations and purpose built questionnaires. In order to ensure a reasonable standard and comparability of the data, the first step was therefore to produce a standard questionnaire and template for the presentation of national information collected. The two were similarly constructed and covered the following broad topics:

- legislation - both support legislation and national implementations of EC Directives;
- DHC needs, barriers and opportunities;
- best-practice local initiatives promoting DHC;

The full template can be found on the project website. In order to develop the templates, the consortium first undertook classifying the countries by their individual DHC development status and clearly defining 'support legislation'.

Country group	**Countries**
Consolidation	Denmark, Finland, and Sweden
Refurbishment	Croatia, The Czech Republic, Lithuania, and Romania
Expansion	France, Germany, Italy, and Norway
New development	Ireland, Spain, and United Kingdom

In **Consolidation countries**, DHC systems have reached a very mature, almost saturated market share of 50-60%. The market share denotes the share of buildings heated by district heat. Some countries include only residential buildings in the market share, while other countries also include the service sector buildings.

In **Refurbishment countries**, district heat has also high market shares (10-50%), but the systems need some refurbishment in order to increase customer confidence, energy efficiency, and profitability. The common denominator for the DHC systems in these 4 countries is that they were introduced and developed within planned economies.

In **Expansion countries**, DHC systems appear in some cities, but the total market share is rather low (3-15%). By expanding existing systems and establishing new systems in other cities, the market shares can grow significantly.

In **New development countries**, very few ordinary DHC systems exist, giving typical market shares below 1%. However, genuine interest for DHC is growing in these countries.

Within each country group, different demands and practices exist for national legislation and support measures concerning DHC. Theses can, in many cases, be more effectively and efficiently presented and understood in the following separate groupings.

The various aspects of each countries national legislation and support were, for the purposes of this information collection and initial presentation, split into the following categories and described in the manner indicated:

Part 1: **National (and regional) policy drivers**

- Overview of National DHC Market (existing laws & schemes)
- Overall DHC legislative framework (existing legislative frameworks and practices)
- Support measures for DHC (detailed descriptions of various measures)
- Implementation EC Directives (3 mandatory & 3 optional EC directives)

Part 2: **Needs-challenges, barriers-opportunities**

- Overview and description of needs, challenges, barriers and opportunities based on information from 10 stakeholder interviews, based on the enclosed questionnaire.

Part 3: **Two local success stories**

- Two national examples of local "best practice" initiatives, according to the instructions in this template memo.

This information gathering exercise produced over 300 pages of quantitative and qualitative information (summarised from the original questionnaires transcripts and inside knowledge) whose main purpose was as input to the later stages of the project. This information is publicly available on the project website, but is intended as a detailed reference to be consulted for information on a specific national concern rather than as a set of reports to be read cover to cover. Indeed for broader purposes a great deal of further analysis and summary was carried out as is detailed below.

2.2 Information Available on Project Website

In spring 2010 the first round of collected and collated data was presented on the website on the **Country-by-Country Database** (http://ecoheat4.eu/en/Country-by-country-db/); which has, to date, received more than 2500 separate visits.

The website will continue to be maintained by Euroheat & Power who will update the existing information and expand the database to cover other countries as and when that information becomes available.

2.3 National Information sheets with benefits of DHC

The aim of these sheets is to clearly present the case for committed uptake of DHC in individual countries by means of numbers and figures produced through clearly defined projection techniques.

Each benefit of DHC has been estimated in three instances:

1. **Outcome for 2007**, from the 2007 district heat demand level with the actual 2007 heat supply mix according to available reliable statistics.
2. **Improved systems 2007**, from the 2007 district heat demand level with an improved heat supply mix (the projected 2030 heat supply mix). This intermediate time situation is provided in order to identify the benefits with the improved heat supply mix only.
3. **Projected expansion 2030**, from the projected heat demand level for 2030 with the projected improved heat supply mix.

The three situation model was chosen in order to illustrate that the current European DHC systems can improve both through an enhanced heat supply mix and through increased heat sales.

The DHC benefits have been estimated by comparing primary energy supplies, energy imports and carbon dioxide emissions with a reference situation without any DHC and CHP at all. In that reference situation, all corresponding electricity is generated in coal condensing power stations and all corresponding heat is generated by a mixture of fuel oil and natural gas boilers.

The 2007 district heat sales figures are based on the IEA energy balances concerning district heat sales with corrections for known statistical inaccuracies. The 2030 district heat sales were chosen as the future heat sales estimated in the 2006 project 'Ecoheatcool' (www.euroheat.org/ecoheatcool).

The lowest 2030 renewables shares appear in Croatia (17%), Italy (21%), Romania (22%), and Ireland (26%). The highest shares will be reached in Sweden (92%), Norway (91%), and Denmark (77%).

Using 2007 as the base year, and assuming improved systems and a projected expansion the estimated benefits from DHC on the EU level in 2030 are:

	Total estimated reduction	Greatest change in:
Primary Energy Supplies	**825 PJ** (229 TWh) or 1%	Cz, De, UK
Energy Imports	**2480 PJ** (689 TWh) or 12%	Fr, De, UK
Carbon Dioxide Emissions	**207** million tons or **6%**	Fr, De, UK

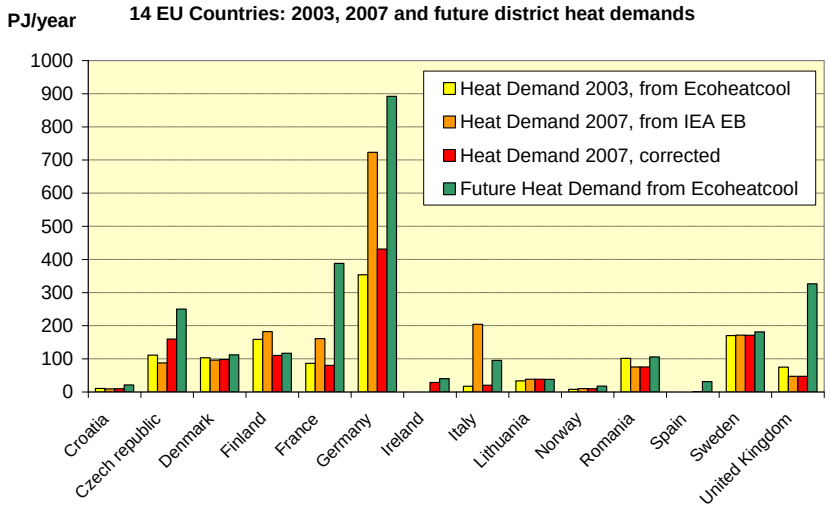


Figure 1. Annual district heating demands

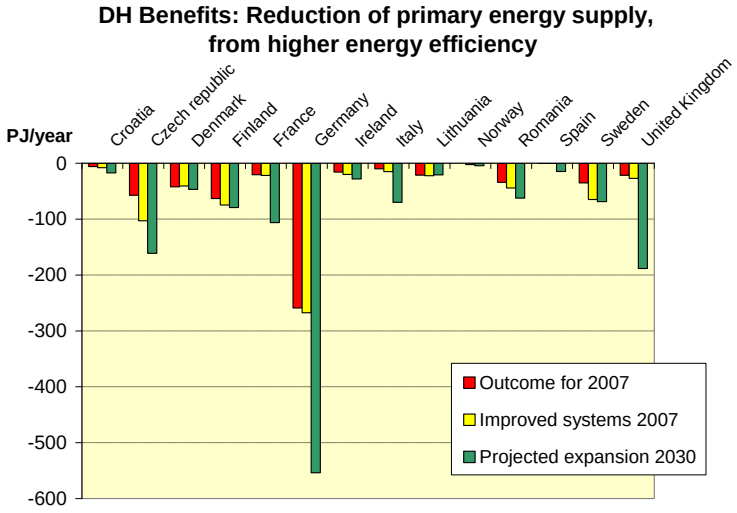


Figure 2. Overview of the annual primary energy supply reductions

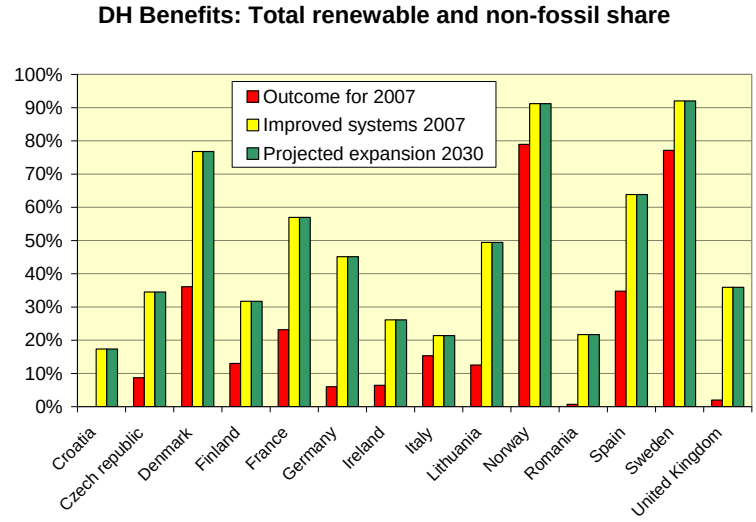


Figure 3. Overview of the renewable and non-fossil shares in the supply mix in the 14 Ecoheat4EU countries for the three situations analysed.

3 Information Analysis

3.1 DHC Legislative Effectiveness Assessment

This report is a country by country assessment of the supports and barriers for DHC and the subsequent effects they have on the sector nationally. It is a country-by-country analysis of the initially collected information. This report aims to address the following for each of the 14 countries covered by Ecoheat4EU:

1. The **effectiveness** of the existing legislative support framework per country.
2. The **intention** of support schemes **compared to** the actual **impact** on DHC market sectors.
3. Potential **inconsistencies** in the legal framework.

Each country report was broken down into:

a) A summary of the **existing national support legislation**
b) An analysis of the identified **needs, barriers and opportunities**
c) A review of the national **implementation of** the three **EC Directives**

The information summarised in these reports is available online and is also further developed as the basis of the national recommendations and roadmaps later in the project.

The main purpose of this was to provide further input into later project work; however these also provide a concise summary of the situation at the national level.

3.2 Checklist with good support scheme characteristics

This report is a summary and analysis of the Ecoheat4EU enquiries concerning national legislation and support measures related to DHC in 14 European countries. The basic enquiries were performed between October 2009 and March 2010. Complementing and additional information was gathered and finally implemented in November 2010.

Within the Ecoheat4EUinfomation collection templates, no strict answer guidance concerning legislative frameworks, support measures, or barriers was given. All answers were given by each country partner as free text and not by predefined multiple choices. Hence, no harmonising or cross-country influences appeared in the original national answers as this would have limited the data. However, an important discussion and learning process took place among the country partners, when the first draft of this report was distributed. After this discussion, several countries wanted to revise their answers when having identified more national legislation concerning DHC, especially with respect to support measures.

The country answers reflect mainly the national opinions about what constitutes a legislative framework or a support measure. What is considered to be very important in one country is not considered at all in another country. Hereby, this summary is not the complete map of all legislative frameworks or support measures for DHC in the 14 countries.

For the purposes of this project and any future analysis of DHC legislation the following main categories of support measures have been identified and described:

Strategic - National energy policy: Recognition for DHC in the EU and national energy strategies is important to provide guidance for the coherent implementation of policies in the different sub-areas. It also increases commercial and official awareness of DHC as a low-carbon option.

Burden measures: A tax or fee burden is generally applied for use of fossil fuels or emissions of fossil carbon dioxide and will benefit systems with higher energy efficiency, such as DHC systems.

Financial **Support**: Investment grants (national or local) or operation support can be given to promising emerging market solutions to facilitate wider and speedier adoption.

Market control: Market supervision and control may decrease the risk of market abuse, giving customer more confidence to use the technology. This is particularly valid in DHC in the case of monopolies created through heat planning and mandatory connections.

Planning: Extension of DHC systems contains some considerable financial risk, since capacity is installed before more customers are connected. Harmonized extensions through thoughtful planning can reduce the risk.

Support measures for DHC are introduced in order to overcome market barriers and to exploit hidden opportunities. The overall aim is to realise the potential benefits of DHC: Higher energy efficiency giving lower primary energy use, lower carbon dioxide emissions, and lower energy import dependence. DHC systems also provide the possibility to introduce renewables in dense urban areas.

The checklist resulting from the exercise described above contains advice on 10 issues concerning what to consider when implementing support measures for DHC systems and is shown below:

	Issue	*Advice*
A	**National energy policy**	Acknowledge the major benefit of higher energy efficiency with DHC. This will give the essential support for applying effective measures for DHC.
B	**General versus specific measures**	Consider whether you want a general support for say energy efficiency or a specific financial support for DHC. Where a general solution is sought the integration and competition with renewable solutions must be carefully considered and preferably encourage a cooperative environment between the two sectors where the greatest CO2 and Primary Energy savings can be made.
C	**Maturity of DHC**	Direct financial support is suitable for extra stimulation of DHC expansions, but should be avoided in developed and mature DHC systems (Consolidation countries). Well planned general support measures such as fossil fuel taxation and climate change investment programmes can benefit DHC in all countries.
D	**Financial support character**	Annual financial support has a long term political risk, as investors put a higher risk reduction value in upfront investment grants
E	**Market control**	Only consider this when DHC systems have reached a strong position where fair competition with more mature or less infrastructure dependent heating (& cooling solutions can be guaranteed.
F	**Heat planning**	Consider adding heat planning to other community planning activities such as waste management, traffic, water, sewage, & land use planning.
G	**Planning perspective**	The DHC benefits will be bankable with proper waste planning, location planning of energy-intensive processes, and building regulations. DHC providers will then take active parts in developing these plans.
H	**Market distortions**	Erase distortions, rather than introducing counteracting measures.
I	**Policy conflicts**	Avoid conflicts with other policy areas and try to solve the social problems without interfering with energy policy.
J	**Sector dimension**	Generation measures dominate, but distribution measures can be effective as they reduce financial risks in distribution. Planning, demand, and organisation can also be supported.

The main **conclusions** from this analysis with respect to support schemes characteristics were:

- **Different approaches** to DHC legislative frameworks in each country.
- There is **a** Strong focus on **generation** measures & distribution measures are also common.
- Planning & financial support measures dominate.
- Support measures are rarely directed at **district cooling**
- Barriers & opportunities dominate the national environments for DHC.
- Strong supply and connection focus regarding local initiatives. Less on ownership, use, distribution, and external benefits.
- **Country Categorisations are justified** by the similarities in measures within each category.

3.3 Best Practice Support Schemes

This report contains an analysis of the Ecoheat4EU enquiries concerning best practise support measures related to DHC in 14 European countries. The basic enquiries were performed between October 2009 and March 2010. Each national answer can be found at the Ecoheat4EU website. Short summaries of the national inputs are available within Ecoheat4EU document D3.1. The national inputs have been refined additionally refined by the partners to align and update the various national contributions. This report contains all changes and additions before December, 2010.

With respect to market situation, the 14 countries were divided into 4 country groups according to:

Country group	Countries
Consolidation	Denmark, Finland, and Sweden
Refurbishment	Croatia, The Czech Republic, Lithuania, and Romania
Expansion	France, Germany, Italy, and Norway
New development	Ireland, Spain, and United Kingdom

Within each country group, different demands appear for national legislation and support measures concerning DHC. The intention is to reflect these non-uniform demands in this summary report.

The final ranking list of the 12 prioritised best practise support measures are presented in Table 1 (see next page). This is the total list for all 14 countries. The different preferences in the four country groups analysed and reported in the preceding section should be noted. No objective selection procedure for finding best practise support measures was identified. Instead, a subjective selection procedure based on country voting was applied

For the selection of best practise support measures, a voting procedure was performed in May 2010 among the various country partners. From the full list of support measures found in the 14 countries, each country had to rank their top 10 preferred support measures. The highest voting score was given to **Planning – Heat planning and/or zoning**. This support measures was in the top 10 list in all countries, except for Sweden, which emphasises the importance of reducing uncertainties and the corresponding financial risk for extending distribution networks. The financial risk is lowered both from the harmonised connection and the reduced connecting pipe construction costs, when buildings are connected at their initial construction.

The three main conclusions from this report concerning best practise support schemes are:

1. **Planning and financial support measures are preferred.**
   - They significantly reduce the financial risk when expanding distribution networks.
2. **Distribution measures** are regarded generally as the **most important**.
   - All three distribution support measures were elected to the 12 priority list & two at the top.
3. **Generation measures are most common**. The total number of identified support measures was dominated by generation support measures.

As stated above the results table overleaf shows that Planning measures or financial supports that focus on the generation or distribution are the most common to be highly regarded as effective and important by the sector. It is also clear that, perhaps unsurprisingly, expansion countries have the most ‘top 12’ measures and new development countries have the least. Interestingly, though again not unexpected, the burden measures are largely limited to consolidation countries.

Table 1. Final ranking list of the 12 best practise support measures elected by the 14 country partners in this project.

#	Top 12 support measures	Short description of the support measure	Consolidation			Expansion				Refurbishment				New Dev'			Sector Dimension	Total
			Fi	Se	Dk	De	No	Fr	It	Ro	Lt	Hr	Cz	Es	UK	Ie		
1	Strategic Planning – Heat planning and/or zoning	Normally at municipality level. May include encouraging or even enforcing particular energy solutions (zoning).			■	■	■	■	■	■				■	■		Distribution	8
2	Support – Investment grant, DH distribution	Financial support for DHC pipes through provision of grant, from government (or other sources).				■	■	■	■	■	■			■	■		Distribution	8
3	Planning – National energy policy	The framework, within which relevant legislation, possibly including measures on this list, may be framed.			■	■	■				■	■	■				Planning	6
4	Support – Operation, CHP (including. feed-in tariff)	Supporting CHP through regulatory means. E.g. Feed In Tariff or a CHP bonus.						■	■	■	■	■					Generation	5
5	Support – Investment grant, DH connection	Financial support for connecting customers to existing mains network by government grants (or others).	■	■	■	■		■									Demand	5
6	Burden – Carbon tax	Tax penalty on fuels proportional to their fossil carbon emissions. energy efficiencies like DHC would prosper.		■	■		■										Generation	3
7	Support – Favourable loans	Providing low interest loans to finance the capital cost of establishing, extending or refurbishing DHC.				■						■					All	2
8	Support – Investment grant, CHP	Financial support for CHP through grants, probably from government, but other sources also possible.				■										■	Generation	2
9	Support – Tax deduction, DH	Implementing a tax benefit for DHC schemes.	■				■	■	■		■						Distribution	5
10	Planning – Building regulations	Using existing regulatory framework to encourage deployment, and ensure avoidable barriers are removed.					■	■							■	■	Demand	4
11	Support – Investment grant, renewables	Financial support for renewables through provision of grant, probably from government (or other sources).	■					■				■			■	■	Generation	5
12	Planning – Waste planning & landfill bans	Promoting in a strategic way disposal of waste, so that the energy can be recovered and put to use in DHC.			■		■										Generation	2
	Distribution	10 countries have a 'top 12' measure in this sector	1		1	2	3	3	3	2	2			2	2		**Distribution**	21
	Planning	6 countries have a 'top 12' measure in this sector			1	1	1				1	1	1				**Planning**	6
	Generation	12 countries have a 'top 12' measure in this sector	1	1	2	1	2	2	1	1	1	2			1	2	**Generation**	17
	Demand	9 countries have a 'top 12' measure in this sector	1	1	1	1	1	2							1	1	**Demand**	9
	All	2 countries have a 'top 12' cross sector measure				*1*				*1*							***All***	*2*
	Total	per country	**2**	**5**	**3**	**6**	**4**	**7**	**7**	**3**	**4**	**4**	**1**	**2**	**4**	**3**		
	Average	Per Country Category	**3.3**			**6.0**				**3.0**				**3.0**				

4 Constraints of National Support Schemes within EC Law

4.1 Guidance Paper on EC legislation in National Support Schemes *(titled as above)*

In this task we established the essential features of a national support scheme for DHC necessary to achieve acceptance under State aid rules.

More and more national measures, including support schemes, are subject to European control in order to ensure that these measures do not distort competition and trade within the European Union. State aid control aims to secure competition and trade between the Member States and guarantee the functioning of the internal market and is one of the main pillars of the competition policy.

If these aids distort competition (Article 107 TFEU) they are deemed to be incompatible with the internal market. However, support measures are steering measures and part of the political instruments available to Member States. If support measures fall under the definition of State aid State aid control therefore faces a conflict of objectives in light of the political sphere of activity of the Member States. In order to resolve this conflict there are allowances for State aid that can be considered compatible with the internal market.

Criteria were established and formed the basis of an analysis in the context of three case studies in which national authorities have negotiated with the European Commission on terms for allowing the introduction of national support legislation for DHC. These three case studies deal with support measures proposed by Germany, Austria and Norway.

The **analyses** of the case studies from Germany and Norway have shown that it is possible to introduce support measures for DHC that do not constitute State aid. The specific conclusions are shown below and were used to ensure the best possible accuracy of the recommendations and roadmaps developed later in the project:

1. The **Renewable Energy Directive does not impact the analysis** on the constraints of national support schemes within the framework of State aid control. The support of fossil based DHC is still possible while the footing of renewable energy & energy efficiency measures is emphasised.
2. The **obligation** of grid operators **to connect CHP** plants to the grid, purchase their electricity and pay an additional bonus **does not constitute State aid** nor does it violate Article 34 TFEU.
3. The **obligation** of grid operators **to pay a bonus for new and extended heating networks** supplied mainly by heat from Combined Heat and Power **does not constitute state aid**.
4. A support measure for DHC based on a **public service obligation** and corresponding tendering procedure **is not State aid if**:
   - a **fair** market price for the public service obligation is achieved;
   - the obligations for the contracting entity is **clearly defined** and
   - the compensation is determined by a **detailed cost analysis**.
5. A support measure for existing and modernized Combined Heat and Power plants utilizing **a support tariff is State aid** in the eyes of the European Commission when a levy system is being used, which is administered by a State-designated body.
6. The analysis has also shown that the European Commission regards such **State aid** as being **justified if it aims to bridge the gap between market prices and the costs** associated with the operation of Combined Heat and Power plants and cover the additional demand.

5 District Heating Barometer

5.1 The DH Barometer

In order to address the current lack of timely and precise statistics on the development of District Heating, the "District Heating Barometer" was elaborated as part of this project. It serves as an important contribution to the knowledge base of policy-makers, contributing to their ability to make well-informed policy and legislative considerations.

Policy making must be based on solid facts and figures to enable proper analysis. For this purpose and in order to address the current lack of timely and precise statistics on the development of our sector, the District Heating Barometer was established.

The District Heating barometer is based on the latest statistical figures, provided by the different national District Heating associations, which are presented for quantitative analysis. These include:

1. Amount of **District Heat sold**; average price per GJ.
2. The current and past **energy supply composition**
3. The **trench length** of the installed transport and distribution network.
4. The **proportion of citizens** served by DH. This indicates its share of the national heating market.

To complement the above mentioned quantitative set of information, the District Heating barometer also reflects the results of online surveys conducted in each of the participating countries. This source provides insight into the present and future development of the sector, based on a qualitative self-assessment of key District Heating stakeholders.

To also be accessible for non-experts, the gathered information is presented in a graphic and accessible form online. The results are presented by country and additionally separated into two categories:

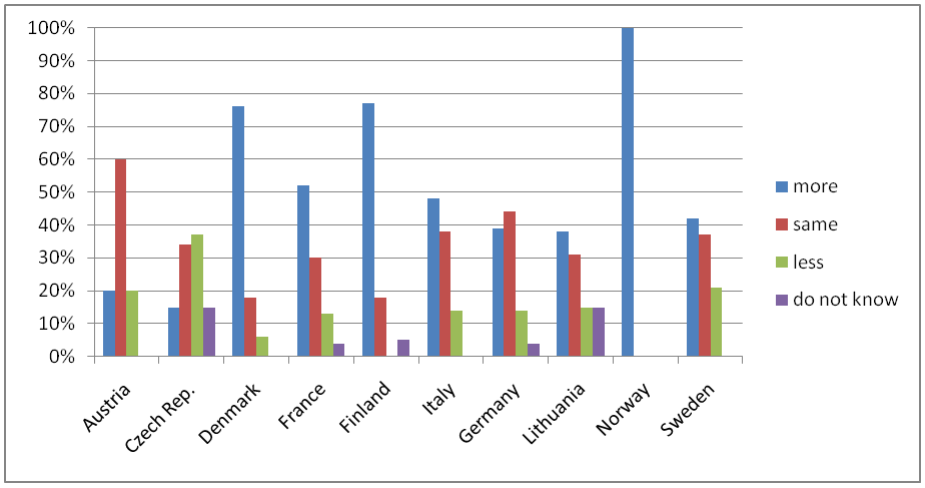
- Development and size related information
- Heat sources and sustainability

The latest results of the District Heating barometer can be accessed on the dedicated part of the Ecoheat4EU website at www.ecoheat4.eu. After completion of the project, Euroheat & Power will maintain and update the District Heating Barometer yearly to complement its biennial production of the DHC Statistics Handbook.

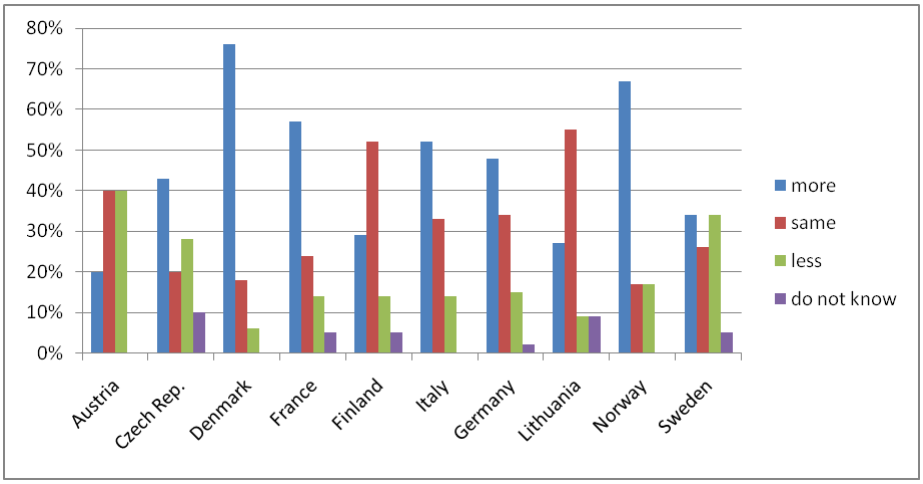
A comparison of the country results was also produced and can be seen below. The following graphs demonstrate the diverse nature of national DH markets due to cultural and historic differences in legislation and promotion. The barometer confirms that expansion countries are the most optimistic about the future, which points towards a strong and healthy future for European DHC as a whole.

The results of the latest barometer survey (spring 2011) were:

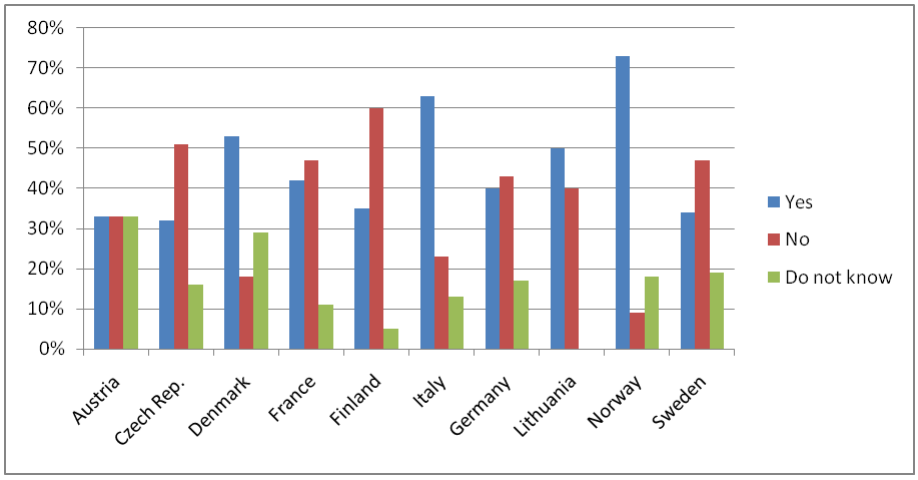
How does the European District Heating sector see its business **growing over the next 5 years** compared to the last 5 years?



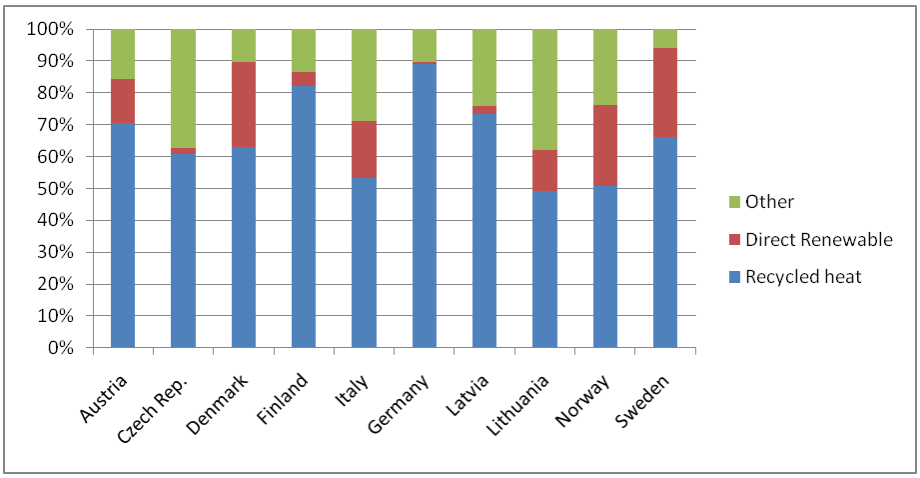
What level of **investment** does the European District Heating sector expect for the next 5 years compared to the last 5 years?



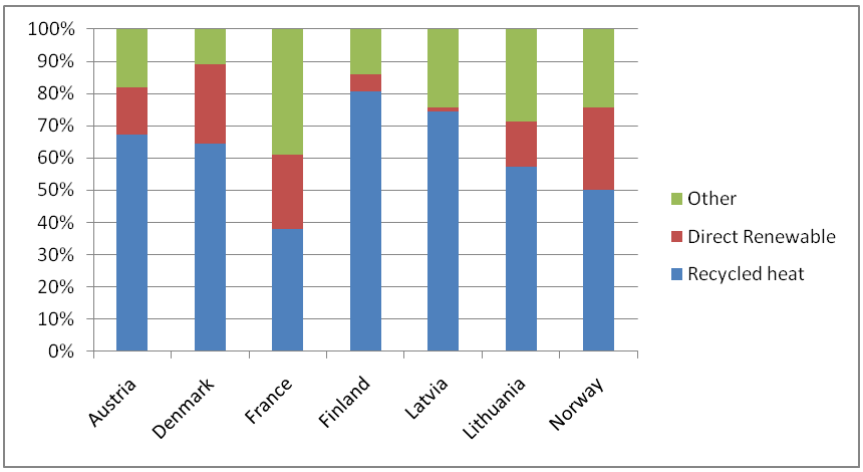
Does the European District Heating sector see today or in the future **District Cooling** as a growing business?



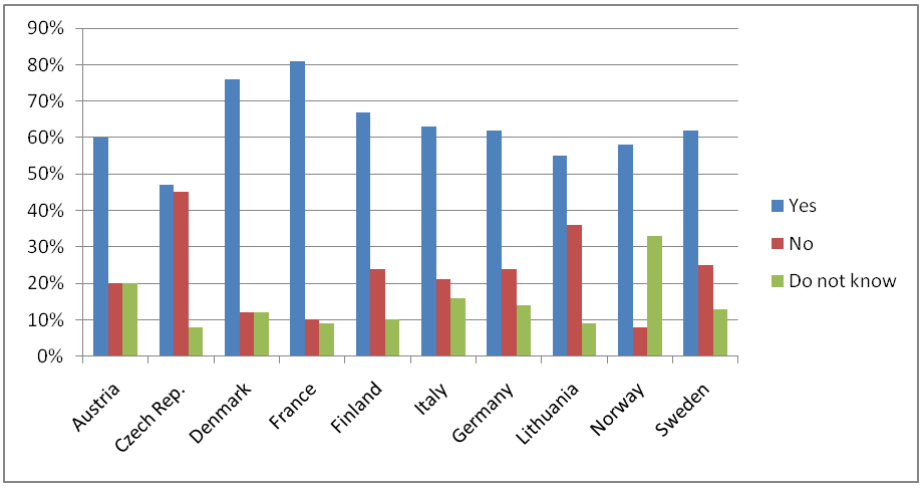
Energy supply composition of **generated District Heat** in 2007[1]



Energy supply composition of **generated District Heat** in 2009[1]



Do actors in the European DH sector have **investment plans in RES** to be realized in next 5 years?



6 Recommendations and Roadmaps (Conclusions)

The Final Part of the project was the production of the most important reports which bring together all the aspects and results to address each country individually and one to address the EU level. These are:

1. Recommendation reports for national policy-makers [Se, Ie, It, Lt, Dk, Fi, Ro, No & Hr]
2. Roadmaps for national policy-makers [Fr, De, Cz, Es & the UK]
3. A detailed feedback paper for European policy-makers

6.1 Recommendations for National Policy-Makers

The recommendations reports reveal varying issues, solutions and focuses. However, there are 5 key tools whose introduction or adjustment is recommended in a majority of the reports. These common areas, which vary in specifics, are presented below in this condensed and concise format:

		Consolidation			Expansion		Refurbishment			New Dev
	Description	**Fi**	**Se**	**Dk**	**No**	**It**	**Ro**	**Lt**	**Hr**	**Ie**
Energy Policy/strategy	*Countries cite increased recognition of DHC in these as key to supporting DH.*		■		■	■	■		■	■
Heat Planning/Zoning	*The efficiencies & reduction of conflicts and gaps can be hugely beneficial to DHC and authorities/communities.*			■			■	■	■	
CO2 Taxation	*Addressing double taxation or omission of certain fossil fuel uses through the ETS & national CO2 taxes.*	■		■	■			■		
Building Regulations	*Introduction or conversion to a focus on Primary Energy in building regulations is urged to ensure uptake of the most beneficial technologies.*	■	■	■	■			■		
Finance support	*Finally grants and investment support for specific areas of DHC depending on National requirements*		■	■	■		■	■	■	■

While these issues are not EU wide issues they are more than likely to occur in the other countries not covered in this project. Further EU-wide analysis and discussion is likely to be valuable and in many cases is already underway. It is recommended for those countries not included to look at the recommendations report for the country which is most closely represents it in terms of DH development and legislative and market culture. The country category should give some indication of this and the roadmap of the country in the same category will also be relevant.

6.2 National Roadmaps

The four DH country categories are all represented within the 5 roadmap countries which were chosen to apply the projects tools and findings to a greater level of complexity in order to give more detailed and extensive directional advice. **Carbon taxation shortfalls** and **acknowledgement of DHC's sustainability** are commonly cited areas for improvement, as are coherent **Energy Strategies**.

Spain

1. **National Energy Plan** – include National Energy Map, Buildings energy legislation & Education
2. **District energy planning** - in close liaison with national energy planning
3. Tax deduction – introduction of a **tariff system**
4. **Financial support** – to offset the barrier of initial capital investment costs.
5. Corporate support – initiate **public-private joint ventures**

Germany

1. Revise the **Combined Heat and Power Act**
2. European Emissions Trading Scheme **(EU ETS) – level the playing field**
3. Incorporate **DHC** further in congested **urban areas**
4. Avoid counter-productive support-measures
5. **Combine DHC with insulation measures -** on the basis of cost and primary energy efficiency

France

1. **End competition distortion** – due to social assistance & unjust environmental taxation.
2. Assist CHP – start **feed-in-tariffs** & acknowledge **CHP as sustainable** heat recovery
3. **Finance** – through grants for DH distribution and connections to support expansion
4. **Avoid distortion -** between ownership and management options
5. Proper **allocation of CO2 emissions** - currently 100% goes to heat if heat is recovered.

Czech Republic

1. S**tate energy policy** - Define realistic fuel mix & set targets for DH market & waste heat use.
2. **Equalise CO2 prices** - The EU ETS does not include fuel used in installations
3. **Investment support** for emission reductions – to react to Directive 2010/75/EU
4. Finance **network replacement** & expedite DH permissions (e.g. Amend Construction Act)
5. **Support CHP$_{elec}$ & DH** - increase CHP$_{elec}$ financing with fuel prices & keep DH's low VAT rate

United Kingdom

1. **Align Waste and Energy strategies** – e.g. rebuild waste plants as CHP
2. **Recognise importance of heat & CHP** - All new power stations should be CHP
3. **Obligate large load connection** (esp. public) – reduces risk and increases stability & investment
4. **Green Investment Bank** for low cost loans – ideally with risk underwriting (instead of Gov.)

6.3 Feedback Paper for EU Policy-Makers

The two clear **objectives** of this report are:

1. To provide guidance on future legislative tools & feedback on current EC directives:
2. To provide feedback on effectiveness of support schemes employed for promoting RES in DHC[1].

The contents of this report were based on the plethora of detailed information and analysis provided by the project as well as the, inherent knowledge of the partners and their members. The key recommendations regarding the main directives considered are shown below:

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

- The use of primary energy factors[2] should be binding.
- The opportunities of eco-districts must be considered when defining zero/low-energy buildings.
- DHC from sustainable sources should be "compensation measures" for fulfilling RES-obligations.
- Fund research on ultra-efficient 'low temp' DHC for combination with low-energy buildings.

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

- Implementation should ensure consideration of efficiency criteria and favor CHP operations.
- Capacity caps for RES support measures should be removed.
- Increased municipal competences required in heat planning, capital investment, & DH.
- Feed-in tariffs for CHP-electricity from biomass should specifically reward heat recovery.
- National waste planning[3] to allow waste to contribute to RES targets.
- Clarify that energy efficiencies & RES are equivalent when fossil energy savings are similar.
- Better reporting on support to DH networks to exploit renewables that are more future proof[4].
- Assess the costs and effects of support for grid-based solutions compared to individual RES.

Directive 2004/02/EC on the Promotion of High-Efficiency Cogeneration

- Reinforce heat component to ensure infrastructure is considered in support mechanisms;
- Introduce urban heat planning, including location planning of new plants & industries[5].
- Harmonise and simplify the methodology for calculating high-efficiency CHP.

In **conclusion** Ecoheat4EU found that the adoption and implementation of the '2020 Package of Directives' has had positive effects on the way Member States value and promote DHC schemes. However, EC Directives and their national implementation partly provide contradictory signals and insufficiently reflect the need for their synergetic application at local level.

To achieve maximum effects in terms of reducing the EU's demands for fossil primary energy and its environmental impact, policies and their implementation should **follow the energy hierarchy** and target:

1. **Reducing high-grade** energy use where possible
2. **Recycling low-grade** energy that otherwise would be wasted
3. **Replacing** remaining fossil fuels **with renewables**.

[1] Considered in the context of the implementation of the Renewable Energies Directive.
[2] As set out in the standards related to the Buildings Directive.
[3] In accordance with the waste framework Directive.
[4] Regarding shortages and future price developments (e.g. geothermal).
[5] This location planning can be seen as a direct application of the Industrial Emissions Directive about best available technology.