

# Barriers and success factors to Energy Efficiency First implementation in buildings and related energy systems

Expert Online Workshop | Thursday 15 April 2021

## Discussion group on District Heating

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## INTRODUCTION

The [ENEFIRST](#) project aims to support the implementation and operationalisation of the Efficiency First (E1st) principle across EU legislation with a **special focus on buildings and the related energy systems**. Previous work of the project [defined the E1st principle](#) in practical terms, collected international experience in the form of [16 case studies](#) and analysed their [transferability to the EU policy framework](#) as well as the [main barriers to a broad implementation of E1st](#) across sectors. The project also looks at [modelling approaches](#) to assess the impacts from implementing E1st.

On the part of policy analysis, we identified priority policy approaches that can translate the E1st principle in policy areas relevant to the EU building sector ([ENEFIRST \(2021\)](#)). The screened policy areas cover buildings, power markets, gas markets, energy efficiency, climate policy, and heating and cooling.

In a next step, we **identified barriers and success factors** specific to these priority policy approaches to further develop policy guidelines to make the E1st principle operational. The most important barriers and success factors will be structured and visualised in an implementation map to inform policy makers and other stakeholder groups.

The **objectives of this workshop** were to:

- Present policy approaches to implement E1st in buildings and related energy systems
- Receive feedback and validate the identified barriers & success factors
- Rank the factors in terms of what recommendations / efforts should be focused on, to get E1st implemented in practice

The discussions were organised in three breakout groups: buildings, power sector and district heating. These minutes summarize the discussions of the “district heating” group.

The policy approaches considered in this group included:



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- Integrated district heating planning and operation
- Network access for third-party waste heat providers

After summarizing the discussions on each policy approach, two complementary sections deal with the cross-cutting and other issues, and with the conclusions including the results from the voting part of the session.

## 1 INTEGRATED DISTRICT HEATING PLANNING AND OPERATION

In light of the E1st principle, district heating (DH) planning and operation should determine an optimal mix of both various supply options (generation, network, storage) and demand-side measures (e.g., thermal renovations in buildings). Such an integrated planning approach essentially requires guidelines for national and local authorities and DH companies to evaluate the costs and benefits of all relevant investment options, as well as effective regulatory instruments to incentivise private DH companies to exploit demand-side potentials.

Business as usual	E1st
District heating system expansion and upgrades based on <b>exogenous energy demand</b>	District heating system expansion and upgrades based on <b>endogenous energy demand</b>
District heating companies have <b>no direct incentive</b> to bring about demand-side energy savings	District heating companies are incentivized to bring about demand-side energy savings through <b>DSM measures</b>

The outcomes of the discussion are summarized in Table 1. Participants generally stress the importance of an enabling **regulatory framework** for integrated district heating planning. At present, DH have little incentive to pursue innovative activities in line with E1st. New forms of utility remuneration are a key issue in this regard. **Lack of capacity** in DH companies in terms of quantitative modelling tools and human resource was also indicated as a barrier. What is needed are reinforced human resources as well as publicly available data (e.g., technology costs) for DH companies to structure their cost-benefit analysis in a way that adequately reflects demand side resources. The barrier of **lacking practical experience** with integrated planning was argued to require demonstration projects as well as venues to exchange on best practices. In terms of **measurement**, difficulties to quantitatively assess the impact of energy saving measures (both ex-ante and ex-post) were also listed as an important barrier.

**Table 1. Overview of barriers, success or enabling factors related to Integrated district heating planning and operation.**

Barriers to implementing E1st	Success or enabling factors to overcome the barriers
Lack of regulatory framework	Existence of long-term visions and policies

<b>Lack of capacity (tools, human resources)</b>	<b>Human resources in regulatory authorities</b> <b>Data availability</b>
<b>Lack of information and knowledge for new innovative services</b>	
Lack of practical experience with integrated planning	<b>Demonstration projects</b> <b>Best practice exchange</b>
<b>Difficulties to assess the impact of energy saving measures vs. heat supply</b>	
<b>Split incentive between building owners, DHC operators, and society as a whole</b>	<b>Incentive framework: Balanced instruments that enable good conditions for demand- or supply investments</b>
<b>Supply side competition</b>	

Note: barriers, success or enabling factors in bold are the ones added during the workshop.

## 2 NETWORK ACCESS FOR THIRD-PARTY WASTE HEAT PROVIDERS

Integrating waste heat in DH systems enhances supply-side efficiency, i.e., the amount of primary energy needed to supply a unit of heat delivered to consumers for purposes of space and water heating. To establish a level playing field between third-party waste heat providers and conventional DH generation, adequate market access regulation needs to be in place.

Business as usual	E1st
Network access negotiated on <b>voluntary basis</b>	<b>Non-discriminatory network access</b> for third-party waste heat providers
<b>Significant transaction costs</b> in negotiation of third-party network access	<b>Low transaction costs</b> in negotiation of third-party network access

Table 2 lists the outcomes of the discussion on network access in terms of barriers and success factors. Most intensely discussed was the barrier of **supply risk**: DH companies require economic security concerning consistent feed-in of third-party waste heat to ensure economic viability. This could possibly be addressed through liabilities and subsidies by regulatory authorities and ratepayers (success factor). Another key barrier discussed was the lack of an enabling **regulatory framework** for third-party access, with the present framework being considered too complex for DH companies and providers to engage in delivery contracts. **Technical feasibility** is another important barrier, i.e. feed-in must have pressure, temperature and aggregate state that corresponds to the condition of the conduit pipe of the district heating network. Lack of information is a barrier that was added by the participants: DH companies may not be aware of surrounding waste heat potentials; in turn, third party providers may be unaware of the possible economic revenues from network feed-in.

**Table 2. Overview of barriers, success or enabling factors related to Network access for third-party waste heat providers.**

<b>Barriers to implementing E1st</b>	<b>Success or enabling factors to overcome the barriers</b>
Too complicated regulation	<b>Transparent regulatory framework</b>
Unreasonableness of third-party feed-in	
Investment risk (stable supply, amortisation of investments)	<b>Support cooperation by liabilities or subsidies by regulatory authority</b> <b>Risk-hedging strategies</b>
Technical feasibility	
Transaction costs	
<b>Lack of information (unknown waste heat potentials around)</b>	<b>Disseminate best-practice examples</b>
<b>Time horizons (industry plans 3-4 years, DH companies 30+)</b>	<b>Long-term strategies for investment security</b>
Lack of interest and incentives	<b>Right incentives in regulatory framework</b>

*Note: barriers, success or enabling factors in bold are the ones added during the workshop.*

## RANKING

The workshop participants were invited to rank the barriers identified in the first part of the discussions, to indicate which ones they considered as most critical to address for a successful implementation of E1st. The results of the voting are presented below.

Note: each participant had 6 points to distribute, with the possibility to add several points on the same barrier. The vote was cross-cutting, considering all policy approaches and barriers at once.

Integrated district heating planning and operation		Network access for third-party waste heat providers	
Lack of capacity (tools, human resources)	5	Too complicated regulation	3
Lack of regulatory framework	3	Supply risk	3
Lack of practical experience with integrated planning	3	Technical feasibility	2
Split incentive between building owners and DHC operators	2	Lack of information (unknown waste heat potentials around)	2
Lack of information and knowledge for new innovative services	1	Lack of interest and incentives	2
Difficulties to assess the impact of energy saving measures vs. heat supply	1	Unreasonableness of third-party feed-in	1
Supply side competition	0	Transaction costs	1
		Time horizons (industry plans 3-4 years, DH companies 30+)	0