ANNEX II

Minutes of the ENEFIRST Expert Online Workshop from April 15th, 2021

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INTRODUCTION

This annex provides the details about the second step of the methodology used to analyse the main barriers and success factors to the implementation of Energy Efficiency First in a selection of nine policy approaches, as presented in the core report ***Implementation map on barriers and success factors for E1st in buildings***.

In this second step, a **consultation workshop** was organised to discuss, validate and rank the barriers and success factors **with EU and national experts**. This online workshop was carried out in an interactive format (using a MIRO board) to receive as much feedback and input from the participants as possible. The discussions were organised in dedicated sub-groups for each of the three selected policy areas:

- **buildings** policy,
- **power sector** policy, and
- **district heating** policy.

The 41 external participants were invited to give feedback, based on their expertise, on the barriers and success factors identified by the ENEFIRST team in the first step described in Annex I. They could add additional aspects that might have been overlooked in our analyses.

Having the development of specific policy guidelines in mind, the barriers and success factors were structured by stakeholder type to overcome the barriers at each policy level (EU, national, regional, local).

Then each break-out group ranked the updated list of barriers and success factors in terms of what interventions/efforts and which stakeholders should be prioritised to achieve a full operationalisation of the E1st principle.

The minutes of the consultation workshop are presented below, with one part for each of the three policy areas listed above.

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 BUILDINGS

Minutes

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 which will be visualised in implementation maps to inform policy makers and other stakeholder groups and help to make the E1st principle operational.

A consultation workshop was held on 15 April 2021, with the **objectives** to:

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

The workshop included three breakout groups: buildings, power sector and district heating. The policy approaches discussed in the break-out group on buildings were:

- Fabric first approach;
- Financial incentives for RES linked to energy performance;
- Planning instruments for investments in buildings.

Generally, there was a broad understanding that the previously identified barriers are indeed relevant for implementing the E1st principle. On a general note, the national level (national energy and climate

plans, NECPs) and regional planning was emphasised as a current barrier due to a lack of guidelines but also the level at which E1st can be successfully implemented. It was agreed that more specific guidance is needed from EU level but that there needs to be close cooperation between national and regional level regarding the specific implementation of E1st measures.

The discussion also raised the issue of E1st implementation on a district level which is important to keep in mind for energy planning on district level and building regulations that might to beyond the individual building.

After summarizing the main discussion points on each policy approaches, the results of the voting part of the session are presented.

Fabric first approach

A fabric first approach in building design and renovation prioritises the improvement of the energy performance of the components of the building fabric before considering the new installation or improvement of mechanical and electrical building services systems (such as heating systems) in order to achieve high energy efficiency buildings. A fabric first provision can be included directly in building regulations or can become a requirement in – for example – subsidy schemes. The approach may regulate new and/or existing buildings.

Table 1. Overview of barriers, success or enabling factors related to the fabric first approach.

Barriers to implementing E1st	Success or enabling factors to overcome the barriers
More demanding requirements leading to less applications for a 'fabric first' subsidy scheme	Established experience in designing and administering financial/fiscal support schemes
Lack of a reliable framework to set the minimum requirements	Wellestablished and recognised framework to define energy performance of buildings (e.g., reliable scheme for Energy Performance Certificates)
Higher total investment costs due to the fabric first requirements	Similar technical or administrative requirements across assistance and subsidy programmes (and thus reducing transaction costs)
Resistance from manufacturers and installers	Experienced and trained contractors and building professionals
"Silo thinking" and lack of cooperation in professional cultures in building and construction industry	Support to the cooperation between building trades and energy advisors
Lack of knowledge/ awareness about multiple benefits of improving the fabric	Availability and promotion of best practice case studies
Lack of expertise/ guidelines to achieve minimum energy performance requirements without using mechanical services or systems (e.g. heat pumps, solar PV etc.)	Bridges between industry players (e.g. manufacturers and installers) and markets (e.g. social housing and grant scheme managers etc.)
Multiple benefits difficult to quantify and build systematically in policy decisions	Communication and awareness campaigns on lifecycle cost and multiple benefits of the fabric first approach
Lack of schemes to value the multiple benefits in the business cases either at macro or micro levels	**Requirement for minimum energy performance level**
Difficult to quantify the impacts in terms of energy consumption/GHG reduction	**Acknowledgement of improving wider benefits through tax revenue or similar schemes by the state**
Lack of information for consumers regarding energy efficiency products and related energy operating costs	**Coherence of building shell priority measures over RES measures in national funding schemes**

Uncertainty whether the expected energy performance level will be achieved in real life	**Performance (energy/comfort)- based approaches and standardisation of works**
In Renovation: Complexity and variety of building types and uses, which are not directly approached via a general policy.	
Long payback time	
Quality issues at the interface between renovation measures leading to lower energy perf. and higher costs	
Lack of standardisation which could reduce costs of energy diagnosis, implementation (by capitalizing on the learnings),	
Vested interest of traditional energy market players, afraid of loss of market share due to EE	

Note: Factors in bold were added by workshop participants.

Regarding the fabric first approach, the participants put an emphasis on the importance of multiple benefits and stressed the difficulties of their quantification and structured consideration in business cases on the micro and macro level. Also, a reliable energy performance measurement after renovations by real energy consumption monitoring to ensure the full exploitation of efficiency first was mentioned several times. Performance (energy- or indoor environmental quality (IEQ/) comfort) based schemes could support an implementation of the fabric first approach.

Key messages:

- Clear alignment with NECP and LTRS
- Performance based approach for building renovation schemes
- Quality assurance (upskilling of building professionals, quality standards)
- Guidelines for including multiple benefits

Financial incentives for RES linked to energy performance

Financial support schemes for building integrated renewable energy installations should be subject to predefined energy performance levels or energy efficiency standards of the related building. This would ensure a priority for demand-side measures, and the energy supply would be sized adequately, increasing the systemic efficiency, too. All in all, financial incentives would impact in front of the meter solutions, and/or to avoid lock-in effects.

Table 2. Overview of barriers, success or enabling factors related to the financial incentives for RES linked to energy performance.

Barriers to implementing E1st	Success or enabling factors to overcome the barriers
Complex and more technical application process	Energy performance certificate (EPC) scheme with high quality and comparability
Long evaluation process for financial support	Sufficient number of EPC assessors or energy advisors
Lack of sufficient energy efficiency experts (e.g. EPC auditors) for the pre-assessment of the buildings' energy performance	Simple and transparent subsidy application process

Low quality of the national EPC scheme or other monitoring framework	Additional financial support for the pre-assessment/ EPC issuing process or possible energy efficiency interventions
Costs for pre-assessment/ EPC issuing and possible related energy efficiency improvements	Reliable information about the benefits of integrating energy efficiency and RES
Lack of awareness or interest of an integrated approach (EE+RES)	**Incentives for RES always linked to the improvement of rating performance**
Financial incentive for RES can compete with incentives for EE	**Align Article 7 with E1st**
Promotion of RES because E1st couldn't be aligned with article 7	**Strategic planning within NECP and national planning**
Contractors are the main source of information to households. While they know their job well, they are unable to advise on integrated approaches and often provide contradictory information	**Acknowledgement of the wider benefits through tax revenue or similar schemes by the state**
Unsatisfactory information or advise related to integrated approaches and/or provision of contradictory information	**Defined long-term consistency of financial support**
	Customer information campaign/consulting on the proper order of measures (renovations first, RES 2nd)
	Performance- based approaches (not available in private residential) to allow the mobilization of private investments

Note: Factors in bold were added by workshop participants.

Participants agreed that vested interests and – so-called - "silo" thinking among professionals and contractors, as well as policy makers that are focused on renewable energy source measures, and those in the energy efficiency domain makes it difficult to make informed decisions on the selection of measures. In the context of EU level policies, the opportunity of linking Article 7 of the EED regarding energy savings obligations (EEOs) with E1st more explicitly was mentioned.

For this policy approach, reliable information specifically explaining the relationship of demand-side and supply-side measures on the consumer/owner level is especially critical in order to avoid oversizing and lock-ins that can affect the energy performance of buildings for decades. The workshop discussion indicated that the individual building level is the most relevant when looking at barriers to implementation of this approach.

Key messages:

- Over-coming silo thinking is crucial to implement E1st;
- More information and expertise on integrated approaches needed;
- Awareness raising campaigns about order of measures for end-users could help implement E1st (incl. multiple benefits).

Planning instruments for investments in buildings

Buildings have a long lifecycle and are only renovated at certain intervals which makes them prone to lock-in effects and stranded assets if the renovation is not done considering all energy saving solutions. Buildings are also closely connected to the energy system as a whole and involve a variety of stakeholders (owners, tenants, contractors, manufacturers/ installers, financing institutions, municipalities). Planning instruments and services can implement the E1st principle by through facilitating the comparison of renovation scenarios or patterns, prioritising demand side measures, making the process of renovation easier, more transparent and more efficient.

Table 3. Overview of barriers, success or enabling factors related to planning instruments for investments in buildings.

Barriers to implementing E1st	Success or enabling factors to overcome the barriers
Lack of knowledge or vested interests of building professionals regarding different options for implementing renovation measures regarding E1st.	Providing information on the E1st principle, how it can be implemented in the planning tools and what are its benefits (including multiple benefits)
Lack of awareness of building owners about planning tools f	Information for market actors about the added value of the planning tools for buildings, and about the opportunities of cooperation between building trades
Low diffusion of building logbooks or similar tools, and lack of incentives to use them	Ensuring that the planning tools are enabling fair comparisons of renovation scenarios that include scenarios prioritizing the improvement of demand-side savings (e.g. the building envelope) in the renovation patterns.
Financial schemes not linked to planning tools	Aligning financial instruments with the E1st principle
Lack of sufficient energy efficiency experts (energy auditors) who can conduct high quality assessment of the building's energy performance and integrate the E1st principle in the recommendations	Good practice examples
Lack of comparable, high-qualitative EPC schemes in all Member States as a basis for building performance assessment	Clear guidelines for integrating the E1st principle in Building Renovation Passports and Digital Building Logbooks as foreseen under the Renovation Wave
Extra cost of the planning analysis	**Guidance for the Multi Annual Financing plans and Recovery Fund**
Guidance for the Recovery Plans missing	**(mandatory?) planning at the scale of district for holistic evaluation of demand side and supply- side investments, in EE, RES and flexibility**
Just Transition plans as a corridor for fossil fuels/ natural gas new grids for heating in buildings	**Improved planning instruments (e.g. implementing Wider benefits) need to fit into existing planning frameworks, without much extra effort of complexity. Especially for public authorities**
Lack of incentives for deep renovation as part of funding schemes	
Lack of building owner s' long term view and financial resources to engage for a step-by-step complex renovation process	
Lack of reference to financial instruments	
Lack of consistent and up-to-date information	
Why would be home-owners engage in deep renovation if funding (grant) is available for individual energy efficiency measures	

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

The discussion around project planning tools evolved towards the barriers and success factors of rolling out more deep renovation, instead of explicitly discussing barriers to E1st implementation in planning tools. There was a consensus that a key barrier is the decision making of homeowners and the lack of knowledge on the benefits of deep renovation and a lack of financial incentives to facilitate deep renovation instead of individual measures. Planning tools can offer a solution to bring deep renovations forwards by giving advice to homeowners and providing information on benefits of renovation measures as well as funding opportunities.

Two new interesting success factors were introduced: on one hand (mandatory) planning at the district level, which could increase flexibility and the other was streamlining new planning instruments with existing planning frameworks, in order to ensure an easy adaptation.

Ranking

The workshop participants were requested to rank the collected barriers and indicate which ones they considered as most critical to address for a successful implementation of E1st. We present the results of the voting below (Note that each participant had 9 votes to distribute and displayed are the number of votes per barrier):

Fabric first		Financial incentives for RES linked to energy performance		Planning instruments for building renovation	
'Silo-thinking' and lack of cooperation in construction industry	7	Low quality of national EPC scheme of other monitoring framework	5	No incentives build into funding schemes	6
Lack of a reliable framework	7	Lack of awareness or interest of an integrated approach (EE+RES)	4	Financial schemes not linked to planning tools	4
Lack of schemes to value the multiple benefits in business cases	7	Financial incentive for RES can compete with incentives for EE	3	Lack of knowledge of building professionals regarding different options of renovation measures	4
Lack of knowledge/ awareness about multiple benefits of a fabric first approach	7	Promotion of RES as E1st could not be aligned with Article 7 EED	3	Lack of comparable, high-qualitative EPC schemes in all MS as a basis for building performance assessment	3
Long pay-back time	3	Lack of sufficient energy efficiency experts for the pre-assessment of the building	2	Extra cost for the planning analysis (energy audit)	2
Quality issues	3	Costs for pre-assessment/ EPC issuing and possible related energy efficiency improvements	2	Lack of building owners' long-term view and financial resources to engage for a step-by-step complex renovation process	2
Multiple benefits difficult to quantify	3	Lack of capacity of contractors to provide adequate information to private homeowners (integrated approaches)	2	Lack of awareness about planning tools (perspective of the building owner)	2
Uncertainty whether the expected energy performance level will be reached	2	Complex and long approval process for subsidies	1	Guidance for the Recovery Plans missing	2
Higher total investment costs per renovation project	2	Complex and more technical application process	1	Just Transition Plans as a corridor for fossil fuels/ natural gas new grids for heating in buildings	2

Lack of standardisation	2			Lack of reference to financial instruments	1
Lack of expertise to achieve minimum performance requirements without using mechanical building services or systems	1			Lack of sufficient energy efficient experts to conduct the buildings' energy performance assessment	1
Complex and long approval process	1				

The ranking results show that the fabric first approach, the first policy approach discussed in the breakout-group, received most attention and possibly therefore also the most votes (bias in distributing the votes).

The four barriers that were **ranked highest (7 votes each)** belong to the fabric first approach:

- 'Silo-thinking' and lack of cooperation in construction industry
- Lack of a reliable framework
- Lack of schemes to value the multiple benefits in business cases
- Lack of knowledge/ awareness about multiple benefits of a fabric first approach

It should be noted that these barriers are also applicable to the other E1st policy approaches as they refer to general barriers to prioritising energy efficiency improvements of the building envelope.

From the above, general cross-cutting aspects shine out, which should be addressed to realise the implementation of E1st in the building sector:

- Capacity building on integrated approaches of energy efficiency improvements and renewable energy installations (resolving 'silo-thinking' of and a culture of a lack of cooperation between building trades and EE and RES);
- Awareness raising and structured approach to multiple benefits in investment decisions;
- Performance-based interventions to ensure a high quality of renovation measures;
- A reliable framework to monitor the energy performance of buildings (high-quality EPC scheme or others);
- Financial schemes implementing E1st.

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DISCUSSION GROUP ON POWER SECTOR

Minutes

Introduction

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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 “power sector” group.

The policy approaches considered in this group included:

- Power market rules
- Transmission and distribution utility provisions
- Transmission and distribution incentives
- Dynamic tariff design

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.

Power market rules

Demand-side resources can be mobilized next to generation to guarantee that supply and demand in the power system are balanced at all times. However, this requires market rules that provide **access** to them to the various power markets (wholesale, balancing) and the capacity mechanisms as well, where applicable.

Business as usual	E1st scenario
Only generation units compete in the various power markets	Demand-side resources have **access** to these markets not only de jure but **de facto** as well.
Power markets are designed for large scale units only.	**Aggregation** of smaller capacities (across generation and demand as well) are **allowed**, and these aggregated resources are treated as single units at these markets.

The issues raised can be clustered into two groups:

- First, the position of aggregators (lack of recognition, consumer perception on their role, and their business case (issue of supplier compensation or prohibition of pooling).
- Second, the level playing field for all resources in the markets and the market monitoring to reveal gaming of market rules.

Table 4 below provides the full list of barriers, success or enabling factors identified before and during the workshop.

Table 4. Overview of barriers, success or enabling factors related to power market rules

Barriers to implementing E1st	Success or enabling factors to overcome the barriers
Unclear rules on supplier compensation	**use system savings to avoid reducing aggregator/DR provider revenue (i.e. applying the net benefit approach)**
Too high transaction costs for Demand-Response aggregation	**Definition of aggregators and aggregation in the regulatory framework**
Individual prequalification of demand-side resources	
	Scrapping of capacity markets
Unclear or impossible approach of aggregators to the power market	

Too large bid size in the various energy markets	**Define rules that do not discriminate power sources depending on the market, origin, technical features of the source/generator**
Pooling of all kinds of resources (demand and load) not always permitted	
Stacking of different services not allowed	
Lack of integrated market where not only System Operators (SOs) procure ancillary services but also Balance Responsible Parties balance their portfolios and SOs resell un-needed contracted resources	
Increase/Decrease Gaming may occur	**Implementing regulation to avoid strategic bidding - Independent market monitoring by NRAs (National Regulatory Authorities) to avoid gaming**
Unclear baseline calculation methodology	
Lack of adequate metering infrastructure	
Lack of general transparency between aggregators and consumers: consumers need to understand easily what an aggregator is for	Involvement of consumers; Simplification of rules so that non- energy experts can easily assess the value of participation
Integration of appliance providers (sellers) and building owners: landlord tenant split incentive	
	Setting of a national Demand Response target

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

Transmission and distribution utility provisions

Provisions for network companies - both at transmission and distribution levels - that require the consideration of demand-side resources **in grid planning and operations**.

Business as usual	E1st
TSOs and DSOs planning is based on forecasted peak load and a fit-and-forget approach.	TSOs and DSOs have to assess the potential and the cost of mobilising demand-side resources and **use them as alternatives** to network investment whenever providing more net benefit.
Development plans are not public and only discussed with the NRAs.	Network planning is **public** so that the need for demand resources and their availability can be matched.

The discussions during the workshop provided new additions about barriers in this field, highlighting several information/capacity problems of DSOs:

- the lack of information of where flexibility potentials are, and
- the need to evaluate the costs and benefits of all types of resources not only traditional network elements.

There is a need for TSO-DSO cooperation: the lack of cooperation is considered to be a barrier today. The other issue identified was the potential conflict of market and network efficiency, i.e., the respective scarcities do not necessarily arise in the same time period.

Table 5 below provides the full list of barriers, success or enabling factors identified before and during the workshop.

Table 5. Overview of barriers, success or enabling factors related to transmission and distribution utility provisions

Barriers to implementing E1st	Success or enabling factors to overcome the barriers
Lack of awareness and knowledge or experts about flexibility and demand- side resources among TSO and DSO staff	Capacity building on the integration of demand-side resources in network planning and operation
Lack of knowledge where DSM potentials are largest (sectors, appliances, use cases)	Experience sharing between network operators and regulators (**and energy companies**)
Difficulties to evaluate the costs and benefits of the different alternatives to network reinforcement (e.g., network upgrade vs. flexibility or automation or...)	Guidance on CBA that can assess both demand- and supply- side options
Priority to security of supply and doubts about the reliability of demand-side resources	Transparency requirement of grid capacity/flexibility need
Lack of DSO-TSO coordination for provision of flexibility (i.e., ancillary services)	**Development of a mechanism for DSO- TSO coordination on flexibility services**
Lack of adequate metering infrastructure	
Market efficiency may be conflicting with network efficiency	
Low maturity of residential flexibility market	Involvement of consumers
Forecasting uncertainty	

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

Transmission and distribution incentives

Financial incentives for regulated network companies (DSOs, TSOs) to consider and invest into demand resources as an alternative to building new grid capacities.

Business as usual	E1st
Network companies have an **incentive to invest** into their assets as they earn a rate of return on the investment,	The same revenue can be earned on **all types of costs** incurred (capex or opex)-
Network companies have **no incentive** to actively innovate and **align with the power system transition.**	**Performance-based incentives** could reduce the inertia of network companies and their appetite for more risky but potentially more efficient solutions.

There was no discussion on this policy approach during the workshop. One solution that has been added on the risk averse behaviour of regulatory agencies was to engage in regulatory experimenting.

Table 6 below provides the full list of barriers, success or enabling factors identified before and during the workshop.

Table 6. Overview of barriers, success or enabling factors related to transmission and distribution incentives

Barriers to implementing E1st	Success or enabling factors to overcome the barriers
Opposition of TSOs or DSOs to regulatory changes	Involving the TSOs and DSOs in the preparation of the regulatory changes
Risk averse regulators	Environmental mandate for energy regulators; Regulatory sandboxes; **All types of regulatory experimentations should be pursued, and only after draw conclusions**
Endowment of regulatory authorities	Assessing the resources needed at the regulatory bodies for the implementation of the regulatory changes

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

Dynamic tariff design

Network and retail tariffs incentivising the **smart use of existing networks** by consumer and hence reducing the need for grid capacity extensions.

Business as usual	E1st
The energy and network tariff paid by the consumers is **independent from the market and system conditions.**	Consumers pay less in case of abundant generation and network supply and **more in scarcity periods**.
Load is considered to be **inelastic.**	Consumers **do respond to prices**.

This policy approach created the most discussion. The focus of most contributions was the consumer behaviour. The problem of risk awareness or aversion, the quest for simplicity were mentioned as key barriers to consumer acceptance of dynamic tariffs. The second main issue was the availability of flexible load and the need for an approach (both regarding potential assessment and utilisation strategy) that segments consumers into large industrial, commercial and residential groups. Different localities can have very different consumer segments and hence need a tailored-made strategy to use the available, different, flexibility potential.

Table 7 below provides the full list of barriers, success or enabling factors identified before and during the workshop.

Table 7. Overview of barriers, success or enabling factors related to dynamic tariff design

Barriers to implementing E1st	Success or enabling factors to overcome the barriers
Regulated retail pricing	
Contradictory EU legislation on network tariff design	
Reputational concern (if dynamic tariffs are viewed as unfair); **Justice implication concerns**	
Lack of adequate metering infrastructure; **costs of smart meters and the devices to manage the load (given the small spreads to earn)**	
Current lack of half-hourly settlement means little incentive to settle customers on actual profiles	
Tariffs with only one dynamic component (e.g. the energy component) and the masking effect of taxes and levies	

Barriers to implementing E1st	Success or enabling factors to overcome the barriers
Still rather limited insight on what tariff designs are best for different consumer segments	
Lack of guidance on price comparison techniques for such tariffs	**Provide principles of good tariff comparison approaches**
Difficulty to provide effective price signals while keeping tariffs simple for consumers to understand and use; **Price signal has to reach customers**	Piloting dynamic tariffs / **Testing of new tariff designs**; **Simplicity in showing DR benefits (platform, bills, ...)**
Lack of information on price signal for the consumer - reaction time	Consumer awareness policies
Dynamic tariffs can add a 'hassle' burden to consumers	Coupling ToU tariff with automated devices for Demand-Response
Lack of penetration of large controllable loads, reducing value of such tariffs	**Support for uptake of EVs (Electric Vehicles) / HPs (Heat Pumps)**
Dynamic tariffs are accompanied by a price risk for consumers compared to the traditional flat rate design; **Risk averse consumers that do not want exposure to market prices**; **Fixed tariffs are some kind of insurance**	Providing clear benefits to consumers;

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 in Table 8.

Note: each participant had 12 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.

Table 8. Results of the voting, presented per policy approach

(*barriers in bold are the ones added during the workshop*)

Barriers related to 1-Power market rules	Points
Lack of adequate metering infrastructure	9
Unclear or impossible approach of aggregators to the Power Market	5
Increase/Decrease Gaming may occur	4
Lack of integrated market where not only SOs procure AS services but also BRP s balance their portfolios and SOs resell un-needed contracted resources	4

Barriers related to 4- Dynamic tariff design	Points
Lack of information on price signal for the consumer – reaction time	4
Risk averse consumers that do not want exposure to market prices	4
Difficulty to provide effective price signals while keeping tariffs simple for consumers to understand and use	3
Still rather limited insight on what tariff designs are best for different consumer segments	3

Barriers related to 1-Power market rules	Points
Lack of general transparency between aggregators and consumers: consumers need to understand easily what an aggregator is for	4
Stacking of different services not allowed	3
Pooling of all kinds of resources (demand and load) not always permitted	2
Too large bid size in the various energy markets	2
Unclear baseline calculation methodology	2
Define rules that do not discriminate power sources depending on the market, origin, technical features of the source/generator	2
Individual prequalification of demand-side resources	1
Too high transaction costs for Demand-Response aggregation	1
Unclear rules on supplier compensation	1
Definition of aggregators and aggregation in the regulatory framework	1
Simplification of rules so that non-energy experts can easily assess the value of participation	1
Integration of appliance providers (sellers) and building owners: landlord-tenant split incentive	1

Barriers related to 4- Dynamic tariff design	Points
Justice implication concerns	3
Reputational concern (if dynamic tariffs are viewed as unfair)	3
Current lack of half-hourly settlement means little incentive to settle customers on actual profiles	2
costs of smart meters and the devices to manage the load (given the small spreads to earn)	2
Lack of adequate metering infrastructure	2
Simplicity in showing DR benefits (platform, bills)	2
Providing clear benefits to consumers	2
Regulated retail pricing	1
Dynamic tariffs are accompanied by a price risk for consumers compared to the traditional flat rate design	1
Contradictory EU legislation on network design	1
Testing of new tariff designs	1
Lack of penetration of large controllable loads, reducing value of such tariffs	1

Barriers related to 2-T&D Utility provisions	Points
Lack of adequate metering infrastructure	3
Difficulties to evaluate the costs and benefits of the different alternatives to network reinforcement (e.g., network upgrade vs. flexibility or automation or...)	3
Market efficiency may be conflicting with network efficiency	3
Transparency requirement of grid capacity/flexibility need	3
Lack of DSO- TSO coordination for provision of flexibility (i.e., ancillary services)	2
Low maturity of residential flexibility market	2
Lack of awareness and knowledge or experts about flexibility and demand- side resources among TSO and DSO staff	2
Forecasting uncertainty	1

Barriers related to 3-T&D incentives	Points
Risk averse regulators	3
Including the development of the use of demand-side resources as part of the missions of the TSOs and DSOs	1
Opposition of TSOs or DSOs to regulatory changes	1
Environmental mandate for energy regulators	1

Barriers related to 2-T&D Utility provisions	Points
Lack of knowledge where DSM potentials are largest (sectors, appliances, use cases)	1
Priority to security of supply and doubts about the reliability of demand-side resources	1

Barriers related to 3-T&D incentives	Points

Clearly, the policy approach that stirred the most debate and contribution was the one about dynamic tariffs. However, barriers related to power market rules get overall more points (43, vs. 34 for the ones related to dynamic tariffs). The barriers related to T&D Utility provision get 21 points, and the ones related to T&D incentives only 6 points (which is consistent with the fact that this policy approach was not discussed by the participants).

The outstanding barrier according to the votes of the workshop participants was the lack of metering infrastructure, or more precisely the regulatory gap on how the various meters should/could operate next to each other. What happens when a consumer has multiple suppliers, EV chargers coming with their own embedded submeters. See further information here on how the UK is dealing with this issue.

Other issues ranked high were around the status of aggregators and consumers behaviour when facing price risk.

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DISCUSSION GROUP ON DISTRICT HEATING

Minutes

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:

- 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.

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 **exogenous energy demand**	District heating system expansion and upgrades based on **endogenous energy demand**
District heating companies have **no direct incentive** to bring about demand-side energy savings	District heating companies are incentivized to bring about demand-side energy savings through **DSM measures**

The outcomes of the discussion are summarized in Table 9. 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 9. 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**
Lack of capacity (tools, human resources)	**Human resources in regulatory authorities** **Data availability**

Lack of information and knowledge for new innovative services	
Lack of practical experience with integrated planning	**Demonstration projects** **Best practice exchange**
Difficulties to assess the impact of energy saving measures vs. heat supply	
Split incentive between building owners, DHC operators, and society as a whole	**Incentive framework: Balanced instruments that enable good conditions for demand- or supply investments**
Supply side competition	

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

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 **voluntary basis**	**Non-discriminatory network access** for third-party waste heat providers
Significant transaction costs in negotiation of third-party network access	**Low transaction costs** in negotiation of third-party network access

Table 10 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 10. Overview of barriers, success or enabling factors related to Network access for third-party waste heat providers.

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

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	
Lack of capacity (tools, human resources)	5
Lack of regulatory framework	3
Lack of practical experience with integrated planning	3
Split incentive between building owners and DHC operators	2
Lack of information and knowledge for new innovative services	1
Difficulties to assess the impact of energy saving measures vs. heat supply	1
Supply side competition	0

Network access for third-party waste heat providers	
Too complicated regulation	3
Supply risk	3
Technical feasibility	2
Lack of information (unknown waste heat potentials around)	2
Lack of interest and incentives	2
Unreasonableness of third-party feed-in	1
Transaction costs	1
Time horizons (industry plans 3-4 years, DH companies 30+)	0