CONCERTED ACTION
ENERGY EFFICIENCY
DIRECTIVE

6/7th Plenary Meeting CA EED

Summary of Proceedings

Date: November 2020

Contents

1 Opening Plenary Session

In the course of the sixth and seventh Plenary Meeting of the CA EED over 270 experts, policy makers and implementers gathered virtually to discuss issues related to the implementation of the EED in Member States. The Plenary Meeting was designed to give Member States and Norway the opportunity to exchange experiences and learn from each other.

1.1 Presentations by DG ENER, EASME and Coordinator

Coordinator and Communicator opening presentation 6/7th PM

News from EASME 6/7th Plenary Meeting

2 Working Group Sessions

The Working Group Sessions of the 6/7th Plenary Meeting covered the following topics: Behavioural economics, EPC as a catalyst for building renovation in the public sector, EEOs and alternative measures - Monitoring and Verification, Combining CO2 targets with energy efficiency targets, Communication between different actors in Art. 7 implementation, Efficiency in cooling and Remote reading of thermal energy Art. 9c.

2.1 Working Group 6.1 – Behavioural economics

The sessions shed some light on the concept of behavioural economics and the advantage of insights in behavioural economics when designing energy efficiency policies in the context of the EED. Behavioural economics can be used in many areas, apart from policy design in general, also in campaigns as well as in ICT tools and other innovative solutions.

Session 1

During the first session, the scientific area was defined. Behavioural science is the science of understanding what people are doing, why they are doing it, and how we might encourage people to change what they are doing. Behavioural economics entails using insights from sciences (e.g. psychology) to people's economic decision making/behaviours. Behavioural insights combine investigations from real life on how people actually make choices with knowledge and insights from different sciences (e.g. psychology and social sciences).

The majority of member states say they apply behaviour science in energy efficiency policy design and implementation at least to some extent. It is more common to use behavioural science in agencies than government. A number of member states indicate that they want to increase use of behaviour science, and that they plan to do so by provide staff education and training. The installation of energy efficiency measures should not be seen as "separate" to behavioural change measures. A lack of access to data and skilled evaluation resources across member states is likely limiting the use of behavioural change interventions. There could be difficulties in understanding the concepts of behavioural science/economy/insights.

During the presentation on "Framing choice to increase retrofitting - An online experiment to test the impact of bundling on retrofit choice" The Irish study showed that:

- Bundling energy efficiency upgrades can increase willingness to pay
- Bundling energy efficiency upgrades can increase retrofit depth
- Wherever we can, we should make choices easier for homeowners
- We should look at every point along a homeowner's customer journey to retrofit their home and optimise it to increase retrofitting

Session 2

In the second session there was a presentation from the Netherlands and also a presentation to introduce the area of behavioural economics and behavioural sciences and how to use it. The findings of a Dutch report were presented, on the importance of addressing behavioural factors in policy making: "Behaviour Change - a critical success-factor for climate change policies and actions".
The report summarized 20 years of Dutch work with behavioural sciences and concluded:

- Support from the national and local governments are necessary for embedding behavioural insights in policy design and interventions
- Focused on enabling *and* motivation
- Behaviour aspects need to be addressed from start to end
- Efforts need to be continuous and repetitive
- Need for systemic learning and application

The general principals and advice when using behavioural sciences in policy were also discussed. There are four rules of behavioural change: the interventions must be easy, attractive, social and timely. Interventions should be designed in steps:

- Define the problem by identifying and understanding the behavioural outcome(s) we seek to achieve.
- Diagnose the behavioural issues causing the problem.
- Based on these hypotheses, we Design interventions.
- Test these interventions using randomized controlled trials and other rigorous methodologies.

The topics discussed during the two sessions were; how to set ambitious but realistic objectives; how to approach target groups in the building sector at the right moment, with the right message and with a trusted sender; how can we improve the use of data; where can we learn more about energy-related behaviour.

It was appreciated from the audience to hear about the examples and how things had been done. However, it also requires the audience to be somewhat familiar with applying behaviourally supported change processes and their fundamentals (such as how to set up interventions, implement and evaluate them). A challenge seemed to be that policymakers in the room wanted solutions or recommendations, rather than tools or approaches.

The EED working group clearly built up a 'body of knowledge' on energy-related behaviour change, with much expertise and many experiences in its network. Perhaps in the next period, this knowledge can be expanded with increased mutual learning and connections to relevant networks outside the programme.

2.2 Working Group 6.2 – EPC as a catalyst for building renovation in the public sector

The sessions focused on two aspects of EPC and how it can accelerate renovation in public sector buildings. The first session presented case studies of where EPC was used to deep renovate buildings, and different models where EPC is used for large scale renovation programmes. The second session focused on EPC financing approaches that can accelerate renovation investment.

Session 1

THE CEO of a hospital in Dublin spoke of their ongoing EPC project. This is a €12m EPC project investing in new lighting, controls, CHP, and extensive renovation of windows and some other building fabric. They also took the decision to invest in non-energy related areas such as new flooring, internal walls and ward refurbishment. 48% of the capital was spent on non-energy saving measures. 97% of the saving were from energy related works, meaning the energy savings subsidized a lot of general renovation work. They are using the EPC model to explore waste reduction opportunities.

A speaker from Belgium spoke on their EPC programme. VEB are a one stop shop for public buildings to scope, conduct feasibility, procure and help manage EPC projects. There are over 30 EPC projects currently being tendered and they have set plans to procure 5/6 EPC projects per year thereafter. They look to the long-term needs of the public building owner and try to encompass those objectives in the EPC solution. Each EPC project is therefore very tailored to the buildings long term needs. This sometimes means investing more, as the building might not be retrofitted again for many years. They mostly do projects on balance sheet as it's hard to balance this flexibility and still meet the off-balance sheet rules. However, they are looking at a hybrid solution that would allow some of the works to be off balance sheet.

In the discussion session there were contributions from Slovenia and from Czech Republic. Both highlighted examples of EPC projects which resulted in deep energy retrofits. Slovenia have strong public building targets in their LTRS, and EPC will be core to this. They use off government balance sheet financing and are exploring hybrid solutions to do deeper retrofits using EPC and still be off GBS. They point to the expertise needed to facilitate good EPC solutions, especially around competitive dialogue and procurement. And they point to the success Elena support has had in developing these schemes. In Czech Republic, they combine subsidies to maximize the EPC impact, and are modifying their schemes to incorporate off government balance sheet options. Austria spoke of the high success in Austria of heating plant EPC, but that deep renovation approaches were limited.

In a Mentimeter poll at the start, 83% felt EPC was a good option for renovation, whilst 17% were not sure. After the session, the not sures reduced to 4%!

Session 2

Session 2 focused on how EPC can accelerate investment in public building renovation, and developing financial instruments using EPC.

The EIB gave a fantastic summary of the different EPC financing approaches. He explained the main EPC financial models and how they were applied and worked in different regions and MS. He covered the advantages and disadvantages of the different approaches. He provided an update on MS who were using off government balance sheet solutions. He covered some core principles of EPC financing that were important to know. Notably how ESCOs needed different financing during construction (biggest risk period for them) and during the energy performance period (less risk for the ESCO). During this period, it's important for ESCOs to be able to sell their receivables (their future revenue streams) to take this debt off their balance sheet to be able to invest in future projects. Robert discussed approaches for the public sector to reduce the ESCO cost of financing, so as to access cheaper financing through the ESCO. These principles are important when developing regional or national financial instruments around EPC.

In the discussion after, Slovakia spoke on their experience of their off-government balance sheet national approach. There were issues getting it started and they are refining the model but expect more projects to start soon. They are looking to combining structural funds with the EPC scheme. Ireland spoke of the ongoing study looking into the potential to utilize EPC for large scale retrofit of public sectoring buildings. There is a national target to achieve a B performance rating for all PS buildings by 2030. The study, being conducted by Trinomics is supported by the SRSP under DG REFORM. Lastly Scotland spoke on the Scottish EPC scheme and their strong plans to accelerate public building renovation using off government balance sheet solution.

A common theme across all the speakers was the impact already and potential impact for financing renovation using EPC financial instruments (FIs). Many MS are using EPC FIs to undertake large scale renovations, with many more planned, so it can greatly accelerate renovation rates. However, the solutions are highly tailored to each MS or region. They need careful design to ensure they deliver the long-term renovation objectives (go beyond just energy related renovations work), coupled with detailed tailoring on the financing approach to optimize the cost of financing and drive large scale thinking and solutions.

A Mentimeter poll highlights that 50% of MS have or plan to use an EPC based FI. Whilst 50% were still unsure.

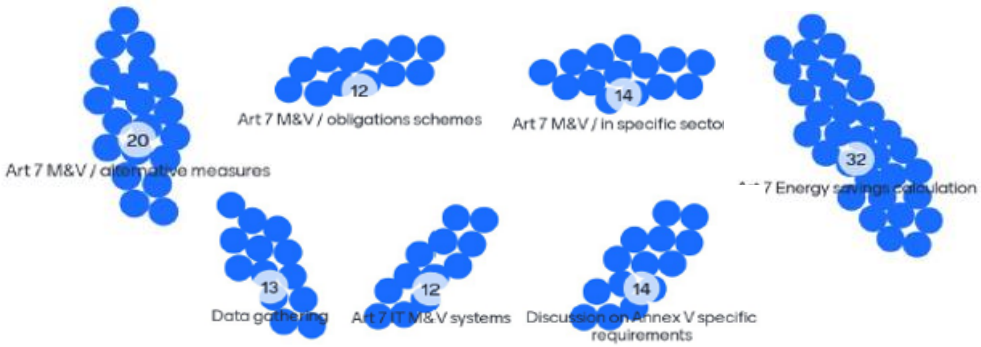
2.3 Working Group 6.3 – EEOs and alternative measures - Monitoring and Verification

M&V and energy savings calculation for eligible Article 7 measures is continuously an issue for many MS. Concrete and practical examples of M&V and energy savings calculations would be appreciated by many MS. The aim of the 1st session was to get concrete information from the Commission on Article 7 M&V. Besides, MS were asked in a Padlet exercise to provide input what additional support they would need in the field of EED Article 7 M&V and who could provide it.

DG ENER stressed the importance of Article 7 monitoring and verification (M&V) in the Energy Efficiency Directive as amended by Directive (EU) 2018/2002 (‚EED'), and highlighted the M&V and reporting rules set in the EED and the Governance Regulation 2018/1999 for the implementation of energy efficiency obligation schemes and alternative policy measures. DG ENER also presented an indicative list of criteria that can be used to monitor materiality as well as key requirements for a strong M&V system, and some points to be taken into account when defining verification protocols. DG ENER also mentioned some concrete good practices regarding M&V system development based on the H2020 multEE project and presented the advantages of an online platform. Commission analysis of the M&V systems for Article 7 policies reported by MS for the years 2014-2017 lead to the following results: for 60% of the savings, there are no concerns; 14% of savings raised some concern; for 7% of savings there are serious concerns mainly related EEOS policies and savings calculations by the obliged parties. In general, in the M&V, the problems relate to the level of independent M&V, the quality of the samples and the quality of implementation.

Discussions once again highlighted that MS wish to get additional support especially related to concrete examples on savings calculations and building up a M&V system which MS could easily implement in their country and would be in advance known to be accepted by DG ENER. Transport sector measures and behavioural measures were specifically highlighted. The Commission recommendations was mentioned to be helpful but too theoretical.

In the 2nd session, Latvia shared experiences on their M&V system, and Italy on savings calculations for soft measures. Energy savings calculations and M&V for alternative measures are the topics of most interest for future discussions, in the area of Article 7 M&V.



Latvia presented how they have built their energy efficiency monitoring system and their future plans to develop an IT-based tool. The energy efficiency monitoring system covers 1200 units; large enterprises, large electricity consumers, state institutions, local governments, and Latvia's EEOS.

Italy presented experiences of calculating energy savings for information and training campaigns both for households and industry in Italy. The methods are notified as to alternative measures for Article 7 purposes since 2019 and are additional to savings reported for the obligated parties. These measures will also be used in the EED Article 7 obligation period starting 2021.

2.4 Working Group 6.4 – Combining CO2 targets with energy efficiency targets

The main aim of the sessions was to identify the ways and possibilities of combining GHG targets with energy efficiency targets, concerning measurement and verification (M&V) procedures and systems.

Session 1

The first session included speakers focusing on model solutions from the Netherlands and Poland.

The Netherlands outlined the Dutch Climate Agreement in the context of monitoring climate and energy policies. The presentation addressed how ex-post monitoring of the effects of climate and energy policies might be used for multiple climate and energy indicators using data on the implementation of measures. Such monitoring, reporting and verification system (MRV) has many benefits such as strong integration of MRV in the policy cycle, robust monitoring due to multiple levels of evaluation. The MRV is cost-effective by using a method and data for the entire (sub)sector and there are no overlapping effects of policies within a sector. However, it has also some challenges, e.g. availability of uniform and detailed data, additionality of individual policies within a sector is difficult to assess; integrated sector-wide modelling to calculate ex-post energy savings is not always available. Ideally, an integrated model is used to calculate energy savings to match bottom-up data with top-down statistics and projections. This is an advanced and likely costly method which is not always available. Learning from each other's methods could be a cost-effective way to improve methods used by the countries.

The second presentation was on the energy efficiency measures implemented in Poland for the GHG emission reduction target, highlighting that one measure can contribute to both targets, i.e. energy efficiency and GHG emission reduction. Historic *trends* of Poland's emission reduction indicators were presented that have taken place over the last 20 years, underlining changes caused due to efficiency improvement, fossil fuel switching, the share of nuclear and increased share of renewable. The data showed how strongly energy efficiency influenced CO_2 emissions. The projected progress in Poland in terms of energy efficiency and GHG emission reduction until 2030 has also been shown. The fact that energy efficiency first principle covers all dimensions of the Energy Union and requires more synergies between undertaken measures should cause that energy efficiency can impact GHG emission reduction objective to a greater extent than before, provided that this message would be effectively brought to policymakers. The requirement to understand this principle by the politicians has been stressed.

Session 2

The second session focused on how best to use the cases presented and how to improve national procedures to link M&V procedures on GHG emission reduction and energy efficiency more closely. The participants were asked to analyse the M&V systems they have and propose modified solutions to eventually come to a "model" solution. The MS indicated that combining M&V procedures for CO_2 emission and energy efficiency might be helpful for many reasons, e.g. to give real data for policymakers in energy efficiency policy, to better measure the effectiveness of energy policies and to provide more data to justify spending on measures that are working and vice versa.

The MS expressed diverging views as some believe that there is a close relationship between GHG emissions and energy efficiency. Some MSs, however, were skeptical and expressed an opinion that energy efficiency is a more abstract concept and cannot be linked to GHG emission directly. It has been underlined that more coherent political actions are needed to start preparation of a unified approach to data usage. The big data from the EU ETS is not fully used for other purposes like energy efficiency. The MSs do not fully use the data they have. The data on emission and energy efficiency should work together and not against each other. When it comes to the recalculation of GHG reduction to energy efficiency improvement and vice versa, it has been pointed out that GHG emission factors which relate the emission with energy savings should be set on national bases but more research and the EC involvement is needed. The MSs believe that recalculating GHG and energy efficiency can be costly and economically viable, with the right data and policy in place. However, little has been done so far to assesses the real costs and try to diminish them through better management of data and procedures.

Malta presented correlating M&V of GHG reduction and energy efficiency data. It was pointed out that different policy areas require different perspectives and different scopes of coverage. GHG and energy efficiency targets are different and require different reports, different statistics, different data sets, compliance, monitoring and verification regime thus GHG and EE M&V systems should complement each other and use the relationship between data sets.

Therefore, maybe the emphasis should be on complementation of different M&V systems rather than integration or correlation. Some opinions were presented on the interpretation of the wording „combining targets". Other words like "correlating" "integrating" or "complementing" would better express what is needed to make the two M&V systems closer.

Reliable data remains a challenge and better exploration of the data at hand, especially from the EU ETS, is possible. Methodologies/guidelines need to be devised to combine, interpolate, extrapolate different data sets to allow for a 'like-with-like' comparison.

2.5 Working Group 7.1 - Communication between different actors in Art. 7 implementation

As amended, Article 7 of the EED plays a central role in the NECPs for energy efficiency improvements. During the 1st NECP process, many MS seemed to struggle with the new process and the need for coordination on national and EU level, including reporting their measures and methodologies to implement EED Art. 7. Before the next Art. 7 obligation period starts, it was seen useful to gather information about how MS have organised or have plans to organise their processes, including communication between different organisations, and to share experiences on how to coordinate the information obtained on the policy measures from the various departments/ministries to ensure Art. 7 requirements regarding the actions and measures, their M&V and reporting are met.

In the first session, participants heard German experiences to build up a harmonised M&V system to fulfil requirements in EED. Besides, based on experiences providing the 1st NECPs, participants shared good/failed experiences, how to pragmatically improve the Art. 7 M&V process, and reduce the administrative burden of M&V. M&V and NECPs is considered to be challenging (see Wordcloud below), nevertheless, it was encouraging to see that in many MS they have plans for improving Art 7 M&V. Many MS also indicated that they have already improved their M&V system over the few past years. Most mentioned plans were related to automatisation and digitalisation of the M&V system, ensuring enough human resources, standardized templates or other tools, and improvements in communication, information and roles with different actors in the process.

In the 2nd session, Greece shared experiences how coordination structures are established in Greece for the preparation of the 1st NECP and for the coming follow up and reporting purposes. In addition, participants shared good and failed experiences or practical tips related to ways to coordinate and communicate the Article 7 implementation and roles of different actors, and possible plans to improve the process. Highlights of the good practices in MS or places to improve included; reserve enough time for the process, ensure in the very beginning that roles and responsibilities for all actors are identified and clear, be aware that Art. 7 is such a special area that there is need to have a good expertise on that involved to the processes.

Germany presented how they have built a centralized M&V system covering alternative measures. The system combines both ex-ante and ex-post evaluations. The central part of the system is an Excel-Template which serves as a tool for collecting data from specialized units of the Federal Ministry of Economic Affairs and Energy (BMWi). The system, including a Guideline or User Manual for all actors, has also established a common understanding about which data is needed. It further enables validation of collected data and checks for plausibility. Highlighted main lessons learned were; the necessity to prepare an evaluation guideline, the reduction of the administrative burden due to the learning effects, the need to design standardized templates in a flexible way, and the legal imposition for performing the foreseen tasks.

Greece presented how they had built up systematic governance structures with appropriate working groups and sub-working groups under the national committee for energy and climate. Working group on impact analysis, study and assessment, and sub group on energy efficiency have a special focus on Article 7 issues. The built structure and its continuous process will support the implementation of the M&V and reporting requirements set in the EED and the Governance regulation in the coming years.

2.6 Working Group 7.2 - Efficiency in cooling

IEA stressed that rising temperatures and increased comfort are the main drivers for the growing demand for cooling in the EU, where **energy efficiency is key to delivering cooling comfort affordably and sustainably**. In addition to measures to improve the energy performance of existing and new buildings (insulation, shading, natural ventilation, free cooling, etc.), priority must be given to improve mandatory standards and labelling for cooling devices, as there is a huge potential for efficiency gains in the market. District cooling and other integrated and flexible solutions (demand response) can enable efficient and competitive use of renewable cold sources, recovery of waste heat, etc., supported by new business models in cooling.

This was proved by a best practice presentation from the Netherlands on the **use of aquifer thermal energy storage (ATES) for efficient and cost-effective cooling of large commercial buildings**. Working principle of ATES is that during summer cool groundwater is used to cool the building whilst rejected heat is stored in aquifer for use in winter and similarly during winter the warm groundwater from the aquifer can be used to warm the building whilst extracted cold is stored in the aquifer to be used in summer. Use of ATES is mature and mostly applies in tertiary buildings as cost effectiveness of the system can be achieved in building area with more than 5.000 m^2 and have huge potential throughout the EU.

There is also enormous geothermal potential for cooling and heating in former mines throughout the EU, as good practise from Germany shows. Huge quantities of pit water are pumped every day ("eternal pumping") to ensure that a safe distance is maintained between pit water and potable water to prevent pollution. A district heating and cooling system from Bochum will cover 80% of the heating and cooling requirements by heat pumps, which will use deeper and warmer pit water for heating and shallow pit water for cooling. A comprehensive state funding framework was the key to the successful planning and ongoing implementation of the project.

Establishing renewable cooling definition under RED2 is the main objective of undergoing **DG ENER study on Cooling.** An overview of the existing cooling technologies shows that almost the entire current cooling demand (99%) is covered by vapour compression technology. Only Active Cooling technologies can be included within the scope of RES cooling calculations (passive cooling technologies are not in the scope). Three possible renewable elements are candidates to be used for the calculation method namely, the presence of constantly low temperature cold source as heat sink, high seasonal performance factors and renewable energy input (local) to the cooling generators.

The general discussion proved the relevance of efficiency in cooling, including the definition of RES cooling. The participants expressed interest in this topic also for the future and suggested several possible topics.

2.7 Working Group 7.3 - Remote reading of thermal energy Art. 9c

Under EED article 9c, new requirements are defined to promote the use of remotely readable devices as critical enablers of frequent feedback to final users on their consumption. The revised EED does not provide any technical definition of what a remotely readable device is. Indeed, the Member States are free to decide whether walk-by or drive-by technologies are to be considered remotely readable or not, by which Member States should communicate its national decision, taking into account the deadline defined for meters and heat cost allocators installed after 25 October 2020.

In such a context, it was important to discuss with all MS, not only about the issues related to the implementation of article 9c of EED but also to share knowledge, experiences, and success stories.

The double session of WG7.3 was based on the presentation of examples of implementation of Article 9c in different Member States, and the first session opened with a presentation by **DG ENERGY** on the state of transposition and review of the Energy Efficiency Directive. The roadmaps for the review of EED were presented, with a review process launched on 3 August 2020 whose results are envisaged to be presented, with possible proposals in June 2021. The current EED review process does not foresee the evaluation of Articles 9 to 11, but there are reflections about a possible revision.

Subsequently, Member States presentations began, starting with **the Netherlands** presenting the current spread of remotely readable heat meters in the Netherlands (10% of heat meters and 80-90% of heat cost allocators, are remotely readable), as well as the state of implementation of EED article 9c. In the Netherlands, in addition to the transposition acts of the EED, several specific decree-laws have been issued for remote reading and billing information, according to Articles 10 and 11 of the EED, published and next to enter into force soon (after a royal decree).

External speakers from **Italy** provided a presentation about the Italian experience about metering and accounting solutions for heating and cooling, the issue of economic feasibility and estimated impact of individual metering in residential buildings. Several case studies had been analysed and a recent study of the University of Cassino and ENEA had been carried out with an experimental campaign on 3050 dwellings in 50 buildings equipped with heat cost allocator and thermostatic radiator valves. The results show an average energy savings of 11% compared to the pre-installation period of the heating cost allocation system. Concerning the cost-benefit analysis in Italy, "technical and economic feasibility guidelines" were developed and proposed by the Italian Thermo-technical Committee (CTI) for existing buildings, furthermore, a software tool for the economic feasibility was developed and proposed by ENEA and the University of Cassino (the SW is based on the standard EN 15459). As for the remote reading of thermal energy, the Italian legislative decree 73/2020 - transposing EED, does not set any specific requirement on the technology to be used thus leaving operators to install either different technological solutions (e.g. be walk-by, drive-by, wireless M-Bus, Wired M-Bus).

The work of the second session started with the presentation of **Portugal** giving a brief overview of the district heating and cooling network of Lisbon (*Parque das Nações*) and its thermal energy individual reading systems. District heating and cooling network distribute cold and heat to the *Parque das Nações* buildings, the heart of modern Lisbon (to thousands of customers through a 90-kilometre-long network of pipes). In the district heating network, there are currently installed more than 5000 individual heat meters but only in some pilot buildings, there are remote reading systems. The local operator is developing a custom app to provide useful information for effective demand-side energy management: e.g. permanent monitoring of consumption, year-on-year comparisons, benchmarking with similar users, early detection of technical failures, forecasts, etc. Although soon *Parque das Nações* may be fully equipped with remote reading technology, for now, there is only the project and the intention to implement it.

France gave a presentation on the implementation of EED articles 9b and 9c and the results of some studies conducted by ADEME on energy savings achieved by individual heat meters in multi-apartment buildings. France has implemented the new EED provisions with a law of 2018, introducing more exceptions than the previous law of 2015. Exceptions include buildings where submetering or regulations systems installation may not be cost-effective. The cost-efficiency limit is fixed to 80 kWh/m² year (no obligation for buildings with a consumption < 80 kWh/m² year). ADEME undertook a study in 2018, compiling French data about energy consumption in multi-apartment buildings (132 residential homes, with 4050 apartments). The study results show an average energetic economy estimated at 15%, considering the installation of submetering and regulation systems (thermostatic valves).

Estonia gave an overview of the current situation of gas metering, electricity metering and heat metering. Estonia collects consumption data for gas and electricity in a national central database (EstFeed), and currently, the heat is also added to this database. All Estonian electricity customers have smart readers that record and transmit at least the hourly data to the central database and consumers have free access to their data. Instead, remotely readable gas meters are mandatory only for consumptions over 750 m³. Regarding heat metering, energy providers must place remotely readable devices, but they are not mandatory for final users. A study on cost-effectiveness and technical feasibility of remotely readable devices has been launched in Estonia: for the economic feasibility, a methodology was developed to model energy savings under four scenarios (2,5 %, 5 %, 10 % and 20 %) in five building groups. For the technical feasibility section, a market survey was carried out to see what solutions are commercially available currently and soon.

As main key findings, despite the differences between the Member States, almost all sessions participants recognized the importance of Article 9c and its implementation will be a reality in a short time. Even though the cost-benefit ratio of remotely readable devices, being directly related to energy consumption, it is expected that the technology will become increasingly cheaper in the coming years and it will become part of a common system, the smart cities and regions.

3 Information Sessions

Information sessions were organised to brief participants about developments on specific topics: Comprehensive assessment update, Waste heat & cool utilization, Public lighting, H2020 The European City Facility, Financing for obligated parties under EEOS, Energy efficiency first principle.

3.1 Info session 6.5 Comprehensive assessment update

The JRC is supporting DG ENER in the implementation of the recast Renewable Energy Directive and the Energy Efficiency Directive by preparing guidance document on accounting for efficient district heating and cooling (DHC). The JRC Technical report elaborates on the current definition and discusses a possible future definition of efficient DHC in light of the 2050 carbon neutrality objective. Initial ideas result in equal or more use of RES and waste heat already by 2030, 60% by 2040 and 100% by 2050. Shift from efficiency to carbon intensity (gCO_2/kWh) criteria seems quite a big conceptual change, raised by several participants in the discussion.

It seems that the majority of MS are still preparing Comprehensive assessment update and formulated several key challenges and issues that they would like to discuss.

The main highlights of the limited implemented discussion were:

- lack of data and support for assessment of individual heating and cooling potential,
- CA to be more guiding document and providing tools (mapping etc.) for more comprehensive local planning (CA cannot assess all DHC systems, clustering of areas and focused on certain plants/fuels)
- more flexibility in CA approach to address specific MS aspects (cooling, individual versus central heat pumps, waste heat utilization etc.).

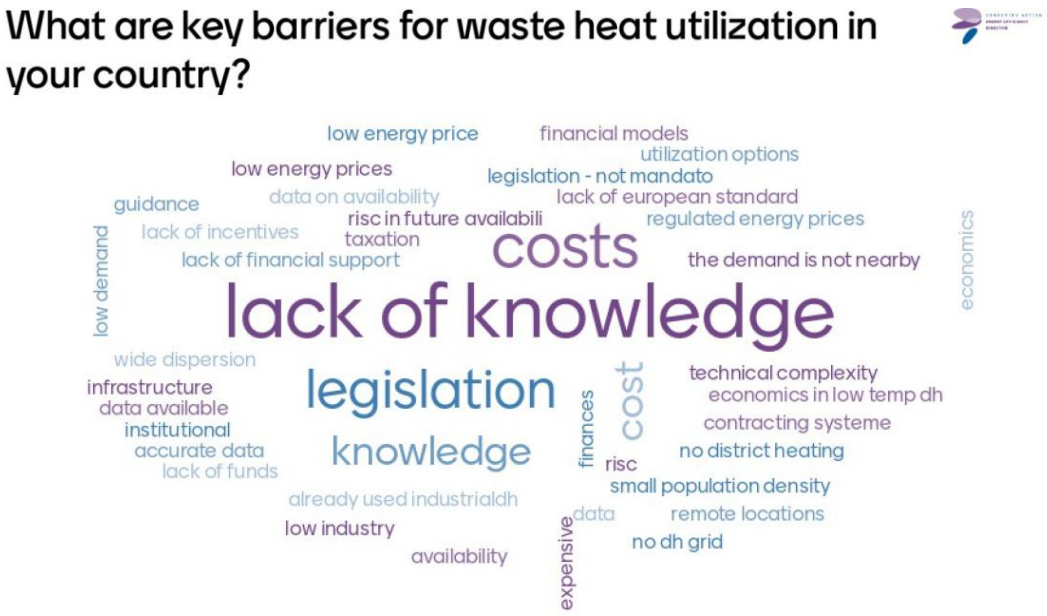
3.2 Info session 6.6 Waste heat & cold utilization

District heating networks in densely populated urban areas represent an essential infrastructure for the integration of renewable and waste heat sources and offer a high potential for flexibility measures, energy storage and sectoral integration opportunities. Low distribution temperatures (at least sufficient for the provision of hot sanitary water, 60 ºC in Finland) and compatible building systems and their temperature levels improve efficiency and enable feasible operational area for many new heat sources. Waste heat accounts for 10% input of district heating in 2019 (Finnish Energy).

About 100 MW electric heat pumps will be installed in the district heating system Fjernvarme Fyn in Odense by 2020 and use waste heat from data center cooling systems, sewage sludge, flue gases and air (another 100 MW by 2030) due to targets driven electrification of the heating sector. Parallel to the Facebook data center cooling system, Fjernvarme Fyn installed a heat pump plant (24 MW, 3 groups of ammonia heat pumps with COP 4.5 - 5.0) to use more than 100 GWh of waste heat and paid for the total investment for the waste heat recovery system. Although Facebook provides the waste heat for free, the waste heat recovery system competes with other variable load heat sources (coal and wood biomass CHP) and is only attractive in times of low electricity prices (base load heat supply is provided by much more competitive waste incineration and straw CHP plants).

Waste heat and cold is defined in RED2 and only mentioned - without a clear definition in EED. Both directives promote the use of waste heat and cold while putting Energy Efficiency First. Waste heat or cold that is used on site plays an important role in achieving the energy efficiency targets, but only heat or cold used off-site in a DHC network counts towards waste heat potential (and sectoral targets) in RED2 (heat that is or could be recovered internally at the same site is excluded). Additional guidance will be provided by guidance document on waste heat and cold accounting, which will be prepared by DG ENER, building on the analysis carried out by the JRC. Only condenser heat is applicable as waste heat in thermal power plants and CHP plants (waste incineration plants are treated like power plants or CHP plants).

Lack of knowledge, legislative barriers and high infrastructure investment costs seems to be most recognised barriers for larger utilisation of waste heat potential by session participants (figure below).



3.3 Info session 6.7 Public lighting

The transitions which we live in today are complex. What was once a simple system of buildings, roads, and bridges is now an integrated and interconnected web of physical and online services, with direct reflection in the way we light our streets and cities.
In this context, the session had as its essence the issues of grid efficiency & transformation efficiency, energy services & ESCOs and energy efficiency obligation schemes & alternative measures, to update the Member States about the solutions for technical and bureaucratic difficulties in the implementation of a requalification or new project of Public Lighting taking into consideration energy efficiency and other aspects such as reliability or light quality.
The session began with a brief description of the importance of a good public lighting project and the importance of a city's public lighting infrastructure for the future of smart cities.

A presentation from a Portuguese expert in public lighting, focused on several important topics, such as:

- the importance of sustainable and efficient public lighting, starting by addressing its objectives, which far exceed energy savings.
- the need to have a register and characterization, updated of the entire public lighting infrastructure.
- the creation of a European strategy for public lighting that includes diagnosis and action plan, namely a set of actions to reduce light pollution.

The presentation also addressed LED technology, challenges, and precautions to consider before its application in the requalification of public lighting and ended with short- and medium-term trends in public lighting, metrics, technologies, marketing, and associated services.

The main key finding of this info session was highlighting the importance that public lighting will have, as the capillary network that it is, for the implementation of emerging smart cities.

3.4 Info session 6.8 H2020 The European City Facility

During this session, there were two presentations on the work of the European City Facility, which is a European initiative to support municipalities, local authorities and their groupings across Europe to develop investment in sustainable energy. The EUCF work is achieved through the delivery of feasibility studies, market analysis, stakeholder analysis, legal, economic and financial analysis, risk analysis and the coordination and organization of activities.

3.5 Info session 7.4 Financing for obligated parties under EEOS

One challenge with Energy Efficiency Obligation Schemes (EEOS) is how obligated parties are financed. There is a variety of EEOS in the EU and different solutions for financing are in place. The financing solution and its transparency is also relevant for public acceptance and consumer engagement in the scheme.

There were two presentations from the European Investment Bank (EIB) as well as an example from Ireland.

The **EIB** introduced their financing related to art 7 EED. The aim for the EIB is to increase the financing of climate actions from 30% of their total investments today, to 50% in 2025. Three examples were presented: Energy Efficiency Financing Platform in Lithuania, One-stop-shop for residential retrofitting in Hauts-de-France, and the Smart Meter Implementation Programme in Ireland.

Ireland then presented the Irish EEOS and how Ireland that financing model looks like. Ireland uses a combination of EEOS and alternative measures in order to comply with art 7 EED. Obligated parties finance their schemes though a combination of own revenue streams, participant co-funding, and leveraging of existing supports.

3.6 Info session 7.5 Energy efficiency first principle

Aim and goals of the session

The aim of the two information sessions on Energy Efficiency 1st (EE1) was fourfold. On the one hand to benefit from insight into the work that is being undertaken by the Commission, learning from work being done by the ENERFirst project where a review of worldwide projects has been conducted, to hear from a Member State who have actively incorporated EE1 into the fabric of their policy making process and finally to learn and identify where MS identify both potential for EE1 and need for further support in order to apply this very important but at the same time somewhat elusive concept.

Presentations

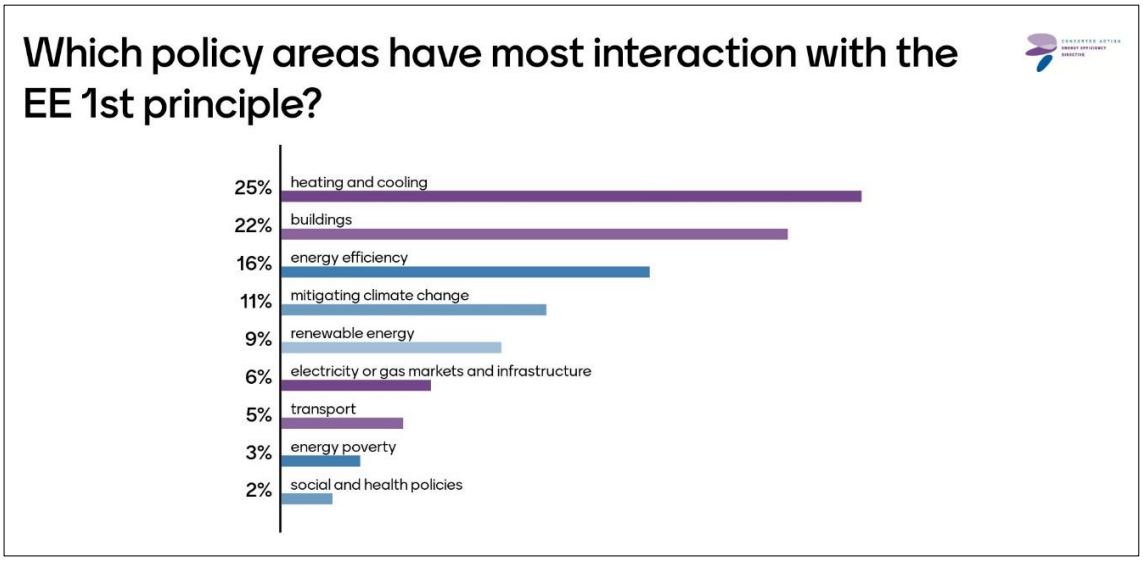
Participants were treated to three excellent presentations, each different and each highlighting different aspects of EE1 and from different perspectives. The first from DG ENER where the initial NECP findings were presented, showing that even though EE1 was considered important there was little detail provided on potential energy savings or how incorporation of EE1 is monitored. The importance of applying the principle across the whole energy system was stressed. We were informed that the Commission is preparing guidelines which should be available to Member States in Q1 20201. Ongoing studies and challenges were shared.

The second presentation was on the ENERFirst H2020 project. The project is tasked with clarifying the Energy Efficiency First principle, reviewing global best practices, and analysing their potential implementation in Member States in a qualitative and quantitative (model-based) manner. The presentation provided insight into the context of EE1 from the project's perspective, operationalizing and implementing EE1, This was followed by examples identified by the project. In addition, barriers were identified.

The third presentation came from Ireland who shared not only two examples from both buildings and industry where EE1 had been applied in Ireland but also enlightened the audience with the reasoning and journey which is being taken in Ireland in order to implement EE1. Key aspects being to think out of the box and not to be afraid to break away from traditional processes and policy making.

Interaction and findings

The Mentimeter tool was used to gather input and trigger discussion. Interestingly 50% of participants felt that EE1 is fully integrated into national policies However monitoring of the application of the EE1 principle is far lower (34%).



In addition the group was invited to indicate which policy areas they felt lend themselves best to EE1, There was a resounding offering of BUILDINGS from public to private to industrial in combination with renewable technologies and innovation.

Suggested follow-up work

Participants considered it valuable to revisit EE1 from the perspective of application in Industry, Transport, Renewable heat programmes and Public Sector. There was also interest in looking at how EE1 could be financed and how EE1 drives delivery of the main EED articles. Once the EE1 guidelines are available the organisation of a workshop would be welcomed.

What does Energy Efficiency 1st mean to you?

4 Bonus sessions

Over the course of the plenary meeting, DG ENER ran two Bonus Sessions. The first was on EED related studies that are currently undergoing in DG ENER and the second gave the participants an overview of the planned and recently published, energy efficiency related policy initiatives.

4.1 EED related studies

Perceptions, Markets and Regulatory Frameworks for Decarbonisation.

The objective of the study is to identify regulatory, economic, behavioral and cultural conditions that influence the H&C market with a particular attention on district heating and heat pump solutions. Results are expected in June 2022

Pathways for Energy Efficient Heating and Cooling

The objective is to provide a foundation for decision making on different heating and cooling technologies and approaches. The study should provide energy efficiency values and decarbonisation potential of different technologies, energy sources and carriers used for heating and cooling. The aims is to model the impact of different H&C approaches on energy consumption and CO2 production. Results are expected in 2023.

Other studies on H&C by the Joint Research Centre

The upcoming technical reports from the JRC include “Defining and accounting for waste heat and cold”; “Efficient District Heating and Cooling: Accounting and reporting guidelines in the context of the Energy Efficiency and the Renewable Energy Directives” and “Accounting Renewable Heating and Cooling: Measuring, calculation and reporting of heat and cold”. Expected publication date is the end of 2020 or early 2021.

The review of the reference values for high efficiency cogeneration

The study should provide data on the reference values for separate production of electricity and heat for the purpose of calculating primary energy savings of high efficiency cogeneration (HE CHP), in line with Annex II EED. For the upcoming review, the study will focus on highly relevant values, on analyzing the primary energy savings level required from HE CHP, and the methodological guidance in Annex II (f). The results are expected at the end of 2021.

Study on the energy savings potential

The objective is to provide technical assistance to assess energy savings potential at national and European level. The study should provide energy saving opportunity assessment tool and dedicated Country fiches. The study is being finalized and soon to be published.

Analysis of support the implementation of the efficiency first principle in decision making

The study should contribute to the operationalizing of the Energy Efficiency First principle. The study should provide a decision making tool, library of relevant information and recommendations. The results are expected in November 2020.

Technical assistance on assessing the effectiveness of the implementation of the definition of small and medium-sized enterprises for the purposes of Article 8(4) of the Energy Efficiency Directive

The objective is to assess the application of the definition of SMEs in relation to the obligation laid out in Article 8(4) of the EED, looking at implementation problems. The study focused on analysing the population of large enterprises and their energy consumption and current implementation of audits. The focus is on assessing feasibility and pros and cons of alternative definitions. Final report should be published by the end of 2020.

Study on assessing energy efficiency policies and measures

The aim is to develop a bottom-up policy assessment tool that would allow quantitative evaluation of the impacts of the various energy efficiency policies targeting different sectors, to assess whether policy interventions were

effective and additional. It should serve as a guide for policy decision making and in particular it shall include an Assessment tool. The final report is expected in November 2021.

4.2 EED related policy updates

NECP assessment & progress report

The Communication on the Climate Target Plan proposed to increase the greenhouse gas emission reduction target to 55%. In order to reach this objective, the Climate Target Plan emphasized the importance for stepping up energy efficiency efforts. The NECP assessment showed an existing ambition gap in energy efficiency.

Individual assessments of the NECPs were published on 14 October 2020. The information assesses how the recommendations were addressed in the final NECPs, the level of ambition, the overview of proposed policies, achievement of Art 7 obligation and last but not least it includes an analysis how the Energy Efficiency First principle was considered. The assessment includes a part dedicated to buildings sector and the Long-term renovation strategies.

The 2020 energy efficiency progress report was adopted on 14 October 2020. It contains information on the developments in final and primary energy consumption. Main findings are that primary energy consumption declined by 0,6% and final energy consumption increased by 0,1% in 2018 compared to 2017. Indicators are above fixed trajectory for 2020 targets. In term of Article 7, it is clear that 12 Member States are not on the trajectory to fulfil the obligation.

Renovation Wave

The Communication on the Renovation Wave was published on 14 October 2020. It was accompanied by a Staff working documents on unlocking investment and a Staff working on tackling energy poverty. The communication stressed the importance of buildings in overall energy consumption (40% total energy consumption and 36% GHG emissions). The aim of the Renovation Wave is to, at least, double the annual buildings renovation rate, make deeper renovations happen and help to deliver the renovation of 35 million building units by 2030. The areas of intervention include for example the strengthening of awareness, legal certainty, and incentives; reinforcing targeted funding, supported by technical assistance; and creating green jobs and upskilling workers. The Strategy focuses on three main areas: 1. Energy poverty and worst performing buildings, 2. Public building and social infrastructure, and 3. Decarbonizing heating and cooling.

Energy efficiency dimension of the Recovery package

The Recovery package is an opportunity to scale up investment in Energy Efficiency. Out of the 1,8 trillion allocated in the Next Generation EU and the Multiannual financial framework for 2021-2027, 550 billion was earmarked to deliver the climate goals of the European Green Deal. This sum represents more than double the budget allocated in 2014-2020. Energy Efficiency has an important role in the recovery considering these investments have multiple benefits, creating local jobs, supporting SME's, and contributing to GDP growth. Financial resources will be allocated in key EU funds, such as the Recovery and Resilience Fund, Cohesion funds, InvestEU, Just Transition Fund, Horizon Europe, LIFE, Modernisation fund and the Innovation fund. The bulk of the Recovery package (Next Generation EU) will be managed by Member States through the Recovery and Renovation Facility (RRF). Member States should submit national Recovery and Resilience Plans (RRPs), which should support the objectives set out in the NECPs. Formal submission of RRPs is in April 2021, with draft being submitted by October 2021.

5 Closing Plenary Session

The Closing Plenary Session provided participants with an overview of the discussions and results of the Working Group sessions.

5.1 Conclusions from Working Group Sessions and CA EED Coordinator

Conclusions presentation for all Working Groups

Coordinator closing presentation 6/7th Plenary Meeting

6 Presentations and Good Practice Factsheets

A number of presentations provided participants with valuable insights into Member States' EED implementations as well as examples from EU projects and information from the European Commission. All presentations are available on the CA EED website.

Working Group 6.1 – Behavioural economics

Behaviour Change: a critical success factor for climate change policies – Netherlands

Applying behavioural science to change behaviour – Ireland

Framing choice to increase retrofitting – Ireland

Working Group 6.2 – EPC as a catalyst for building renovation in the public sector

Financing EPC – EIB

EPC as a catalyst for building renovation in the public sector – VEB

Working Group 6.3 – EEOs and alternative measures - Monitoring and Verification -

Energy efficiency monitoring system in Latvia – ERCD

Italian experience in quantifying the energy savings from information & training campaign in households and industry – ENEA

Good practice factsheet: Quantifying the energy savings from information & training campaign – Italy

Good practice factsheet: Energy Efficiency Monitoring System – Latvia

Working Group 6.4 – Combining CO2 targets with energy efficiency targets

Energy efficiency for GHG reduction target in Poland - Institute of Power Engineering

Monitoring climate and energy policies – Netherlands

Correlating GHG data M&V and EE M&V - Malta Resources Authority

Info session 6.5 Comprehensive assessment update – practical implementation challenges

Efficient District Heating and Cooling Technical Background Approach towards a possible clarification of definition – JRC

Info session 6.6 Waste heat & cool utilization

The potential of district heating Refurbishing urban heating systems and integrating excess and renewable heat - VTT

Utilizing Facebook Data Center Surplus heat for District heating in Odense - Fjernvarme Fyn

The European Commission's science and knowledge service – JRC

Info session 6.7 Public lighting

Energy efficiency in street lighting: Present and future – CPI

Info session 6.8 H2020 The European City Facility

European City Facility- EUCF - EASME

European City Facility - Bridging the gap between cities and finance - EASME

Working Group 7.1 - Communication between different actors in Art. 7 implementation

Established coordination structures for the preparation of the draft and final versions of the NECP - Greece

Insights: The M&V system for EED alternative measures - Germany

Good practice factsheet: The M&V system for EED alternative measures – Germany

Good practice factsheet: Established coordination structures for the preparation of the NECP – Greece

Working Group 7.2 - Efficiency in cooling

Renewable and efficient cooling with aquifer thermal energy storage (ATES) in NL Status – RVO

Renewable Cooling under the Revised Renewable Energy Directive - TU Wien, Armines

Efficiency in cooling: Global and EU perspectives – IEA

Ex-mine as a source for district heating and cooling – IREES

Working group 7.3 - Remote reading of thermal energy Art. 9c

Metering and accounting solutions for heating and cooling - University of Cassino,

Where are we with the Energy Efficiency Directive? - DG ENER

Implementation of Art.9b and Art.9c of the EED – France

Overview of the cost-effectiveness and technical feasibility of remotely readable devices – Estonia

Individual metering in district heating and cooling – Climaespaco

Implementation of EED 9c – Netherlands

Information session 7.4 Financing for obligated parties under EEOS

Financing for obligated parties under EEOS – Ireland

Financing for obligated parties under EEOS – EIB

Information session 7.5 Energy efficiency first principle

Introducing ENEFIRST - IEECP

Energy Efficiency First Practical Implementation – Ireland

Legal Disclaimer

The Concerted Action for the Energy Efficiency Directive (CA EED) was launched in 2013 to provide a structured framework for the exchange of information between the 28 Member States and Norway during their implementation of the Energy Efficiency Directive (EED). Since spring 2017, the CA EED is funded by the European Union's Horizon 2020 in its second phase.

For further information please visit **www.ca-eed.eu** or contact the CA EED Coordinator Lucinda Maclagan at lucinda.maclagan@rvo.nl

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DIRECTIVE

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