THE STREAMSAVE AND DEESME FINAL EVENT

FROM POTENTIALS TO ACHIEVEMENTS

UNLOCKING THE POWER OF ENERGY SAVINGS

Assessing energy savings is crucial to the energy transition. Join us to discover the different methods to use and how they contribute to achieving greater energy savings!

Key Discussions & Insights

- ✓ Accurately estimating energy savings through deemed savings
- ✓ Improving energy audits in SMEs with insights on multiple benefits
- ✓ Measuring and verifying energy savings of policies, jointly organised with ENSMOV Plus

6 JUNE 2023
9:00 - 15:30

COMET MEETINGS
BRUSSELS, BELGIUM

stream SAVE

DEESME

WELCOME TO OUR FINAL EVENT

WELCOME AND INTRODUCTION

NELE RENDERS
VITO / ENERGYVILLE
streamSAVE COORDINATOR

IVANA ROGULJ
IEECP
DEESME COORDINATOR

What did we achieve?

Nele Renders, VITO/EnergyVille, coordinator streamSAVE

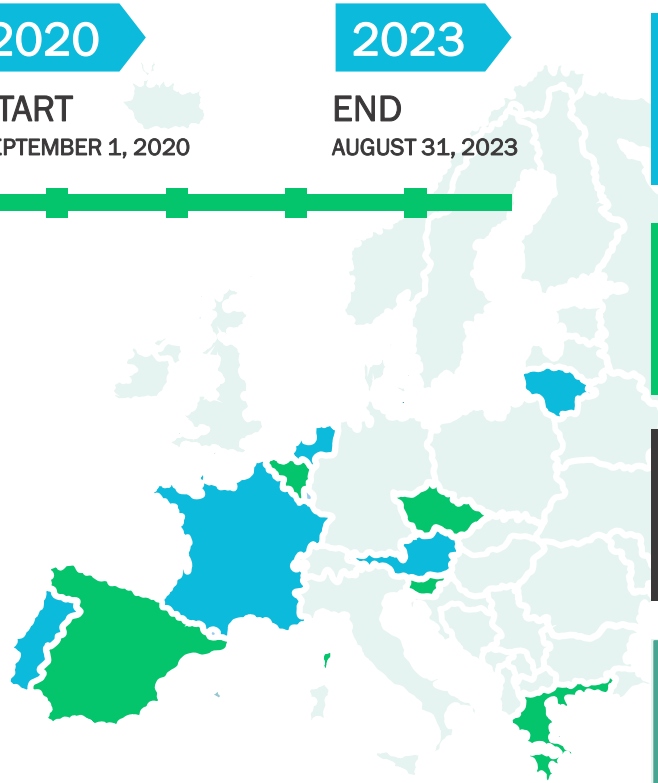
Final event - Unlocking the Power of Energy Savings

This project has received funding from the Horizon 2020 programme under grant agreement n°890147. The content of this presentation reflects only the author's view. The European Commission is not responsible for any use that may be made of the information it contains.

Who are we?

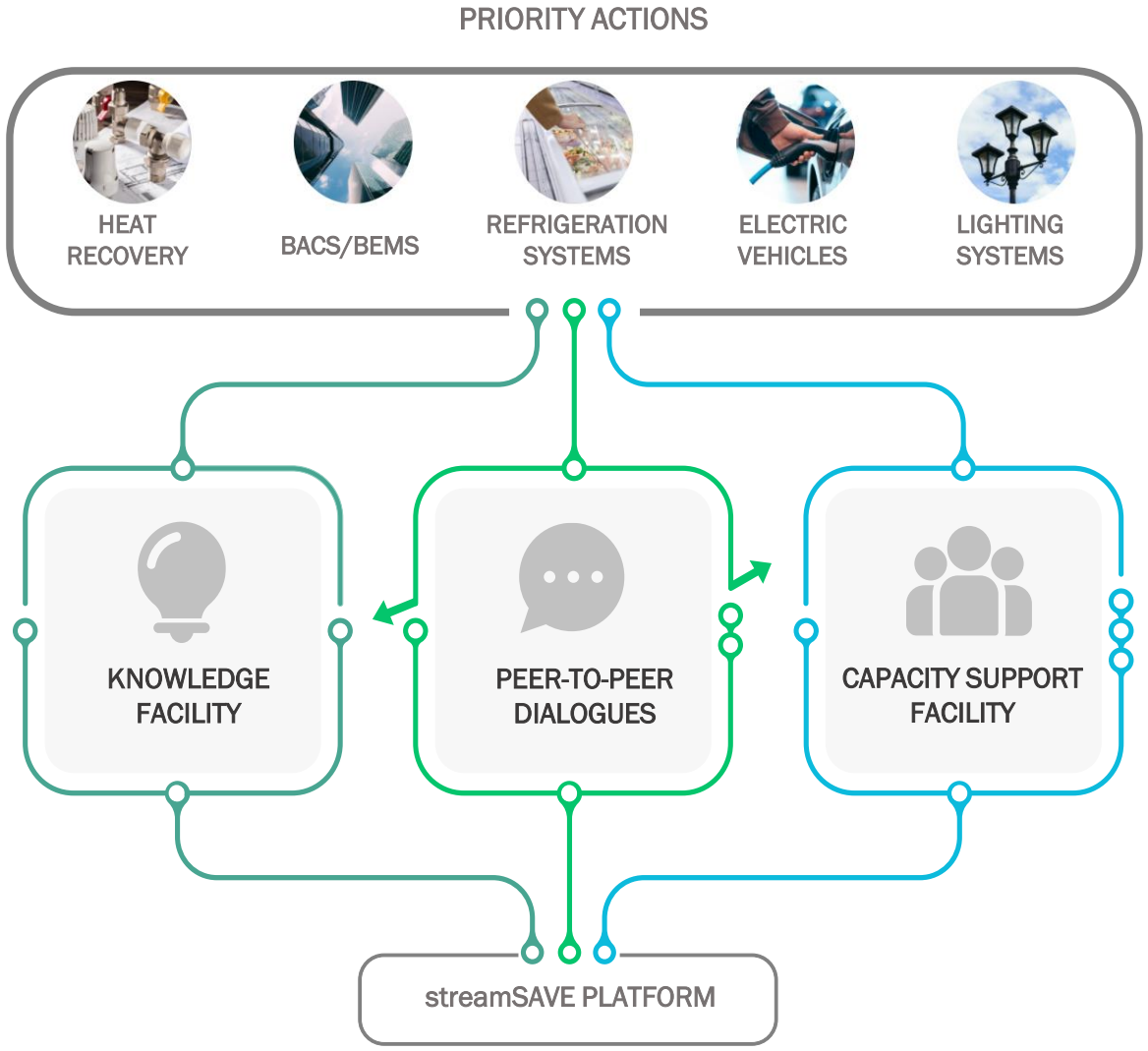
2020
START
SEPTEMBER 1, 2020

2023
END
AUGUST 31, 2023

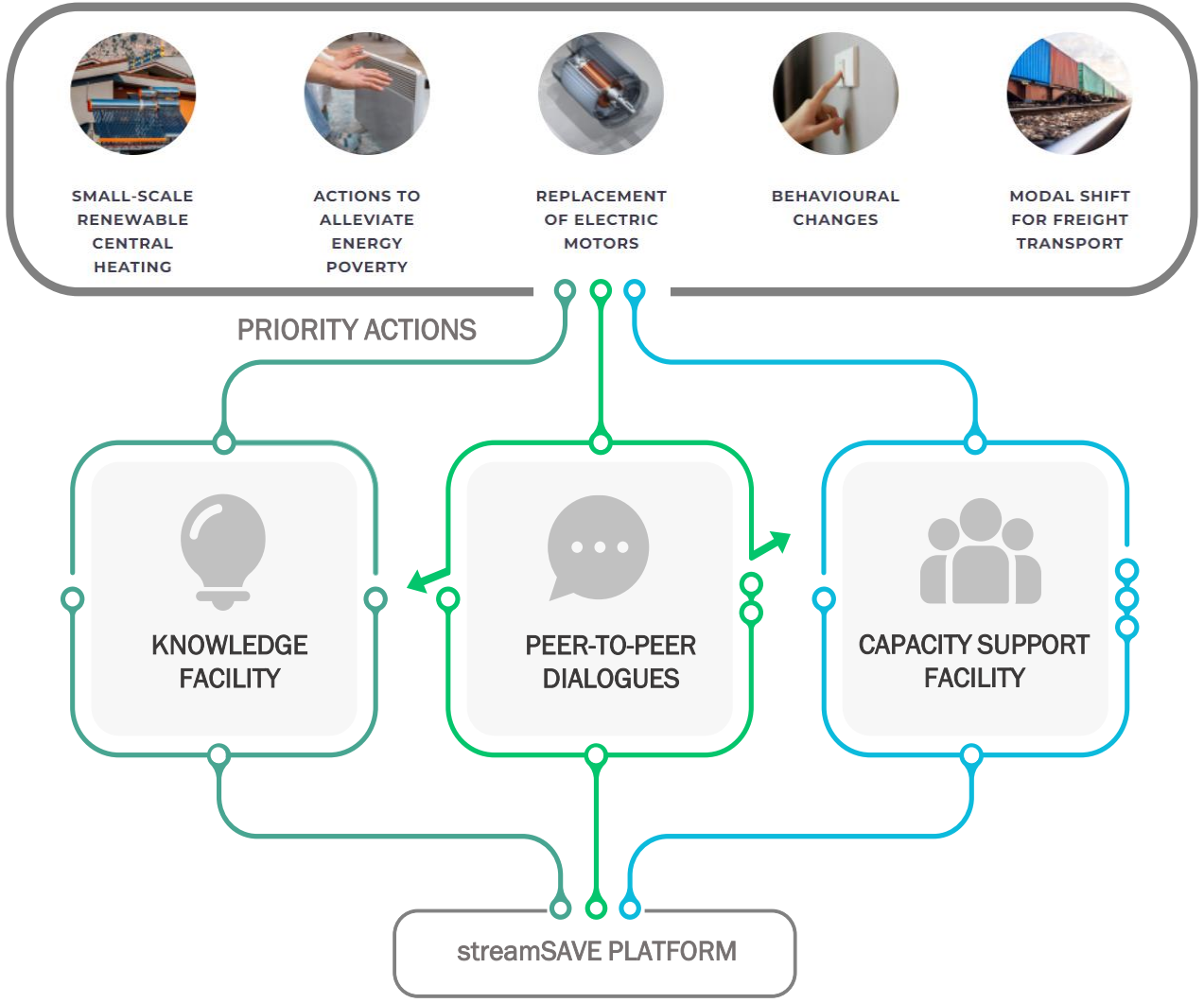


COORDINATOR	vito, Energy Ville — 12 PARTNERS 10 COUNTRIES
RESEARCH & POLICY INSTITUTIONS	vito, IEECP, ISR, circe, Jožef Stefan Institute
ENERGY AGENCIES OR RELATED	AUSTRIAN ENERGY AGENCY, ADEME, Agence de l'Environnement et de la Maîtrise de l'Energie, ΚΑΠΕ CRES, LIETUVOS ENERGETIKOS AGENTŪRA, SEVEn
CONNECTORS TO MARKET & TECHNOLOGY ACTORS	European Copper Institute, Copper Alliance, LGi sustainable innovation

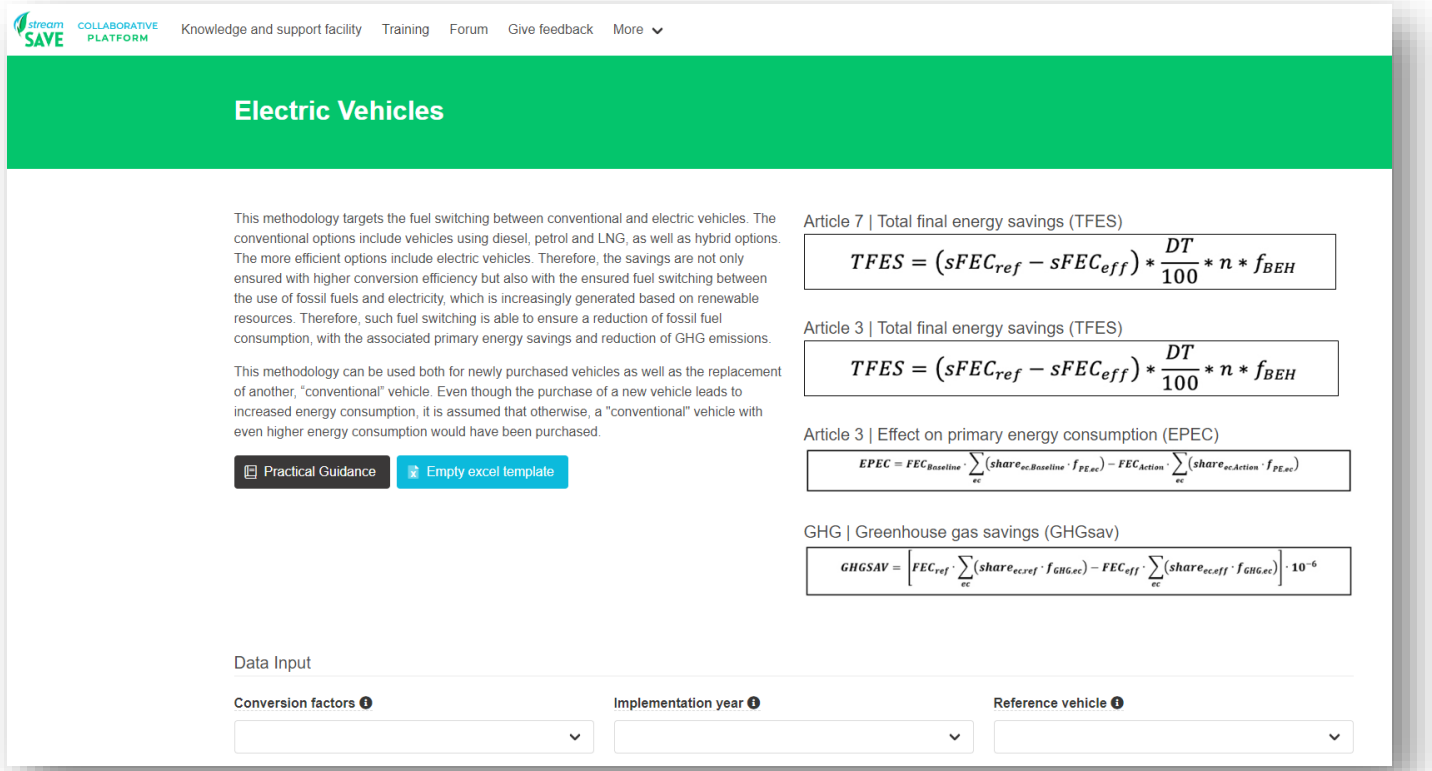
How did we realize these objectives?

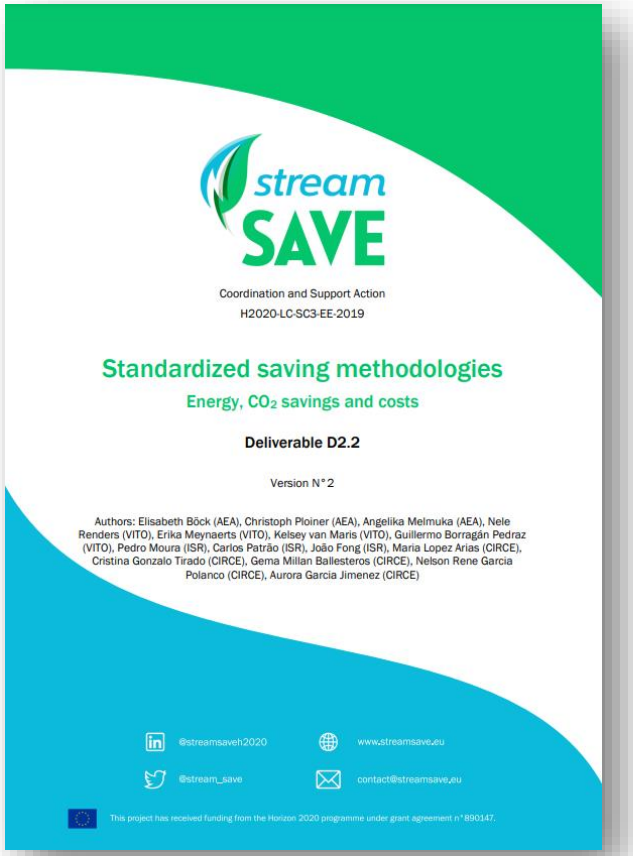


How did we realize these objectives?



streamSAVE guidance & platform





Challenges & data needs differ per Priority Action which is reflected in our guidance (Example, public lighting vs. behavioural measures vs. heat recovery in industry)

Community of experts in dialogue

The 16 dialogue meetings and 4 dialogue workshops were only possible…

- Thanks to the **30 external speakers** who shared their knowledge and experience
- Thanks to the **300+ single participants** who joined the dialogue meetings or workshops and contributed to the discussions

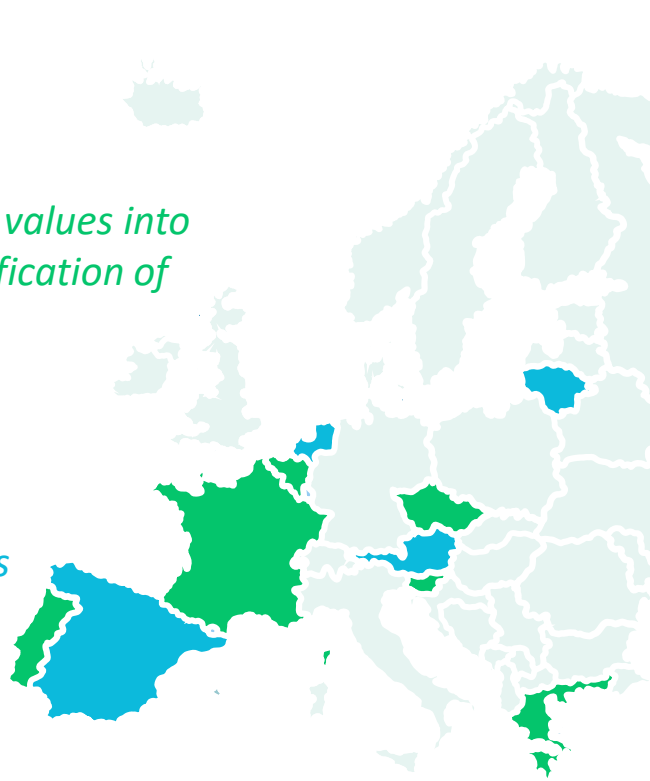
Improvements of policies 10 (+3) countries

- Support covered almost all 10 Priority Actions
- Concrete outcomes of this support:
  - Suggestion for improvements on calculation methodologies and/or national indicative values
  - Examples of improved policy implementations, already realized during the project

Improvements of policies 10 (+3) countries

Belgium: *"publication deemed method & values into the revised Circular 307septies for electrification of federal car fleet"*

Spain: *"More realistic savings estimations for heat pumps in buildings"*



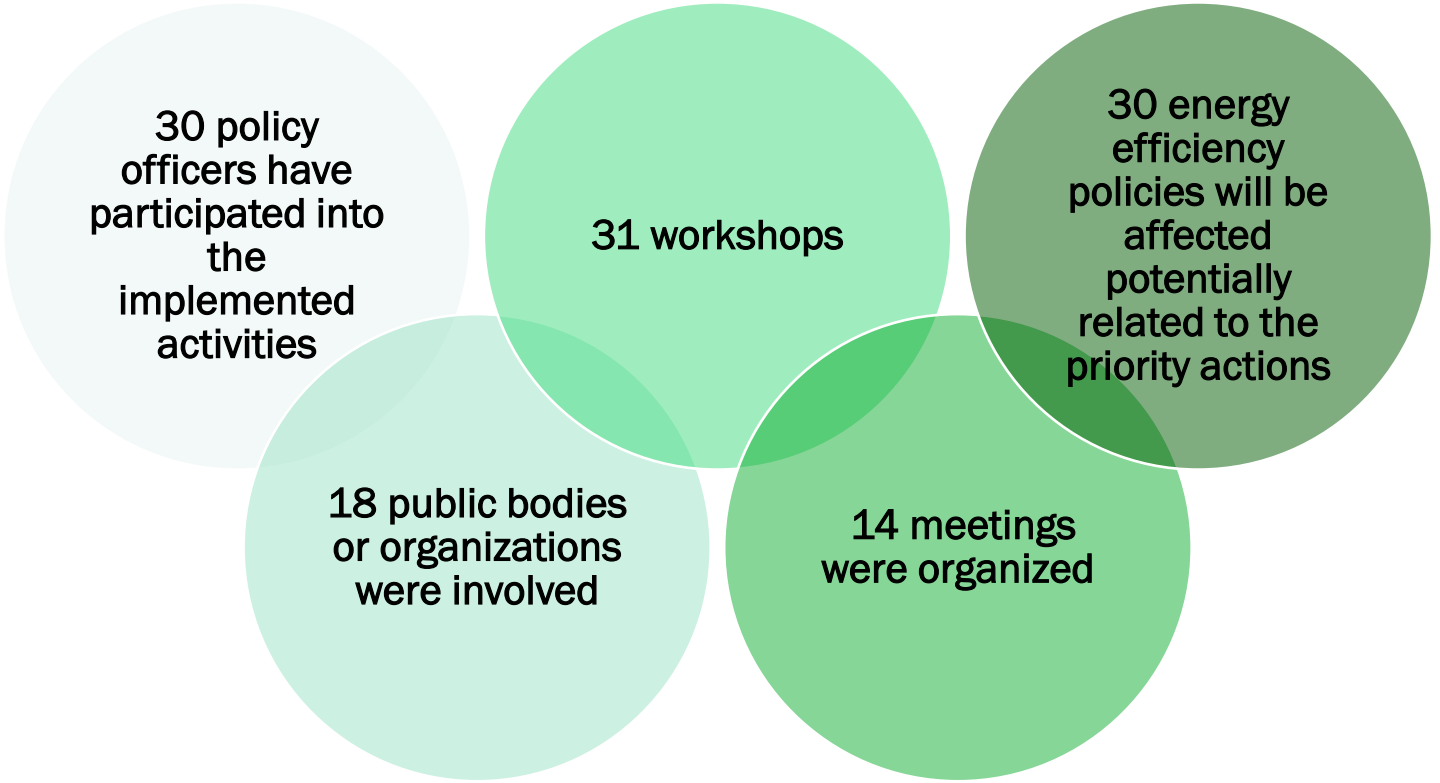
Austria: *"ready-to use methodology & indicative values for BACS, which was applied to a new subsidy program for BACS in non-residential buildings to estimate savings potential "*

Slovenia: *"integration of the developed BACS methodology in the Slovenian catalogue" "improving the existing awareness of the obligated parties on BACS"*

Greece*: "Improvement of the existing Greek catalogue of the EEO scheme for heat recovery from industry".*

"BU calculation methodologies support the coordination of monitoring, reporting and verification procedures between different bodies responsible for monitoring of the savings measures".

Realized impacts in 10 countries



Project Partners

vito

ISR

circe

Cu European Copper Institute Copper Alliance

SEVEn

AUSTRIAN ENERGY AGENCY

Jožef Stefan Institute

IEECP INSTITUTE FOR EUROPEAN ENERGY AND CLIMATE POLICY

LIETUVOS ENERGETIKOS AGENTŪRA

ΚΑΠΕ CRES

ADEME Agence de l'Environnement et de la Maîtrise de l'Energie

LGi sustainable innovation

Thank you

Get in touch for more information!

Project coordinator - Nele Renders, VITO

All project reports will be available for download on the streamSAVE website www.streamsave.eu

Email the project at contact@streamsave.eu

Follow the project on LinkedIn @streamSAVEH2020

Follow the project on Twitter @stream_save

DEESME

National schemes for energy efficiency in SMEs

Developing National Schemes for Energy Efficiency in SMEs (DEESME) - achievements

Ivana Rogulj, IEECP

DEESME has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 892235.

Meet the DEESME partners

DEESME has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 892235.

Barriers to energy audits, EMS and energy efficiency investments

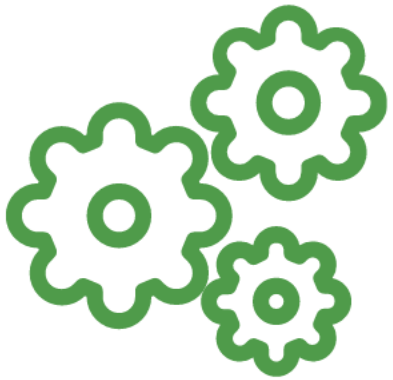
from the side of the companies

- Lack of awareness
- Low capital (small companies)
- Difficulty with accessing financing
- Lack of technical human resources
- Doubts around actual savings potential

from the side of the National Authorities

- Limited resources dedicated to companies
- Quality of audits and data availability
- Lack of support mechanisms (one stop shops)
- Guiding of the companies towards action?
- Not looking at the benefits for the whole society

DEESME intervention logic



Working with NAs

We investigate what national authorities do & need in audits obligation and promotion. With the view on multiple benefits

We develop the Guideline on best practices for NAs version 1 based on the resarch on the topic and the knowledge transfer

Recommendation and the direct support for the National Authorities.

Working with companies

The Multiple benefits approach for energy auditing to connect energy concerns to managerial

Trainings in companies and DEESME multiple benefits tool

Implementation of the audits and the EMS

and stakeholders

Workshops, campaings and feedback collection from the key stakeholder community

In the work with NA:

- inventory of needs and requirements of NAs;
- report on best-practice for policies on energy audits, energy management and multiple-benefits;
- identify and share best practices from national schemes, EU projects and other initiatives with NA;
- generic guideline on best-practice;
- **National guidance documents for targeted national authorities .**

DEESME

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DEESME

National schemes for energy efficiency in SMEs

Guidance for national authorities on overcoming challenges in the implementation of Article 8 EED

Challenge overview

Eleven generalized challenges with regard to the implementation of energy audits and energy management systems based on the requirements of Article 8 of the EED were identified. These challenges were derived from a literature review, a survey and interviews conducted with NAs and their implementing bodies in the 27 Member States (MS) of the EU. Six challenges target non-SMEs, four challenges are targeted at SMEs, and one challenge deals explicitly with NEBs across both company types.

Objectives of the work with companies:

1. To obtain at least 50 audits, 25 energy management system based on ISO 50001 and multiple benefits approach during the project, energy efficiency low costs and management solutions
2. To show to companies how to take profit of energy efficiency by assessing and managing the integrated aspects according to multiple benefits approach
3. To develop several working models such case histories, template, methods, EMS procedures to allow the involvement of as many companies as possible in national schemes after the project
4. To raise awareness among companies of direct relations between energy efficiency and its multiple benefits

DEESME

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Mobilising companies: training activities and energy auditing

Encourage energy investments in the involved companies based on the analysis made using the multiple benefits approach with priority given to low-cost energy organizational and procedural/behavioural solutions

Selection of 500 companies to be involved

Performing 50 energy audits & 25 EMS in IT,GE, BG & PL

Conduction of training activities in IT,GE, BG and PL

Selection criteria and guidelines along with a company register template

Energy audit report template

Training session guidelines along with reporting templates

DEESME

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Multiple benefits – why?

Standards (CEN/CENELEC) serve for understanding among the financial sector, businesses and policy makers as they measure the benefits from the investments.
Therefore, it is important that in development there is a standard that includes ALL benefits of energy efficiency.

Source: With modifications from Worrell et al. (2003)

Waste	Emissions	Operation / maintenance
↑ Use of waste fuels, heat, gas ↓ Product waste ↓ Waste water and hazardous waste ↓ Materials reduction	↓ Dust emissions ↓ Gas emissions (CO, CO_2, NO_x, SO_x)	↓ Need for engineering controls ↓ Cooling requirements ↑ Facility reliability ↓ Wear and tear ↓ Labour requirements

Production	Working environment	Other
↑ Product output/yield ↑ Performance ↑ Reliability ↑ Product quality/purity ↓ Process cycle times	↑ Lighting ↑ Temperature control ↑ Air quality ↓ Noise levels ↓ Need for personal protective equipment	↑ Image ↑ Liabilities ↓ Delayed or reduced capital expenditures ↓ Space requirements ↑ Worker morale

Implementing the DEESME campaign for energy efficiency

- ✓ Tested the attractiveness of the solutions adopted by DEESME to encourage companies towards energy efficiency
- ✓ Involved more than 500 companies in each country by the end of the project
- ✓ Involved national trade associations and other key actors in each country
- ✓ Provided the Institutionalisation process with working documents based on real scale and key actors' points of view

DEESME

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Institutionalisation process – in progress

- ✓ Policy proposals for the National Authorities (NAs) and with activities to ensure their implementation. *Preparation of 10 policy proposals for the NAs*
- ✓ Involvement of NAs and relevant national stakeholders from 10 countries
- ✓ Providing direct tailored support to 5 NAs
- ✓ Obtaining the adoption of DEESME proposals and/or to introduce improvements in the existing policies in at least 5 NAs

Depending on the country circumstances, NAs will receive support in implementing new policies dealing with energy audits and the promotion of energy efficiency measures or in improving the existing ones.

DEESME

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Thank you for your attention!

Follow us and subscribe to our newsletter not to miss any news!

www.deesme.eu @DeesmeH2020 @DEESME H2020

DEESME

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Turning policy into action – LIFE-CET outlook

Filippo GASPARIN – Project Advisor

Ulrike NUSCHELER – Senior Project Advisor

CINEA - D1 LIFE Energy and LIFE Climate

LIFE CET sub-programme

Final event streamSAVE & DEESME

Brussels, 06.06.2023

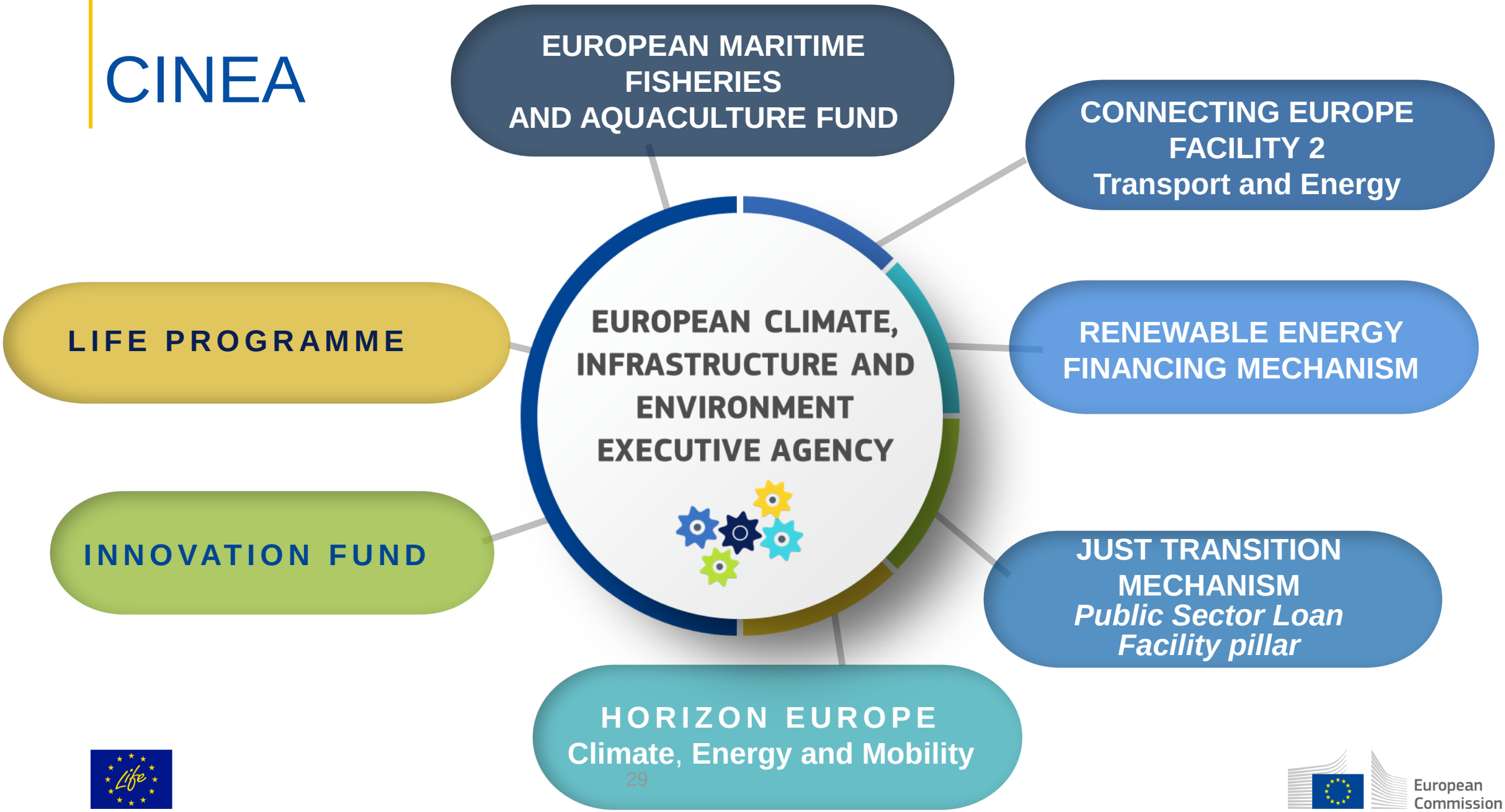
Filippo GASPARIN – Project Advisor (CINEA)

Ulrike NUSCHELER – Senior Project Advisor (CINEA)

D1 LIFE Energy and LIFE Climate

European Climate, Infrastructure and Environment Executive Agency

CINEA



https://www.youtube.com/watch?v=XE4O1ph7mp4

European Commission

LIFE programme 2021-2027

- **LIFE Regulation (2021-2027) adopted at the end of April 2021**
- **€5.4 billion** funding
- **Four sub-programmes:**

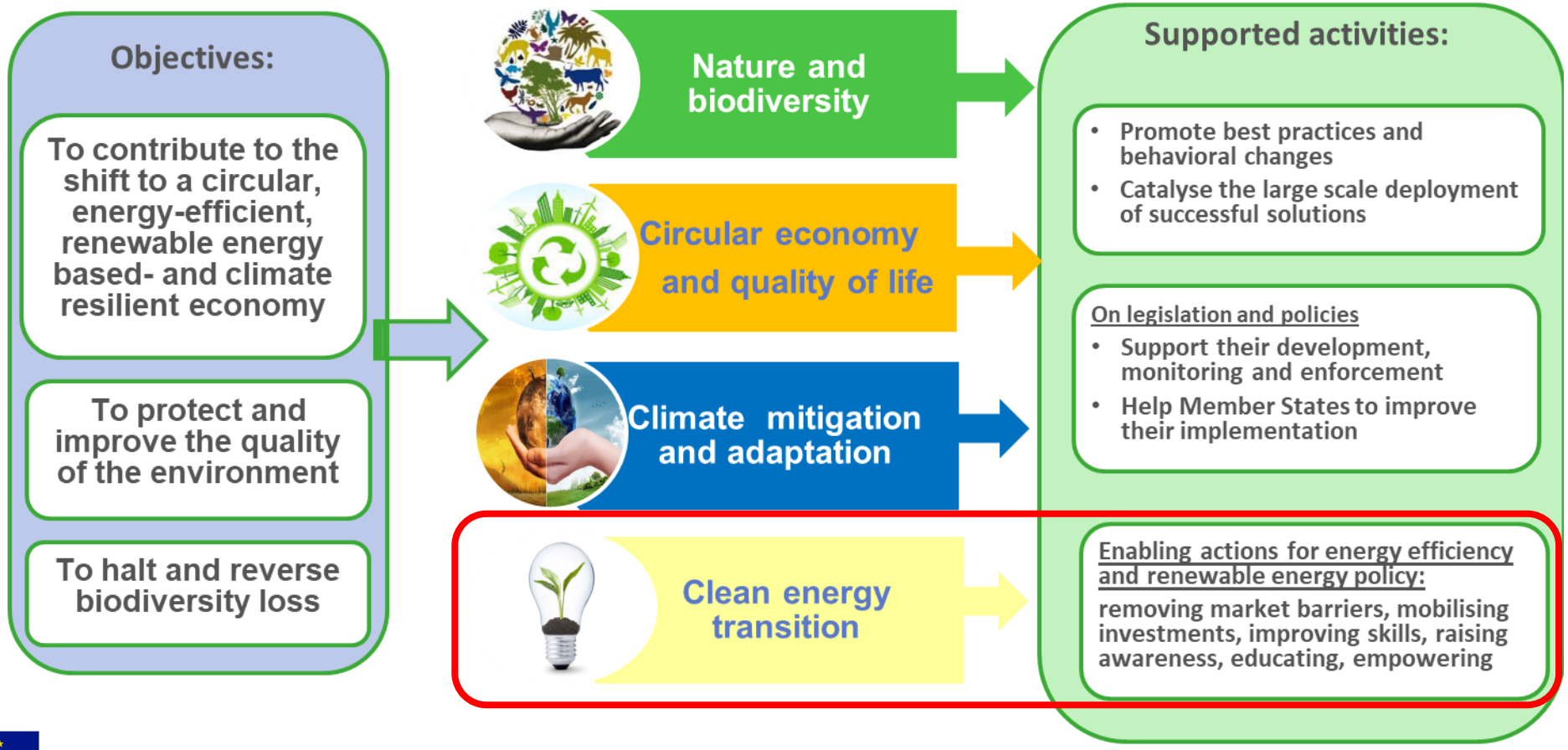
1. **Nature and Biodiversity** (€2.1 billion)
2. **Circular Economy and Quality of Life** (€1.3)
3. **Climate Change Mitigation and Adaptation** (€947 million)

+

4. **Clean Energy Transition** (€1 billion; follow up of energy efficiency part of H2020)

- **Info:** https://cinea.ec.europa.eu/index_en

LIFE: Objectives and Supported Activities



LIFE CET Call 2023 timeline

- **13 call topics** have been launched
- Call publication **11 May 2023**
- The deadline for submission is: **16 November 2023** – 17:00:00 CET (Brussels)
- Budget for this call **+/- 100 mEUR** available for **+/- 60 grants**
- Evaluated by **three external experts**
- Most funding topics: **minimum of 3 (eligible) entities from 3 different eligible countries** (average number of partners is higher)
- **95% co-funding rate**

European Commission

LIFE CET – Call 2023 Funding topics (I)

Building a national, regional and local policy framework supporting the clean energy transition

- Cites and regions: Technical support to clean energy transition plans and strategies in municipalities and regions
- **Effective implementation of key legislation in the field of sustainable energy**
- Maximising use of and valorising EPREL data

Decarbonisation of buildings and H&C

- Energy Performance of Buildings
- District heating and cooling: investment plans and skills
- Boosting heat pump deployment: alternative models and skilled installers

Building skills and capacity of industry and the service sector

- BUILD UP Skills – Upskilling and reskilling
- **Supporting the clean energy transition of European businesses**

LIFE CET – Call 2023 Funding topics (II)

Facilitating investment projects at local and regional level

- One-Stop-Shops - Integrated services for buildings and businesses
- Project Development Assistance

Attracting private finance for sustainable energy

- Crowding in private finance: Mainstreaming and Innovative financing schemes

Citizens in the clean energy transition

- Supporting European households to alleviate energy poverty and vulnerability
- European Energy Communities Facility

LIFE-2023-CET-POLICY

Towards an effective implementation of key legislation in the field of sustainable energy

European Commission

LIFE-2023-CET-POLICY

The Basics	
Other Grants type of action – **95% co-funding**	Indicative budget for the topic **€ 8 million**
Minimum 3 applicants from **3 different eligible countries**	EU contribution up to **€ 2 million** per proposal would allow objectives to be addressed (not precluding submission and selection of proposals requesting other amounts)

European Commission

General Scope

• Sharing of **best practices** within and across Member States	• Support the **monitoring and evaluation** of policy implementation • Develop and apply methodologies to more **accurately measure, calculate and account** for contributions made under specific policy measures and programmes
• Provide support, technical advice and tools for **contextualisation and specification of requirements** • Scope, assess and model the impact of **implementation options**, including non-energy impacts	• Develop + support approaches for **integrated collection of data, calculation/accounting**, verification, monitoring, evaluation and reporting across legislation • Monitor and model energy and **non-energy impacts** of integrated solutions; gather data for the energy and buildings sector.

Scope A: Support for the implementation of the Energy Efficiency Directive (EED)

Actions to address core aspects of the Energy Efficiency Directive, in particular those reinforced or newly introduced under the revision, notably the	
Energy Efficiency First Principle, supporting operational implementation and developing assessment methodologies + tools and benchmarks	**Energy Savings Obligations** + Energy Efficiency Obligation Schemes, supporting the design/ implementation and calculation/ evaluation of measures.
Energy Efficiency targets, including new methods to collect/ integrate sources of data, forecast trends and evaluate policies/ measures	**Energy Services**, support for establishing standard contracts + quality control schemes.
Role of the **public sector**, support for gathering and calculating data from public bodies	

LIFE-2023-CET-POLICY - Scopes B and C

Scope B: Support for the implementation of the Renewable Energy Directive (RED)	Scope C: Support for the implementation of the Energy Performance of Buildings Directive (EPBD)
Permitting (permit-granting and other administrative processes, EU community of practitioners)	Actions to enhance the **effectiveness and coherence of instruments** (EPCs, MEPS, Buildings data)
Self-consumption + energy sharing (enabling frameworks, e.g. for multi-apartment blocks)	Actions to support the transition to a **climate-neutral building stock** (ZEBs, Global Warming Potential, Cost Optimaility)
Renewable energy communities (RECs), interaction with CECs and in less common sectors, like heating.	

Turning policy into action – LIFE-CET outlook

Filippo GASPARIN – Project Advisor

Ulrike NUSCHELER – Senior Project Advisor

CINEA - D1 LIFE Energy and LIFE Climate

LIFE-2023-CET-BUSINESS

Supporting the clean energy transition of European businesses

European Commission

The Global Challenge

- In 2020 the Industry and Services sectors were responsible **of almost 40% of the total EU-27 final energy consumption** (respectively accounting for 26,1% and 13,7%) [1].

- Industry has been steadily reducing its emissions and increasing its energy savings over the past decades. **In the last fifteen years between 2004 and 2018 European industry reduced its emissions by 20%**[2].

- To meet the EU's carbon neutrality ambition by 2050, the EU Industry will have to reduce its emissions to around **90-95% compared to 1990 levels**[2].

[1] https://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_statistics_-_an_overview#Final_energy_consumption
[2] https://ec.europa.eu/transparency/regdoc/rep/10102/2020/EN/SWD-2020-176-F1-EN-MAIN-PART-2.PDF

LIFE-2023-CET-BUSINESS
Actual VS Potential energy savings

LIFE-2023-CET-BUSINESS

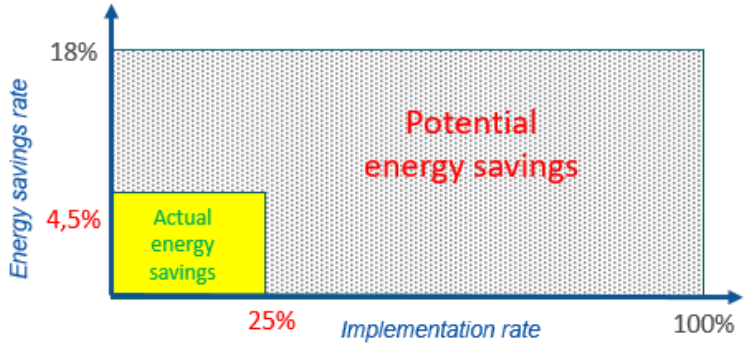
- ***Scope A:*** *Strengthen a favorable ecosystem for energy audits and EnMS*
- ***Scope B:*** *Fostering Energy Cooperation*

CINEA's Report (May 2021)
https://cinea.ec.europa.eu/system/files/2021-10/1%20EASME%20CINEA%2041%20Final%20Report%20FINAL.pdf

European Commission

The core aspects of Scope A

Strengthen a favourable ecosystem for energy audits and EnMS



➢ Support to Companies

- Services tailored to the participating companies to support them in the implementation of cost-effective measures as identified in the energy audit.

- Enhancement of corporate energy culture to facilitate the uptake of energy audits recommendations.

➢ Support to national / regional authorities

- Gap assessment of the participating national / regional ecosystems for energy audits and energy management systems.
- Quality of energy audits, management and exploitation of data.
- Replication of best practices e.g. for tax / financial incentives, support schemes, informational campaigns, energy efficiency networks, energy audit centres for SMEs, etc.

European Commission

The core aspects of Scope B

Fostering energy cooperation among companies

- To foster the **market uptake of energy efficiency measures** and **renewable energy** (heat pumps when relevant) through **collaborative mechanisms** among companies operating in the **same value chain** OR in **proximity**.

- Decarbonising and increasing the energy performance of companies will **generate an increasing value for the society** (contributing to the EU Green Deal).

Sustainable Value chains	Local cooperation
❑ Companies of all size operating in the same value chain	❑ Companies in proximity (region, clusters, industrial park/site)
❑ From local to European and international when relevant	❑ Sharing energy related assets (e.g. renewable, energy storage), energy services, etc.
❑ Not need to target the full value chain	❑ facilitate better access to finance

Triggering interest, awareness, knowledge and **know-how** on the **added value of the selected concept**

To establish **concrete cooperation initiatives** within the timeframe of the project

To capture the value of sustainability within business models (*going beyond concepts such as Net Value Income/free cash flow)*

To develop **benchmarking mechanisms to track the Clean Energy Transition of the business sector**.

LIFE-2023-CET-BUSINESS

EU Contribution and duration

Topic	Total Budget	Expected EU Contribution (m/€)	Expected funded projects	Expected Project duration (months)	Funding rate
LIFE-2023-CET-BUSINESS	*6*	*~1,75*	*3/4*	*~36*	*95%*

Nothing prevents you from requesting a different EU contribution and/or different duration

European Commission

Keep in touch with us

https://cinea.ec.europa.eu/life/clean-energy-transition_en/

@CleanEnergy_EU, @LIFEprogramme

European Climate, Infrastructure and Environment Executive Agency

LIFE youtube channel

Thank you

European Commission

POLICY PANEL 10:00 – 11:15

Improving energy efficiency policies by understanding savings: From deemed savings to measurement

Moderator: Václav Šebek (SEVEn)

- streamSAVE and its replication potential to support energy efficiency policies – example from Slovakia – Jan Maygar (SIEA)
- DEESME for policy implementers: Energy audits and management in the EED – Antoine Durand (Fraunhofer ISI)
- Country examples from Croatia: Role of deemed savings calculations and measurements in monitoring savings and identifying new savings potential – Vesna Bukarica (EIHP)
- Ireland's approach to the evaluation and monitoring of scaled and metered savings and the identification of new savings potential – Aidan Condell (SEAI)
- Debate: Role of and interaction between deemed savings, energy audits and measurements to improve policies and monitoring

MINISTRY
OF ECONOMY
OF THE SLOVAK REPUBLIC

SIEA
SLOVAK INNOVATION
AND ENERGY AGENCY

streamSAVE and its replication potential to support EE policies – example from Slovakia

Jan Magyar, streamSAVE/DEESME final event, Brussels 06.06.2023

Content

- SIEA context
- EE monitoring at national level
- streamSAVE from SK perspective
- Lessons learnt / potential applications in Slovakia

SIEA context

SIEA

- Preparation of documents for **energy legislation** and **strategic and program documents** in energy and for **financing** projects that contribute to the fulfillment of the goals of the Integrated National Energy and Climate Plan;
- **Monitoring and evaluation of energy efficiency** and use renewable energy sources in Slovakia;
- **Education and examinations** of energy specialists;
- Projects and support programs:
  - National project Green for households II + III
  - National project Expansion of energy efficiency monitoring
  - National project Energy professionally
  - Technical assistance for guaranteed energy services in the public sector
  - National project Live by Energy
  - International projects

https://www.siea.sk/

Demand for EE monitoring at national level

Increasing targets in the area of energy savings

- classic EE policies/measures are slowly being exhausted
- the need for new EE policies/measures

- substantiated determination/calculation of the corresponding savings (bottom-up approach)

How to calculate it in harmonized way (for reporting)?
Where to find additional energy savings?

Transport, e-mobility, heat pumps, energy poverty, behaviour change ...

Value added from streamSAVE (non-exhaustive)

List of 10 priority actions
(identified as previously unexploited energy saving actions)

- In-depht analysis of evaluation/calculation methodologies supporting national efforts **helping effectively implement, monitor and redesign policies under Article 3 and 7 of the EED**

- Support of **on-line platform helping exchange of knowledge and experience** concentrated to one place in the community of experts

Value added from streamSAVE (non-exhaustive)

Knowledge & support facility

- Evaluation calculation methodology on consensual basis – harmonization
- Supported by analysis/reports of existing methodologies in individual countries on PAs
- Practical guidance with explanations
- Presentations + videos
- Calculators and excel sheets enabling to see the impact of changing boundary conditions
- Reference values at EU level and national level with possible adjustments in calculation procedures

Forum

- Exchange of views, articles, contributions to discussions on targeted methodologies

Training

– possibility for discussion/exchange of views on methodologies with their creators, direct discussion on new potentially interesting policies/measures/actions

Lessons learnt / potential applications in Slovakia

Reference values for comparison/adjustment

Example – ODYSSEE-MURE expert estimations for EE indicators

Mobility – Background data - vehicle-km for different modes of transport (personal cars, buses etc.)

- **Discussion on methodologies and boundary conditions for values/limitations of methodologies**

Lessons learnt / potential applications in Slovakia

Update of national catalogue of EE measures & methodologies for calculation of savings

Example – Reporting of energy savings (e.g. NECPs)

New potential policies/measures
(reducing the gap between the target and reality)

- **Analysis of existing calculation methodologies, optimization of existing data collection**
- **Covering of new policies/measures**
- **Discussion on limitations/boundary conditions**

Behavioural change, e-mobility – electric vehicles, trucks, modal shift ...

Lessons learnt / potential applications in Slovakia

Support for creation of new policies/measures/actions

Example – Replacement of electric motors in industry (from energy audits)

Proposal for creation of new targeted national policy

↓

Definition of energy savings potential using calculation methodology (optimalization of impact)

↓

Results: Energy savings – reduction of energy costs
Increased competitiveness
Reporting of savings – **WIN-WIN situation**

Example – Application of heat pumps (small/medium scale RES in buildings)

↓

Impact on savings and on infrastructure (optimization - quasi-modeling of boundary conditions)

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Thank you for your attention!

Jan Magyar
Project manager / Expert

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AND ENERGY AGENCY

DEESME

National schemes for energy efficiency in SMEs

DEESME has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 892235.

DEESME for policy implementers: Energy audits and management in the EED

Antoine Durand, Fraunhofer ISI

06/06/2023

Energy Audit obligation according to Article 8 of the current Energy Efficiency Directive (EED)

Article 8: Energy audits and energy management systems

(4) Member States shall ensure that **enterprises that are not small-to-medium sized enterprises (SMEs)** are subject to an **energy audit** [...] by 5 December 2015 and at least every four years from the date of the previous energy audit.

(6) Enterprises [...] that are implementing an EMS [...] shall be exempted.

25.10.2012
Directive 2012/27/EU on energy efficiency

Company category	Staff headcount	Turnover or	Balance sheet total
SME	<250	<= € 50 m	<= € 43 m

Link to EED: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02012L0027-20200101&from=EN

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national authorities

Enabling National Authorities to enhance the Impact of Energy Audits and EMS in the DEESME project

Identification of **Challenges**

A: Inventory of needs and requirements of NAs

Survey/interviews with NAs

Reports available at https://www.deesme.eu/knowledge-hub/

DEESME

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national authorities

Enabling National Authorities to enhance the Impact of Energy Audits and EMS

Identification of **Challenges**

A: Inventory of needs and requirements of NAs

Survey/interviews with NAs

- 11 challenges
- 27 sub-challenges

non-SMEs

1 Limited resources for transposition

2 Identification of obligated companies

3 Ensuring compliance

4 Quality of audits

5 Compromise between reporting and monitoring

6 Enhancing the uptake of measures

SMEs

7 Creation of support mechanisms

8 Limited available resources

9 Guiding SMEs to action

10 Raising awareness on opportunities

11 Non-energy benefits

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DEESME

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national authorities

Enabling National Authorities to enhance the Impact of Energy Audits and EMS

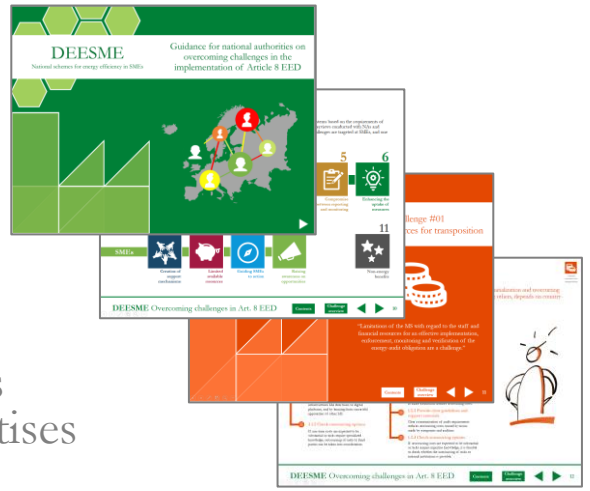
Identification of **Challenges** **Best practises**

A: Inventory of needs and requirements of NAs

Survey/interviews with NAs

B: Requirement-based report on best-practice for policies

Reviews/interviews with NAs



- 55 solution strategies
- 50 country best practises

- Interactive PDF document

Link to guideline →

Reports available at https://www.deesme.eu/knowledge-hub/

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Challenges in transposition of Art. 8 EED

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2 Identification of obligated companies

The identification of obliged companies can be challenging. Commonly, either existing or self-established databases are used to identify companies. Energy thresholds can also be introduced.

Identify companies	Energy threshold to allow simplified EA	Energy threshold to include add. companies
▪ Identify companies based on existing registers ▪ Identify companies based on own data collection ▪ Assist the self-declaration of companies	▪ Define who would be targeted by the simplification ▪ Define simplified requirements to fulfil Art. 8 ▪ Implement simplified approach	▪ Collect energy consumption data ▪ Define energy thresholds ▪ Inform companies

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Challenge #02: Identification of obligated companies

Example: Active identification of obligated companies (EE)

#1
#2
#3
#4
#5
#6
#7
#8
#9
#10

non-SME
SME

- **Active identification:**
  - **Step 1:** data of the public commercial register are used and filtered according to the non-SME definition of the EU
  - **Step 2:** information on the pre-listed companies are manually checked (using e.g. financial reports of the companies)
  - **Step 3:** if some data are missing:
    - enterprises fulfilling some of the criteria are listed separately
    - information is also collected from other sources
  - **Step 4:** list of "obligated companies" is published yearly in spring
- **Active contact:** Companies are individually informed by the authorities.

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Challenge #02: Identification of obligated companies

Example: Active identification of obligated companies (EE)

non-SME

#1
#2
#3
#4
#5
#6

SME

#7
#8
#9
#10

Remarks:

- Companies can show evidences that there are below the SME thresholds at least 2 years long
- Only multi-nationals **registered in Estonia** can be identified in the list of obligated companies
- **Transparency**: list as well as the methodology are online

- Further possible improvement: In Estonia, there is a central database for electricity and gas. It would be technically possible to cross the database of obliged companies with the one on energy consumption, but this would required some legal changes.

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national authorities

Challenges in transposition of Art. 8 EED

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4 Quality of audits

Factors with influence on the quality of energy audits include the qualification of auditors, the requirements to both content and structure of the audit reports as well as the regularity and depth of audit quality checks.

Quality of auditors	Clarity of procedure	Quality control of reports
▪ Requirements for certification ▪ Auditor specialization ▪ List with certified auditors ▪ European cooperation	▪ Legal requirements ▪ Guidelines ▪ Templates	▪ Basic validation ▪ Spot checks of quality ▪ Subcontracting

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4 Quality of audits

Factors with influence on the quality of energy audits include the qualification of auditors, the requirements to both content and structure of the audit reports as well as the regularity and depth of audit quality checks.

Ensuring up-to-date qualification by **requiring auditors to do regular trainings**

In Germany, requirements were recently updated and auditors are now obligated to participate in **regular trainings**, on which they have to inform the national agency BAFA (EDL-G Article 8). It is expected that auditors will have to complete **16 units of training (each 45 minutes)** with relevance to energy audits **every 2 years**.

Defined in draft legislation

Improving audits by **providing a detailed guideline on how to conduct audits**

Ireland created an elaborate **64 page interactive PDF document** that guides auditors and companies step by step through the process of conducting the energy audit and reporting the results.

SEAI Energy Audit Handbook

DEESME

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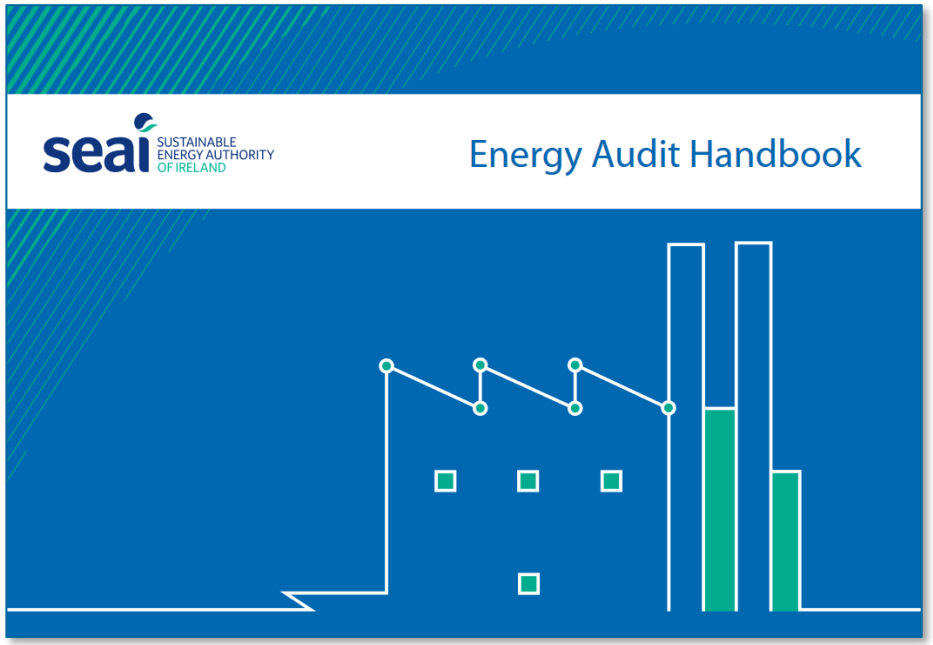
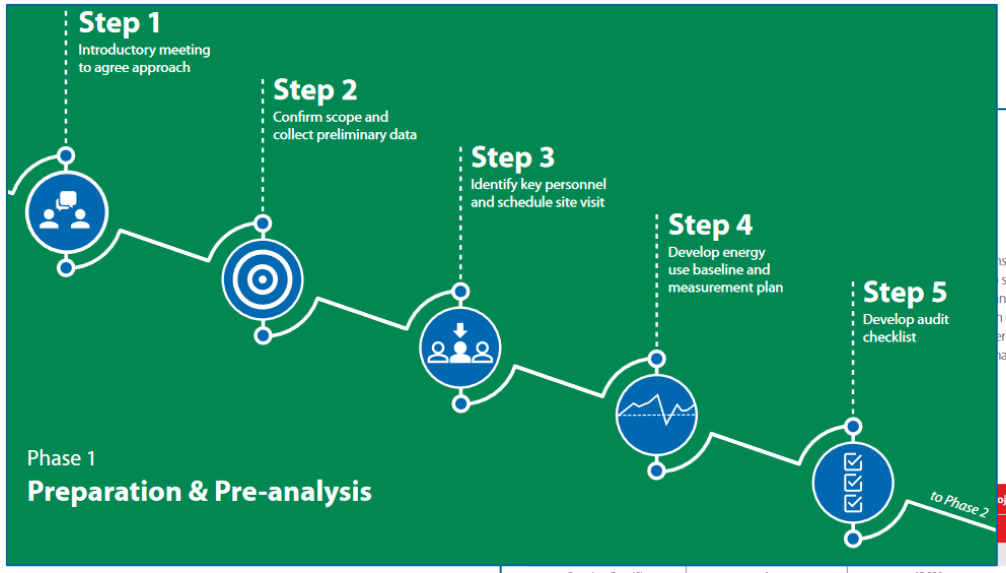
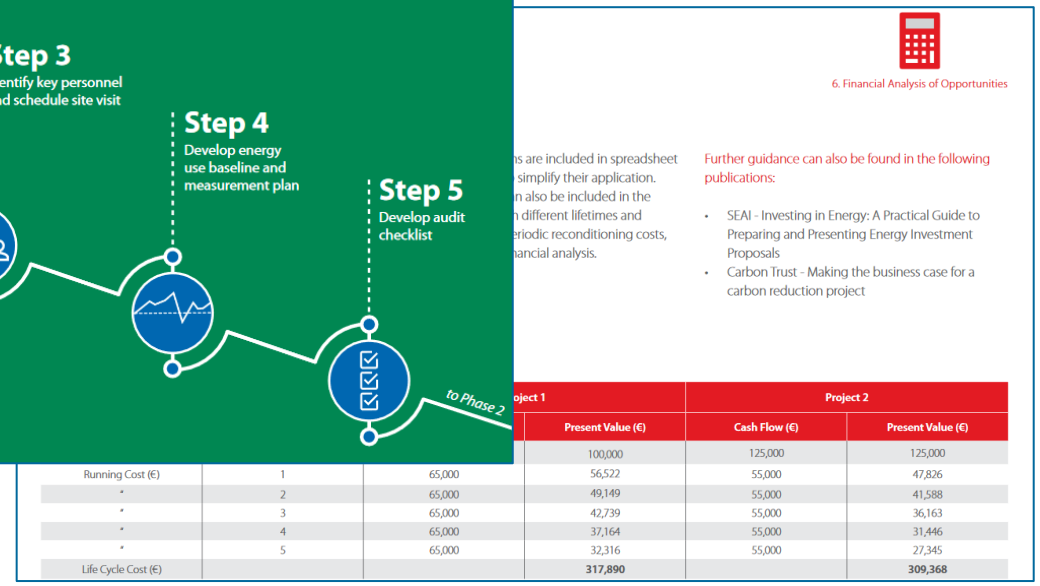
4 Quality of audits

Factors with influence on the quality of energy audits include the qualification of auditors, the requirements to both content and structure of the audit reports as well as the regularity and depth of audit quality checks.



https://www.seai.ie/publications/SEAI-Energy-Audit-Handbook.pdf





6. Financial Analysis of Opportunities

...s are included in spreadsheet ... simplify their application. ...n also be included in the ...n different lifetimes and ...eriodic reconditioning costs, ...ancial analysis.

Further guidance can also be found in the following publications:

- SEAI - Investing in Energy: A Practical Guide to Preparing and Presenting Energy Investment Proposals
- Carbon Trust - Making the business case for a carbon reduction project

			...oject 1		Project 2	
				Present Value (€)	Cash Flow (€)	Present Value (€)
				100,000	125,000	125,000
Running Cost (€)	1	65,000		56,522	55,000	47,826
"	2	65,000		49,149	55,000	41,588
"	3	65,000		42,739	55,000	36,163
"	4	65,000		37,164	55,000	31,446
"	5	65,000		32,316	55,000	27,345
Life Cycle Cost (€)				**317,890**		**309,368**

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national authorities

Challenges in transposition of Art. 8 EED

non-SMEs

1 Limited resources for transposition

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SMEs

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Challenge #05: Compromise between reporting effort and monitoring

Current practices




Form of submission	Content of submission	Submission support	Submitter
▪ PDF ▪ Excel ▪ Online form	▪ Full report ▪ Summary of report ▪ Key data	▪ Guidelines ▪ Templates	▪ Company ▪ Auditor

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Challenge #05: Compromise between reporting effort and monitoring

#1
#2
#3
#4
#5
#6
#7
#8
#9
#10

non-SME
SME

Example: Online portals for submission

Online form Germany

Gesamtenergieverbrauch

Gesamtanzahl der Standorte des verpflichteten Unternehmens: *

Energieträger	Eingabeart	Netto-Energiekosten [€]	Eingabe Verbrauchsmenge	Eingabe Energieverbrauch [kWh]	Anteil Gesamtenergieverbrauch [kWh]	CO_2-Emission [tCO_2]
Stromverbrauch Inland					0	0,00
Nah-/ Fernwärme					0	0,00
Fernkälte					0	0,00
Erdgas					0	0,00
Heizöl leicht	--- Bitte wählen ---		l		0	0,00
Heizöl schwer	--- Bitte wählen ---		l		0	0,00
Schiffsöl (Binnenschifffahrt)	--- Bitte wählen ---		l		0	0,00
Flüssiggas	--- Bitte wählen ---		kg		0	0,00
Steinkohle	--- Bitte wählen ---		kg		0	0,00
Braunkohle	--- Bitte wählen ---		kg		0	0,00
Ottokraftstoffe	--- Bitte wählen ---		l		0	0,00

https://fms.bafa.de/BafaFrame/orea

Business platform Austria (USP)

Audit: Daten

Bereich: Gebäude — auditiert: nein

Bereich: Prozess — auditiert: nein

Bereich: Transport — auditiert: nein

Gesamtenergieverbrauch des Unternehmens [GWh] *

gesamtes prognostiziertes Einsparungspotential pro Jahr [GWh] *

durchschnittliches Energiekosteneinsparungspotential pro Jahr [€] *

Abschlussdatum des Audits *

Sonstiges

Kurzfassung des Auditberichts, sonstige Dokumente * Dokument auswählen

zurück | Endgültig melden

https://www.usp.gv.at/

→ High initial cost, lower running costs
→ Filtered information, easy to process

Contribute also to Challenge 1 "Limited resources for transposition"

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National schemes for energy efficiency in SMEs

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@DEESME H2020

9 Guiding SMEs to action

Guiding SMEs towards energy audits or energy management systems can be supported by passive facilitation, e.g. lean application process for funding schemes, by active facilitation, e.g. via individual consultancy services or by establishing peer networks.

Passive facilitation	Active facilitation	Peer networks
▪ Provide a clear overview of the support schemes ▪ Facilitate the application process	▪ Define aim and target group ▪ Implement the facilitation	▪ Implement a peer network

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9 Guiding SMEs to action

Peer networks (e.g. Energy Efficiency Networks) effectively engage companies with low effort for NAs.

Increase implementation rate by **supporting the creation of energy efficiency networks**

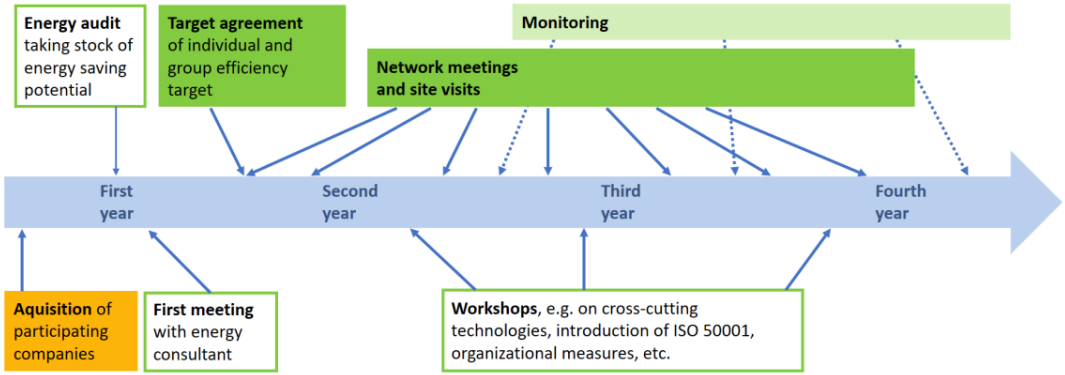
In Germany, the Energy Efficiency Networks Initiative was started in 2014, and grew to 306 registered networks by June 2021, involving 2 709 companies. 5 to 15 different companies form a network for several years and use it to share information and best practices on energy efficiency measures. An energy consulting is used in the beginning to identify measures and commit to targets.

Energy Efficiency Networks Initiative

Educate individuals by **supporting the creation of energy efficiency networks**

In its 4th National Energy Efficiency plan, Croatia included as a measure so-called Industrial Energy Efficiency Networks (IEEN). Some of the key elements of IEEN are to educate the management as well as employees of industrial companies in the field of energy efficiency and promote best practise projects.

4th National Energy Efficiency plan



Source: Based on IPEEC 2017.

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Country example from Croatia:

Role of deemed savings calculations and measurements in monitoring savings and identifying new savings potential

streamSAVE and DEESME joint final event “From potentials to achievements: unlocking the power of energy savings ”

Brussells , 6th June 2023

Agenda

- Intro on monitoring of energy savings (and energy consumption) in Croatia
- Examples of deemed vs. measured savings
  - Public buildings
  - Public lighting
  - Deemed savings for information measures
- Lessons learned

Monitoring of energy savings in Croatia

Monitoring of EE measures implementation and energy consumption in public sector

EIHP

Legal framework for monitoring of energy savings (and energy consumption) in Croatia

Law on EE

(amended April 21)

- Art 7. targets are defined in Law, NEEAP and NECP
- 50-50 AM-EEOS for 2014-2020; 30-70 AM-EEOS for 2021-2030
- Public sector – obligatory energy management
- Annual reporting

Regulation on M&V (Revised version adopted Sept 2021; March 2022)

- Obligatory use of **MVP (SMIV)** for subsidy providers, obligated parties, public sector and ESCOs
- BU methods for calculation of energy savings for **33 measures**

Regulation on energy management system in the public sector (2015/16)

- Energy advisors and energy associates in the public sector – education
- Use of **EMIS**

EIHP

MRV of savings provisions

- Monitoring
  - Process of data and information collection about implemented EE measures: type of measure; input data for energy saving calculation; cost of implementation, received subsidies
- Measurement
  - Calculation of new annual energy savings achieved by EE measures using prescribed methods -> always using project specific data rather then reference data prescribed in methodology
  - For measures for which methods are not prescribed, energy savings should be calculated by the authorized design engineers or energy auditors
- Reporting
  - Annually by 15th March
  - Savings from EEOS and AM
  - All other data and information required by Regulation (EU) 2018/1999
  - Reported savings to be based on data from SMiV
  - Report to be published on national web site for EE
- Verification
  - Process of confirming energy savings by the authorized body – National EE Coordination Authority within Ministry of Economy and Sustainable Development

EIHP

System for M&V (SMiV)

- **SMIV** developed through regional cooperation project implemented by GIZ – ORF EE
- Used since 2015
  - transfer of savings
  - stimulation of energy poverty related measures –10 to 30% higher savings are accounted
  - primary energy savings
- Obligatory tool for subsidy providers, public sector, obligated parties and ESCOs
  - Dominant user is EE Fund – subsidy provider (cca 90% of all entries)
- Data base of implemented EE measures in Croatia
  - > 26,000 EE projects
- Tool for calculation of energy savings and CO2 emission reductions
  - Calculates new and cumulative annual savings from a measure
- Public sector
  - In Croatia, obligation to input data on energy consumption in IT system for energy management (**EMIS**)
  - Enables monitoring of actual energy savings achieved in renovated public buildings

EMS in public sector

- Obligation to nominate person responsible for EMS
- Obligatory education for persons responsible for EMS
- Obligatory use of EMIS and annual reporting
- Energy bills + direct metered data from energy supplier/DSO

Examples of deemed vs. metered savings

Public buildings and public lighting

+

Deemed savings for informational/behavioural measures

Case example – renovated public building (hospital)

- EE measures included: Building envelope, Heating substations and systems, Reactive power compensation, External and internal lighting, BACS, Water supply system

ENERGY [kWh]	BASELINE energy consumption before*	DESIGNED energy consumption after**	METERED energy consumption after***	DEEMED energy savings****
Heat	9.730.096,00	3.041.367,00	4.632.624,00	
Electric	4.272.870,00	2.475.256,00	2.993.532,00	
TOTAL	14.002.906,00	5.516.623,00	7.626.156,00	
ENERGY SAVINGS		8.486.283,00	6.376.750,00	9.489.402,78

** Based on energy audit and detailed investment study (data from energy bills)*
*** Based on calculations of energy service provider (as contracted)*
**** Based on data from EMIS, normalised by heating degree days*
***** Based on data from SMIV*

$$UFES = \frac{SHD_{init}}{\eta_{init}} - \frac{SHD_{new}}{\eta_{new}}$$

$$FES = \sum_{i=1}^{n} UFESi \times Ai$$

Case example – public building to be renovated (office)

1. **Hourly dynamic simulations for different combinations of EE measures (DesingBuilder & EnergyPlus)**

OPTIMAL TEHNICAL SOLUTION:

Heating/cooling: *heat pump water/water*
Lighting: *LED*
External wall insulation: *16 cm*
Roof insulation: *20 cm*
U-value of windows : *1,40 W/(m²K)*

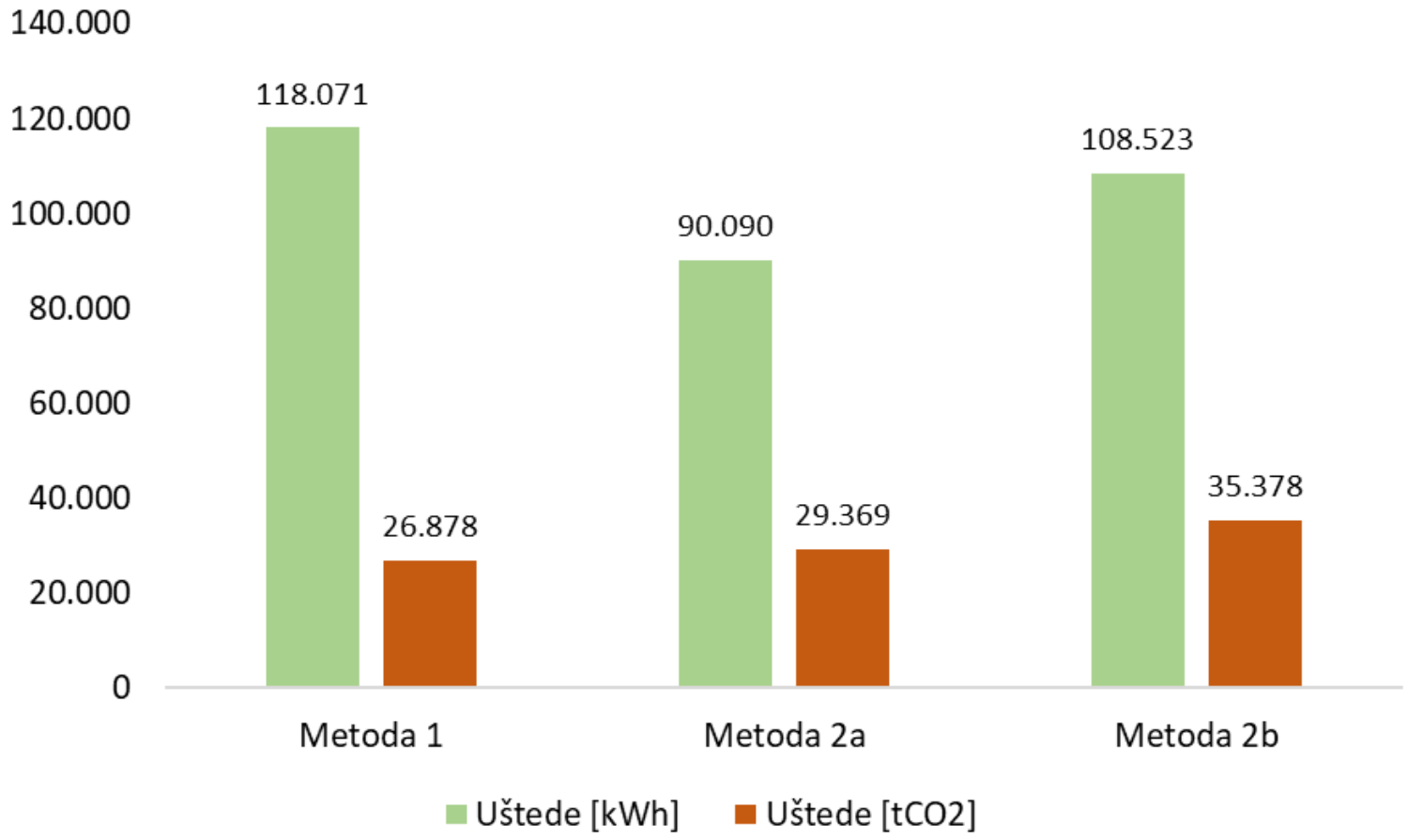
2. **Regulation on monitoring, measurement and verification of energy savings**
2a – project values
2b – reference values

Method – Integral renovation of a building

$$UFES = \frac{SHD_{init}}{\eta_{init}} - \frac{SHD_{new}}{\eta_{new}}$$

$$FES = \sum_{i=1}^{n} UFES\,i \times Ai$$

Case example – public building to be renovated (office)



Case example – public lighting

- Metred data on electricity consumption available in EMIS
  - Enables comparison of savings calculated using BU methods (SMIV) and metered savings
- Data for 37 public lighting projects available in SMIV
- Analysis methodology
  - Annual energy savings from SMIV distributed per year after renovation
  - These savings compared with savings determined from EMIS (metered data before and after renovation, per year)

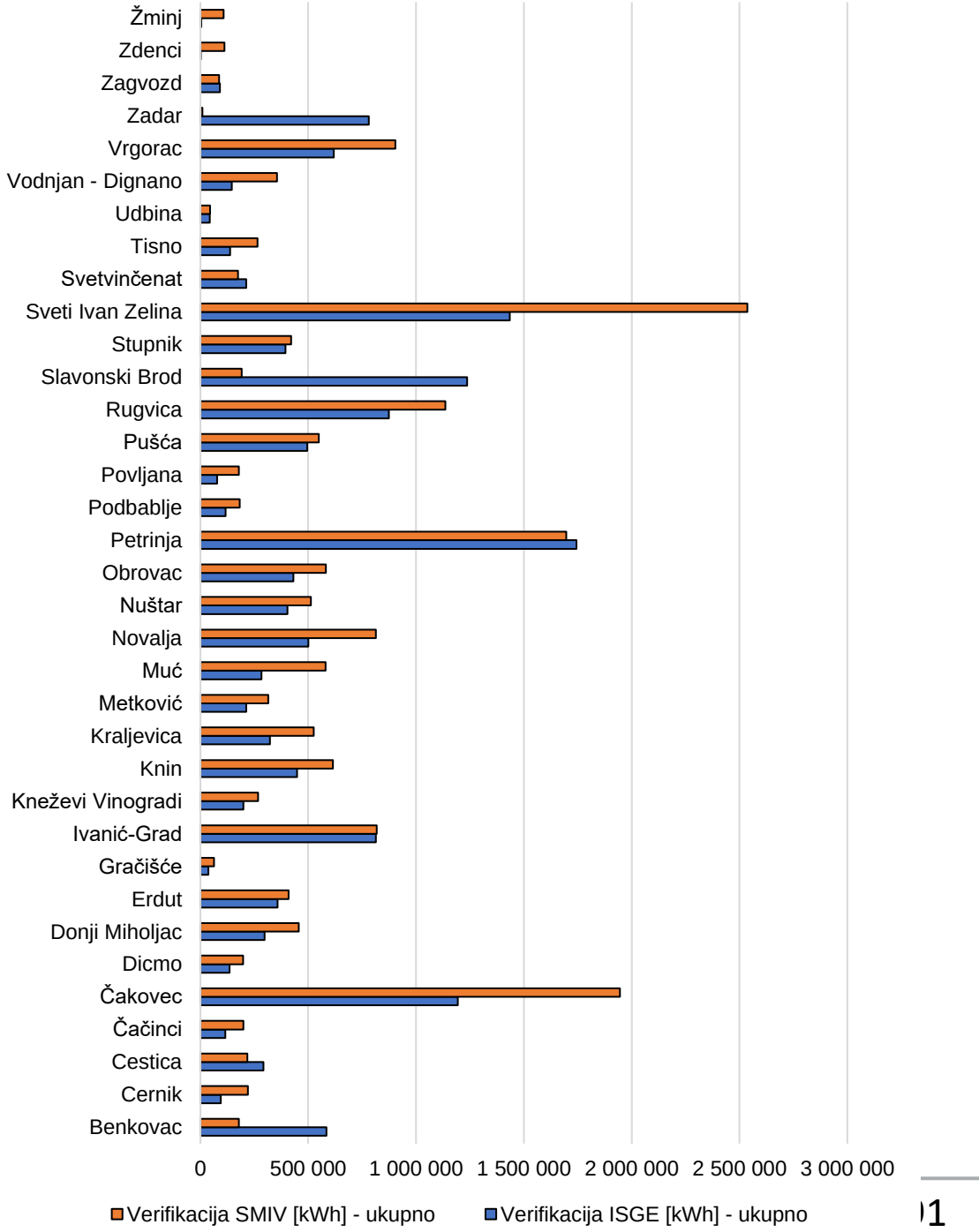
$$UFES = \frac{P_{init} \times n_{hinit} - P_{new} \times n_{hnew}}{1000}$$

$$UFES = \frac{P_{init} - P_{new} \times r}{1000} \times n_h$$

$$FES = UFES \times N$$

Case example – public lighting

- Results
  - EMIS savings 15.14 GWh
  - SMIV savings 17.87 GWh
- Deemed savings 18% higher than metred



Case example – information measures

- Measures mostly used by obligated parties in EEOS
  - Sending leaflets to their customers
  - Preparation of leaflets or brochures and their distribution by inserting in daily newspapers

$$UFES = FEC_{HHs} \, x \, S$$

$$FES = N \, x \, UFES$$

- Energy saving factor – lowest level of advising 0.25% (MultEE)
- Energy savings from 30.000 leaflets ≈ replacement of 10 electric motors from 18,5 to 110 kW
  - Value of saving, duration of savings

EIHP

Lessons learned

- Metered data available in some cases – public sector (EMIS)
- Energy savings are not simple '*before* – *after*' even when metered data are available
- Possibility to improve deemed savings by using metered data
  - Must be available before and after
  - Influencing factors must be taken into account (quite complex for buildings) - > more data needed
- Additional research in the domain of behavioural measures needed

Thank you for your attention!

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The evaluation and monitoring of scaled and metered savings: Ireland's approach

Aidan Condell

6th June 2023

seai SUSTAINABLE ENERGY AUTHORITY OF IRELAND

Overview

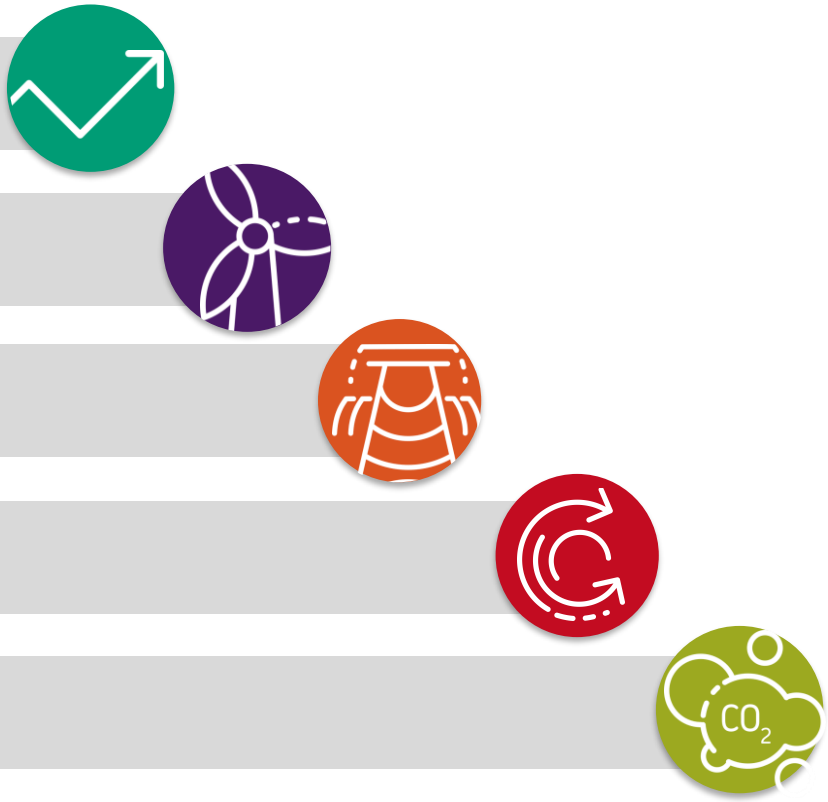
Introduction

Platform for Monitoring Savings

Savings Evaluation: SEAI assessment

Savings Approaches: Scaled and Metered

New Savings Opportunities

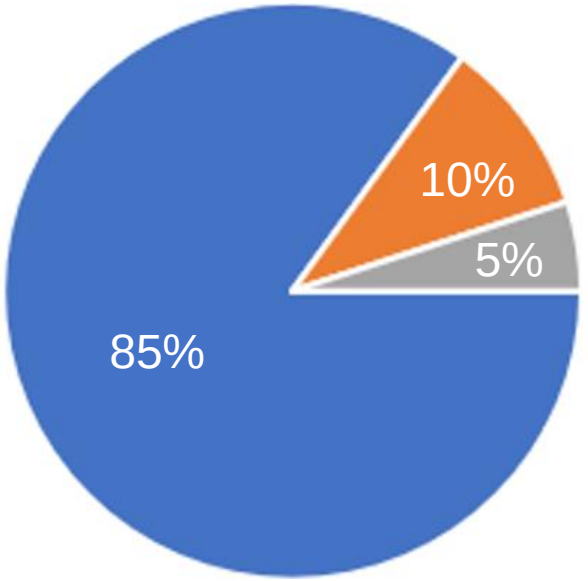


seai SUSTAINABLE ENERGY AUTHORITY OF IRELAND

Introduction

Energy Efficiency Obligation Scheme (EEOS)

- Began in 2014
- EEOS accounts for 60% of Irelands Article 7 savings target
- EEOS savings targets are divided into three savings categories:
  - Energy Poverty (5%)
  - Residential (10%)
  - Cross-sectoral (85%)
- Cross-sectoral savings are made up of:
  - Non-Residential energy savings
  - Transport energy savings
  - Deemed domestic savings



Platform for monitoring savings

Energy Credit Management System (ECMS)

- ECMS is an online database where energy savings are uploaded and tracked for EEOS and domestic and non-domestic SEAI grant schemes

- Savings uploads are classified by:
  - Obligated party
  - Sector (Energy poverty, Residential, Cross-sectoral)
  - Energy savings category and measure
  - Obligation period

- Supports monitoring of policy interaction through tracking of energy savings for individual homes and business addresses (avoiding double counting of savings)

- Each Obligated Party can track their uploads, as well as their progress to targets

- Allows SEAI to track overall progress and effectively monitor energy savings, as well as exchanges between Obligated Parties

Savings Evaluation: SEAI assessment

Project Evaluation Platform (PEP)

- After works are completed and saving are quantified, obligated parties notify SEAI of Non-residential energy savings
- All submissions are made online through PEP, via a non-residential energy credit application, or NREC.
- NRECs contain detail on:
  - Information on the obligated party and client organisation (beneficiary)
  - Project summary with technical details
  - Calculation methodology, measurement and verification
  - Annual energy savings and savings attributed by technology
  - Materiality of contribution by energy supplier to savings achieved
  - Signed declaration of client organisation
  - Supporting documentation (M&V report, datasheets, calculations, etc)
- After submission, PEP is used to move projects through the EEOS evaluation process
- Applicants are notified of the progress of the project throughout
- Once projects are approved, savings are automatically transferred to ECMS and counted towards the obligated parties cross-sectoral target

EEOS QMS – NREC Evaluations

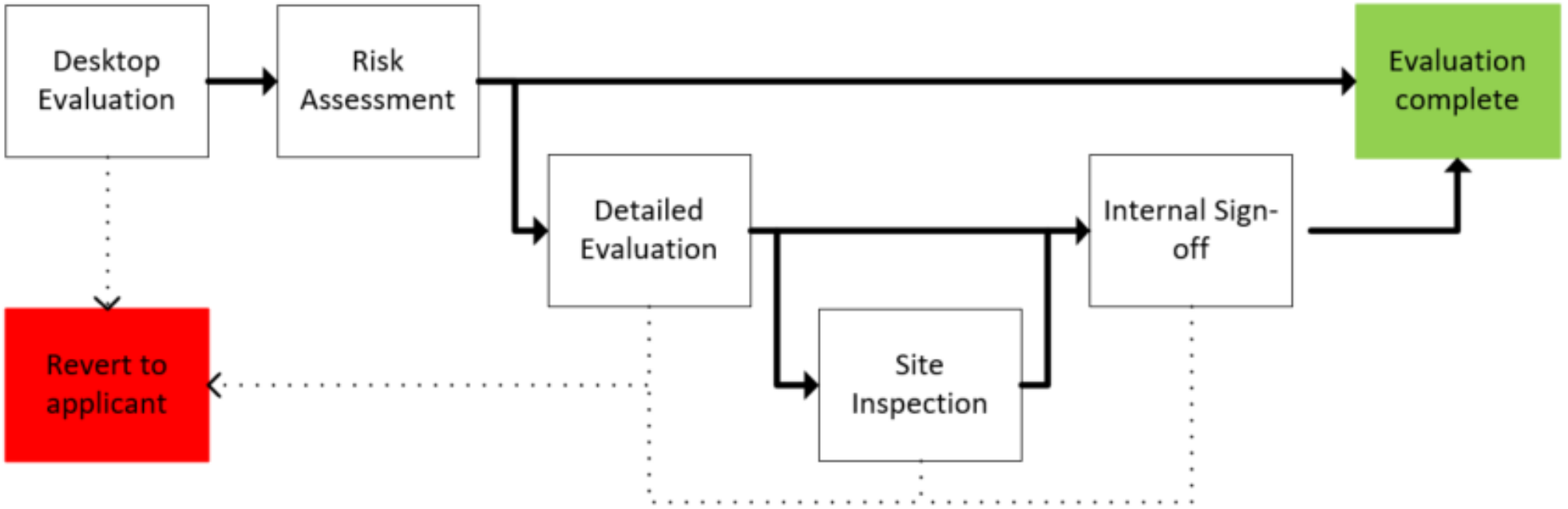
- All NREC applications are subject to a desktop audit. This audit will:
  - Ensure the application has been completed correctly
  - Ensure the relevant supporting documents are included
  - Complete a risk assessment of the project
- The risk assessment process is used to select the most relevant portion of applications for a further evaluation.
- This further evaluation involves an in-depth look at the project with respect to the EEOS requirements, and an evaluation of the energy savings measurement.
- Site inspections are also completed on a sample of projects.
- Projects which undergo this detailed evaluation then undergo a sign-off procedure within the SEAI.
- Detailed evaluations are also conducted on a sample of project, regardless of risk score.

NREC Risk Assessment

The following seven criteria are reviewed for each NREC application, with a score is assigned for each criteria:

	Risk Factors	General Rules	Scores (Low, Med, High)
1	Project Size	< 0.1 GWh = “low”, 0.1 to 0.5 GWh = “med”, > 0.5 GWh = “high”	1, 2, 3
2	Savings as a % of PES Sectoral Target	< 5% = “low”, 5 to 20% = “med”, > 20% = “high”	1, 2, 3
3	Technology	Proven vs Unproven, unusual application of technology etc.	1, 2, 3
4	Complexity (e.g. multi-technology project)	Single site / single technology vs multiple sites / multiple technologies, potential for interactive effects	1, 2, 3
5	Previous Inspection Record	QS Audit, Inspection and Evaluation history. Deductions applied to recent projects, etc	1, 5, 9 (full range)
6	Savings Calculation Method	Clarity, Appropriateness, Practitioner competence, etc,	1, 3, 6 (full range)
7	M&V Report	Clarity, Comprehensible, Aligned standard (e.g. ISO50015, IPMVP)	1, 3, 6 (full range)

NREC Evaluation Process



Savings Approaches: Scaled and Metered

Savings Types

Annex V sets out a number of energy saving calculation methodologies.

a) **deemed savings,** by reference to the results of previous independently monitored energy improvements in similar installations. The generic approach is termed ‘ex ante’

b) **metered savings**, whereby the savings from the installation of a measure, or package of measures, are determined by recording the actual reduction in energy use, taking due account of factors such as additionality, occupancy, production levels and the weather which may affect consumption. The generic approach is termed ‘ex post’;

M&V Report

c) **scaled savings**, whereby engineering estimates of savings are used. This approach may be used only where establishing robust measured data for a specific installation is difficult or disproportionately expensive, e.g. replacing a compressor or electric motor with a different kWh rating than that for which independent information about savings has been measured, or where those estimates are carried out on the basis of nationally established methodologies and benchmarks by qualified or accredited experts that are independent of the OP involved

Engineering calculations

Metered Savings - M&V Report

- SEAI requires:
  - that the M&V approach adopted is broadly similar to the IPMVP or an equivalent protocol such as International Standards ISO:50015 and that it strives to deliver results that are **accurate, complete, conservative, consistent, relevant and transparent.**
  - that the M&V Report be completed by a **professionally competent individual** (i.e. understanding the subject matter, underlying theory and the ability to apply these) who must be independent of the project

- SEAI have developed an M&V Guidance document for obligated parties and their consultants for preparation of an M&V Report and M&V Plan.

Scaled Savings – Standardised Calculation Tools

- SEAI have developed standardised approaches to determine energy savings from certain project types
- All standardised approaches require the collection of project specific data, and as such, are not classed as deemed savings.
- Standardised approaches are based on engineering principals
- The accuracy of the savings returned from these approaches has been verified using data from detailed M&V of projects in the past.
- These standardised approaches replace the need for detailed M&V of savings, which would otherwise impact the financial and technical viability of certain projects.
- These tools have brought small projects into the scope of EEOS non-residential support
- Two examples of these SEAI calculation tools are:
  - Lighting Calculator
  - Pipe Insulation Calculator

Scaled savings approaches - Lighting upgrade projects

- The lighting project calculation tool can be used to determine the savings arising from upgraded lighting projects
- The tool requires users to input specification of existing lighting fixtures and replacement lighting fixtures, from which the savings are calculated.
- The user must also specify the facility type and usage hours
- A completed SEAI lighting project tool is required when submitting a commercial lighting upgrade project where energy savings have not been metered.
- The tool is accompanied by guidance on its correct use, and on the SEAI requirements for lighting upgrade project.
- In 2022, the improved viability of lighting projects was demonstrated with almost 50 projects submitted, covering 300 sites, the majority of which were small. This accounted for 5% of all non-residential savings.

Lighting Upgrade Calculation Tool

Site Details

Site name:	Centre 1
Site number:	S1
County:	Kildare
Eircode:	W90 H7Y4
Site contact - Name:	John
Site contact - Position:	Smith
Site contact - Phone:	085 123 4567
Site Activity:	Community Centre
Total site project cost:	€0
Recent bill **Day** rate (€/kWh):	
Recent bill **Day** usage (kWh):	
Recent bill **Night** rate (€/kWh):	
Recent bill **Night** usage (kWh):	
Floor area upgraded (m²):	

Operating Hours

Hours Usage basis:	Medium

Individual Zone Details: | **Original Luminaire:**

Zone name	Zone photo ref	Zone Activity [Selection must be made]	Luminaire Photo ref	Lighting type [Selection must be made]	Description	Lamp Watts (ex control gear)	Total No. of luminaires	Total No. of lamps	Daylight control fitted?	Occupancy control fitted?	kW before
1		Entrance halls		Fluorescent 2D EB	twin fittings	80	5	10	No	No	0.8
2		Reception		Fluorescent 2D EB	single fittings	80	5	5	No	No	0.4
3		Common room/staff room		Fluorescent Compact	twin fittings	60	8	16	No	No	1.0
4		Hall/Assembly area		Fluorescent T5	quad fittings	100	4	16	No	No	1.6
5		Hall/Assembly area		Fluorescent T5	quad fittings	100	4	16	No	No	1.6
											0.0
											0.0
											0.0
											0.0

Lighting Upgrade Calculation Tool

Summary Information

Original luminaires kWh pa:	33,197
New luminaires kWh pa:	3,014
Saving kWh pa:	30,183
Saving kWh (PEE)	52,820
% Saving kWh pa:	91%
CO2 reduction (t/a):	7
Cost saving (€ pa):	€ 0
Upgraded W/m² :	

Project costs (ex VAT)

Fittings:	€0
Installation:	
Project Management:	
Hired access:	
Other:	
Total:	€0

Summary of new fittings

New luminaires (non-emergency):	24
New bulbs:	0
Emergency lighting:	0
Total:	24
Other fittings	
Number of daylight controls:	0
Number of occupancy controls:	0
Number of highbay fittings:	0
No. of energy meters or monitors:	0

New Luminaire:

Lighting type [Selection must be made]	Description	Enter Luminaire Watts	No. of new luminaires:	Cost per luminaire (ex VAT)	Enter Triple E LIG code	Daylight control?	Occupancy control?	Triple E Luminaire Details	Triple-E Watts ±5%	kW after	New luminaire entered
New fitting (Triple E or equivalent)		30	5			No	No			0.2	Yes
New fitting (Triple E or equivalent)		30	5			No	No			0.2	Yes
New fitting (Triple E or equivalent)		20	6			No	No			0.1	Yes
New fitting (Triple E or equivalent)		40	4			No	No			0.2	Yes
New fitting (Triple E or equivalent)		40	4			No	No			0.2	Yes

Lighting Upgrade Calculation Tool – Summary Tab

SEAI Lighting Upgrade Credits Calculation Tool

SEAI Programme name: EEOS
Obligated Party:

Project Summary

Site No.	Site Name:	County:	Eircode:	Site Activity:	Hours Profile: High/Medium/Low or User defined:	Original luminaires kWh pa:	Different types of fitting (Before):	Average (€/kWh):	Replaced luminaires € pa:	No. of luminaires removed:	Zones with controls before:	New luminaires kWh pa:	Saving kWh pa:	% Energy Saving:	Primary energy saving (kWh pa):	No new fitting installed	Total Cost (ex VAT)
S1	Centre 1	Kildare	W90 H7Y	Community Centre	Medium	22,830	3			26		3,014	19,816	87%	34,678	0%	€0
S2	Centre 2	Dublin		Community Centre	Medium	33,197	3			34		3,014	30,183	91%	52,820	0%	€0
S3				----Select----		-	-					-	0	0%	0		€0
S4				----Select----		-	-					-	0	0%	0		€0
S5				----Select----		-	-					-	0	0%	0		€0
S6				----Select----		-	-					-	0	0%	0		€0
S7				----Select----		-	-					-	0	0%	0		€0
S8				----Select----		-	-					-	0	0%	0		€0
S9				----Select----		-	-					-	0	0%	0		€0
S10				----Select----		-	-					-	0	0%	0		€0
S11				----Select----		-	-					-	0	0%	0		€0
S12				----Select----		-	-					-	0	0%	0		€0
S13				----Select----		-	-					-	0	0%	0		€0
S14				----Select----		-	-					-	0	0%	0		€0
S15				----Select----		-	-					-	0	0%	0		€0
S16				----Select----		-	-					-	0	0%	0		€0
S17				----Select----		-	-					-	0	0%	0		€0
S18				----Select----		-	-					-	0	0%	0		€0
S19				----Select----		-	-					-	0	0%	0		€0
S20				----Select----		-	-					-	0	0%	0		€0
S21				----Select----		-	-					-	0	0%	0		€0
S22				----Select----		-	-					-	0	0%	0		€0
S23				----Select----		-	-					-	0	0%	0		€0
S24				----Select----		-	-					-	0	0%	0		€0
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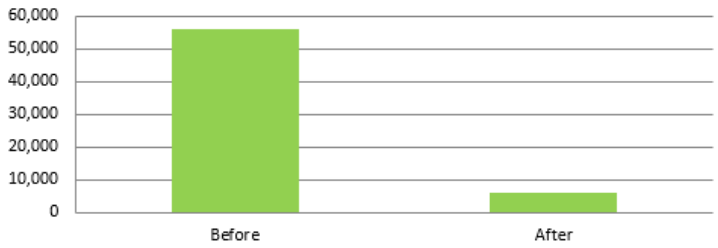
S26				----Select----		-	-					-	0	0%	0		€0
S27				----Select----		-	-					-	0	0%	0		€0
S28				----Select----		-	-					-	0	0%	0		€0
S29				----Select----		-	-					-	0	0%	0		€0
S30				----Select----		-	-					-	0	0%	0		€0
Overall						56,027	6		€0	60	-	6,028	49,999	89%	87,498		€0

Lighting Upgrade Calculation Tool – Results Tab

Business Overview

Date: 23/01/2023

Annual Savings Indentified: €0



Survey Information	Before	After
Number of fittings:	60	48
Total Wattage kW	13	1
Watts/m^2	0	0
Zones with controls	0	0

Energy Consumption	Before	After
Annual kWh	56,027	6,028
Annual Cost	€0	€0

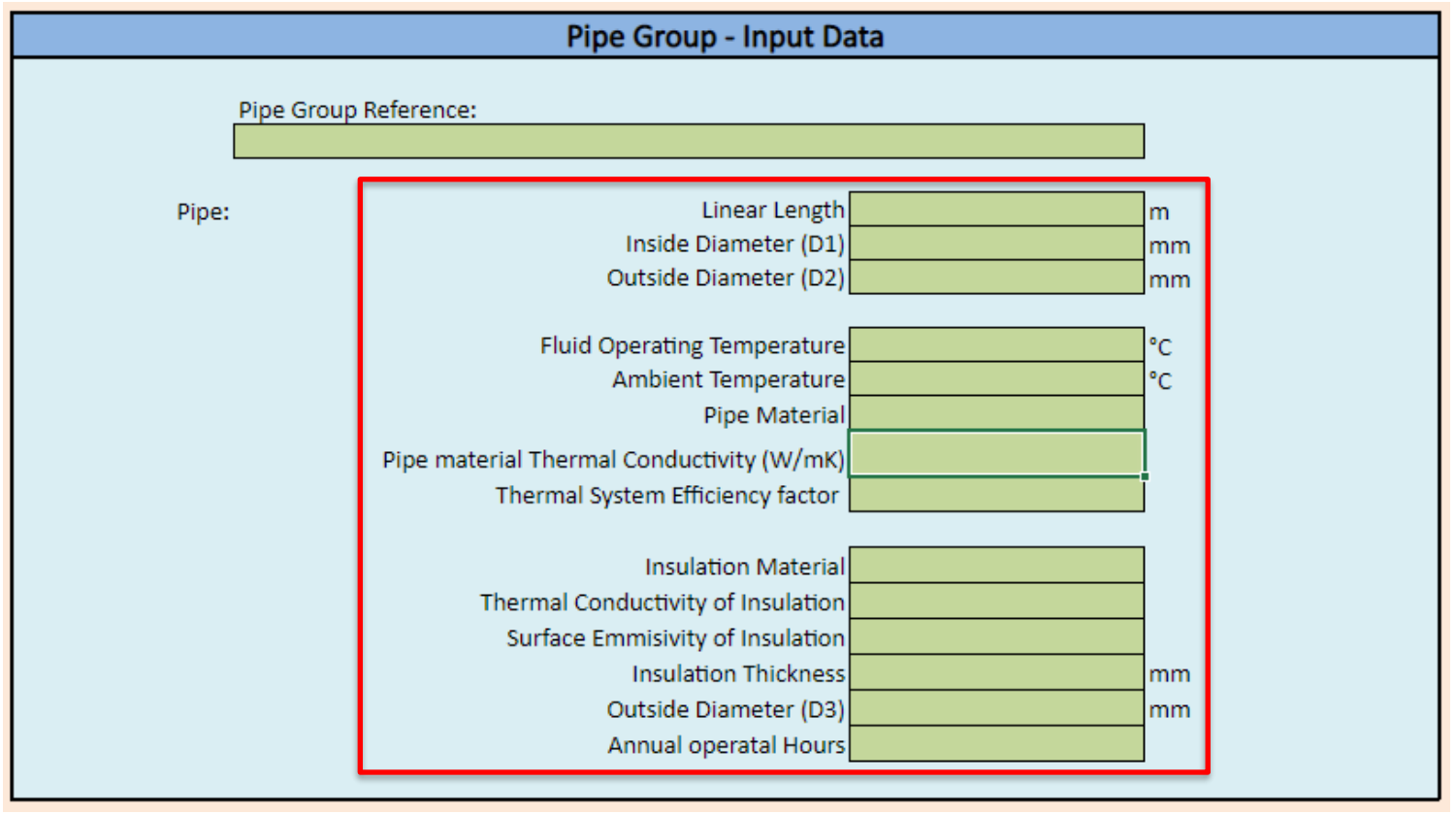
Savings Identified		
Annual Savings		
Primary Energy kWh	87,498	kWh
CO_2	19.6	tonnes
Energy Cost Saving	€0	
Final Energy kWh	**49,999**	**kWh**
Economics		
Capital Costs	€0	
Payback		years

Scaled savings approaches - Pipe insulation projects

- The Pipe insulation tool has been developed to standardise the methodology for calculations around energy savings achieved by insulating pipework.
- The tool requires users to input data relevant to the pipe/thermal system and the insulation, from which the savings are then calculated.
- The tool calculates savings for individual pipework groups, which are defined by the input data.
- Savings calculations and supporting data must be uploaded to the “supporting data” tab to support the savings for each pipe group.
- SEAI pipe insulation calculator will be required for submission as part of all pipe insulation projects where energy savings have not been metered.
- The tool is accompanied by guidance on its correct use, and on the EEOS requirements for lighting upgrade project.

Pipe Insulation Calculator - Required Inputs

1	Pipe Linear Length	m
2	Pipe internal diameter	mm
3	Pipe external diameter	mm
4	Fluid operating temperature	°C
5	Ambient temperature	°C
6	Pipe thermal conductivity	W/mK
7	Thermal system efficiency factor	%
8	Insulation thermal conductivity	W/mK
9	Surface Emissivity of insulation	
10	Insulation thickness	mm
11	Outside diameter of insulated pipe	mm
12	Annual operating hours	



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Pipe Insulation Calculator

Screenshot Pipe Group Results:

Pipe Group - Input Data

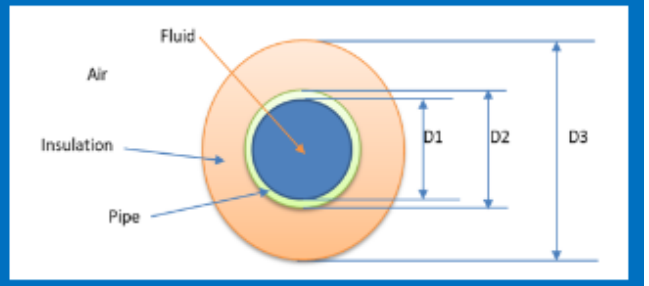
Pipe Group Reference:

Pipe:		
Linear Length		m
Inside Diameter (D1)		mm
Outside Diameter (D2)		mm
Fluid Operating Temperature		°C
Ambient Temperature		°C
Pipe Material		
Pipe material Thermal Conductivity (W/mK)		
Thermal System Efficiency factor		
Insulation Material		
Thermal Conductivity of Insulation		
Surface Emmisivity of Insulation		
Insulation Thickness		mm
Outside Diameter (D3)		mm
Annual operatal Hours		

Summary of energy savings:			0	
Input	Length of pipe upgrade		0	metres
	Nom. Diameter of pipe			mm
	Thermal System Efficiency factor		0%	
	Annual operatal Hours		0	hours
Output	Heat loss per unit area			W/m^2
	Heat Loss saved per linear length			W/m
	Pipe Group Energy saved per annaum			kWh
	Pecentage savings			
	Carbon Savings			Kg CO_2

Output : Heat Loss & Energy Saving calculation

Description	Unit of measure	Bare or uninsulated Pipe	Insulated Pipe	Heat Loss saving from insulation	Correction Percentage adjustment factor	Thermal System Efficiency factor
Heat Loss per Unit Area	W/m^2					0%
Surface Temperature	°C					
Heat Loss per Unit Length	W/m					0%



Results

Record calculation results here:

Pipe Group	Reference:	Final Energy Savings (kWh)
P1		
P2		
P3		
P4		
P5		
P6		
P7		
P8		
P9		
P10		
P11		
P12		
P13		
P14		
P15		
P16		
P17		
P18		
P19		
P20		
P21		
P22		
P23		
P24		
P25		
Total Final Energy Savings (kWh)		0

NREC application reference:	

Pipe Group 1

Please insert photos of before and after for pipe upgrade, along with Screenshot of Pipe Calculator results

Pipe Group Reference		
Before	After	Calculator

Pipe Insulation Calculator – A New savings Opportunities

- The pipe insulation tool has been developed this year to target energy savings in SMEs
- Obligated parties previously submitted a mixture of M&V and engineering calculations for pipe insulation projects. The tool has now standardised the approach for all obligated parties to determining energy savings from these projects.
- The tool was developed following increased interest in this project type over recent years
- SEAI actively engage with obligated parties, who are engaging with energy end user, to discuss new savings opportunities
- There is scope for the development of further tools to increase the viability of projects in the future

Thank you

@ seai_ie

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INDUSTRY PANEL 11:30 – 12:30

Achieving energy savings in industry

Moderator: Dusan Jakovlievic (EEIP)

- Heat recovery in industry: streamSAVE's practical guidance on standardised savings methodologies – Elisabeth Böck (AEA)
- Heat recovery in industry and supermarkets – view on quantification of energy savings – Torben Funder-Kristensen (Euroheat & Power)
- Audits for actions in SMEs: European Covenant of Companies for climate and energy – Karen Clements (Low Associates Brussels)
- Measuring energy savings in industry: the experience of the Italian white certificates scheme – Livio De Chicchis (FIRE)
- Q&A

Heat Recovery in industry: streamSAVE's practical guidance on standardized savings methodologies

June 6th, 2023

Elisabeth Böck (Austrian Energy Agency)

This project has received funding from the Horizon 2020 programme under grant agreement n°890147. The content of this presentation reflects only the author's view. The European Commission is not responsible for any use that may be made of the information it contains.

Guidance document

16 newly developed bottom-up calculation methodologies:
Estimation of energy savings:

- Calculation formula for Article 7 & Article 3 savings
- Indicative calculation values
- Explanation of methodological aspects
- List of data sources

- Estimation of relevant costs connected to energy savings actions
- Estimation of GHG savings

https://streamsave.eu/wp-content/uploads/2022/08/D2.2_PracticalGuidance_final.pdf

Heat Recovery in industry:
Bottom-up calculation methodologies

Methodologies developed

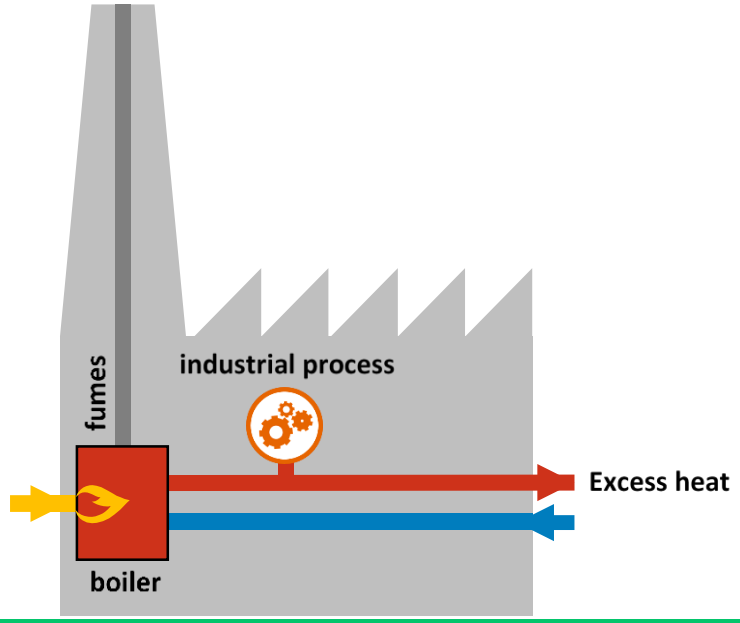
- Heat recovery for on-site use in industry – feedback of excess heat into process
- Heat recovery for on-site use in industry – use of excess heat for on-site applications
- Heat recovery for feeding into a district heating grid

Term of final energy savings

- In 2014 – 2020 period, Article 7 savings referred to "energy sales to final customers"
- Since the 2018 update, the Article 7 savings target is based on final energy consumption
- For heat recovery, this can lead to changes in eligibility due to some areas being considered part of the energy transformation sector and not final energy consumption

Baseline situation

- Heat production to operate an industrial process.
- Excess heat will be cooled down or get lost due to:
  - unusable temperature level after the process
  - different temperature levels in between production steps
  - Timely discontinuity of process cycles (e.g. shift operation of production)



Heat recovery: feedback into same process

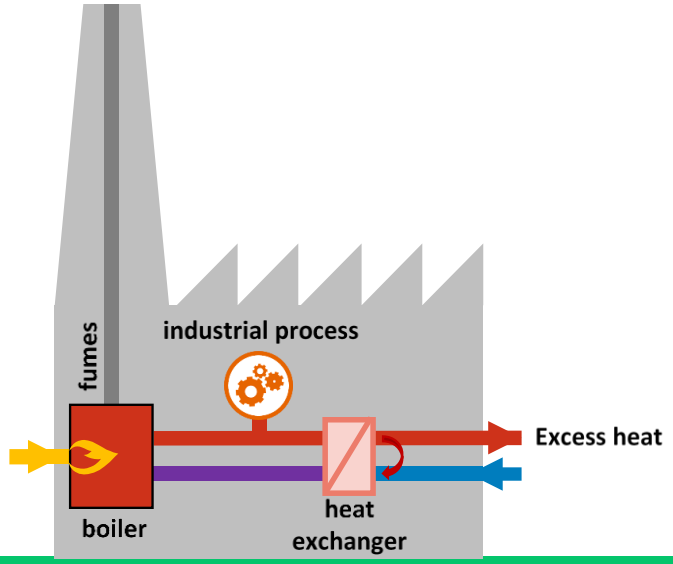
- Reduces the energy input by feeding back excess heat into the same process
- Final energy saving within the affected process

Calculation formula

specific energy consumption action

$$TFES = \left(\frac{FEC_{Baseline}}{po_{Baseline}} - \frac{FEC_{Action}}{po_{Action}} \right) \cdot \mathrm{po}_{Action}$$

specific energy consumption baseline



TFES	Total final energy savings [kWh/a]
FEC	Final energy consumption [kWh/a]
po	Production output [units/a]
Baseline	Index for the baseline situation of the action
Action	Index for the situation after implementing the action

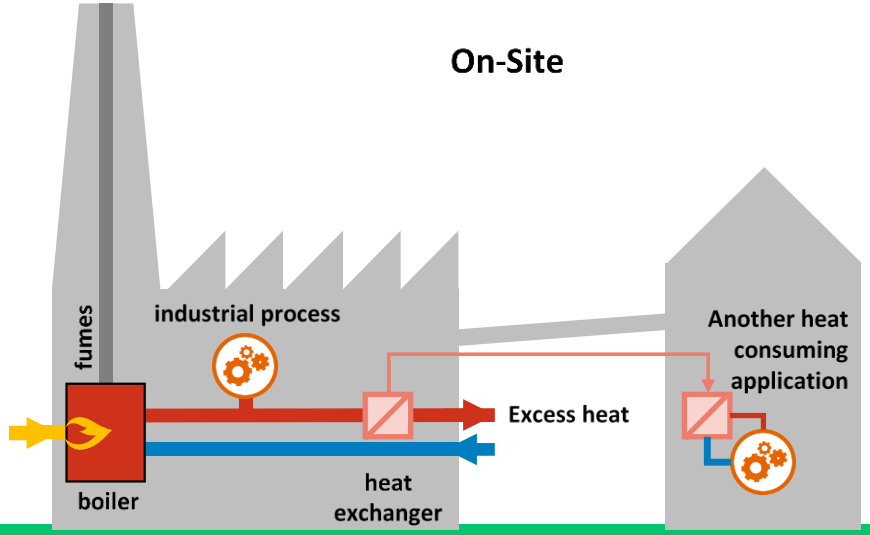
Do not forget the power inputs of auxiliary systems (i.e. additional pumping energy)

Heat recovery: feeding another application

- Reduces the energy input of another heat consuming application (e.g. space heating of on-site buildings, drying plants)
- Final energy saving on-site

Calculation formula

$$TFES = Q_{rec} \cdot \frac{1}{eff_{mhs}} \cdot f_{BEH}$$



TFES	Total final energy savings [kWh/a]
Q_{rec}	Recovered heat consumption of the application [kWh/a]
eff_{mhs}	Conversion efficiency of the main heating system of the relevant application [dmnl]
f_{BEH}*	Factor for correction of behavioural effects [dmnl]

* in case relevant; e.g. increased space heating temperature

Heat recovery: feeding into district heat

- Reduces the energy input of final customers (difference to reference heating system)
- Final energy savings occur at the final customer:

Conversion efficiency of a reference heating system

(e.g. combination of heating systems installed according to national/regional statistics)

VS

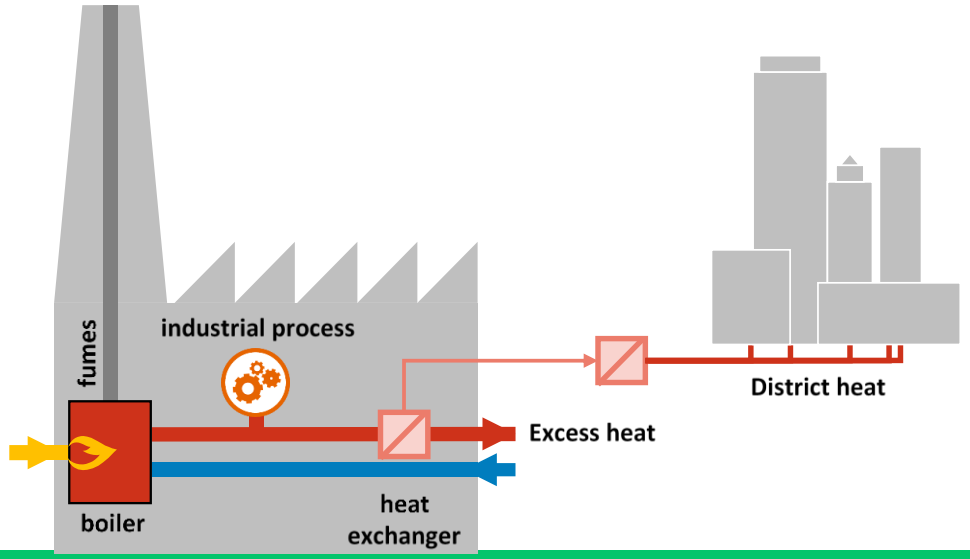
Conversion efficiency of district heating

Heat recovery: feeding into district heat grid

Calculation formula

$$TFES = Q_{EH} * (1 - HL_{DHG}) * \left(\frac{1}{eff_{Baseline}} - \frac{1}{eff_{Action}}\right) * (1 - f_{ei}) * (1 - fBEH)$$

baseline energy consumption — savings — extrinsic effects



TFES	Total final energy savings [kWh/a]
Q_{EH}	Excess heat fed into the district heating grid [kWh/a]
HL_{DHG}	Heat losses in the district heating grid [dmnl]
$eff_{Baseline}$	Conversion efficiency of the reference heating systems [dmnl]
eff_{Action}	Conversion efficiency of the district heat consuming heating systems [dmnl]
f_{ei}	Factor to calculate extrinsic incentives [dmnl]
f_{BEH}	Factor to calculate rebound effects [dmnl]

Thank you

Get in touch for more information!

Project coordinator - Nele Renders, VITO

All project reports will be available for download on the streamSAVE website www.streamsave.eu

Email the project at contact@streamsave.eu

Follow the project on LinkedIn @streamSAVEH2020

Follow the project on Twitter @stream_save

ENGINEERING
TOMORROW

Heat Recovery in Supermarkets and Industry

Torben Funder-Kristensen

Excess heat feeding into the district heating network

The calculation methodoligies are used on a Supermarket case and a Brickyard

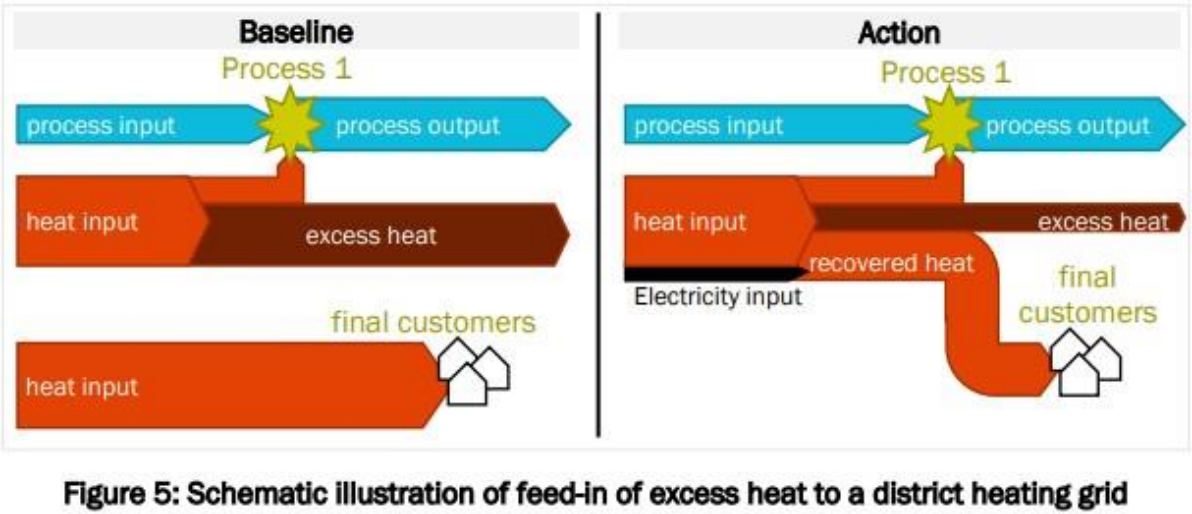


Figure 5: Schematic illustration of feed-in of excess heat to a district heating grid

Final energy savings at end customers:

$$TFES = Q_{EH} \cdot (1 - HL_{DHG}) \cdot \left(\frac{1}{eff_{Baseline}} - \frac{1}{eff_{Action}}\right) \cdot (1 - f_{ei}) \cdot (1 - f_{BEH})$$

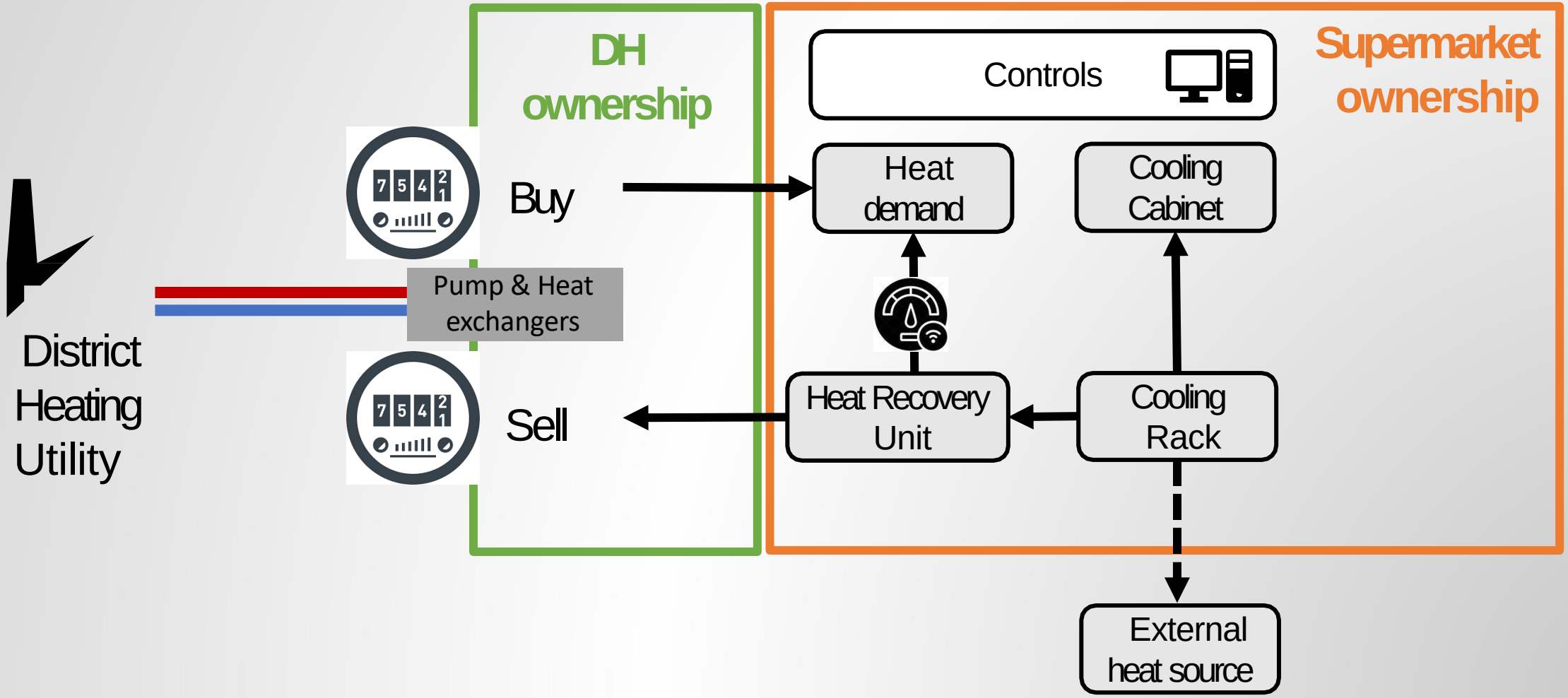
TFES	Total final energy savings [kWh/a]
Q_{EH}	Excess heat fed into the district heating grid [kWh/a]
HL_{DHG}	Heat losses in the district heating grid [dmnl]
$eff_{Baseline}$	Conversion efficiency of the reference heating systems [dmnl]
eff_{Action}	Conversion efficiency of the district heat consuming heating systems [dmnl]
f_{ei}	Factor to calculate extrinsic incentives [dmnl]
f_{BEH}	Factor to calculate rebound effects [dmnl]

Effect on primary energy consumption at end customers:

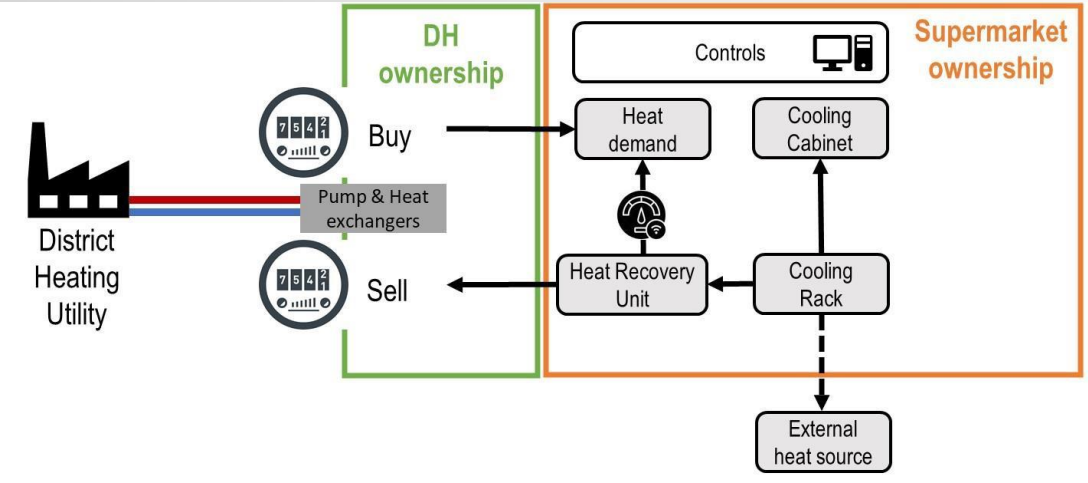
$$EPEC = Q_{EH} \cdot (1 - HL_{DHG}) \cdot f_{PE}$$

EPEC	Effect on primary energy consumption [kWh/a]
Q_{EH}	Excess heat fed into the district heating grid [kWh/a]
HL_{DHG}	Heat losses in the district heating grid [dmnl]
f_{PE}	Primary energy factor of the reference heating system [dmnl]

The outline of a ‘prosumer’ supermarket in Denmark



The EU perspective of aggregating Supermarkets



Number of supermarkets in the EU : 230.000

Basic Excess Heat generation : 30 TWH/a

TFES = 0,11*30 = 3,3 TWH/a
EPEC = 0,90*30 = 27 TWH/a

Potential Heat Pump operation : 70 TWH/a

EPEC = $EPEC_{gas}$ - $EPEC_{el}$ = 10 TWH/a

$EPEC_{gas}$ = (1-DHL)*PEF_{gas}*Q_{EH} = 0,90*70 = 63 TWH/a (gas)
$EPEC_{el}$ = PEF_{el}*Q_{EH}/COP = 2,28*70/3 = 53 TWH/a

Local PEF for Wind based elecricity can reduce $EPEC_{el}$

Technologies are developed and ROI is always below 3 years:

In operation : 150 supermarkets

12 month outlook : 200 new installations

Specific state of the art Case

SuperBrugsen in city of Augustenborg:

- **All** internal heating demands are covered and the heating bill reduced from 13.500 to 1.350 €/a

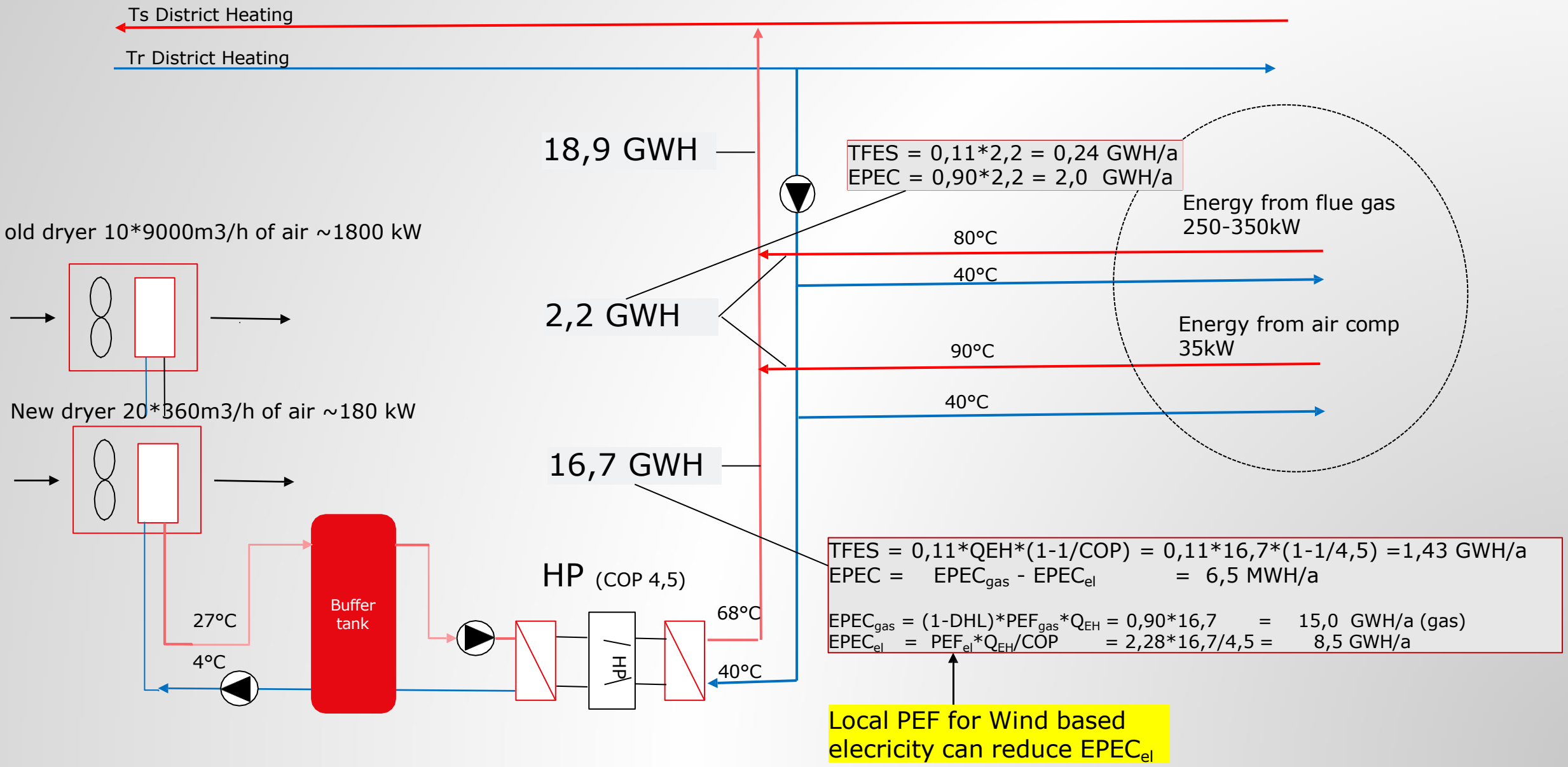
- 15 family dwellings are additionally heated by DH with heat from the supermarket

Brickyards are obvious sources of Excess Heat

- Situated in Graasten Denmark
- MW of (gas fired) heat consumed for owens and to dry the bricks
- District Heating will be connected to the facility in 2024
- DH feed of heat usage from flue gas and air compressors
- Most recovered heat needs upgrading from heat pumps

Heat recovery from this brickyard is equivalent to the potential of 20 supermakets

Principles for heat recovery



European Commission

EUROPEAN
COVENANT OF COMPANIES
FOR CLIMATE AND ENERGY

No net zero without SMEs

Karen Clements, Project Coordinator

CCCE Secretariat

What is the Covenant of Companies?

- A new pilot initiative led by the European Commission (DG Energy) to **encourage and support companies** to step up their contribution to a **clean energy transition**.
- Provides **a pledging scheme** encouraging businesses, **in particular SMEs**, to commit to take action to reduce their carbon emissions. Companies can choose from different **levels of commitment** which reflect where they are on their journey to decarbonisation.
- Whatever the commitment, companies will receive practical, step-by-step **guidance and/or technical assistance** to help them take concrete actions resulting in the decarbonisation of their businesses.
- Recognises the steps taken by companies with a **'Seal of Approval'** scheme.
- Duration: January 2022 – December 2023

Why is it important?

- **24 million** small and medium enterprises (**SMEs**) in the EU make up **99,8% of all EU businesses**.
- **SMEs** contribute to **64% of industrial pollution** in Europe.
- **40-45% of SMEs** are considered to have a **large environmental impact**;
- By supporting and recognising the efforts of companies – no matter how big or small – to **induce bottom-up change**, the Covenant of Companies can help reach **the 55% emissions reduction targets by 2030**.

How will it achieve this?

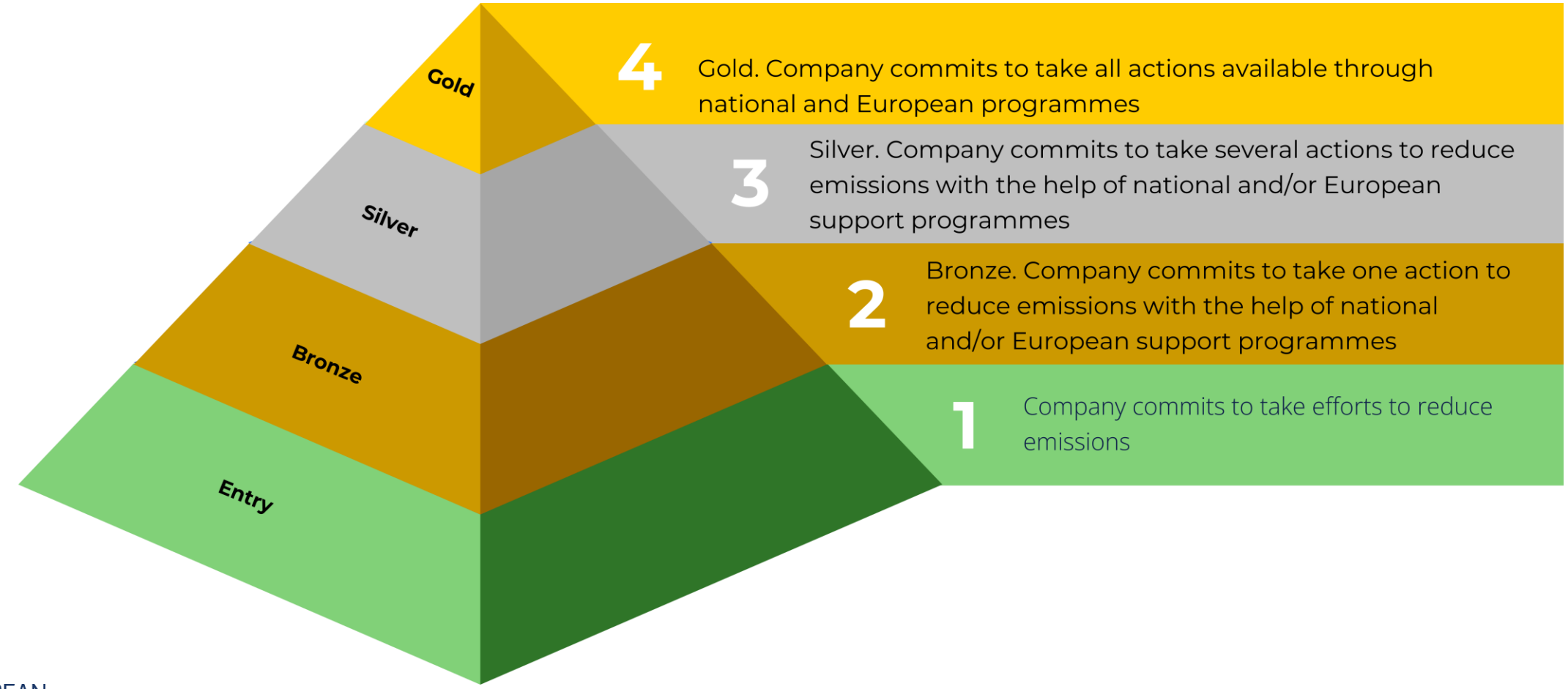
PLEDGING AND RECOGNITION

- The initiative offers a pledging scheme with several levels of recognition (entry, bronze, silver and gold).
- The entry level of commitment looks at finding ways to trigger a company's awareness and understanding of which actions are crucial for business and planetary survival.
- Bronze, silver and gold encourage and support companies to take one or more concrete measures to reduce their GHG emissions.

ADVISORY SERVICES/TECHNICAL ASSISTANCE

- Provide practical advisory services to European companies to help them decarbonise.
- Two calls for technical assistance for companies: the first one in June 2022. The second from May 2023.
- Guidance documents and other useful resources available online, but also peer-to-peer learning and masterclasses.
- Encourage business investment in clean energy solutions/technologies to help mitigate climate change while also improving business performance.

The CCCE pyramid approach



EUROPEAN
COVENANT
OF COMPANIES
FOR CLIMATE AND ENERGY

An initiative of the European Commission

Who can pledge and apply for assistance?

- The Pledging is open to **companies in all 27 EU Member States** (and groups of companies)
- **Technical Assistance** can be delivered in **Bulgarian, Dutch, English, French, German, Lithuanian, Romanian and Spanish**.

How to get involved

- Make a Pledge on the CCCE website
- Become an Ambassador
- Join our Partner network

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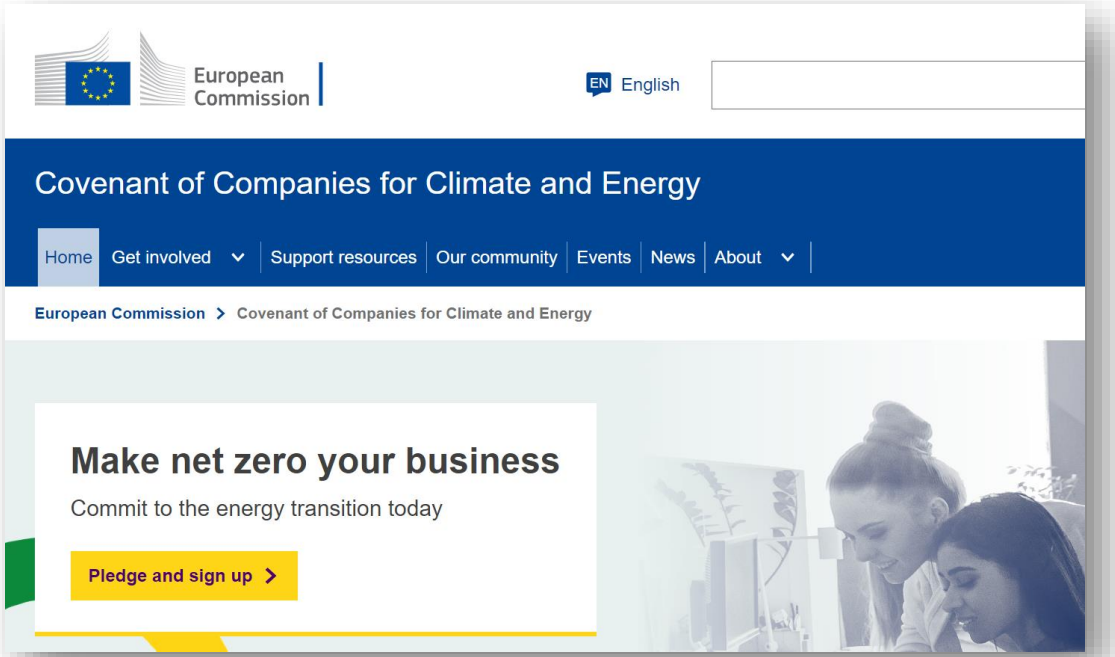
CCCE Website & Newsletter

Website:

https://covenant-of-companies.ec.europa.eu/index_en



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DEESME

Recast EED

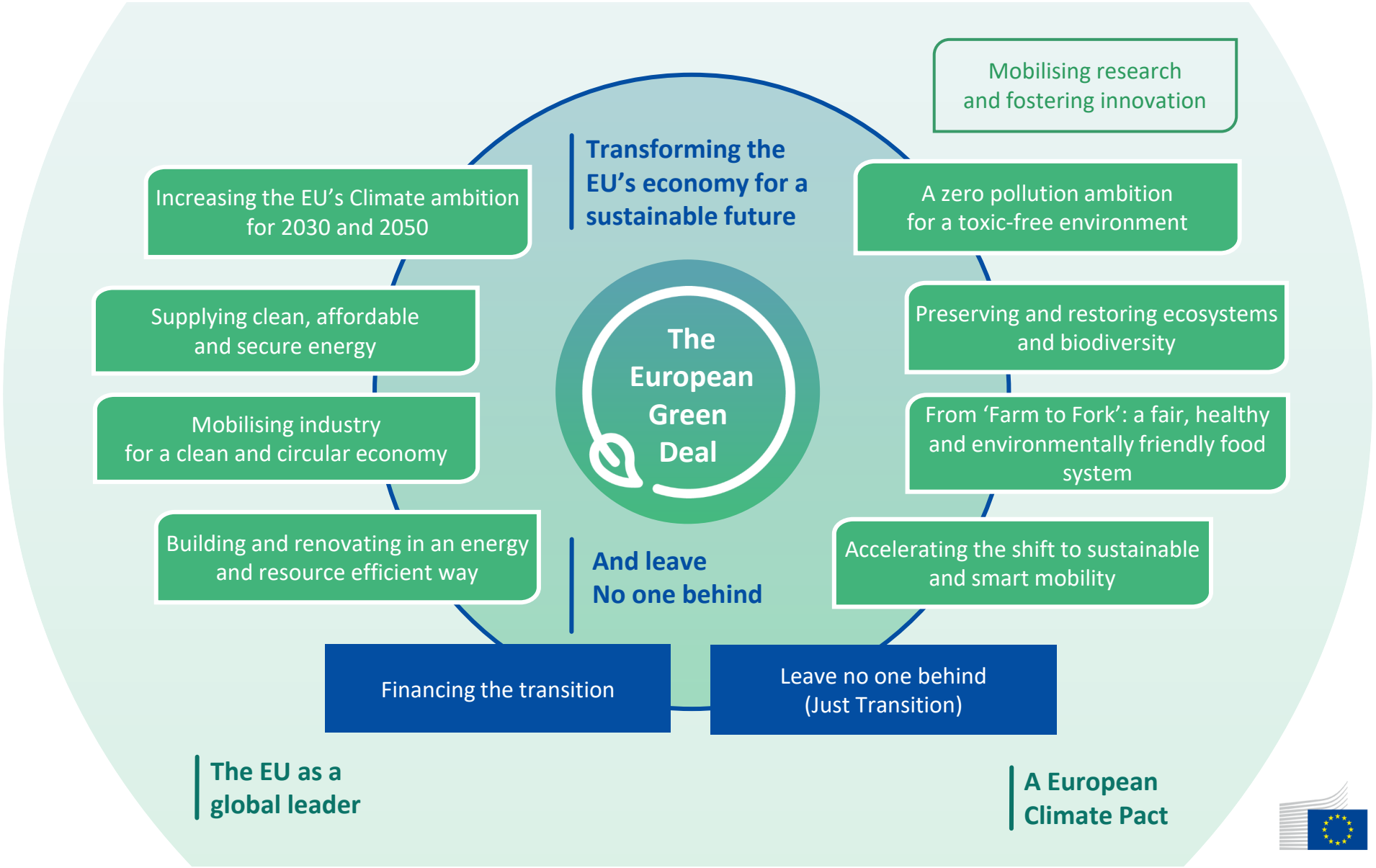
Articles 4, 8 and 11

targets
energy savings obligation
energy efficiency in industry

6th June 2023

Heidi Adensam, Policy Officer, Energy Efficiency Unit - ENER.B2

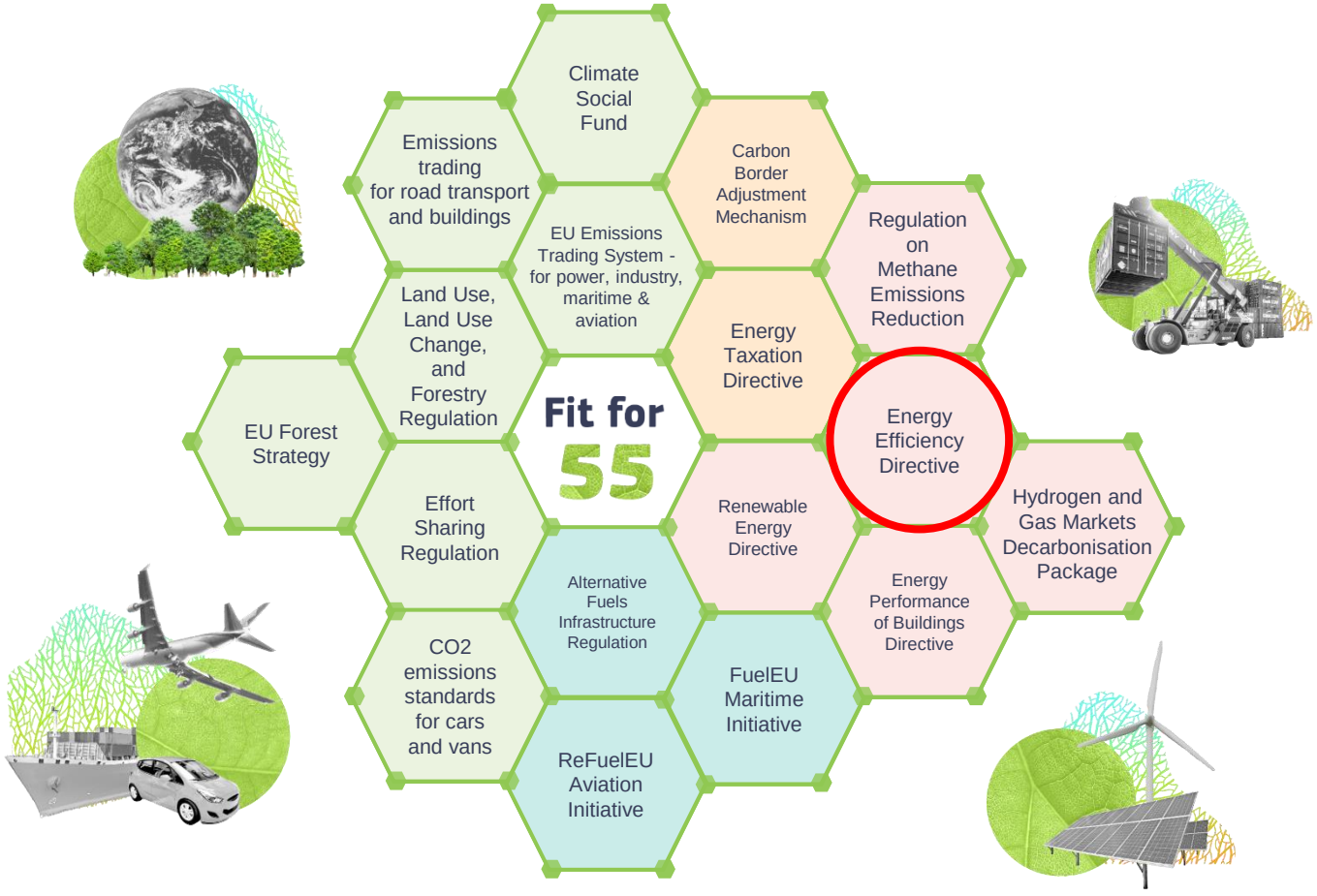
The European Green Deal



European Commission

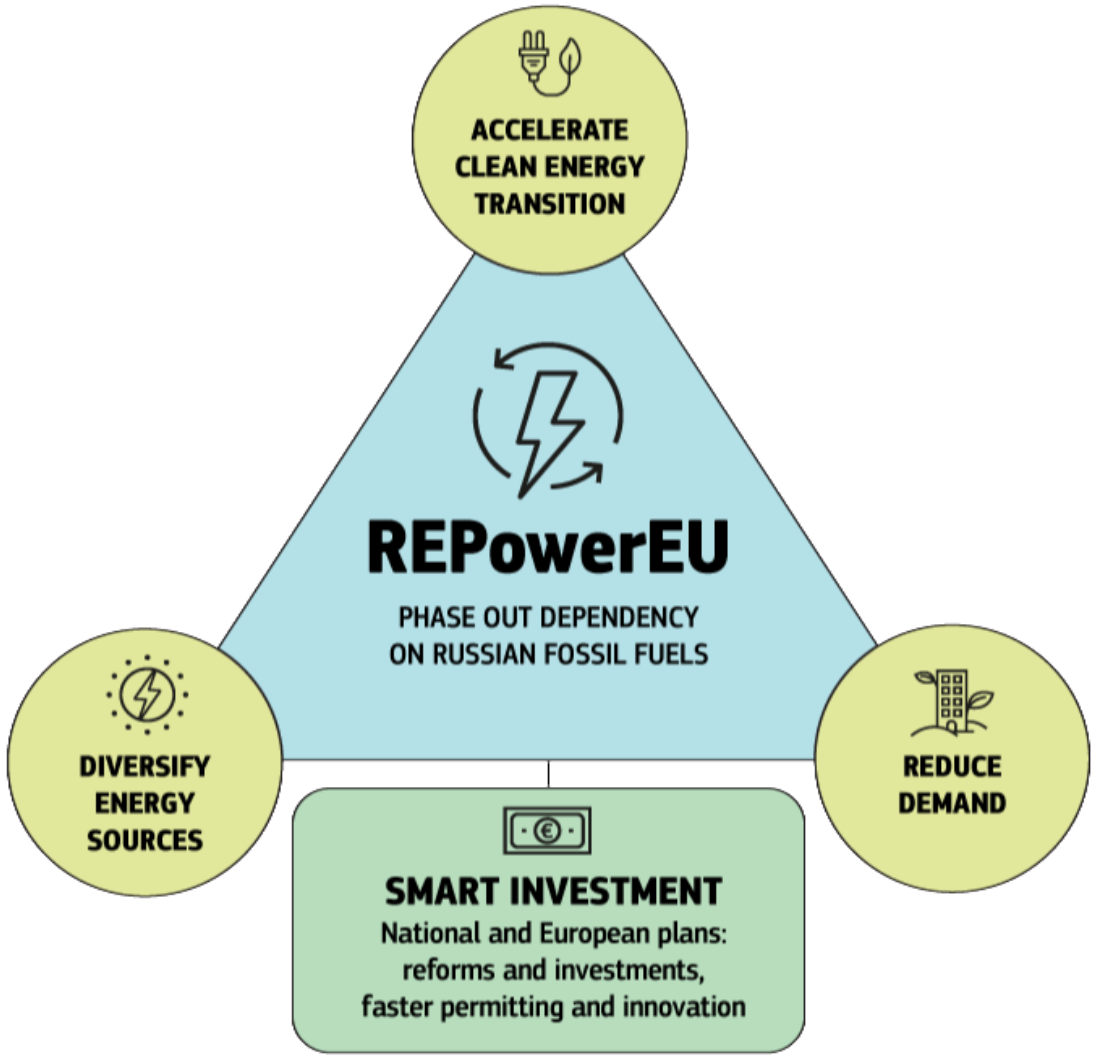
Fit for 55 package of proposals

The **Fit for 55 Package** consists of a set of **interconnected proposals** that strike a balance between pricing, standards and support measures **to achieve the energy and climate targets**.



European Commission

REPowerEU



Increase the target of renewable energy from 40% to **45%** by 2030

Increase the target of energy savings from 9% to **13%** by 2030

Complemented by:

- EU Save Energy Communication
- EU Solar Energy Strategy

European Commission

Revising the Energy Efficiency Directive

ambitious targets and new instruments

- ‘Energy Efficiency First’ Principle – making it an integral part of policy and investment decisions
- Binding EU energy efficiency target & indicative national contributions
- Strengthened energy savings obligation in end-use
- Stronger exemplary role of public sector
- Increased focus on alleviating energy poverty and consumer empowerment

Ambitious targets - recast EED Article 4

- energy efficiency targets 9% in FF55 and 13% in REPowerEU proposals
- Updated in EED **to 11.7% reduction for 2030 compared to forecasts made in 2020**
- for primary and final energy consumption
- requires EU Member States to collectively reduce final and primary energy consumption

New instruments recast EED article 8 and 11

- **national energy saving obligations** nearly doubles on average with step-wise approach
- **new thresholds for energy audits and energy management system** requirements for enterprises

<u>Linked to articles 8 and 11:</u>

- **Increase the exemplary role from the public sector**
- Reinforce provisions on financing to leverage further private capitals
- Introducing measures to alleviate energy poverty and boost consumer empowerment

Other key-initiatives

Revision Electricity Market Design

- Accelerate/accommodate further renewables and phase-out fossil fuels
- Better protect consumer from price volatility and enhance their participation

Digitalising the energy system

- Support digital tools and services to help consumers and enterprises monitor their energy consumption and further energy system integration
- Monitor energy consumption and increase energy system integration of ICT sector;

Revising renewable energy directive

- Increase RES target by 2030 to 42.5%
- accelerating RES permitting, overriding public interest and ‘go to areas’
- Sustainable bioenergy reinforced criteria in line with the EU Biodiversity Strategy

Net-Zero Industry Act and Green Deal Industrial Plan

- Scale up manufacturing of clean energy technologies in the EU
- Facilitate access to market and enhance skills for clean energy transition

Sustainable Finance and unlocking private financing

- Enable the framework to develop innovative financing solutions and financial products for investment in sustainable energy
- Mainstream sustainable energy investments in the financial sector and support EU Taxonomy alignment

Revising energy performance of buildings directive

- Provide a long-term vision for buildings
- Minimum Energy Performance Standards
- Introduction of zero-emission buildings as new standard for new buildings

Thank you

Heidi Adensam, Policy Officer, Energy Efficiency Unit - ENER.B2

European Commission

Measuring energy savings in industry: the experience of the Italian white certificates scheme

Livio De Chicchis, FIRE

DEESME and StreamSave final conference

June 6, 2023

FEDERAZIONE ITALIANA PER L'USO RAZIONALE DELL'ENERGIA

FIRE: Italian energy efficiency association

SINCE **1987**

www.fire-italia.org

The scheme basics: EEO + certificates trade

Source: FIRE.

WhC: white certificates scheme
EEO: energy efficiency obligation
DSO: electricity and gas distributor
EnMS: energy management systems

White certificates are obtained for a period of time that varies from 3 to 10 years according to the complexity of the implemented energy efficiency action. All sectors are virtually eligible. 1 WhC = 1 primary energy toe saved.

Evaluation of energy savings and M&V

Deemed savings projects

The method is easy to use and facilitates the evaluation.

Savings are just estimated. Need for policy makers to evaluate effective savings ex- post, which can be complex.

Certificates are generated soon after the implementation of the action.

Required documentation: choice to go easy or bureaucratic. In the first case possible risk of large frauds over time.

Importance to check proponents and not only projects to avoid frauds.

On field controls are expensive.

Possibility to pre-evaluate energy efficiency products in order to simplify evaluation.

Monitoring plan projects

The method is usually complex.

Savings are measured (approach in line with IPMVP option B).

Certificates required time to be generated (ex-post metering).

Required documentation: is usually substantial, but the size of the project allows it.

Effort required to present the project both for the proponents and the evaluators. Shall project data be available for everybody?

On field controls are usually a viable option.

Very flexible approach, but requires discussion, information, and training.

Both approaches have pros and cons and the best option is probably to use them both.

What is included in a project application

Project description, including ex-ante situation and expected modifications.

Definition of M&V programme (metered variables, installed meters, algorithm, adjustments, etc.).

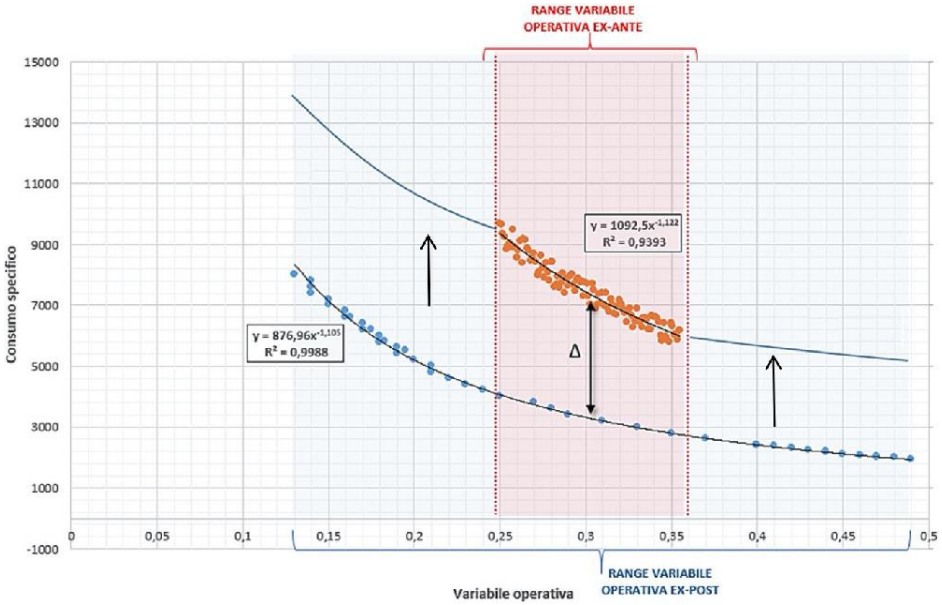
Ex-ante energy consumption and adjustment variables values or evaluation of reference baseline for new installations.

Information and documentation on the start-up date of the project.

Other information (e.g. information on the proponent, periodic verification of meters, other incentive used, etc.).

After the proposal is accepted, year by year request for certification are presented with data on ex-post measurements.

M&V baseline adjustments and statistics



In the Italian WhC the evaluation of ex-ante energy consumption shall be based on a year of measures, implemented with hourly meters.

This represents one of the main challenges for proponents, especially when the required meters are not available when the project starts to be discussed.

A guide is dedicated to the methodologies eligible to evaluate the ex-ante energy consumption when data are available for periods of time below one year.

There are also sectoral guidelines that describe the main energy efficiency measures eligible in each sector (both process related and cross-sectoral) and the consumption baselines that can be considered as references.

Source of figure: GSE.

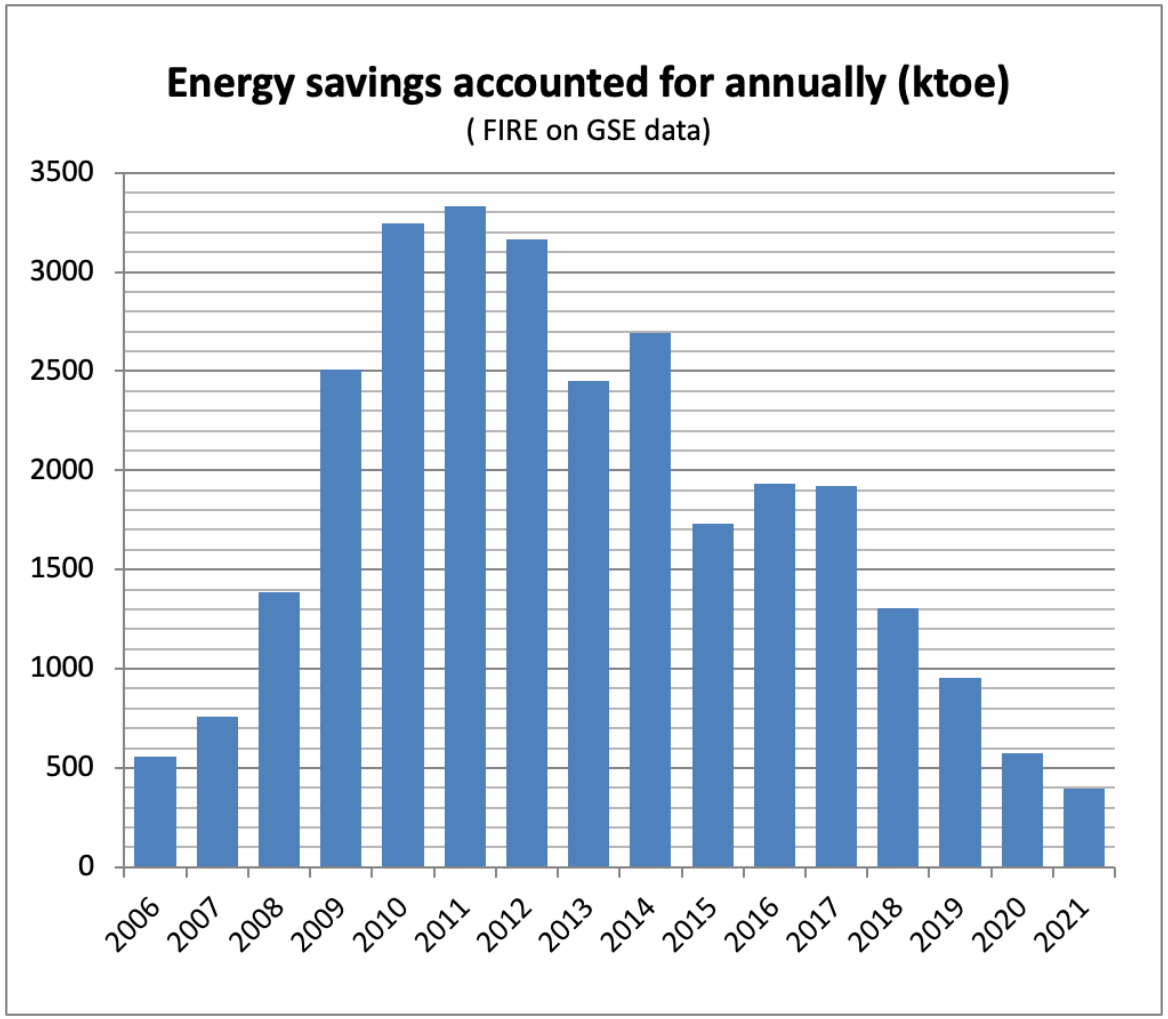
Lessons learnt from M&V in WhC 1/2

- M&V based on IPMVP option B or similar approaches is complicated, but feasible with the size of projects typical of the industrial sector.
- High quality M&V improves projects quality, qualifies operators, and provides a lot of valuable data to managing authorities.
- Metered savings stimulates proponents to achieve high performance, since the incentive is based on the real results.

Lessons learnt from M&V in WhC 2/2

- High quality M&V needs support in terms of information, training and continuous communication with market operators.
- Flexibility should be granted in terms of meters' requirements and ex-ante baselines evaluation.
- Finding out the right mix between easy of use and strictness is important to avoid disaffection and to maintain cost-effectiveness.

What happened in terms of savings



The reasons behind the reduction of accounted savings:

- from 2013 only projects yet to be built can be presented;
- from 2015 short pay-back time projects exclusion;
- 2017-2018 large frauds discovered;
- from 2017 only metered projects with stricter rules on M&V.

ITALIAN FEDERATION
FOR ENERGY EFFICIENCY

Thank you!

www.facebook.com/FIREenergy.manager

www.linkedin.com/company/fire-federazione-italiana-per-l'uso-razionale-dell'energia

www.twitter.com/FIRE_ita

PRIORITIES PANEL 13:30 – 15:00

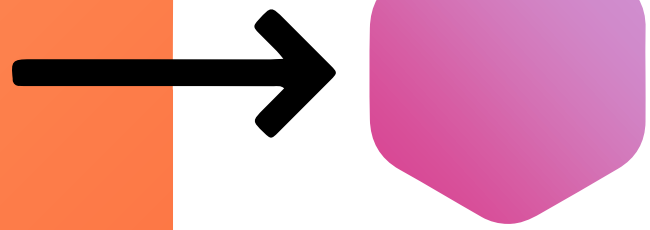
Future of energy savings and beyond in the context of the EED recast

Moderator: Jean-Sébastien Broc (IEECP)

- Priorities of the EED recast: Article 4, 8 and 11 – Heidelinde Adensam, European Commission (DG ENER)
- Developing the ESCO market and the assessment of energy savings: the German experience – Rüdiger Lohse (EDL_HUB, DENEFF)
- Auditing and managing: DEESME's tools, integration of multiple benefits – Laura Bano (SOGESCA)
- From voluntary agreements towards energy savings obligations – actions towards energy efficiency 2030 targets & beyond: The Netherlands – Jorieke Rienstra (RVO)
- Pay-for-Performance schemes and other ways to develop measured energy savings: concrete examples from the SENSEI and ENSMOV Plus projects – Marion Santini (RAP)

Session in partnership with ENSMOV PLUS

EDL_HUB

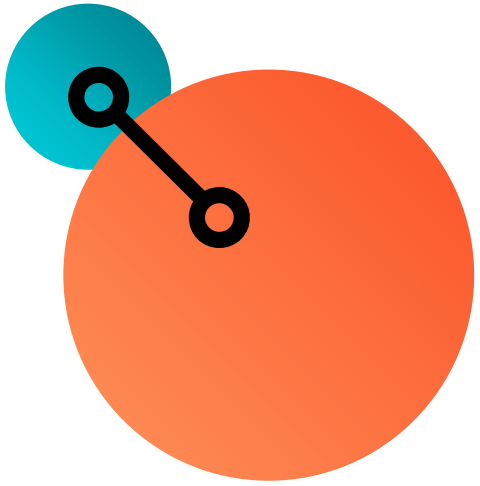


DENEFF EDL_Hub- The Strong Voice for Decarbonization as a Service in Germany.

Development of the German ESCO Market, Challenges and Best Practices.

Brussels 6. June 2023 | Rüdiger Lohse, MD

Energy Service Market in Germany: 75% of the ESCO Market Potential still untapped as level playing field for ESCOs does not exist



German ESCO Market:

- ESCO Market Volume 2020/21: 8-10 Mrd. €, static
- > 100 ESCOs on national and regional level
- 90% Providing Energy Supply Solutions

2020 / 2021 ESCO Market Report provided by BAFA/BfE

- Stagnating Market nvestive ESCO products
- Overregulation in Housing Sector and Industry
- 75% of Market Potential is still untapped
- No Level Playing Field for ESCos

Energy Policy and Market Framework has changed disruptively in 2022- providing huge challenges and opportunities for Energy Service Companies…

Energy Services Strategy 2045 by DENEFF
EDL_HUB 2019/2020

...to be successful ESCo Business Models need to be Adopted to the Needs of Target Groups with regard to their specific Technical and Organizational Demands...

Energy Services Strategy 2045 by DENEFF
EDL_HUB 2019/2020

…which leads to ESCo Toolbox Business Models and Contracts replacing more and more the two standard contracts for Energy Performance Contracting (pay-as-you-save) and Energy Supply Contracting…

…and while technical and organizational complexity and the need for funding increases drastically user demands make ESCos venture in a more broader scope of services and technologies provided in a „one-stop-shop-solution“.

Energy Services Strategy 2045 by DENEFF
EDL_HUB 2019/2020

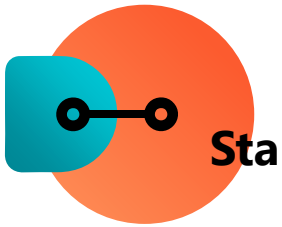
DENEFF EDL_HUB: Innovation and Association Hub with Major German ESCOs and the Purpose of Professional Decarbonizers since 2020

DENEFF EDL_HUB: Mission and Vision- Help Creating Framework Allowing ESCos to Work Succesfully as Professional Decarbonizers

Policy HUB

We Contribute Strongly to Create Level-Playing Field for ESCOs in Germany in the EU Context

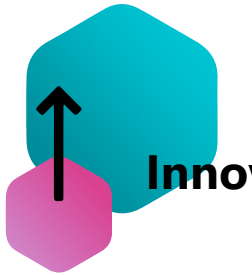
- **Prio 1: „**Level Playing Field“ for ESCos in terms of the recent EED Art. 26 in 2023
- **Prio 2:** Non-discriminatory access to funding and subsidy programmes
- **Prio 3:** Revise discriminatory regulation in Building-, Industry- and B2C Sector



Stakeholder HUB

Creating Interaction Between Stakeholders

- **Connecting** ESCOs and Stakeholders
- **Enhancing** interaction between ESCOs, Suppliers and Energy Consumers
- **Create** broad acceptance in target groups and especially SME and End Consumers (Heating Grid)



Innovation HUB

- **Inkubation and Fertilization of innovative Business and Finance**
- **Strategic Market Development** for Dis-functional Markets in Research Projects on IEA, EU and national level
- **Finance:** Integrate ESCo into the Green Financing Schemes as Performance Assured System Providers
- Social Decarbonization: affordable building renovation with ESCos financing and De-risking

EDL_HUB

Lessons Learnt:

Disruptive Changes in Framework-Impacts on the Business Model and the M&V

EDL_HUB

The Political Agenda, new User Demands have Sparked Disruptive Changes and Frictions in the ESCO market since 2021- replacing „old school“ ESCo approaches

Challenges: Policy & Society

- Climate Protection has become Main Stream
- Decarbonization Target 2045 for Buildings and Industry
- 65% Renewable Energy in the Heating Market
- Energy Security and Independance
- Building Sector: MEPS
- Factor 3 Heating Grids 2045

….changing User Demands

- Reduction of Coordinative Effort: One-Stop-Shops instead of complex multi tasking of dozens of partners
- Longterm Partnerships instead of Project approaches
- Simple Front End Solutions-moving complex structures into the back end

…require innovative Responses !

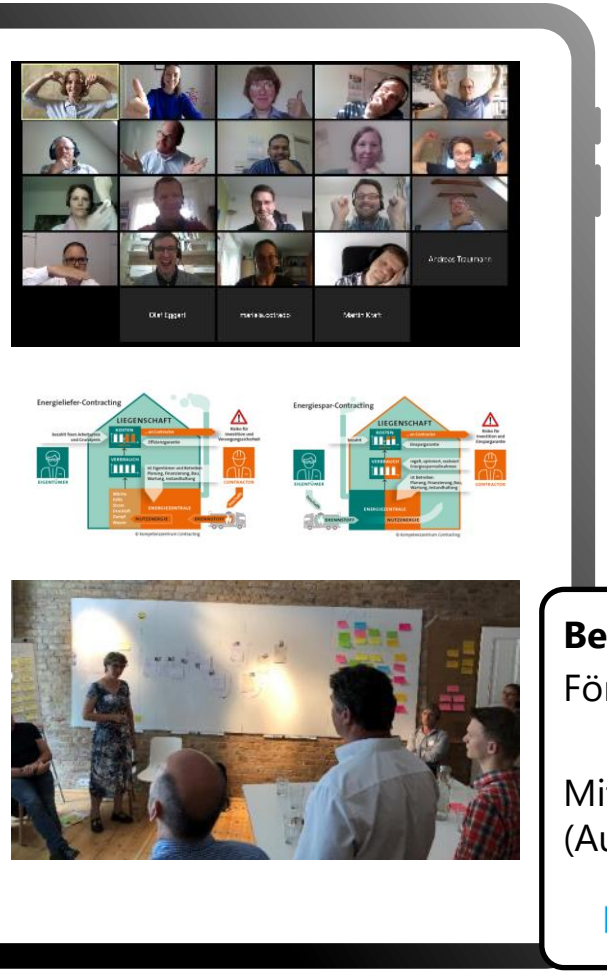
- „old school“ Business Models „ESPC“ and „ESupplyC“ do not match with user needs (scope of work, complexity)
- Mixtures and tool-box approaches replace the „old school“
- Detailed M&V highly complex and time consuming replaced by
  - „5%-tolerance saving scope“,
  - No-penalty when missing
  - Mutual maintenance finance pools
  -

EDL_HUB

…ESCo ESPC M&V is priority 5 in Hospitals in Germany when it comes to decision making pro or against ESCo

Result of Interviews with leading hospital carrier companies in DE 2021 in the CoSo Project

Best Practice: Adoption of ESCO Services to Specific Requirements of Hospitals in the Project CoSo



Target

- Increase Opportunities for ESCOs in the Hospital Sector
- Help Hospitals and Retirement Homes to Cut Energy Cost Bills
- Create Standard Contracts

Key Achievements

- Stakeholder Process with all major German hospital owner associations and hospital groups
- Demand Profiles for Hospitals and Retirement Homes
- Adoption and Match-Making Workshops with ESCOs and Hospitals
- Pilot Projects with technical and business scope adopted to the needs of Hospitals

Beteiligte

Förderer: Bundesministerium für Wirtschaft und Energie

Mitwirkende & Anwender (Auswahl): KEA-BW, bpa, Diakonie, HFT Stuttgart, zafh.net, AWO

Next Steps

- Trainings for Hospital Owners- how to cut costs now
- Set up of new project: One Stop Shop for Hospitals- Information, Finance Diligence, Transformation Roadmap Services and Investment specifically drawn to the demand of hospitals

DENEFF EDL_HUB innovation Hub is Tackling also Other Disfunctional Market Sectors of High Relevance for ESCOs

Home Owner Associations

20% of Housing in Germany is organized in HOAs

Refurbishment Rate < 1%

Issue

Low Refurbishment Activities

Complex Approach for ESCOs and Financiers to conduct Deep Energy Retrofits

Approach

- EU Project GREEN home
- Creating One Stop Shops with ESCOs, Financiers, Consultancies
- Learning from LaBeef

SME Financing of Energy Investements:

Finance Industry does not provide financing approaches for Energy Efficiency Investments

- Lack of Finance Products and Energy Service Approaches for SME Decarbonization
- Finance: mismatch of costs for due diligence and project size

- Effinvest.de- DENEFF has set up the first finance plattform for financing energy investments in SME
- Launch in Berlin October 13, 2022
- Handover to SME Bank January 2023

Affordable Decarbonization for Financially Vulnerable Person Groups

- Low Income Person Groups live in the least efficient building stock
- Price volatilty hurts the most here
- Additional financial burdens are not

- ESCo pay as you save Models provide annual rates and cost neutral approaches
- ESCo and Mortgage Banks provide Service+Finance
- Risks dilution in financing pools
- Remaining Risks partly covered by FedGov

EDL_HUB

Contact

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Managing Director DENEFF EDL_HUB

E-Mail: ruediger.lohse@edlhub.org

DEESME

National schemes for energy efficiency in SMEs

DEESME has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 892235.

Auditing and Managing: DEESME's tools, integration of multiple benefits.

DEESME Final Event

6 June 2023

Bruxelles, COMET Louise

Laura Bano, SOGESCA srl

Auditing and Managing:
DEESME's tools, integration of Multiple Benefits

DEESME suggests **approaching energy efficiency investments from a strategic perspective.**

The recognition of the multiple benefits that go along with energy efficiency is **based on the analysis of the business model.**

The following tools were developed to show companies how to take profit of energy efficiency by assessing and managing the integrated aspects according to the Multiple Benefits approach:

- ✓ Multiple Benefits approach to energy audit
- ✓ The Energy Management System supporting the Multiple Benefits approach
- ✓ Investments analysis according to Multiple Benefits Approach

DEESME

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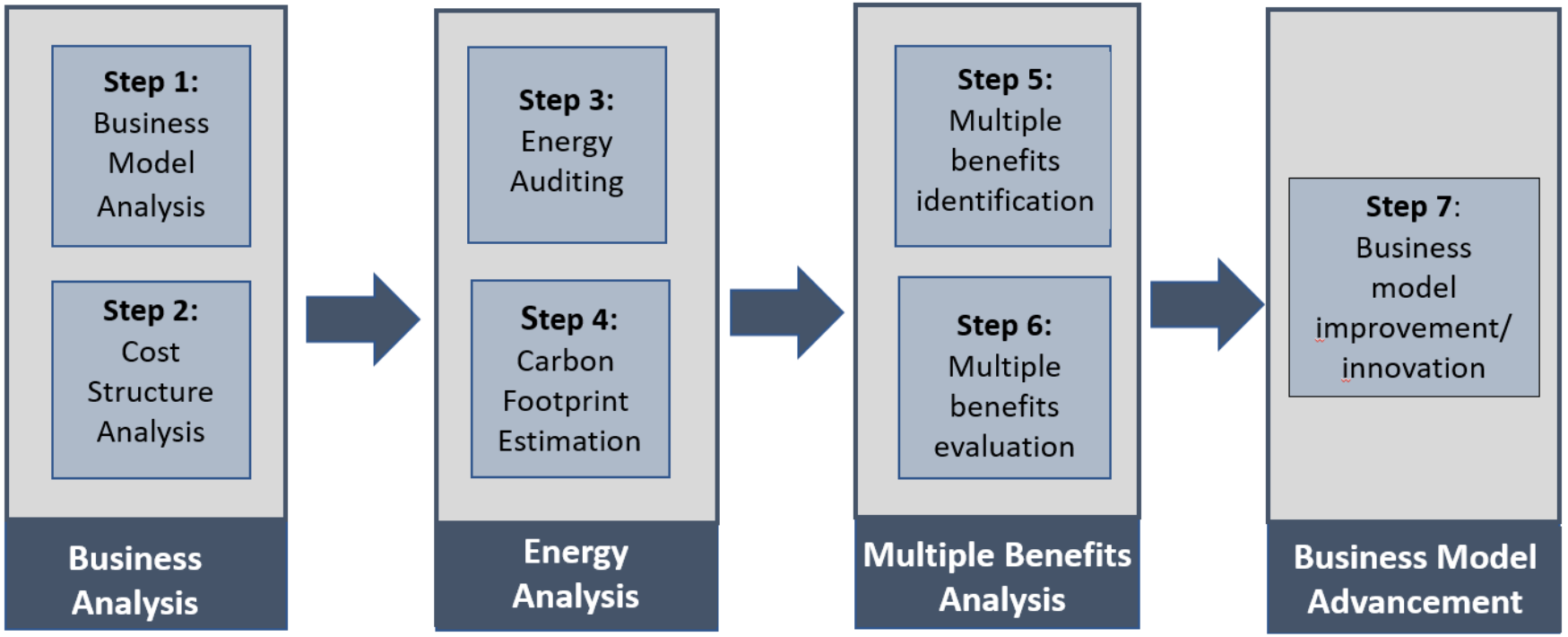
Multiple Benefits approach to Energy Auditing

DEESME has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 892235.

Multiple Benefits approach to Energy Auditing: methodology

The proposed DEESME multiple benefits approach to energy auditing combines business model analysis with energy efficiency in order to achieve a dual objective:

- ✓ relate the energy efficiency decisions with the attainment of the general business objectives
- ✓ introduce concepts of energy efficiency and sustainability in the business modelling analysis



DEESME

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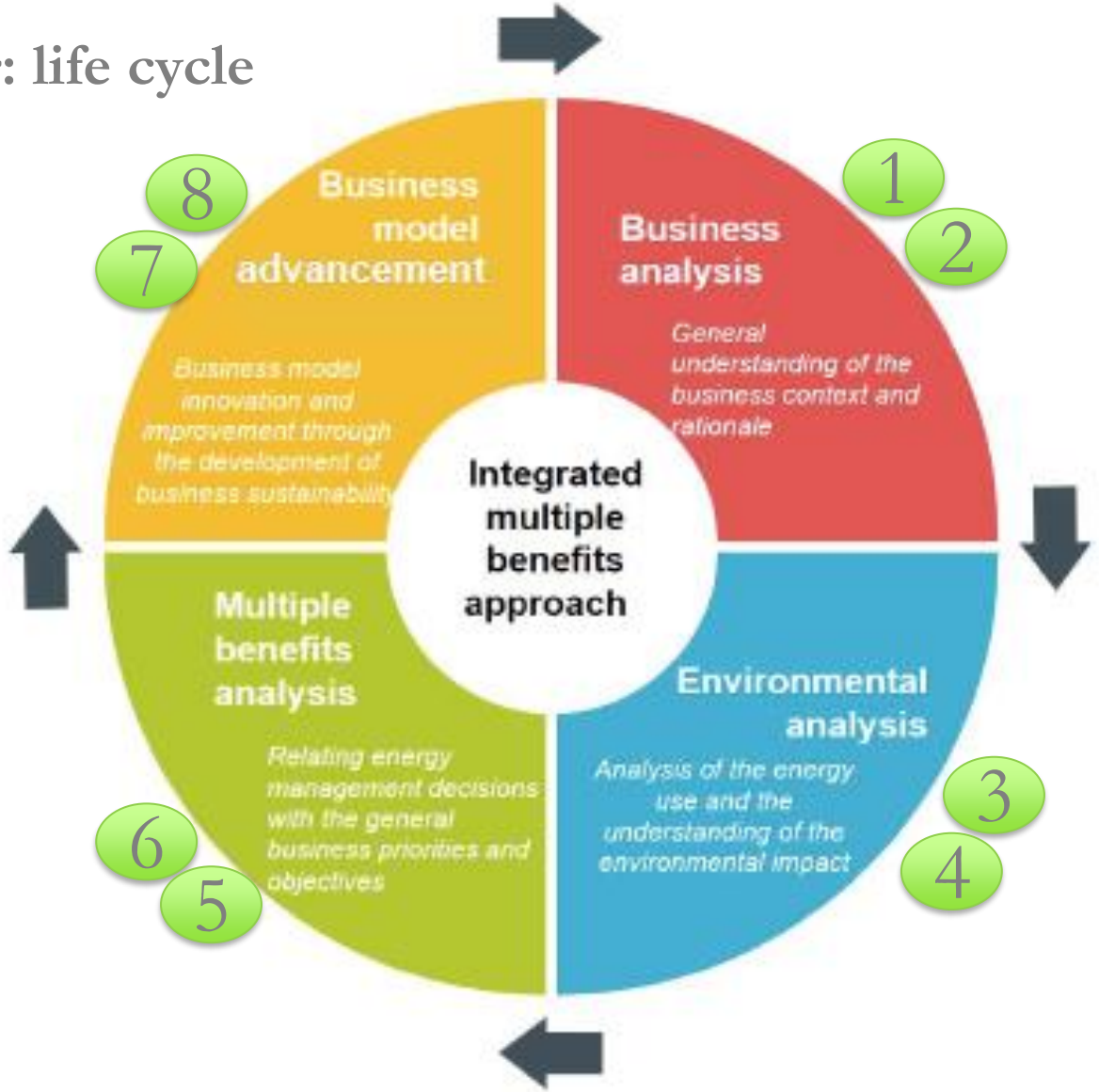
Multiple Benefits approach to Energy Auditing: life cycle

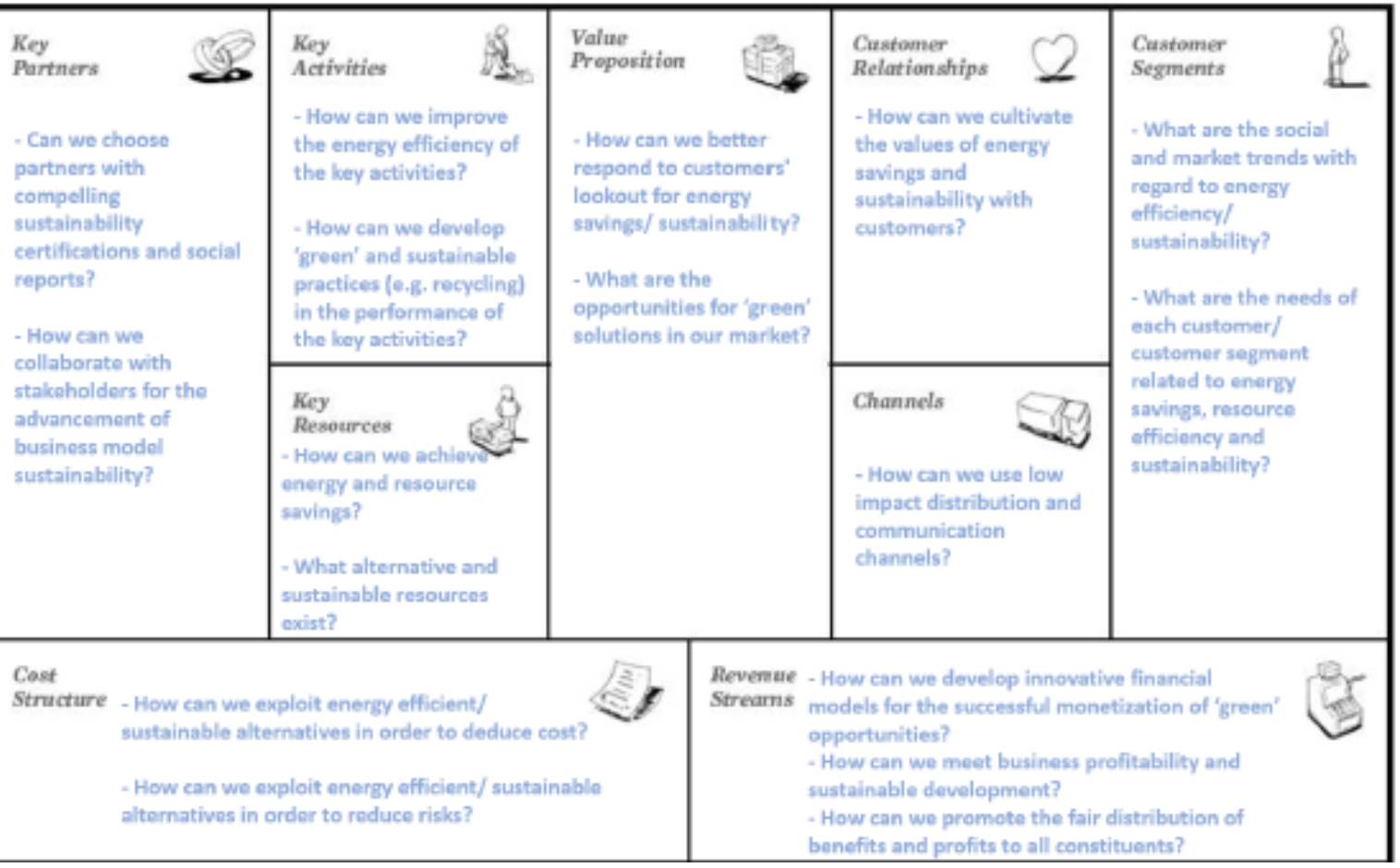
The DEESME methodology can be seen as a life cycle that begins and ends with the business model analysis – as a diagnostic and as a strategic tool, respectively.

Each iteration of the cycle leads to improved levels of energy efficiency and business model sustainability through improvement and innovation.



DEESME has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 892235.

List of Multiple Benefits with regard to the Business Model Canvas and Business Model Sustainability Advancement



DOMAIN	BENEFIT TYPE	INDICATOR
Value Proposition	1. Improved product/ service efficiency	Energy cost per unit of product/ service
	2. Introduction of new products/ services	N° of new 'green' products/ services
	3. Development or innovations	Total R&D expenses for 'energy efficiency' initiatives
Activities	4. Increased productivity	Value of output items/ Value of input items
	5. Increased utilization	Capacity utilization
	6. Improved maintenance	Maintenance Unit Cost
	7. Reduced carbon footprint	Total GHG emissions per year
	8. Improved quality	Right First Time
	9. Improved Safety	Incidence Rate
Resources	10. reduced energy consumption	Total energy consumption per year
	11. Improved raw materials consumption	Quantity of raw materials purchased
	12. Increased recycling	Percentage of total waste that is recycled
	13. Reduced waste	Waste reduction rate
	14. Increased employee satisfaction	Employee Satisfaction Index
Customers	15. Acquisition of 'green' customers	'Green' customers share
	16. Acquisition of new customers	New customers share
	17. Increased customer satisfaction	Satisfied customers share
	18. Increased customer loyalty	Loyal customers rate
Partners	19. Improved supply chain relationships	Total n° of suppliers with ISO certification for energy or environmental management
	20. Improved stakeholder relationships	Total n° of stakeholders involved in decision making
	21. Reduced litigation risks	Total amount of expenses and fines related to environmental law violations
	22. Increased regulatory compliance	N° of EU and national energy policies adopted

DEESME

DEESME has received funding from innovation programme under grant ag

The ENergy Management System supporting the Multiple Benefit Approach

DEESME

DEESME has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 892235.

The ENergy Management System supporting the MB Approach

✓ **The MB approach is an integrated approach** it is NOT an integrated management system

✓ An integrated management system can be defined as a unique system to manage different aspects of an organization according to various standards like energy management, environmental and health&safetey standards

✓ Once a company decides to implement the ISO 50001 standard, the inclusion of MB is not mandatory, rather it is at the company discretion; ISO 5001 certification is not applied to MB

✓ Multiple Benefits identification helps defining other (non-energy) KPIs to be used in the Extended EnMS, and also gives management inputs to energy policy

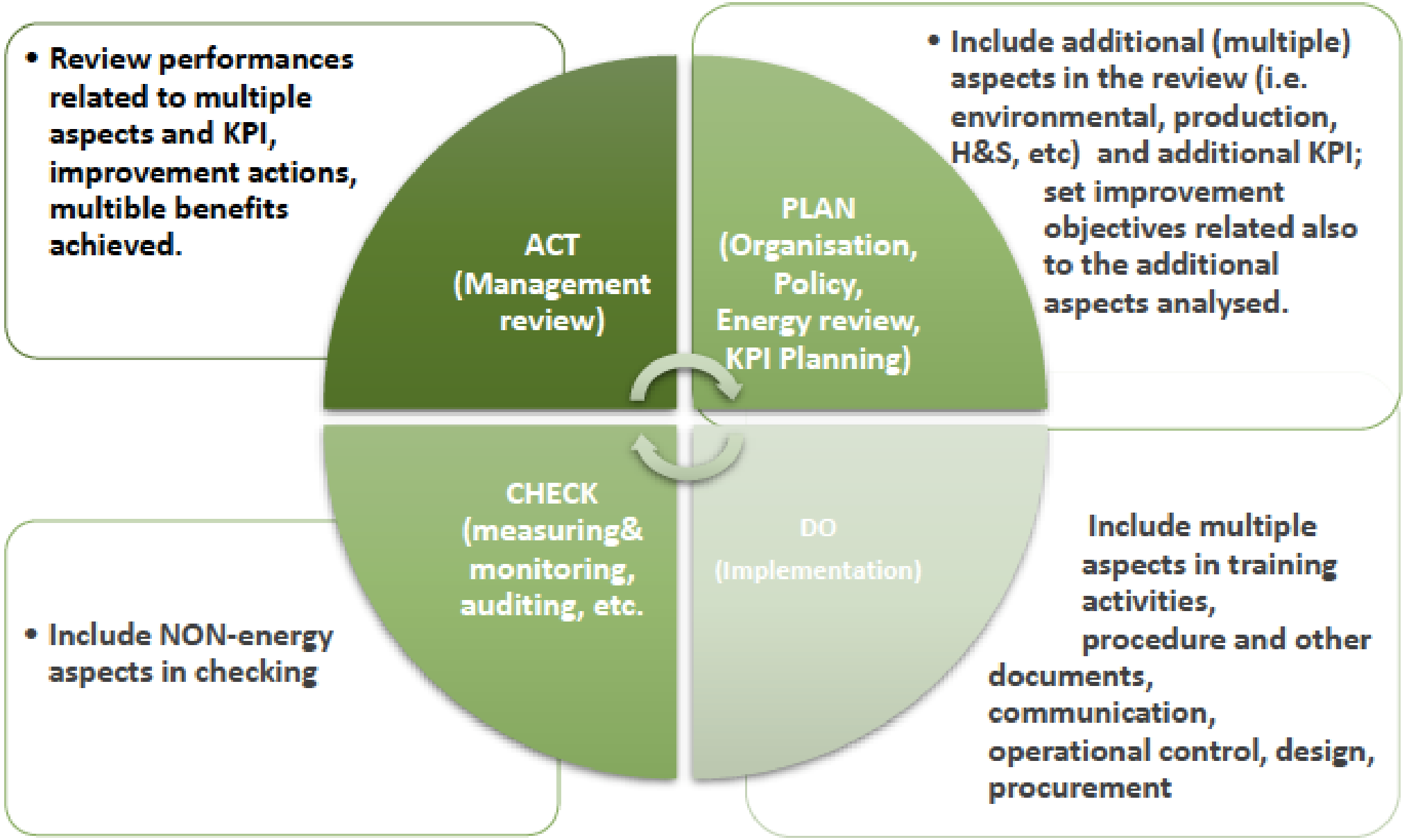
✓ **Extended EMS: an ENergy Management System that intends to manage the implementation of the MB approach whose scope includes the mutiple benefits**

✓ **CURRENTLY WORKING ON A NEW STANDARD!!!!**

DEESME has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 892235.

The ENergy Management System supporting the Multiple Benefit Approach: interaction with ISO 50001 implementation cycle (Deming cycle)

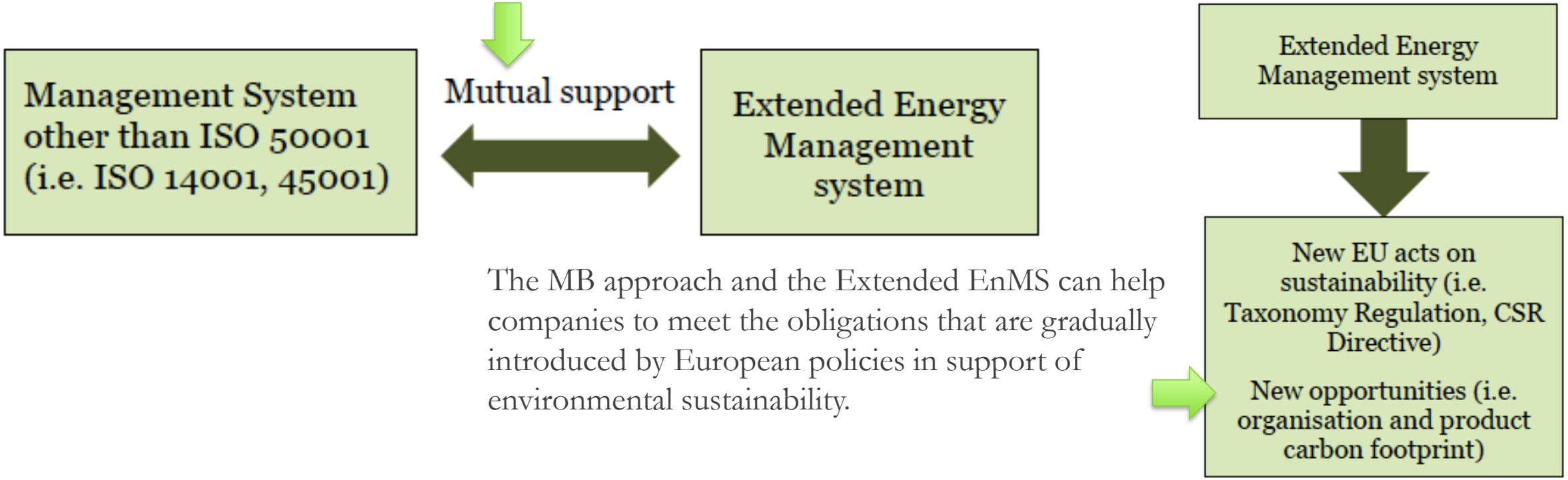
The approach suggests managerial and operational solutions to keep the MB aspects under the management control and improve them over time to achieve MB.



DEESME

The ENergy Management System supporting the Multiple Benefit Approach: relationship with Management Systems other than ISO 5001 and new EU policies on sustainability

Companies already adopting other management systems could have an advantage in applying the MB approach into the EnMS. Similarly, the assessment and management of non-energy aspects in the energy management system can facilitate the implementation of the reference standard and certification: the inclusion of environmental aspects in the Extended Energy Management System can help a company if it decides to obtain ISO 14001 environmental certification.



The MB approach and the Extended EnMS can help companies to meet the obligations that are gradually introduced by European policies in support of environmental sustainability.

DEESME

DEESME has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 892235.

Investments analysis according to the multiple benefit approach

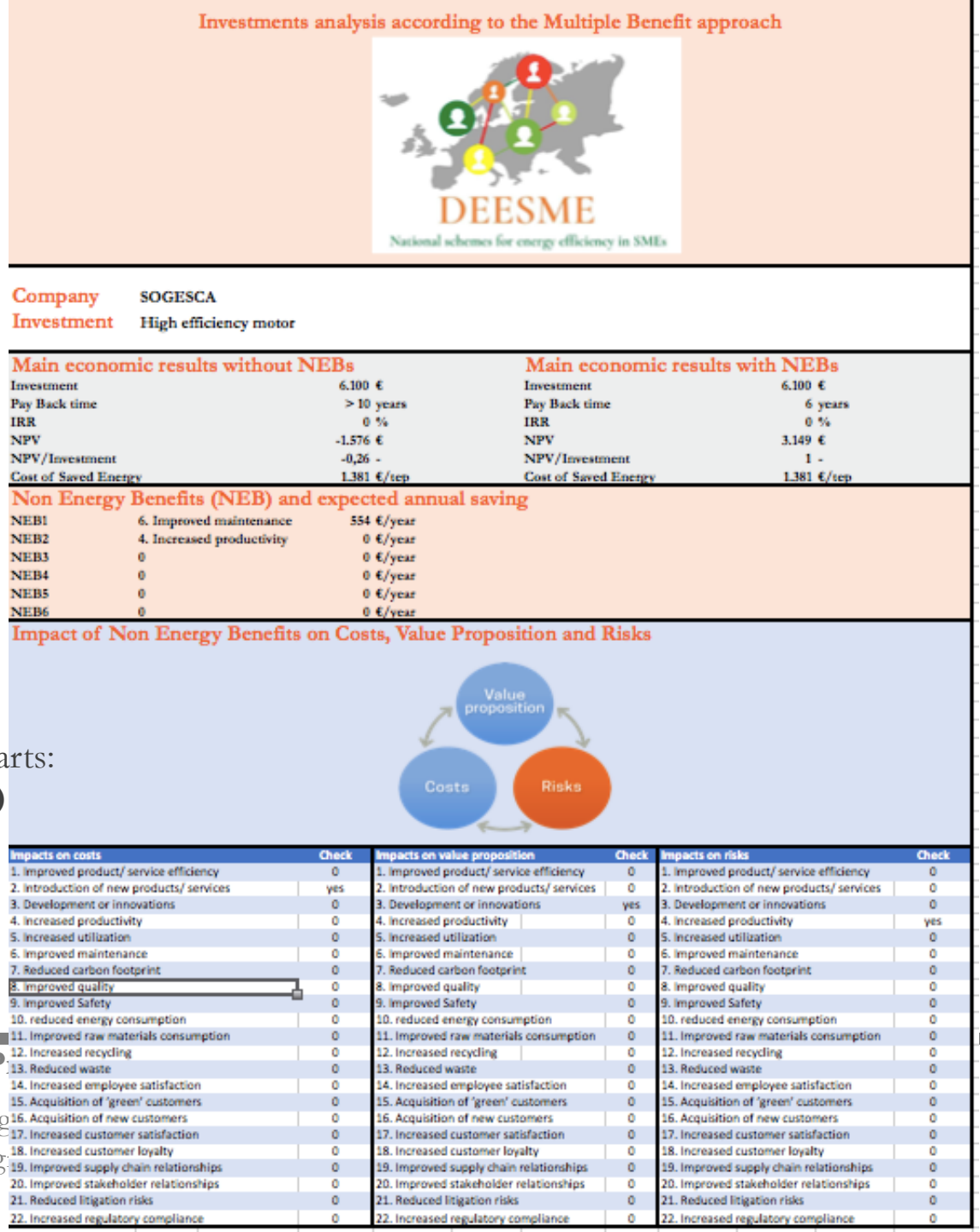
DEESME has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 892235.

Investments analysis according to the multiple benefit approach – xls tool

- SOGESCA developed a tool for investments analysis according to the MB approach
- Target: companies that have been involved in energy audits
- Tool type: xls spreadsheet
- Information to be compiled by energy auditors together with the companies

Xls spreadsheet divided in 5 parts:

- **Cover (and main results)**
- Introduction
- Specifications
- Economic analysis
- MB



Investments analysis according to the Multiple Benefit approach

DEESME
National schemes for energy efficiency in SMEs

Company	SOGESCA
Investment	High efficiency motor

Main economic results without NEBs		Main economic results with NEBs	
Investment	6.100 €	Investment	6.100 €
Pay Back time	> 10 years	Pay Back time	6 years
IRR	0 %	IRR	0 %
NPV	-1.576 €	NPV	3.149 €
NPV/Investment	-0,26 -	NPV/Investment	1 -
Cost of Saved Energy	1.381 €/tep	Cost of Saved Energy	1.381 €/tep

Non Energy Benefits (NEB) and expected annual saving

NEB1	6. Improved maintenance	554 €/year
NEB2	4. Increased productivity	0 €/year
NEB3	0	0 €/year
NEB4	0	0 €/year
NEB5	0	0 €/year
NEB6	0	0 €/year

Impact of Non Energy Benefits on Costs, Value Proposition and Risks

Value proposition
Costs
Risks

Impacts on costs	Check	Impacts on value proposition	Check	Impacts on risks	Check
1. Improved product/ service efficiency	0	1. Improved product/ service efficiency	0	1. Improved product/ service efficiency	0
2. Introduction of new products/ services	yes	2. Introduction of new products/ services	0	2. Introduction of new products/ services	0
3. Development or innovations	0	3. Development or innovations	yes	3. Development or innovations	0
4. Increased productivity	0	4. Increased productivity	0	4. Increased productivity	yes
5. Increased utilization	0	5. Increased utilization	0	5. Increased utilization	0
6. Improved maintenance	0	6. Improved maintenance	0	6. Improved maintenance	0
7. Reduced carbon footprint	0	7. Reduced carbon footprint	0	7. Reduced carbon footprint	0
8. Improved quality	0	8. Improved quality	0	8. Improved quality	0
9. Improved Safety	0	9. Improved Safety	0	9. Improved Safety	0
10. reduced energy consumption	0	10. reduced energy consumption	0	10. reduced energy consumption	0
11. Improved raw materials consumption	0	11. Improved raw materials consumption	0	11. Improved raw materials consumption	0
12. Increased recycling	0	12. Increased recycling	0	12. Increased recycling	0
13. Reduced waste	0	13. Reduced waste	0	13. Reduced waste	0
14. Increased employee satisfaction	0	14. Increased employee satisfaction	0	14. Increased employee satisfaction	0
15. Acquisition of 'green' customers	0	15. Acquisition of 'green' customers	0	15. Acquisition of 'green' customers	0
16. Acquisition of new customers	0	16. Acquisition of new customers	0	16. Acquisition of new customers	0
17. Increased customer satisfaction	0	17. Increased customer satisfaction	0	17. Increased customer satisfaction	0
18. Increased customer loyalty	0	18. Increased customer loyalty	0	18. Increased customer loyalty	0
19. Improved supply chain relationships	0	19. Improved supply chain relationships	0	19. Improved supply chain relationships	0
20. Improved stakeholder relationships	0	20. Improved stakeholder relationships	0	20. Improved stakeholder relationships	0
21. Reduced litigation risks	0	21. Reduced litigation risks	0	21. Reduced litigation risks	0
22. Increased regulatory compliance	0	22. Increased regulatory compliance	0	22. Increased regulatory compliance	0

DEESME has received funding
innovation programme under g

Investments analysis according to the multiple benefit approach - xls tool

Main economic results without NEBs		Main economic results with NEBs	
Investment	6.100 €	Investment	6.100 €
Pay Back time	> 10 years	Pay Back time	6 years
IRR	0 %	IRR	0 %
NPV	-1.576 €	NPV	3.149 €
NPV/Investment	-0,26 -	NPV/Investment	1 -
Cost of Saved Energy	1.381 €/tep	Cost of Saved Energy	1.381 €/tep

DEESME has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 892235.

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Rijksdienst voor Ondernemend Nederland

From voluntary agreements towards energy savings obligations

Jorieke Rienstra
STREAMSAVE Final event
June 6, 2023

Voluntary agreements (2006 – 2020)

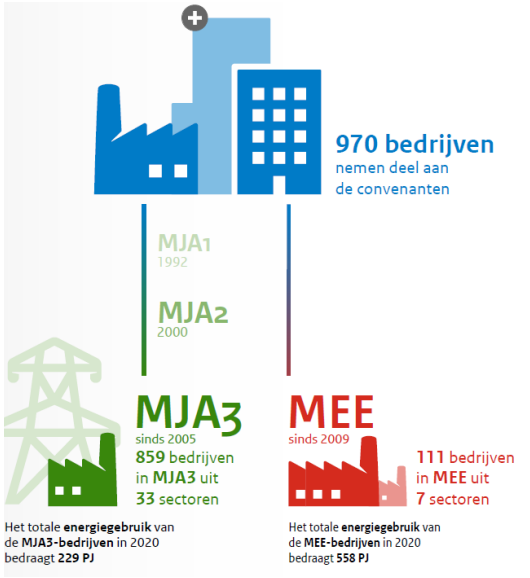
For many years the base of energy efficiency policy in industry in the Netherlands

1000 participants industrial and service sectors

Energy efficiency plans to be handed in and checked each 4 years

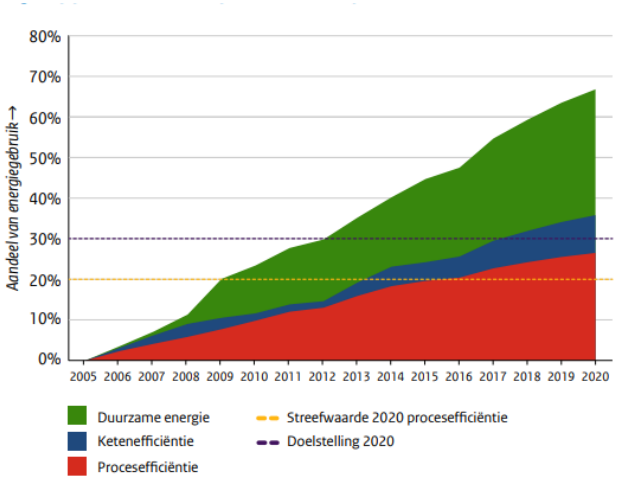
A yearly extensive montoring report per participant

Sectoral knowledge exchange and support, and in some cases energy tax reduction

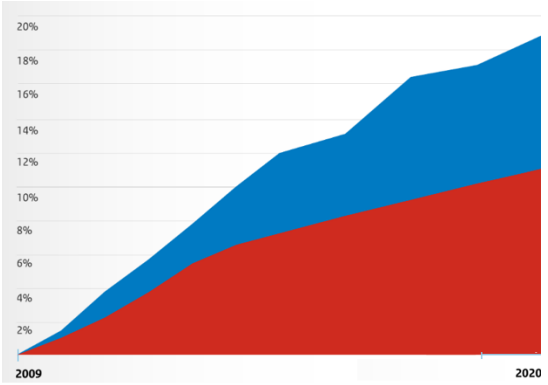


Voluntary agreements (results)

The cumulative targets of **MJA in 2020**: 20% proces efficiency
These targets were met with 27%.



No long-term target for **MEE.**
This agreement resulted in 12% proces efficiency 2020.



Voluntary agreements in EED Art 7

Tabel 3 – Gerealiseerde jaarlijkse energiebesparing per beleidsmaatregel en sector (in PJ)

Beleidsmaatregel	*sector*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*
MJA	industrie	4,3	2,3	1,6	5,4	3,1	2,4	0,9
MJA	utiliteitsbouw	0,7	0,2	0,3	0,4	0,8	0,6	0,1
MEE	industrie	5,5	3,9	3,3	5,4	3,9	3,2	2,7
EIA	industrie	5,2	6,3	4,1	3,7	5,3	5,3	5,5
EIA	utiliteitsbouw	1,4	2,0	2,9	4,0	3,6	2,8	3,1
EIA	transport	0,3	0,1	0,1	0,1	0,7	0,1	0,5
mix-GO	huishoudens	8,1	9,0	11,6	11,1	11,7	10,7	15,1
mix-GO	utiliteitsbouw	2,5	2,7	3,9	3,4	3,0	3,8	7,8
Totaal (ongecorrigeerd voor overlap)		28,0	26,5	27,7	33,5	32,1	28,8	35,7
Correctie overlap		4,1	6,4	4,5	5,5	6,5	5,0	4,4
Totaal (inclusief correctie overlap)		23,9	20,1	23,2	27,9	25,6	23,8	31,4
Multiplier (jaren)		7	6	5	4	3	2	1
Energiebesparing incl multiplier		167,5	120,5	116,2	111,8	76,7	47,6	31,4
Cumulatief		167,5	288,0	404,2	516,0	592,8	640,3	671,7

The voluntary agreements ensured well-monitored energy saving data, sufficient to enable overlap correction with energy savings of other instruments.

The Art. 7 EED target of 482 PJ for 2014-2020 was achieved.

Energy saving obligation

1993 included in law

2008 defined as all measures are obliged with a payback time <5 year

2013 it was agreed that enforcement must be done by local authorities (however difficult to implement)

2019 the **Information obligation** came into force

- Recognized checklists of measures for 19 sectors
- Financial support for local authorities
- 2019-jan.2022: 60.000 reports (out of 90.000) were submitted

2023: Further developments (I)

In 2023 the target group was enlarged with:

- EU ETS / energy intensive industries
- Permit holders
- Greenhouse horticulture

In the new target group a large saving potential is expected due to improved insulation, improved process control systems, heat recovery, optimizing electromotor systems, etc.

Scope is widened: next to energy savings, renewable production and electrification will be taken into account

Extra budget (56 milllion EUR) is available for enforcement of local authorities in period 2022-2026

2023: Further developments (II)

From 19 sectoral lists to 3 category lists: buildings, facilities, processes

A 4 yearly **Research obligation** for large energy users on proces-related energy use (research obligation) (>10.000MWh or >170.000 Nm3)

From 2027 the maximum payback time will be stretched to 7 years

Other instruments for Industry and monitoring for EED Art 7(8)

EIA Energy investment tax deduction

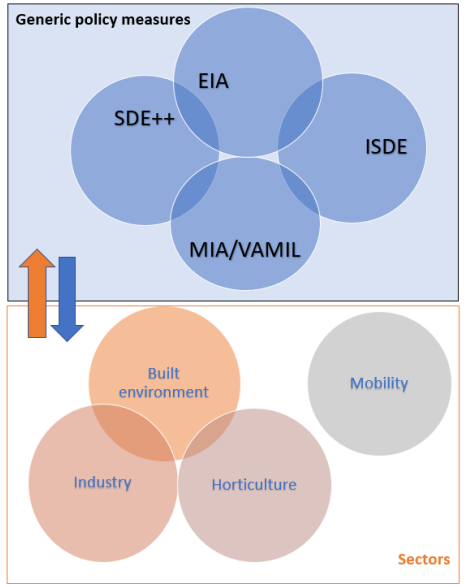
bottom-up data and assumptions on typical energy savings per technology

SDE++ Stimulating renewable energy production and climate transition

technical estimates used for both the realized and expected savings with data in the subsidy decision, production data is available

VEKI /DEI Acceleration for climate investments in industry & Demonstration Energy innovation

detailed project data in grant application is used



Including overlap correction

Energy saving obligation in monitoring for EED art. 7(8)

Until now, data is only available on the level of checklists: if an enterprise did take the measure, with little quantitative information.

From next round in december 2023 we intend to:

- Collect extra data to be able to calculate savings based on bottom-up data and assumptions
- Use assumptions in line with current methods for other instruments
- To make sure data is more suitable for deduplication in case of overlap with other instruments

Conclusions

Shift from voluntary agreements to energy saving obligation is expected to be impactful

A monitoring challenge: from relative extensive reports of 1000 voluntary participants to > 60.000 checklists with little quantitative data, how to collect essential data with the least administrative burden

Meanwhile, from other financial instruments quantitative data for EED Art 7(8) is collected, in most cases good quality so overlap correction is possible

Questions?

Back up:

Savings in 2021 (petajoules)

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	totale besparing	cumulatief
									?		
								?	?		
							?	?	?		
						?	?	?	?		
					?	?	?	?	?		
				?	?	?	?	?	?		
			?	?	?	?	?	?	?		
		?	?	?	?	?	?	?	?		
	?	?	?	?	?	?	?	?	?		
31,5	**31,5**	**31,5**	**31,5**	**31,5**	**31,5**	**31,5**	**31,5**	**31,5**	**31,5**	**314,7**	**314,7**

Klimaatsector	2021
Landbouw	1,3
Industrie	13,4
Gebouwde omgeving	13,5
Mobiliteit	3,3
Totaal	**31,5**

.	te besparen
huidige EED	924
voorgestelde EED	1.292
compromis EED?	1.347

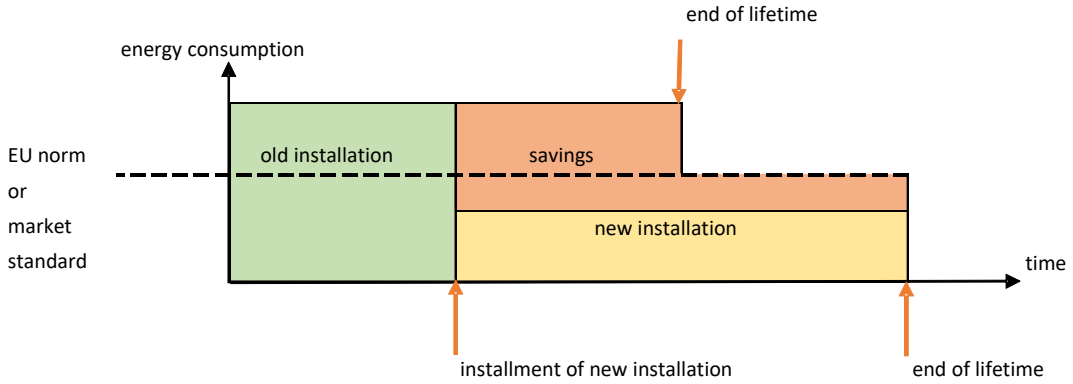


Figure 1: Schematic visualisation for determining energy savings in the case of early replacement

Tabel 4.1
Bandbreedte mogelijke bijdrage per sector aan de doelstelling voor artikel 7 van de EED in de periode 2021-2030

Sector	Petajoule (cumulatief voor de periode 2021 tot en met 2030)
Huishoudens	229-343
Diensten	266-323
Industrie	74-243
Verkeer en vervoer	61-100
Landbouw	0-27
Totaal	721-939

Pay-for-Performance schemes and other ways to develop measured energy savings

Concrete examples from the SENSEI and ENSMOV Plus projects

Marion Santini, Regulatory Assistance Project

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Our project

- Support for the **implementation of Article 7 > 8 EED.**
- Target groups: **public authorities & agencies, and stakeholders** (energy companies, ESCos, …)
- Scope: **whole policy cycle,** from policy design to evaluation

14 partners from 12 countries

8 public authorities, agencies or institutes

AUSTRIAN ENERGY AGENCY · KAPE · EIHP ENERGY INSTITUTE HRVOJE POŽAR · LITHUANIAN ENERGY AGENCY · MEKH Hungarian Energy and Public Utility Regulatory Authority · ΚΑΠΕ CRES · MINISTERUL ENERGIEI · Jožef Stefan Institute

2 national associations of stakeholders

atee ASSOCIATION TECHNIQUE ENERGIE ENVIRONNEMENT · FIRE FEDERAZIONE ITALIANA PER L'USO RAZIONALE DELL'ENERGIA

4 research labs or think tanks

IEECP INSTITUTE FOR EUROPEAN ENERGY AND CLIMATE POLICY (Coordination) · RAP® · Fraunhofer ISI · TEESlab University of Piraeus Research Center

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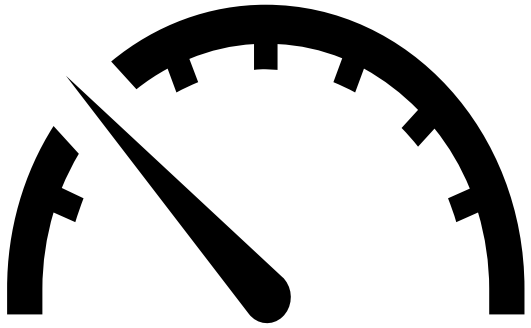
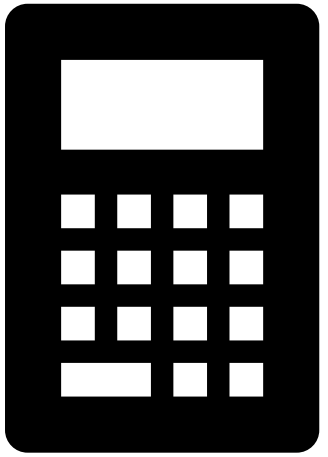




Smart meters

Data processing

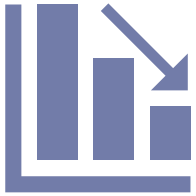
Measured savings allow policy innovation

Tracking real-life performance: Behaviour, equipment. Real time.

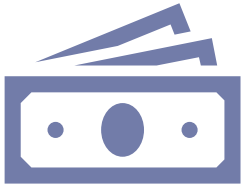
Granularity: Location and time-specific energy savings

Incentives: Pay-for-performance schemes

TRADITIONAL SUBSIDY SCHEME



Deemed savings (assumption about impact of measure)



One-off payment (usually upon installation)

PAY-FOR-PERFORMANCE SCHEME

Savings established by comparing metered energy consumption to baseline

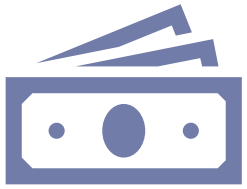
Payment proportional to energy saved, delivered “as the savings occur”

sensei

EXAMPLE: PACIFIC GAS AND ELECTRIC (PG&E) RESIDENTIAL P4P

Performance

- Residential sector in California
- Through aggregators
- Rewarded based on portfolio performance (fleet of buildings)
- CalTRACK method



Payments

- 100% proportional to energy saved
- Prices per kWh and therm result from bids
- Monthly
- Over 2 years
- Prices based on expected lifetimes of measures

More information: https://senseih2020.eu

sensei

What is P4P: Payments for energy efficiency are based on measured savings

Pay-for-Performance (P4P) is an innovative approach to finance energy efficiency projects. It allows to:

- Improve subsidy schemes with periodic payments that are proportional to the measured energy savings, using advanced Measurement and Verification techniques.
- Aggregate projects into portfolios to attract investments from financial institutions which are looking to invest in bigger projects.
- Recognize energy efficiency as a demand-side energy resource by quantifying its benefits for the energy system,

sensei

Other policy use of measurement methods

- Identifying energy savings potentials
- M&V methods for existing energy efficiency obligation schemes
- M&V methods for existing subsidy schemes
- Provide inputs to update deemed savings

Upcoming developments

- ENSMOV Plus
  - Case studies on the use of measurement (Croatia, France, Germany, Italy + probably Ireland)
  - First online workshop on this topic in September 2023 TBC → get our newsletter on energysavingpolicies.eu
- RetroMeter project in the UK

Resources

- Sipma, J., Broc, J.S., Skema, R. (2019). Comparing estimated versus measured energy savings. Topical case study of the EPATEE project, funded by the European Union's Horizon 2020 programme.
- Santini, M., Tzani, D., Thomas, S., Stavrakas, V., Rosenow, J., & Celestino, A. (2020). *Experience and lessons learned from pay-for-performance (P4P) pilots for energy efficiency*.
- Tzani, D., Stavrakas, V., Santini, M., Thomas, S., Rosenow, J., & Flamos, A. (2022). Pioneering a performance-based future for energy efficiency: Lessons learnt from a comparative review analysis of pay-for-performance programmes. *Renewable and Sustainable Energy Reviews*. 158. 112162.

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https://ieecp.org/projects/ensmov-plus/

Our Platform: energysavingpolicies.eu

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