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ODYSSEE-MURE

Third meeting of the project
*“ODYSSEE-MURE, Monitoring EU Energy Efficiency First Principle and Policy
Implementation”*
15-16 November 2021, Visio Conference organized with EIHP

How first comes energy efficiency? –
Assessing EE1 Implementation in EU Member States using a
comprehensive indicator approach

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AGENDA

- What is the Energy Efficiency First Principle?
 - Definition
- Part I: Construction of the indicator
 - Introduction to 13 criteria to assess EE1
 - Methodology of the composite indicator
- Part II: Assessment of EE1 in the NECPs
 - Data sources
 - Results
- Example Grid Planning Germany
- Discussion / Outlook

What is the Energy Efficiency First Principle (EE1)?

Governance Regulation ((Regulation (EU) 2018/1999, Article 2,18)

„ `energy efficiency first' means taking utmost account **in energy planning, and in policy and investment decisions**, of alternative cost-efficient energy efficiency measures to make energy demand and energy supply more efficient, in particular by means of cost-effective end-use energy savings, demand response initiatives and more efficient conversion, transmission and distribution of energy, whilst still achieving the objectives of those decision” (EU 2018, Article 2, 18).

New Article 3 in EED

Article 3

Energy efficiency first principle

1. In conformity with the energy efficiency first principle, Member States shall ensure that energy efficiency solutions are taken into account in the **planning, policy and major investment decisions** related to the following sectors:
 - (a) energy systems, and
 - (b) non-energy sectors, where those sectors have an impact on energy consumption and energy efficiency.
2. Member States shall ensure that the application of the energy efficiency first principle is **verified by the relevant entities where policy, planning and investment decisions are subject to approval and monitoring requirements**.
3. In applying the energy efficiency first principle, Member States shall:
 - (a) promote and, where **cost-benefit assessments** are required, ensure the application of cost-benefit methodologies that allow proper assessment of wider benefits of energy efficiency solutions from the societal perspective;
 - (b) identify an **entity responsible for monitoring** the application of the energy efficiency first principle and the **impacts of planning, policy and investment decisions on energy consumption and energy efficiency**;
 - (c) report to the Commission, as part of the integrated national energy and climate progress reports in accordance with Article 17 of Regulation (EU) 2018/1999 on how the principle was taken into account in the **national and regional planning**, policy and **major investment decisions** related to the national and regional energy systems.

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+

EE1 Guidelines

https://ec.europa.eu/info/news/commission-publishes-recommendation-and-guidelines-energy-efficiency-first-principle-2021-sep-28_en

EE1 in the Energy Efficiency Directive EED

Core elements of EE1

- Energy demand is **not fixed**
- **Equal treatment** of supply and demand-side resources and energy efficiency (EE) to be **prioritized whenever it is less costly** or delivers more value than alternative options.
- **Cost-Benefit Assessment**
- **Verification** of the possibility to apply EE1 in decision making
- Ensure that cost effective (EE) measures come first **in all planning, designing, and decision processes** related to the energy market.

(Qualitative) Indicator Approach

Why is the EE1 relevant?

- Essential component of achieving carbon neutrality by the mid of the century
- „The cheapest and cleanest energy, is the energy that was never produced“

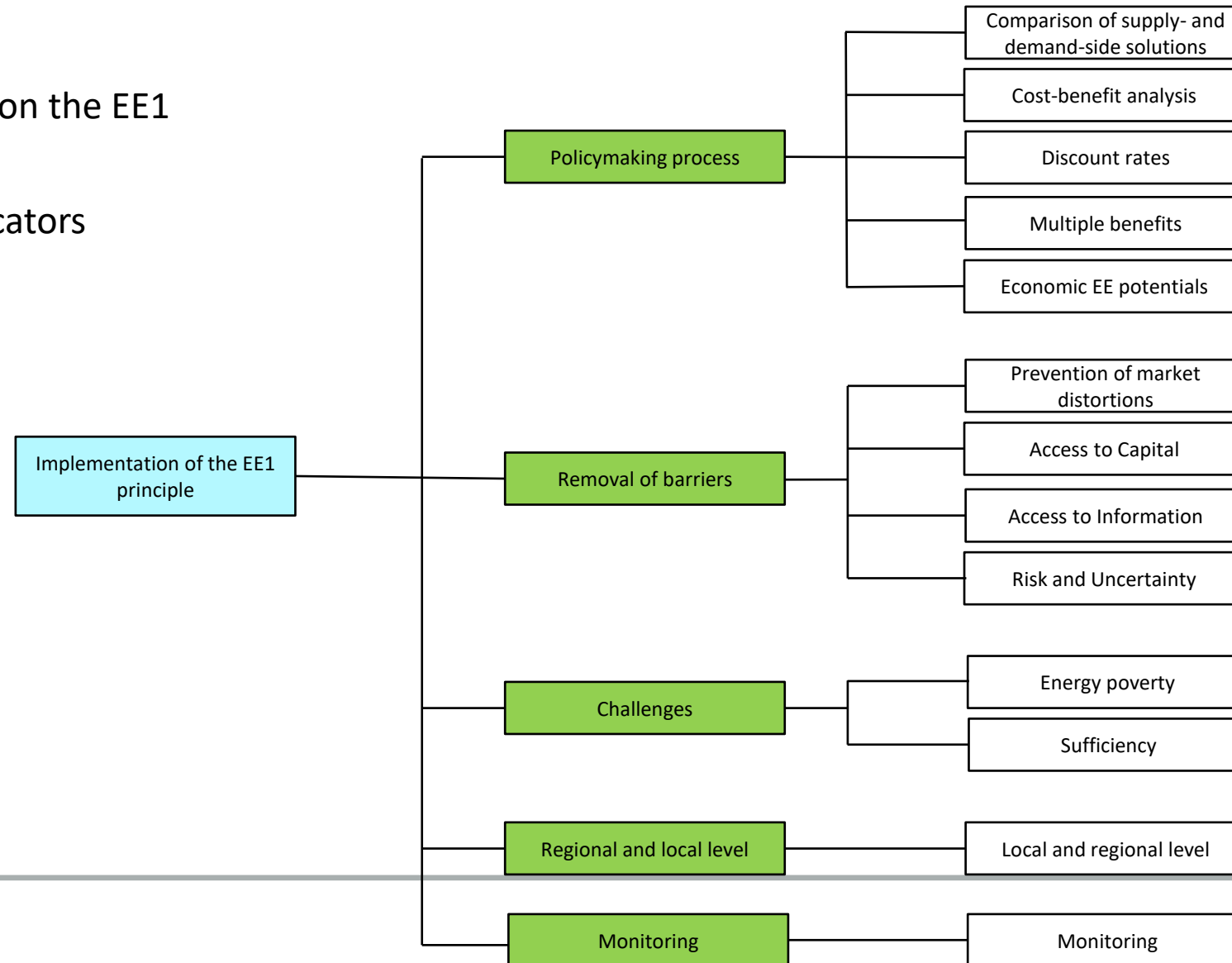
Is there a demand for an indicator based approach?

- Since the EE1 principle is a relatively recent concept, so far no assessment approach exists
- Indicators can improve the understanding of the EE1 principle
- Aim of the indicator
 - Applicable across different country circumstances
 - Straightforward and simple design
 - Qualitative indicators

Composite Indicator on the EE1 principle

Composite indicator on the EE1 principle:

- 13 individual indicators
- 5 categories



Category I : The EE1 principle in the **policymaking process**

- The EE1 principle requires the **recognition of EE as a flexible input** variable in the policymaking process, which should be **considered on par with alternative resources**. Therefore, the indicator in this dimension assesses the extent to which EE is treated as **resources on its own** in the policymaking process and how it is compared with other options in this context.
- Selection of 5 indicators:
 - **Comparison** of supply- and demand-side solutions (scope of considered options)
 - Application of a systematic **Cost-benefit Analysis** for comparison
 - Application of social **discount rates**
 - Inclusion and quantification of **Multiple Benefits**
 - **Economic EE potentials**

Category II: The **removal of market barriers** to EE investments

- The core of the concept rests in the equality of supply and demand resources. However, a combination of **historic preference for supply-side investments** across the policy landscape and of **deep-seated market barriers to end-use EE investments**, often contribute to a market imbalance in favor of supply-side solutions. **Focus was to set to select those barriers, which actively create a bias in the way that EE resources are assessed, valued, and compared with other resources or limit the scope of options considered in the decision process related to the energy market.**
- Selection of 4 indicators:
 - Prevention of **market distortions**: e.g. preferential subsidies to fossil fuels and infrastructures. The prevailing imbalance between the different resources is reflected by energy investments in the EU, which in 2018 amounted to 120 billion euros in oil and gas infrastructure, electricity networks and power generation compared to 63 billion euros in EE
 - **Access to capital**: High upfront cost > funding, and financial support for buildings has been identified as one of the key pillars
 - **Access to information**: Unawareness or a lack of information on EE opportunities and the benefits associated with such investments, significantly impacts the valuation and assessment of EE investments.
 - Reduction of **risk and uncertainty**: Policies can provide regulatory stability, lower the financial risk, and reduce the perceived technological risk

Category III + IV + V

III: Consideration of challenges to EE

This category encompasses **societal trends and issues**, which if they remain overlooked by policymakers, might **impede, or even counteract the purpose of the EE1 principle**.

- Energy Poverty
- Sufficiency

IV: Regional and local adaption of the EE1 principle

While the national level presents a good starting point for the introduction of the EE1 principle, the regional and local adaption is essential to guarantee that the EE1 principle is considered **in all decisional related to the energy market**.

- Regional and local adoption of the EE1 principle

V: Monitoring and verification process

Quality monitoring and verification process has dual function. Firstly, it allows for more **effective and targeted policy** interventions. Secondly, monitoring and evaluating of the impact of EE measures provides **a base for the quantification of the multiple benefits of EE**

- Monitoring

Methodology: How was the composite indicator constructed?

1 Normalisation:

- Categorical scales were assigned to each of the 13 indicators

Score	Performance
0	No compliance with the indicator
1	Partial compliance
2	Full compliance

2 Aggregation and weighting method:

- Simple additive weighting is applied

$$y_j = \sum_{i=1}^{13} w_i x_{ji} \quad i = 1, 2, \dots, 13 \quad j: \text{country}$$

Methodology: Definition of scores (Example Policy Process)

Criteria	Score	Description
Screening process, in which both supply and demand-options are compared with each other	0	Demand is considered as a fixed variable in the modeling process.
	1	Both supply and demand-side solutions are considered but separated from each other.
	2	Both demand and supply-side solutions are compared in the modeling process.
Comparison between different solutions via cost-benefit analysis (CBA)	0	No CBAs are not conducted
	1	CBAs are conducted; however, these do not have an impact on policy decisions.
	2	CBAs are conducted and serve as a decision tool between different measures and policies.
Discount rates	0	The discount rates differ between supply and demand.
	1	The discount rates are similar or the same, but only in a few sectors.
	2	Across all sectors the discount rates are the same or differ slightly.
Multiple benefits (MBs)	0	The MBs are neither acknowledged in discussions nor quantified or included in the decision-making process.
	1	It is recognized in discussions that EE has positive impacts including social, economic, and environmental aspects. Furthermore, some of those benefits are quantified and incorporated in the decision-making process.
	2	The MBs are recognized in discussion as well as quantified and included in the modeling approach.
Economic efficiency potentials as a guiding principle	0	While economic EE measures might be calculated, they have no significant role during the policymaking-process.
	1	Economic EE potentials have a guiding function. They are used to identify end-user and sector/areas with large potential as well as support the target setting.
	2	EE potentials are used to guide policy makers in their decision process. Additionally, the impact of the chosen policies is compared to the economic EE potential, to ensure that the existing and planned policies are sufficiency to exploit the economic potential of EE.

Methodology: Definition of scores (Example Barriers)

Criteria	Score	Description
Prevention of distorted markets	0	No concern is given to this issue.
	1	Distorted markets are recognized as a concern and current as well as planned policies aim to prevent any market imbalances. However, past policies and measures are not actively revised for this purpose.
	2	Distorted markets are recognized, and past policies/ measure are actively reversed in order to correct those imbalances.
Access to information	0	No specific measures regarding information, training or education campaigns are implemented to overcome informational barriers
	1	While information exists, it is kept in a general format, e.g., on a website.
	2	Besides the provision of general information, specific information and awareness campaigns are conducted. Furthermore, more targeted campaigns in form of seminar and trainings offered to a diverse group of actors.
Access to capital	0	No concrete measures offer financial support to incentive EE investments.
	1	Financial incentives are in place but limited to certain sectors and instruments.
	2	Financial incentives are offered across different sectors and available in form of different instruments, so that a diverse group of recipients can profit from them.
Reduction of risk and uncertainty	0	No measures to mitigate the risk for individuals or companies are implemented.
	1	The introduction of measures to mitigate the risk for businesses or in the residential sector.
	2	The introduction of measures to reduce risk for both businesses and in the residential sector.

Weighting structure: How are the individual indicator weighted?

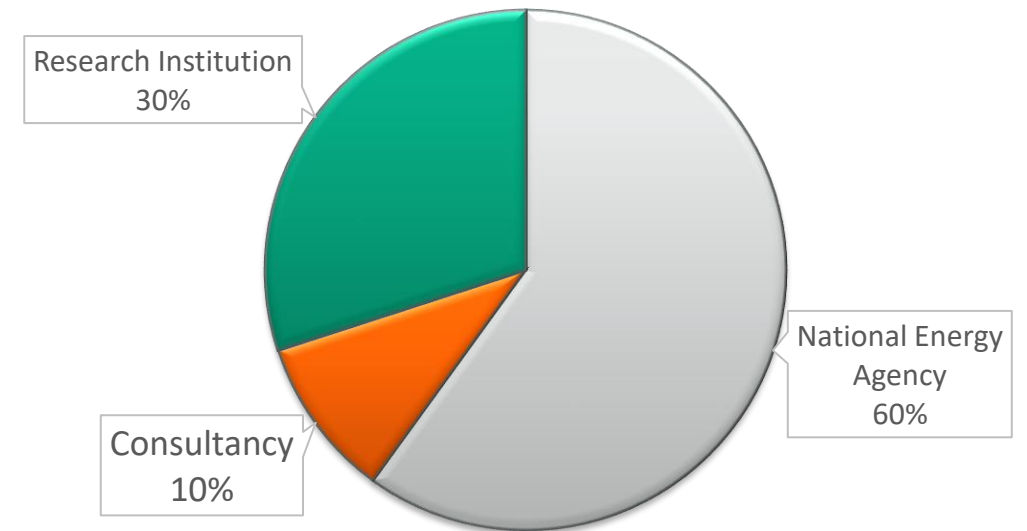
Category		Criteria	Level of priority	Weight
Policy-making process	1	Comparison of supply and demand	High	2
	2	Cost-benefit analysis	High	2
	3	Discount rates	High	2
	4	Multiple Benefits	High	2
	5	Economic efficiency potentials	Medium	1.5
Market Barriers	6	Prevention of distorted markets	Medium	1.5
	7	Access to information	High	2
	8	Access to capital	High	2
	9	Risk and certainty	Low	1.0
Challenges	10	Energy poverty	Medium	1.5
	11	Sufficiency	Low	1.0
Regional and local level	12	Regional and local level	Low	1.0
	13	Monitoring	Medium	1.5

- **Level of priority** to the realization of the EE1 principle determines weight

What data sources were used?

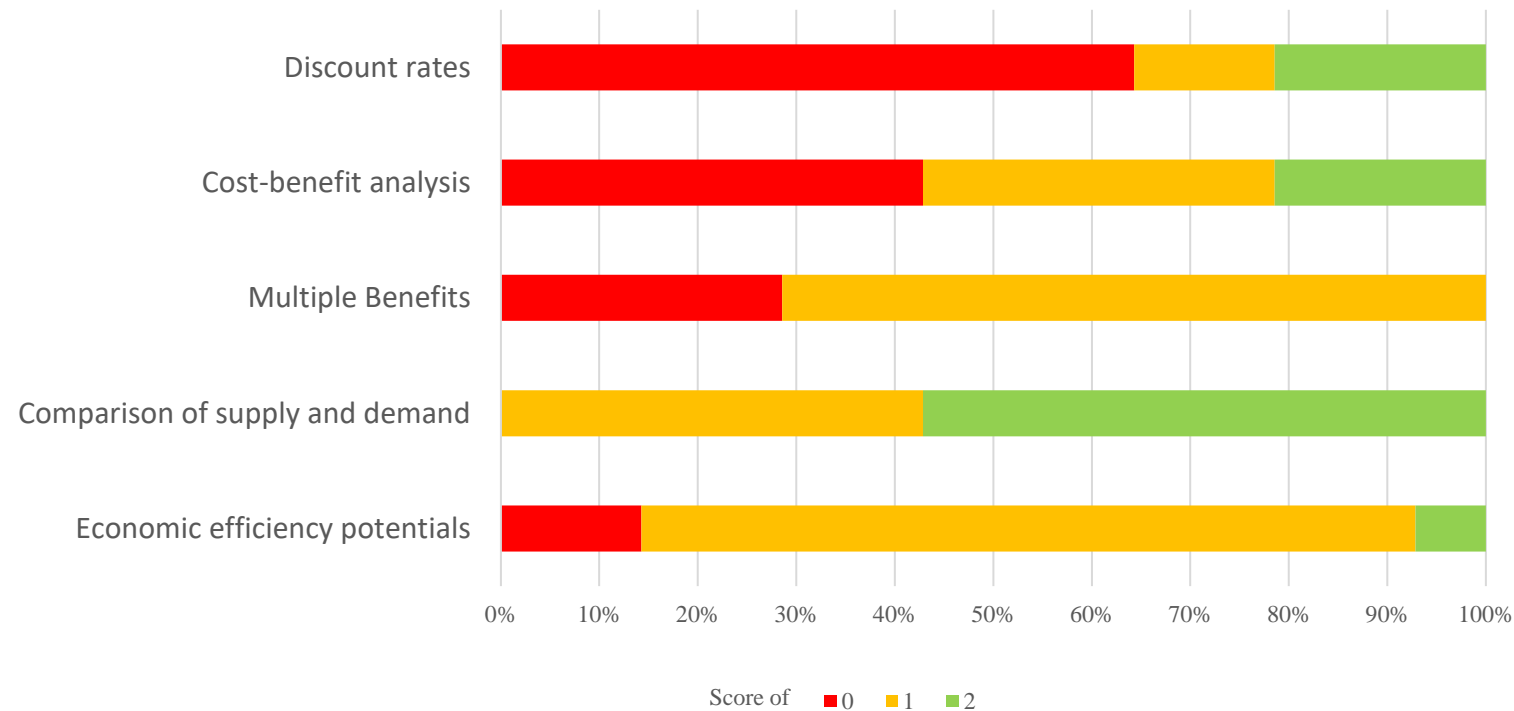
- 1** Interviews:
 - Semi-structure interviews
 - **14 countries in total**
 - Criteria of selection: Size, geography, EE performance
- 2** NECPs:
 - National energy and climate plans for the period 2021 to 2030
- 3** ODYSSEE-MURE:
 - Database on energy efficiency indicators and policies

Type of organizations the interviewees work for



Results: How did the Member States perform in Category I?

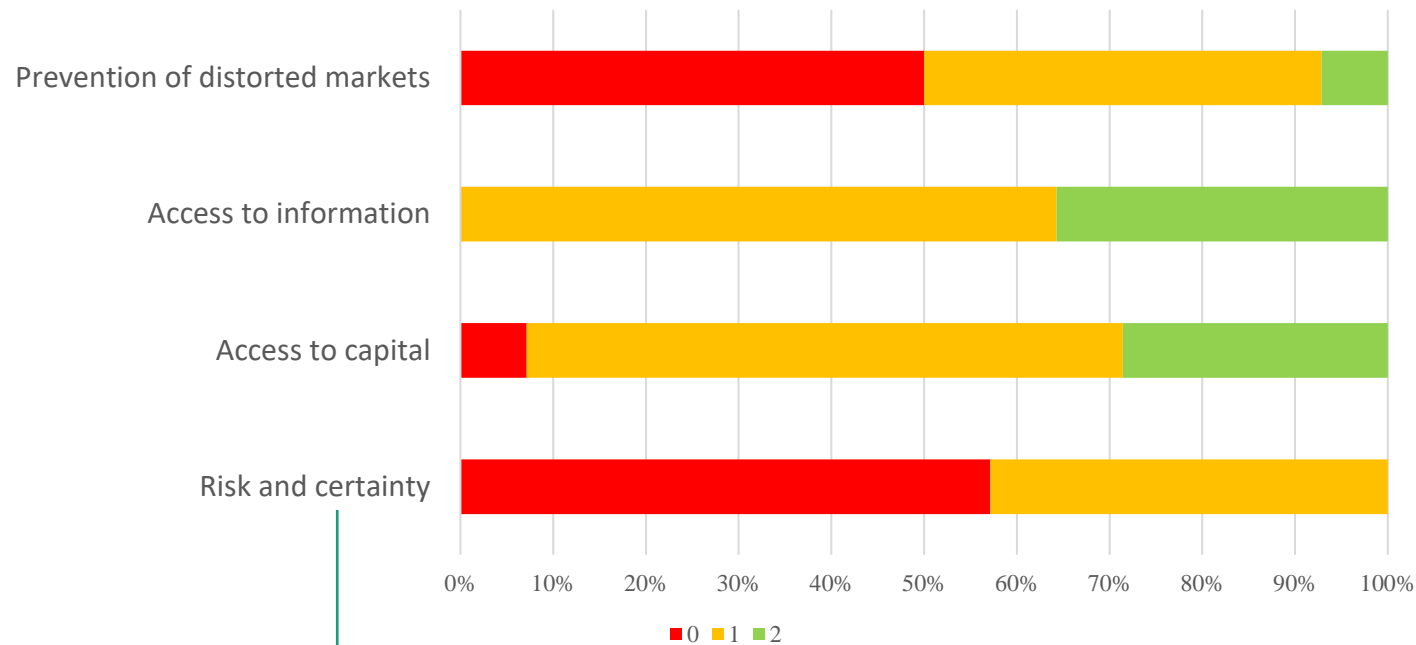
I: The EE1 principle in the policymaking process



- All countries consider EE as a resource on its own
- Countries still lack a systematic approach, which guarantee a comparison on par
- Only Ireland compares its measures and policies with the economic EE potentials

Results: How did the Member States perform in Category II?

II: The removal of market barriers to EE investments

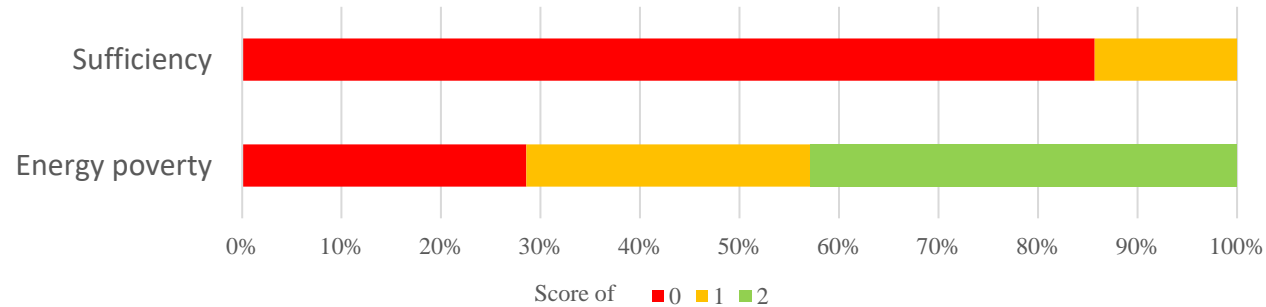


- Apart from France, no MS systematically reverses past policies and measures to correct existing imbalances
- The majority of countries provide measures to overcome financial and informational barriers

With 57 percent, the majority of interviewed MS relies on loans and grants to reduce the *risk and uncertainty* related to EE. While financial measures constitute as instruments to reduce economic risk associated with EE investments, within the scope of this indicator, they are counted under the previous criterion. This is due to the fact that risk as a relevant barrier, which merits policy intervention, **rather refers to regulatory and misperceived technical risk instead of business and financial risks**, which are part of economic efficient behaviour and present a general issue in regard to investments > Ireland: Learning Networks to reduce risk perception of EE technologies

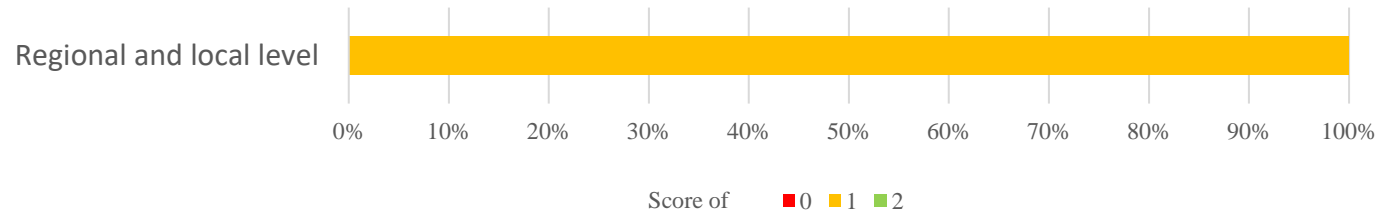
Results: How did the Member States perform in Category III, IV and V?

III: Consideration of challenges to EE



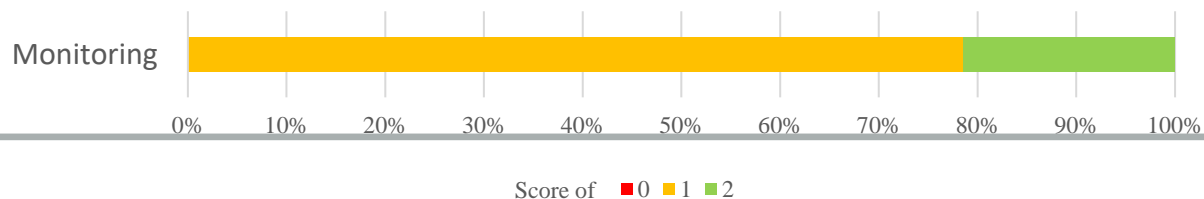
- Sufficiency has not reached the political sphere yet

IV: Regional and local adaption of the EE1 principle



- On the governmental level, no local and regional entity has formally incorporated the EE1 principle

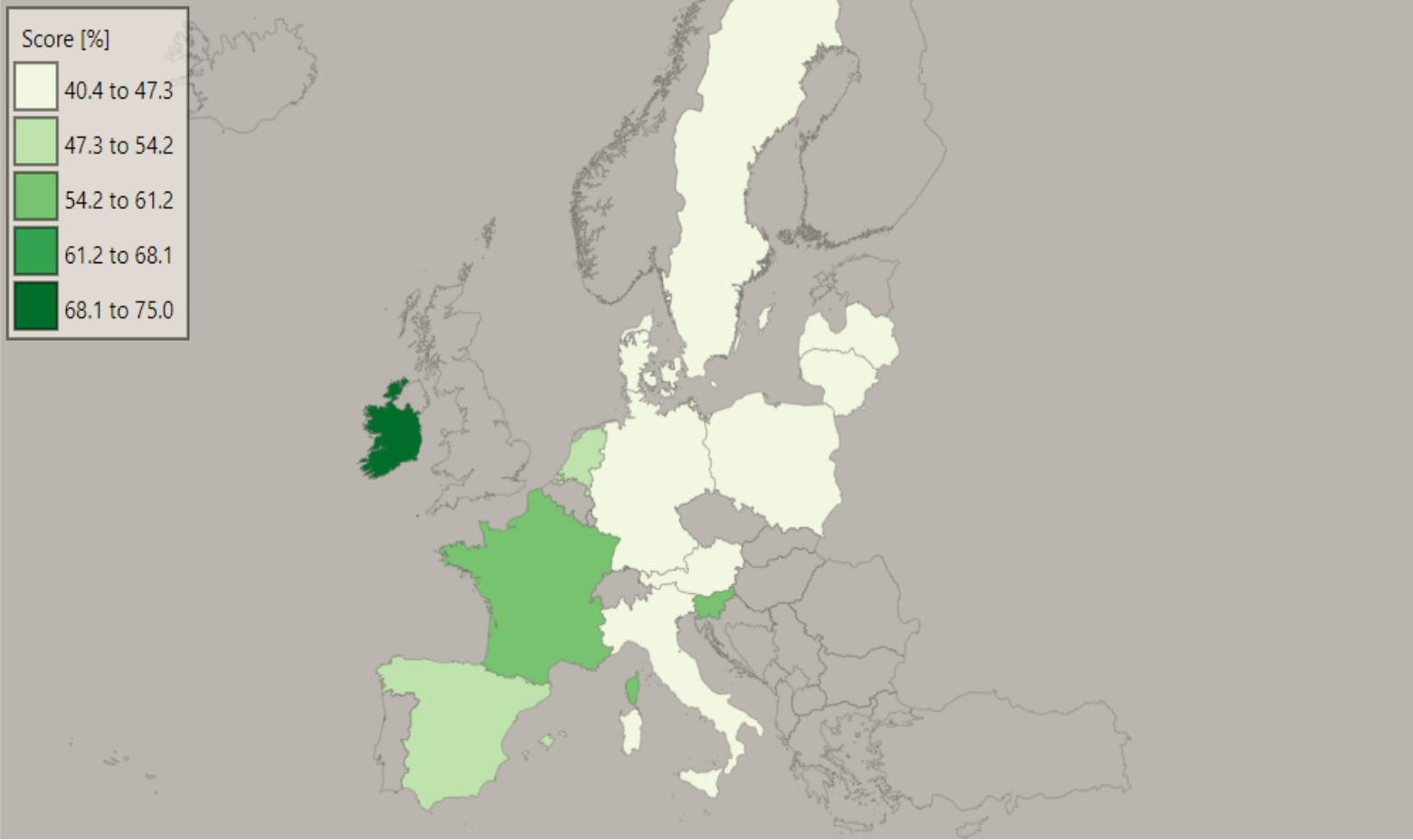
V: Monitoring and verification process



- The quality of the monitoring methods and coverage varies mostly across sectors and programs

Results: How efficient is the EU?

Implementation of the EE1 principle in NECPs by the Member States



Example: Electricity Grid Extension Plan Germany

Genehmigung des Szenariorahmens 2021-2035

26. Juni 2020

Energieeffizienz: Die Bundesnetzagentur gibt den Übertragungsnetzbetreibern zur Ermittlung und zur Regionalisierung des Stromverbrauchs szenariospezifische Effizienzsteigerung im Stromsektor (für die klassischen Stromanwendungen) gegenüber 2018 vor. Laut den Energiedaten des Bundeswirtschaftsministeriums sind zwischen 2008 und 2018 insgesamt 2,3 % Effizienzgewinne beim Nettostromverbrauch erzielt worden. Sofern man von Ende 2018 (Referenzdatum für den Verbrauch) auf das Ende 2035 extrapoliert, ergeben sich für diese 17 Jahre 3,91 % Effizienzgewinne ($0,23\% \cdot 17$ Jahre). Für die Annahmen in den Szenarien wird diese lineare Entwicklung aufgespreizt, um die die Unsicherheit der zukünftigen Effizienzsteigerung abzubilden. In Szenario A 2035 werden 2,5 % Effizienzsteigerungen gegenüber 2018 angenommen, in Szenario B 2035 5 %, in Szenario C 2035 7,5 % und in Szenario B 2040 6%.

- Stringente Cost-Benefit-Analyse EE
- Multiple Benefits EE
- Link Grid Expansion to political measures related to EE.

Energiemengen [TWh]	2018	Szenario A 2035	Szenario B 2035	Szenario C 2035	Szenario B 2040
Nettostromverbrauch 2018 (abz. Korrekturterm Sektorenkopplung)	503,5	503,5	503,5	503,5	503,5
Effizienzsteigerung	-	13,0	26,0	39,1	31,3
Elektromobilität	0,3	31,6	41,4	51,8	49,3
Wärmepumpen (Haushalte)	2,5	9,6	16,0	22,4	20,8
PtH in Fern- und Prozesswärme	0,3	8,2	10,8	12,9	11,6
Power-to-Gas	0,3	11,3	18,3	28,8	35,8
Industriemehrverbrauch	-	34,8	40,2	53,8	46,1
Nettostromverbrauch	506,9	586,0	604,1	634,1	635,8
Verteilernetzverluste	17,4	17,4	17,4	17,4	17,4
Nettostromverbrauch inkl. Sektorenkopplung, Effizienz und Verteilernetzverluste	524,3	603,4	621,5	651,5	653,2

Tabelle 13: Bestimmung des zukünftigen Nettostromverbrauchs

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https://www.netzentwicklungsplan.de/sites/default/files/paragraphs-files/Szenariorahmen_2035_Genehmigung_1.pdf

Outlook and Conclusion

- **All MS consider EE as a resource on its own** and not as a fixed variable in the energy equation, means that the most fundamental element of the EE1 principle is understood and implemented by all MS
- However, **most Member States still fail to guarantee an equal playing-field between demand and supply-side resources**
- A provision of a **guideline** on the EE1 principle might support Member States implement all aspect of the EE1 principle and to ensure that EE comes first at all governmental levels
- The **weights** are recommend to be adjusted over time and its validity improved e.g., through a budget allocation process.

Thank you very much!

ENEFIRST Project (Coordination IEECP)

<https://enefirst.eu>

EU Guidelines on Operationalising Energy Efficiency First:

https://ec.europa.eu/info/news/commission-publishes-recommendation-and-guidelines-energy-efficiency-first-principle-2021-sep-28_en

Questions or feedback:

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Title: How first comes energy efficiency? Assessing the Energy Efficiency First Principle in the EU using a comprehensive indicator approach¶

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Abstract¶

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The energy efficiency first (EE1) principle was defined and established as a leading principle with the Clean Energy for All Europeans package in 2016. The principle requires demand resources to be considered on par with supply-side solutions and prioritized whenever they are less costly or deliver more value than alternative options. This approach should be applied in every planning process, decision-making and investment regarding the energy sector. In order to examine to which degree, the EE1 principle is actually implemented by the Member States, we developed a composite indicator, which consists of 13 criteria. These criteria capture the multiple facets of the EE1 principle and thus, can also be used as a guide for the Member States in their operationalization of the EE1 principle. In this paper, the indicator approach was deployed to assess the implementation of the EE1 principle in the national energy and climate plans of 14 Member States, which demonstrated its applicability as an assessment tool across different countries in the EU. The results imply that the fundamentals of the principle are understood and realized. However, most countries still fail to ensure an equal treatment between supply and demand-side resources and neglect the multiple benefits associated with energy efficiency improvements.¶

Keywords: Energy Efficiency First, Composite indicator, Energy Policy, European Union, Energy poverty, Sufficiency¶

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