

EEOS Addtionality Workshop

16th Sept 2021
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Ríaltas na hÉireann
Government of Ireland

Overview

Additionality - EEOS



Baseline approach



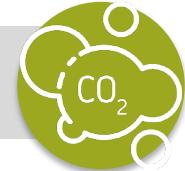
Review of lighting survey



Other non-residential



Proposed approach



Next steps



Additionality – EEOS

EED on Additionality

Annex V(2)(a) EED

The savings shall be shown to be additional to those that would have occurred in any event without the activity of the obligated, participating or entrusted parties, or implementing public authorities.

To determine the savings that can be claimed as additional, Member States shall have regard to how energy use and demand would evolve in the absence of the policy measure in question by taking into account at least the following factors:

- energy consumption trends,*
- changes in consumer behaviour,*
- technological progress, and*
- changes caused by other measures implemented at Union and national level.*

Suggested Methods

EED Art 7 Annex - Appendix XI

... the following methods could be considered when assessing net or additional savings:

- randomised controlled trials (RCTs) and options for randomised approaches;
- quasi-experimental designs, including matching;
- survey-based approaches;
- market sales data analyses;
- structured expert judgement approaches;
- deemed or stipulated ‘net to gross’ ratios;
- historical tracing (or case study) method;
- common practice baseline approaches;
- top-down evaluations (or macroeconomic models).

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- top-down evaluations (or macroeconomic models).

Randomised Controlled Trial (RCT)	
Description and main principle of the method	Experimental design. The full study population is randomly assigned to either the treatment group or the control group. The treatment group is then subject to the policy and their savings can be evaluated. The same applies to the control group that is not subject to the policy.
Strengths	Limitations
Random assignment reduces and limits bias in estimates	Ethical problems when assigning people to the control group and barring them to participate
Increases reliability and validity	Expensive in terms of time and money
Widely accepted method	Needs to be planned as part of a programme implementation to allow for appropriate randomisation
Populations of participating individuals are clearly identified	Volunteer biases: participating group may not be representative of the whole
In which cases is it used?	Evaluation is planned before the period subject to evaluation. Access to energy consumption data (e.g., energy bills) Access to non-participants and sample sizes are large enough for randomisation. Savings have to be measured savings In practice, RCT has been mostly used to evaluate behavioural programmes or experimentations (e.g., pilot programmes).
Examples and references to go further	Examples: (James and Ambrose 2016; Kendel et al. 2017; Mukai and 2014; Tiefenbeck et al. 2016) Review of studies: (Dougherty and Van de Grift 2014)

Quasi-experimental designs	
Description and main principle of the method	Similar to RCT, but without randomisation. A participant group is evaluated and a matching non-participant group with equal characteristics related to energy use has to be found. Energy savings are then compared like in RCT
Strengths	Limitations
Limits bias if a matched comparison group can be identified regarding the actions that influence energy-use	Difficulty to identify a matched comparison group
Unlike RCT can be applied after programme implementation	There is no empirical means to determine the adequacy of the comparison group
Widely accepted when random assignment cannot be used	Without randomisation, statistical tests can be meaningless
In which cases is it used?	<p>Access to energy consumption data (e.g., energy bills) and data needed to match participant and non-participant groups.</p> <p>Access to non-participants but randomisation is not possible.</p> <p>Savings have to be measured savings.</p>
Examples and references to go further	<p>Examples: EPATEE case studies about Better Energy Homes (Ireland) and about the Weatherization Assistance Program (US); (Asensio and Delmas 2017; Bertholet et al. 2014; Granell et al. 2017; McClure and Provencher 2014; Schleich et al. 2015)</p> <p>Further discussions and guidance: (Gaffney et al. 2015; Hannigan and Cook 2015; Stuart 2010 ; Violette and Rathbun 2017)</p>

Survey approach	
Description and main principle of the method	Participants and possibly non-participants are surveyed about how they would have reacted in the absence of the policy and further questions to reduce biases.
Strengths	Limitations
Does not require a non-participant control group	Prone to a long array of biases common to surveys
Flexibility to adjust questions to programme	Participants' inability to know what they would have done in the absence of the policy
Relatively low costs	Tendency to rationalise past choices
Can be combined with participant satisfaction survey	There is no way to validate the accuracy of the responses.
In which cases is it used?	When starting from deemed or scaled savings. No access to non-participant group. Budget and time restrictions.
Examples and references to go further	Examples: German and Danish examples presented further on; (McClaren and Bliss 2018; Sulyma and Tiedemann 2016) Further discussions and guidance: (Galhotra and Randazzo 2015; Meurice et al. 2014; Ridge et al. 2009; Violette and Agapay-Read 2016; Violette and Rathbun 2017)

Baseline approach

Baselines - EPATEE on Additionality

EPATEE Guide 30, section 4.4

Approaches to account for additionality (for the purposes of Art 7.):

1. Take into account **additionality criteria** in the definition of the baseline.
2. Apply **adjustment factors** to gross energy savings

Common Practice Baseline Approaches

EPATEE Guide 30

Typical examples of baselines used to calculate additional savings are:

- **market average:** using statistics on market average is a common way to reflect market trends in the baseline. This option can for example be used for cross-cutting technologies. One possible difficulty to use this option is when market data are not available. In this case, one alternative is to use as market average the characteristics of the technology deemed to be dominant on the market. Moreover, this option might not be applicable for actions very specific to particular industrial processes (for which there is no real market to compare with).
- **minimum efficiency standards:** using as baseline the minimum energy performance requirements set in current regulations is a common way to ensure that energy savings are additional to these regulations (thereby avoiding double counting).

Common Practice Baseline Approaches

EPATEE Guide 30

Typical examples of baselines used to calculate additional savings are:

- **energy efficiency indicators from benchmarking:** when no market average can be defined or no standard is applicable, an alternative can be to look for benchmarking data about energy efficiency indicators (e.g. kWh per ton of product).

In some cases, the baseline for additional savings can be the same as for gross savings, i.e. equivalent to a before/after comparison. When using engineering estimates, the rules of the EEO scheme can require in that case to calibrate the baseline energy consumption with metered data. This option can for example be allowed when it is considered that the current rate of action is very low (e.g. actions with long payback time), thus assuming that all corresponding actions can be considered additional.

Non-Residential (complex) - EED

EED Art 7 Annex - Appendix XI

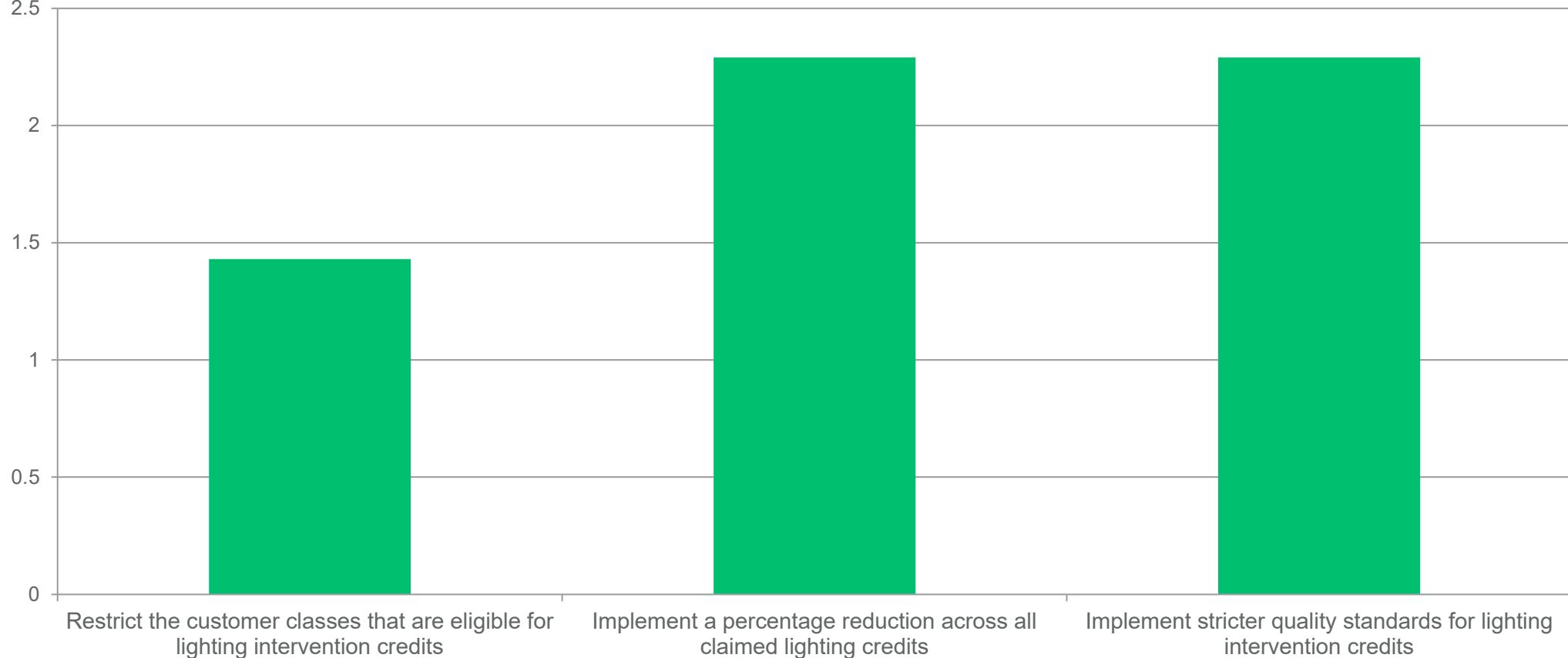
Situation	Issues	Guidance
Complex industrial processes without a clearly defined market	Market averages are difficult to establish for complex systemic processes individually designed for a certain industrial plant (no real market).	A reference investment can be constructed as the baseline. The approach should be based on the technological system with the lowest investment cost and an output that is comparable with that of the efficient option

Review of Lighting survey

Frontier Economics identified 3 options to increase the certainty of additionality

<p>Option 1: Restrict the customer classes that are eligible for lighting intervention credits</p> <ul style="list-style-type: none">▪ It could be assumed that businesses that would undertake interventions without EEOS support are those for which lighting interventions are commercially viable.▪ Credits could then be limited to businesses that do not have the ability to undertake interventions through the commercial market.▪ In theory, this would ensure that the credits claimed are additional to those that would occur in the absence of EEOS. However, this option requires that the segments served by both commercial lighting providers and OPs can be accurately identified.▪ Challenges with identifying these groups risks leaving some businesses unable to undertake lighting improvements.	<p>Option 2: Implement a percentage reduction across all claimed lighting credits</p> <ul style="list-style-type: none">▪ The percentage reduction would account for the proportion of businesses that would have undertaken a lighting intervention without energy credits.▪ Ideally, to undertake this option, information would be needed on:<ul style="list-style-type: none">▫ how much higher the price of energy savings measures would be without EEOS; and▫ the price elasticity of energy saving interventions.▪ Alternatively, a survey of businesses could be undertaken to estimate the proportion that have or would undertake interventions without EEOS. Significant consideration would need to be paid to ensuring the robustness and timeliness of results.	<p>Option 3: Implement stricter quality standards for lighting intervention credits</p> <ul style="list-style-type: none">▪ OPs indicated that, even when a business may have undertaken a lighting intervention without EEOS, it is likely that the energy credits supported a higher quality intervention.▪ Therefore, stricter quality standards could be implemented for lighting upgrades to increase the likelihood that they are above the standard that would be implemented in the absence of EEOS.▪ For example, SEAI may choose to require a full lighting design to be undertaken in order to claim energy credits for a lighting project.▪ A potential downside of this approach is that some demand for lighting interventions may be lost.
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Of the scenarios identified by Frontier Economics, which in your opinion, is the best option to meet the additionality requirements for lighting in EEOS:



- Or a hybrid between option 3 & 2 (1 vote)

Why implement a percentage reduction?

- The documentation required to obtain credits for lighting has been reviewed and increased already. Restricting customer classes will bring its own level of additional quality control.
- A percentage reduction on credits claimed would be pragmatic and more straightforward to implement for obligated parties while still encouraging relevant organisations to engage in lighting projects under EEOS.
- It is too difficult to just exclude sectors and would give bad publicity to the scheme. Certainty around all elements would be most beneficial. Inclusion for SMEs should be a priority.

Why implement stricter quality standards?

- Lighting retrofits are not happening quickly enough to meet the Paris Agreement goals, so targeted inclusion in the scheme should be encouraged.
- In my opinion all these options are too general and will restrict uptake. A simpler assessment would be a return on investment hurdle (typically 15% to 20%) where if a project could beat the ROI hurdle without credits it doesn't qualify, if it can't, it qualifies. There should be an appeal or review process where a submission can be made about a borderline case.
- Customer classes should not be limited for energy efficiency works. This introduces an inherent bias to the scheme and should be discouraged. Introducing stricter quality standards to lighting will help drive improved standards in the industry which has been beset with "man in unmarked van" lighting companies for several years.

Why a combination of Option 2 & 3?

- Where full credits are available but a full light design is required, this additional expense in itself may deter projects from availing of the supports or from going ahead at all. This would have a particular impact on SMEs who we need to be careful not to disadvantage as part of EEOS design. Giving businesses therefore the choice between stricter quality to avail of full credits or avoid lighting design and sacrifice a portion of the credits would be fairest.

Percentage reductions

- 20%
- We would expect the percentage to be in the region of 15%
- This is my second choice but the reduction should be minimal, if any. If a product achieves savings, it will continue to do so. Even if the lights eventually fail, there is no evidence to suggest the customer will revert to less efficient lighting.
- The % discount would need to be fair and reasonable and as called out in the report, strong evidence for justification would be required.
- The minimal amount possible to meet requirements. The targets have got exponentially more difficult to achieve so reducing the percentage by any more than the commission will accept is counter productive. Are there any other countries viewing lighting this way and what reduction are they proposing? We should look at 10-15% perhaps on a simple sliding scale.

How to calculate percentage reductions

- Amend the SEAI lighting calculation tool.
- One suggestion could be to expand on the SEAI's survey, or repeat the survey again with the 152 SME respondents to see how they are tracking in terms of answers provided on the first round.
- The percentage should be evidence based, a calculation based on previous credits that would no longer be 'additional' taking account of the Frontier Economics outputs may generate an appropriate outcome.
- There should be no reduction but the customer burn hours should be guaranteed by the lighting product for the timeframe of the scheme. For example, an office with annual burn of 2,500 hours should install lighting that has a guarantee to cover the total burn hours. If the office purchases lights in 2022 that have a guarantee of only 20,000 hours - the savings should be reduced in line with that. If the annual savings are 100kWh - these get reduced to $(20,000/(2,500 \times 9)) * 100\text{kWh} = 89\text{kWh}$ 9 = number of years remaining of the scheme

Other Non-Residential

Additionality -General considerations

1. Why is the action / upgrade happening?
2. What options are available and have been considered?
3. What would the standard solution be without external intervention (e.g. market baseline / industry standard)
4. What minimum equipment / energy use / design standards apply?
5. What is required to ensure savings (energy and financial) will continue to be delivered over the lifetime of the action?
6. What is the payback time, and how is it calculated?

Commercial building - HVAC upgrade

Factors to consider when establishing additionality	Examples
Reasons for upgrade?	EE overhaul / reduce energy consumption, End of life, statutory or legal requirement , change of use / function etc
Options considered	refurbish / optimise existing system, part for part replacement of system, complete replacement, etc
Design considerations	e.g. EXEED, IS.399, ASHRAE, etc
Review of systems considered	Establish market baseline
Servicing Preventative Maintenance regime selected	To ensure savings are persistent
Payback consideration	(< 2 years, 2 to 5 years, > 5 years)

Industrial heating production system

Factors to consider when establishing additionality	Examples
Reasons for upgrade?	EE overhaul / reduce energy consumption, End of life, statutory or legal requirement, change of use / function, fuel change, etc
Options considered	refurbish / optimise existing system, complete replacement, etc
Review of systems considered	Review of eligible heat sources (boilers, heat pumps, etc) on the market
Design considerations	EXEED, IS.399, ASME, etc
Best available technology (in line with EPA recommendations)	EU-IPPC: Large Combustion Plants Best Available Techniques (BAT) Large Combustion Plants
Servicing Preventative Maintenance regime selected	To ensure savings are persistent
Payback consideration	(< 2 years, 2 to 5 years, > 5 years)

Industrial cooling / refrigeration system

Factors to consider when establishing additionality	Examples
Reasons for upgrade?	EE overhaul / reduce energy consumption, End of life, change of use / function / products, etc
Options considered	refurbish / optimise existing system, complete replacement, etc
Review of systems considered	Review of eligible and applicable cooling systems (heat pumps, evaporative, chillers, etc) on the market
Design considerations	EXEED, IS.399, ASHRE, etc
Best available technology (in line with EPA recommendations)	EU IPPC - Industrial Cooling Systems , Best Available Techniques to Industrial Cooling Systems
Servicing Preventative Maintenance regime selected	To ensure savings are persistent
Payback consideration	(< 2 years, 2 to 5 years, > 5 years)

Motor / Fan replacements

Factors to consider when establishing additionality	Examples
Reasons for upgrade?	EE overhaul / reduce energy consumption, End of life, change of use / function, etc
Options considered	refurbish / optimise existing system, part for part replacement of system, complete replacement, etc
Review of systems considered	Review of eligible products on the market
Design considerations	EXEED, IS.399, etc
Best available technology (in line with EPA recommendations)	ecodesign requirements for electric motors and variable speed drives
Servicing Preventative Maintenance regime selected	To ensure savings are persistent
Payback consideration	(< 2 years, 2 to 5 years, > 5 years)

Process systems upgrade

Factors to consider when establishing additionality	Examples
Reasons for upgrade?	EE overhaul / reduce energy consumption, End of life, statutory requirement / change of use / function etc
Options considered	refurbish / optimise existing system, part for part replacement of system, complete replacement, etc
Design considerations	EXEED, IS.399, etc
Best available technology (in line with EPA recommendations)	Best Available Techniques - Food, Drink and Milk Industries Best Available Techniques - Production of Pulp, Paper and Board Best Available Techniques in the Slaughterhouses and Animal By-products Industries
Servicing Preventative Maintenance regime selected	To ensure savings are persistent
Payback consideration	(< 2 years, 2 to 5 years, > 5 years)

New built, Commercial property

Factors to consider when establishing additionality	Examples
Design considerations	BREEAM, LEED, EXEED, etc
Market Review	what standard is required to be "competitive" in the current market
Savings verification method	IPMVP Option D, (how will model be calibrated and validated?)
Payback consideration	(< 2 years, 2 to 5 years, > 5 years)

Note, for existing building upgrades minimum standards are derogated:

“By way of derogation from that requirement, savings related to the renovation of existing buildings may be claimed as energy savings for the purpose of Article 7(1), provided that the materiality criterion referred to in point 3(h) of this Annex is ensured”

Proposed approach

Demonstrating Additionality

Proposed requirements (non-residential projects)

When submitting the M&V report, evidence should be provided of:

- Reason for undertaking the work
- A list of alternative approaches considered
- Design considerations, including steps taken to ensure persistence of savings
- Payback time

SEAI to consider surveys of beneficiaries at stages during the scheme (see EPATEE case study on Denmark's EEO)

Additionality – your thoughts

- Do you agree that a high level of energy efficiency design can be used to demonstrate additionality?
- Do you think that applying a minimum 3 year payback is feasible?
- When the technology being replaced is at or near end of life, do you agree that the baseline for energy savings should be calculated using market standard technology?
- Do you agree that reduction factors could be acceptable in some situations (e.g. short payback times, replacement technology not significantly better than market average, little or no consideration to design...)

What approach is best for lighting?

- Option 1: Restrict the customer classes that are eligible for lighting intervention credits
- Option 2: Implement a percentage reduction across all claimed lighting credits
- Option 3: Implement stricter quality standards for lighting intervention credits
- Option 4: A combination of Option 2 & 3

Next steps

2021 Additionality, Materiality, Lifetimes – Next steps

Plan to survey Obligated Parties, SEAI Programme Managers, Local Authorities and previous EEOS beneficiaries to gauge levels of support that would have “*more than a minimal effect on the end-user’s decision to undertake the energy-efficiency investment*”

Potential workshop with LIEN and SME sector to discuss additionality and materiality

Workshops to be scheduled on:

- Establishing requirements and rules for reporting/documentation requirements
- Materiality levels and how to demonstrate them
- Additionality options (building on from the Frontier Economics report) classifications
- Energy Efficiency Design requirements, determining minimum baselines / reference levels.
- **Additionality criteria for the domestic sector** ✓

2021 Additionality – Next steps

SEAI will:

- Evaluate feedback from Obligated Parties and other stakeholders
- Will produce a draft guidance document for the EEO on how additionality can be demonstrated

Obligated Parties will have an opportunity to comment on the guidance document.

AOB

Thank you

