Ireland's Energy Efficiency Obligation Scheme

Policy background

The Energy Efficiency Obligation Scheme (EEOS) has been in place since 2014[1] and currently delivers around 60% of Ireland's EED energy savings obligation. The EEOS has two sub-targets: a 5% target for households in energy poverty; and a 10% target for the residential sector. The rest of the obligation can be met through savings across all sectors. Deemed, scaled and metered savings approaches are used to estimate energy savings.

Metered savings, requiring full measurement and verification (M&V) by a professionally competent individual must be completed in most non-residential projects. This requirement is in place to ensure that savings are accurate, complete, conservative, consistent relevant and transparent.

The Sustainable Energy Authority of Ireland (SEAI) provides some derogations from the strict metered savings approach where the burden of measurement is deemed to be too high. The use of conservative default values is permitted in certain circumstances. Scaled savings, using engineering estimates can be used in some smaller non-residential projects.

Technical

The measurement process for an energy efficiency improvement measure (EEIM) in the non-residential sector must be prepared by the obligated parties (OPs) or their consultants in the form of an M&V Plan. The results must be reported in an M&V Report.

The measurement requirements are not prescriptive, but they must use an approach broadly in line with the International Performance Measurement and Verification Protocol (IPMVP), the International Standards Organisation's ISO 50015 standard or other relevant standards, such as those developed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

The measurement must be carried out by a competent professional, for example a Certified Measurement and Verification Professional (CMVP) or Certified Energy Manager (CEM).

The use of the ISO 50001 energy management system by end-users is encouraged through the design of the EEOS. Where the host end-user is using the ISO 50001

[1] The scheme was significantly revised from 2023.

energy management system in a sustained way, OPs can claim a portion of their compliance credits up front.

1.1.1.1 Approach to measurement

The SEAI allows OPs to decide the exact approach to measurement, but highlights in its guidance that:

- The decision to measure a key parameter (e.g. using IPMVP Option A) or at whole facility level (e.g. using IPMVP Option C) must take into account the size of the savings relative to the metered energy use. Savings below 10% of metered use are more likely to be difficult to demonstrate, given normal fluctuations in energy use.
- Where percentage changes are small, the savings may need to be demonstrated over a longer period, i.e. over several operating cycles.
- Where multiple energy efficiency actions have been undertaken over several years, a combination of metering or sub-metering and suitable engineering calculations can be used to take account of interaction effects, unless the ISO 50001 approach is employed.
- The onus is on the OP to determine the best approach.

A conservative approach to measurement is required where estimates or judgements need to be made, assumptions or unsubstantiated data are used, or SEAI allow particular parameters to be excluded from the analysis. Guidance on authenticating and claiming compliance credits helps OPs to decide whether to use any of the derogations from the full measurement approach[2]:

- Scaled savings (engineering calculations) can be used where projects or sub-projects install pipe insulation, steam trap replacements or lighting upgrades (without controls), as these are deemed to be well proven technologies with little operational variance.
- Scaled savings can be used for some small projects and sub-projects. In these cases, samples of projects and sub-projects need to have full measurement. The size of the samples depends on the size of the savings.
    - 10% where savings are less than 0.1 GWh;
    - 33% where savings are at least 0.1 GWh and less than 0.3 GWh;
    - 67% where savings are at least 0.3 GWh and less than 0.5 GWh.
- Conservative default values can be used for:
    - The replacement of electro-magnetic with electronic ballasts in lighting;
    - The U-values of building fabric installations; and

[2] Theses derogations only applies to projects or sub-projects that deliver less than 20% of an OP's non-residential energy savings. As an OP needs to achieve 10% of its target with residential energy savings and another 5% with 'energy poverty' savings, it means that these projects or sub-projects cannot represent more than 17% of the total energy savings reported by an OP.

- Boiler and cooling unit rated efficiencies.

Baseline periods should represent at least one operating cycle and will vary from as little as one week to a year, depending on the factors affecting variations in energy use.

SEAI provide guidance regarding meters. Good M&V practice would see all meters listed and referenced, including the meter point, the type, make, model and measurement interval, noting also whether readings are automated or manually recorded. The suitability of each meter would be noted, with justifications where suitability is not ideal, e.g. for cost reasons. Suitability depends on the meter type. The guidance points out that good practice would see heat meters sized to the expected normal operating flow range and installed to minimise turbulence.

Savings must persist until the end of the obligation period (2030 in the case of the current EEOS period running from 2021 to 2030). Risks to the persistence of savings must be identified and mitigation measures, with responsible owners, put in place where appropriate.

Photographs, before and after installations, along with screenshots of building management system graphics and contractor invoices, should be included in the M&V reporting where relevant.

SEAI uses external evaluators to review M&V reports. They may make suggestions for how to make improvements to energy savings calculations. SEAI maintains open communication with obligated parties in these cases, with the aim of ensuring that projects meet M&V requirements, potentially having made changes to the calculation method.

Experiences - stakeholder interview with Aidan Condell (SEAI)

- What is the main added value of using measured data?

The use of metered data for energy savings increases accuracy and gives confidence in the reported savings. This is turn means progress to targets can be accurately tracked with no surprises or correction adjustments. This gives the SEAI confidence that the savings reported at the end of a target period are concrete.

- How many resources are needed on the side of the public authority to assess the energy savings from metered data? (Is it more resource-incentive compared to the use of scaled savings?)

The assessment of metered energy savings is resource intensive. SEAI's process uses an external team to complete desktop evaluations, external consultants who bring industry expertise and M&V evaluation skills and experience, and an internal team to coordinate the quality management system processes and review and sign-off evaluations.

This is intensive in comparison to deemed or scaled savings, where a public authority might engage with a consultant to determine energy saving values for use in the scheme. However, once those values are in place far fewer resources are needed to maintain them. Resources are also needed to evaluate energy savings achieved from projects where simplified calculations (scaled savings) are used to allow the default values in the calculators to be made more accurate.

In the non-domestic part of the EEOS (75% of energy savings), metered savings accounted for 80% of energy savings over the last 12 months (to July 2023). The preference for metered or scaled savings at the individual project level will depend on the costs and benefits of metering. Bigger, more complex projects, are likely to benefit more from metering, as the measurement process itself can help to identify energy savings, while the ability to report higher savings if they arise, aligns the incentives of participants, OPs and the government, which can be more confident about meeting EED targets and climate goals.

- Are the analyses made from the metered data used only to assess energy savings? Or are they used also in an approach of energy management (e.g. to detect unusual deviations in electricity consumption)?

With respect to the EEOS, yes. The M&V reports are completed purely to assess the annual energy savings associated with a project. However, for the client there are other potential benefits of completing a full M&V of a project, such as project impact verification, for energy management purposes, and to determine accurate returns on investment. However, these do not form part of the analysis relevant to the EEOS, and do not form part of the EEOS M&V report template.

SEAI also proactively encourage OPs to support organisations to implement ISO50001, which ensures the metering of data at the site. This provides added benefits for sites in the long run.

- Do you think that a similar approach could be used for other types of energy efficiency actions (e.g. building renovations, behavioural measures)?

There is potential for savings to be metered in building renovation projects. Energy savings can be achieved through the renovation of buildings, or through the completion of building work which surpasses building regulation requirements. These savings can be claimed under EEOS. In such cases, baseline data may not be available, or available data may not be relevant for comparison. Where accuracy, uncertainty or reliability of measured data cannot be relied upon, then a calibrated simulation may be a more desirable and reliable method for the quantification of savings.

Behavioural changes are supported under the EEOS, but only where the impact of those behavioural changes can be metered. In practice these actions make for challenging M&V processes, and practical examples are not common.

- Did you see an improvement of the quality of the submitted files (and their data) over the years?

As SEAI works to standardise, clarify, and (where possible) simplify the work associated with the M&V of energy savings, we have seen an improvement in our own processes. By standardising M&V requirements and introducing flexibilities where applicable, we can maintain a high standard of energy saving accuracy while minimising the burden of metered savings on the OPs. We have found that as OPs adapt to metered savings, they have developed around the processes that have been introduced by SEAI.

Outside of the EEOS, the field of M&V has grown over the past few years, which has led to the greater availability of, and access to high quality energy data. This has aided the metered savings approach.