
# Impacts, Achievements and Success Stories of relevant EU-funded projects supporting the market uptake of Energy Efficiency measures in Industry and Services

Publishable Executive Summary

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# Contents

# 1 Overall aim of the study

The aim of this study, which has been prepared by Ricardo on behalf of the European Climate, Infrastructure and Environment Executive Agency (CINEA), is to evaluate the impact of 41 projects receiving funding from the Intelligent Energy – Europe II (IEE-II)[1] programme (2007-2013) and the Energy Efficiency calls within the Horizon 2020 programme (2014-2020).[2] The 41 projects sought to increase the market uptake of cost-effective energy efficiency measures within the industry and services sectors.

The study further aimed to assess whether the activities supported, such as training and capacity building programmes for relevant market stakeholders, definition of benchmarks, development of tools or sharing of best practices, continue to be an effective way to support the Clean Energy Transition of companies toward the achievement of EU Climate and Energy targets as well as the Paris Agreement's objectives. The learnings gathered from this study will feed in to the preparation of industry-related funding priorities to be supported in the future Programme for the environment and climate action (LIFE) 2021–2027.

Ricardo evaluated 41 energy efficiency, coordination and support activity projects based on data from the submitted reports and publicly available information. For each project, the study team established and examined the intervention logic i.e. mapping the activities of the projects, the outputs and the achievements. This involved a review of the project's own estimates of the Key Performance Indicators (KPIs) that resulted from project activities. The KPIs that were examined across the projects included primary energy savings, greenhouse gas savings, investment triggered, market stakeholders with increased skills on energy issues and (for some earlier projects) renewable energy generated. These KPIs were examined both for 'during project lifetime' and 'after project lifetime' impacts.

Alongside this work, an online stakeholder survey was conducted, focusing on current and future priorities. The survey sought to identify market stakeholder views on the market priorities and content gaps to accelerate the energy transition of the industry and service sectors, with a particular focus on Small and Medium Enterprises (SMEs).

The study also identified a number of success stories that describe specific projects and company participants who were able to take their learnings and apply them to achieve change within their company energy culture and ultimately improve levels of energy efficiency. Several other success stories were developed to highlight how benchmarking and standards work can lead to significant progress and potential savings.

The findings from the quantitative evaluation of the impacts and achievements of the 41 energy efficiency projects, combined with the learnings from the survey and the stakeholder interview phase of the work, are presented in detail in the final report of this study, which can be accessed separately.[3]

# 2 Policy context

According to its 2030 climate & energy framework, the EU aims to achieve at least 40% cuts in greenhouse gas (GHG) emissions from 1990 levels, at least a 32% share of renewable energy, and at least a 32.5% improvement in energy efficiency.[4] Meanwhile, as part of the European Green Deal, the Commission seeks to raise the 2030 target to 50-55% cuts in emissions, and to reach net-zero emissions by 2050.[5]

The EU has also adopted an industrial strategy[6] with strong interlinkages with these ambitions, in which industry will lead the transition towards climate neutrality through increased digitalisation and competitiveness. This strategy specifically targets SMEs, which account for 50% of Europe's GDP, two

[1] See https://ec.europa.eu/energy/intelligent/projects/
[2] See https://ec.europa.eu/programmes/horizon2020/en
[3] See https://cinea.ec.europa.eu/publications/assessment-and-communication-relevant-eu-funded-projects-supporting-market-uptake_en
[4] See European Commission. 2014. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. *A policy framework for climate and energy in the period from 2020* (/* COM/2014/015 final */). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014DC0015
[5] See European Commission. 2019. Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. *The European Green Deal.* Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1588580774040&uri=CELEX:52019DC0640
[6] See European Commission 2021. Communication from the Commission. *Updating the 2020 New Industrial Strategy: Building a stronger Single Market for Europe's recover*. Available at: https://ec.europa.eu/info/sites/default/files/communication-new-industrial-strategy.pdf

out of three European jobs, and nearly all (99.8%) of the enterprises in the EU's non-financial business sector, and thereby are critical for the performance of EU industry.[7]

Energy efficiency in industry has a key role to play in the EU meeting its 2030 and 2050 climate targets and fulfilling its objectives under the Paris Agreement. The Energy Efficiency Directive (EED) includes requirements for Member States to implement policy measures to achieve energy savings and to develop programmes encouraging SMEs specifically to undergo and implement recommendations from energy audits. In 2018, industry and services made up about 40% of the total EU-27 final energy use.

The majority of energy efficiency measures in industrial SMEs relate to heating/ventilation/air conditioning (HVAC), compressed air and lighting. In most cases, savings by technology area range from 17-20%, with HVAC systems presenting savings values sometimes greater than 40% and averaging at about 30%.[8] However, the uptake of energy efficiency among SMEs has been rather limited, with only about 33% investing in energy efficiency measures in 2019.[9]

# 3 Barriers to and drivers for adopting energy efficiency measures in SMEs

The EU industrial strategy[6], and other EU-wide and national policy frameworks, attempt to tackle the barriers that SMEs face in adopting measures to increase energy efficiency and/or incorporate renewable energy technologies. These barriers and challenges are often specific to SMEs in that they often lack the resources necessary to support cost-saving energy efficiency measures from which they would otherwise benefit.

Internal barriers for SMEs depend on the company context and can arise due to the "principal-agent relationship", "split incentives" and "moral hazard"[10], which relate to organisational factors and ways in which key decisions on energy efficiency are made.[11] Lack of awareness and commitment from top management, for example, can pose significant barriers for SMEs.[12] Barriers tend to vary with company size and complexity of production, with small enterprises tending to face greater barriers due to organisational issues than larger ones.[13]

Lack of time and/or internal skills are key internal barriers faced by SMEs more often than by larger businesses. Other barriers may arise from: a reluctance to invest in building energy efficiency improvements from SMEs leasing or renting their buildings; potential disruption of day-to-day routines; and deviation from standard practices.[14] Barriers therefore depend heavily on different aspects within a company including its procedures, processes, incentives, and daily operations. The decision-making process in an organisation, in particular, relies heavily on its overall strategy and energy culture, and there may be a lack of recognition of the strategic value of energy efficiency improvements.[15]

An external barrier SMEs often face is the limited financing sources available to them, as they often do not have access to capital markets, and banks and other financial institutions are often reluctant to provide loans due to the perceived risks. SMEs tend to offer limited prospects for growth and face

[7] See European Commission. 2019. Annual report on European SMEs. Available at: https://ec.europa.eu/growth/smes/business-friendly-environment/performance-review_en#annual-report; European Commission. 2020. Unleashing the full potential of European SMEs. Available at: https://ec.europa.eu/commission/presscorner/detail/en/fs_20_426

[8] See Thollander, P. et al. 2015. International study on energy end-use data among industrial SMEs and energy end-use efficiency improvement opportunities. *Journal of Cleaner Production 104,* 282–296.

[9] See European Investment Bank (EIB). 2020. Going green: Who is investing in energy efficiency and why it matters. Available at: https://www.eib.org/attachments/efs/eibis_2019_report_on_energy_efficiency_investments_en.pdf

[10] Principal agent problem: Where there are conflicting priorities between ownership and management ; Split incentives: A principal-agent problem in which those responsible for costs and those responsible for making investment decisions are different entities; Moral hazard: Where an entity lacks an incentive to protect against a risk as it does not bear the full costs of that risk.

[11] See Trianni, A. & Cagno., E. 2012. Dealing with barriers to energy efficiency and SMEs: Some empirical evidences. Energy, 37(1), pp. 494-504. Available at: https://www.sciencedirect.com/science/article/pii/S0360544211007237

[12] See Johansson, I. et al. 2019. Designing Policies and Programmes for Improved Energy Efficiency in Industrial SMEs. *Energies, 12*(7), 1338. Available at: https://www.mdpi.com/1996-1073/12/7/1338/htm

[13] See Trianni, A. & Cagno., E. 2012. Dealing with barriers to energy efficiency and SMEs: Some empirical evidences. Energy, 37(1), pp. 494-504. Available at: https://www.sciencedirect.com/science/article/pii/S0360544211007237

[14] See UK Department of Energy & Climate Change (DECC). 2014. Research to Assess the Barriers and Drivers to Energy Efficiency. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/392908/Barriers_to_Energy_Efficiency_FINAL_2014-12-10.pdf; European Investment Bank (EIB). 2020. Going green: Who is investing in energy efficiency and why it matters. Available at: https://www.eib.org/attachments/efs/eibis_2019_report_on_energy_efficiency_investments_en.pdf

[15] See Paramonova, S., & Thollander, P. 2016. Energy-efficiency networks for SMEs: Learning from the Swedish experience. *Renewable and Sustainable Energy Reviews, 65,* 295-307. Available at: https://www.sciencedirect.com/science/article/pii/S1364032116303227

relatively short life cycles. Relevant energy efficiency projects are often too large for microfinance initiatives but too small for commercial banks and this may result in high transaction costs.

The Carbon Trust[16] reports that many UK SMEs make the assumption that climate policies will not affect their business. Decreasing energy consumption and meeting environmental objectives were found to be important for survey respondents, but in many cases not as important as other objectives, such as complying with legislation and performing well financially. There is also evidence of misalignment between perceived and real barriers, showing that SMEs perceive economic and informational barriers to be more significant than behavioural barriers such as lack of interest and other priorities.[17] These perceived barriers may create social constructs or perceptions that energy efficiency measures are too costly or too challenging to be broadly adopted, even though there may be a lack of real evidence that this is the case.[18]

The barriers faced by SMEs vary considerably according to the sector, activity, and energy culture. Institutional and organisational barriers are sometimes more prevalent than economic ones. Economic models, therefore, are not always adequate in explaining the uptake of cost-saving energy efficiency measures. Consequently, the role of policy interventions in addressing these barriers is not always clear.

The key drivers to overcome the barriers faced by SMEs can be viewed in three steps in the decision-making timeline: the first step stems from policies and regulations that encourage the uptake of energy efficiency measures or from internal pressure within a company to take action; the second step is to leverage external drivers such as technical support and information; and the final step is to unlock internal drivers, such as information about real costs to support the investment decision-making.

# 4 The role of policy in supporting the adoption of energy efficiency measures

In 2006, the EU launched its first directive promoting energy efficiency in SMEs, and a number of Member States subsequently initiated energy efficiency audit programmes specific to SMEs.[19] The Energy Efficiency Directive (EED) of 2012 established a set of binding measures to help the EU reach its 20% energy efficiency target by 2020. In 2018, the EED was amended to increase the EU's 2030 target to 32.5% and to require Member States to deliver additional energy savings up to 2030, putting a greater emphasis on energy efficiency.[20]

Attention in both research and policy is often directed towards energy-intensive industries, while in fact there is a larger relative energy efficiency potential in SMEs and non-energy intensive industry.[21] Evidence suggests that large companies and companies in energy intensive industries generally already have a greater incentive to reduce energy costs and therefore do not necessarily make changes in response to regulations.[22] The results of the 2019 EIB Investment Survey suggest that the share of companies investing in energy efficiency is positively correlated with the energy intensity of their sector.[23] For small companies and non-energy intensive SMEs, local and/or regional energy audit programmes, and local and/or regional energy efficiency networks, may be more effective in stimulating the learning process.

Article 8 in conjunction with Annex VI of the EED mandates EU Member States to promote the availability of high quality, cost-effective energy audits to all final energy consumers, to develop programmes encouraging SMEs specifically to undergo and implement recommendations from energy

[16] See Carbon Trust. 2020. SMEs and energy efficiency. Available at: https://www.carbontrust.com/resources/smes-and-energy-efficiency
[17] Trianni et al. 2013. Empirical investigation of energy efficiency barriers in Italian manufacturing SMEs. *Energy 49,* 444-458. Available at: https://www.sciencedirect.com/science/article/pii/S0360544212007748?via%3Dihub
[18] See Palm, J. and Thollander, P. 2010) An interdisciplinary perspective on industrial energy efficiency. Applied Energy 87, 10, 3255-3261, ISSN 0306-2619.
[19] See Johansson, I. et al. 2019. Designing Policies and Programmes for Improved Energy Efficiency in Industrial SMEs. *Energies, 12*(7), 1338. Available at: https://www.mdpi.com/1996-1073/12/7/1338/htm
[20] See European Commission. 2019. Energy efficiency directive. Available at: https://ec.europa.eu/energy/topics/energy-efficiency/targets-directive-and-rules/energy-efficiency-directive_lv
[21] See Johansson, I. et al. 2019. Designing Policies and Programmes for Improved Energy Efficiency in Industrial SMEs. *Energies, 12*(7), 1338. Available at: https://www.mdpi.com/1996-1073/12/7/1338/htm
[22] See Thollander, P. et al. 2015. A review of industrial energy and climate policies in Japan and Sweden with emphasis towards SMEs. *Renewable and Sustainable Energy Reviews 50,* 504-512. Available at: https://www.sciencedirect.com/science/article/pii/S136403211500372X
[23] See European Investment Bank (EIB). 2020. Going green: Who is investing in energy efficiency and why it matters. Available at: https://www.eib.org/attachments/efs/eibis_2019_report_on_energy_efficiency_investments_en.pdf

audits, and to encourage training programmes for energy auditors.[24] Energy audit programmes have the potential to support SMEs in understanding their energy saving potential and overcoming the informational barriers preventing take up of existing energy efficiency opportunities.

# 5 The role of the 41 projects in supporting the adoption of energy efficiency measures

Although a wide range of cost-effective energy-saving measures is currently available for companies, many have yet to be sufficiently deployed and taken up by relevant market stakeholders. In this regard, lack of expertise, time and capital often prevents companies from implementing energy-saving measures or from gaining access to the energy services market. EU Programmes such as IEE-II, Horizon 2020 and LIFE have therefore been shaped in response to the challenge of speeding up the market uptake of low-carbon technologies and services among companies, including SMEs, operating in the industry and services sectors.

All 41 projects considered in this study focused on supporting the market uptake of cost-effective energy efficiency measures among companies operating in the industry and services sectors across Europe; mainly through the implementation of capacity building programmes to overcome the existing market information barriers and to facilitate investments in energy efficiency measures. The total EU contribution granted to the 41 projects was €57.7 million, with IEE-II projects funded at 75% of eligible costs, and H2020 projects at 100% of eligible costs.

Over 4.5 million people across Europe were reported to have been reached by the 41 projects. More direct interaction was achieved through over 1,100 workshops and events run, involving over 32,000 participants. The projects produced 368 good practice guides, case studies and fact sheets, 598 written articles, 51 tools and platforms and 59 roadmaps/strategies. Furthermore, the projects also trained over 10,000 people and undertook over 3,500 energy audits.

When determining the final energy savings from project activities, one has to consider two elements: the potential energy savings associated with the recommended measures (e.g. the potential savings an audit identifies) and the implementation rate of those recommended measures. The product of these two elements, the potential savings rate and the implementation rate, is the final savings rate. An analysis of over 2,500 energy audits carried out by the projects showed that the average audit identified 18% in potential energy savings. On average, 25% of those potential energy saving measures were implemented by the companies, resulting in a final savings rate of 4.5% per conducted energy audit. Capacity building activities led to an average of 4.1% final energy savings, while tools and benchmarking activities led to 3.2% final energy savings on average.

To put this into context, the new industrial strategy[6] targets a 15% reduction in energy consumption by the EU industry sector by 2030. Considering the 4.5% final energy savings potentially achieveable through the implementation of the measures and methodologies developed by the 41 analysed projects, one can extrapolate that if this final energy savings rate were applied across the whole EU industry sector one could achieve almost a third of the targeted 15%.

The activities carried out by the 41 projects resulted in significant energy savings, GHG reduction, investment and renewable energy. The aggregated Key Performance Indicators (KPIs) of the project portfolio that had reliable and acceptable calculations[25] are presented in Table 1.

[24] See European Commission. 2014. Obligation schemes and alternative measures. Available at: https://ec.europa.eu/energy/topics/energy-efficiency/targets-directive-and-rules/obligation-schemes-and-alternative-measures_en#:~:text=Under%20the%20Energy%20Efficiency%20Directive,annual%20sales%20to%20final%20consumers.

[25] 36 projects for impacts during, and 12 projects for impacts after the project lifetime

Table 1: Overview of main impacts achieved by the projects, presented by KPI.[26]

| KPIs | *Total* | During | After | IEE-II (average) | H2020 (average) |
|---|---|---|---|---|---|
| Primary energy savings (GWh/year) | ***3,491*** | 1,754 | 1,737 | 50 | 67 |
| GHG reduction (ktCO2/year) | ***1,097*** | 586 | 511 | 19 | 17 |
| Investment triggered (€m) | ***457*** | 232 | 225 | 6 | 10 |
| Renewable energy triggered (GWh/year) | ***227*** | 225 | 2 | 37 | 26 |

As a further step in the analysis, the energy savings data was disaggregated by type of implemented action or activity carried out by the projects. The main categories considered were audits (which also included implementation of energy management systems in the analysis), capacity building, events and dissemination, and tools and benchmarking. Figure 1 below illustrates the extent to which these activities contributed to the final energy savings achieved by the projects. The three charts present the energy savings split by activity on a programme level, based on whether the activity was carried out during or after the project time, and based on whether the projects took a cross-sectoral or a single sector approach.

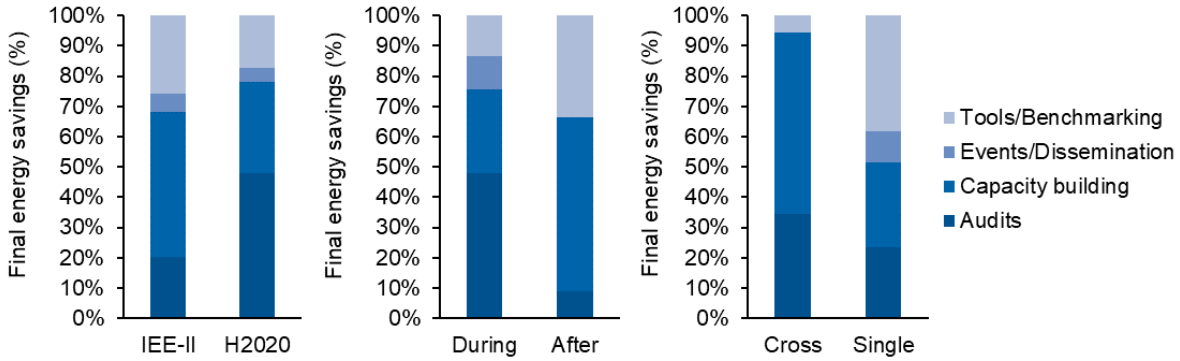



Figure 1: Cross-sectional analysis of the final energy savings by activity. The left chart splits the final energy savings by programme, the middle chart by when activity was carried out (during or after the project), and the right chart by whether the project took a cross-sectoral or single-sector approach.

Noticeable differences illustrated by the three charts are that energy savings from IEE-II projects relied more on capacity building related activities while H2020 projects relied more on audit related activities. Comparing the impacts of activities during and after the project lifetime, it is noted that audits led to a higher percentage of the energy savings during the project time – for many projects, a significant number of audits was understaken during the project lifetime and relatively few after – while capacity building activities and tools/benchmarking had effects after the project lifetime. Tools and benchmarking are more relevant within a sector than across sectors and the proportion of resultant energy savings is illustrated in the final chart.

A Cost Benefit Analysis (CBA) was carried out on the project level to identify the scale of the project impacts for the funding awarded[27]. With the re-assessment of impacts carried out, the energy savings delivered (and other KPIs) were established per Euro of EU funding. Table 2 shows the cost-benefit metrics for primary energy saved, investment triggered, GHG reduction and yearly cost savings against project funding for projects.

[26] The averages for IEE-II and H2020 projects presented here are based on impacts from activities carried out during the project lifetime of completed projects.
[27] IEE-II projects were co-funded and received 75% of their funding from the European Commission. This was considered when calculating the metrics. Since only the funding by the European Commission is considered, the funding used for the cost-benefit analysis is only 75% of the total funding received. Conversely, the H2020 projects were fully funded by the European Commission. When considering the full funding amount received by IEE-II projects (1.6 €m), it is still smaller than the amount received by H2020 projects (1.9 €m), on average, which explains the difference in the cost-benefit analysis metrics compared to the KPIs shown in Table 1.

Table 2: Cost-benefit metrics based on re-estimated project KPIs against EU funding.[28]

| Indicator | All (29) | IEE-II (22) | H2020 (7) |
|---|---|---|---|
| Energy savings / funding (GWh/year per €m) | 39.2 | 39.9 | 37.6 |
| GHG reduced / funding ($ktCO_2e$/year per €m) | 11.0 | 15.2 | 9.2 |
| Investment triggered / funding (€m per €m) | 5.1 | 4.8 | 5.7 |
| Yearly cost savings / funding (€m/year per €m) | 1.9 | 2.1 | 1.5 |

As well as the direct benefits, achievements and impacts described, there is a range of non-energy benefits (NEBs) created through pursuing energy efficiency. Some projects actively sought to identify these NEBs, which could come in the form of improved productivity or product quality, or in the form of reduced cost of disruption, material cost, maintenance cost and waste. Considering NEBs can have a considerable impact on investment decisions. If NEBs were assigned a value as a benefit, then this could have an impact on calculated payback times and hence on whether an investment is considered sufficiently profitable. Table 3 illustrates how annual cost savings would change depending on the effect of NEBs on average payback time of implemented measures.

Table 3: Potential increases in annual cost savings of the projects if NEBs were considered.

| NEB consideration | Average payback time (years) | Total annual cost savings (€m) | Annual cost savings / funding (€m/€m) |
|---|---|---|---|
| No NEB consideration | 2.7 | 89.4 | 1.9 |
| NEBs reduce payback time by 0.5 years on average[29] | 2.2 | 110.0 | 2.4 |
| NEBs halve payback time[30] | 1.3 | 178.8 | 3.9 |

# 6 Insights from the stakeholder survey

A survey was undertaken to identify particular market priorities and content gaps to accelerate the energy transition of the industry and service sectors, with a particular focus on SMEs, in order to determine priority areas in the forthcoming LIFE programme (2021-2027). Notably, the participating stakeholders were asked to share their views on the relevance of past and ongoing actions supported through IEE-II and H2020 as well as to identify priorities for the industry and service sectors to achieve the low energy transition needed. More then 180 stakeholders provided their contribution with the largest proportion of respondents (40%) describing themselves as a company, business organisation or business association.

Figure 2 below shows a number of energy efficiency topic areas supported under the IEE-II and H2020 programmes, and the prioritisation of these by stakeholders for inclusion in the new LIFE programme. As is clearly seen, all of the topics are predominantly considered to be 'essential' or 'high priority', with industrial waste heat/cold recovery receiving the highest ranking, followed by innovative energy efficiency services. The lowest ranked topic was joint actions with 50% of respondents considering these to be 'essential' or 'high priority'.

[28] Only considering KPIs rated reliable and acceptable. Based on activities carried out during project time of completed projects. Numbers in brackets indicate how many projects contributed to the calculated metrics.
[29] As suggested by the STEAM-UP project
[30] As suggested by the M-BENEFITS project

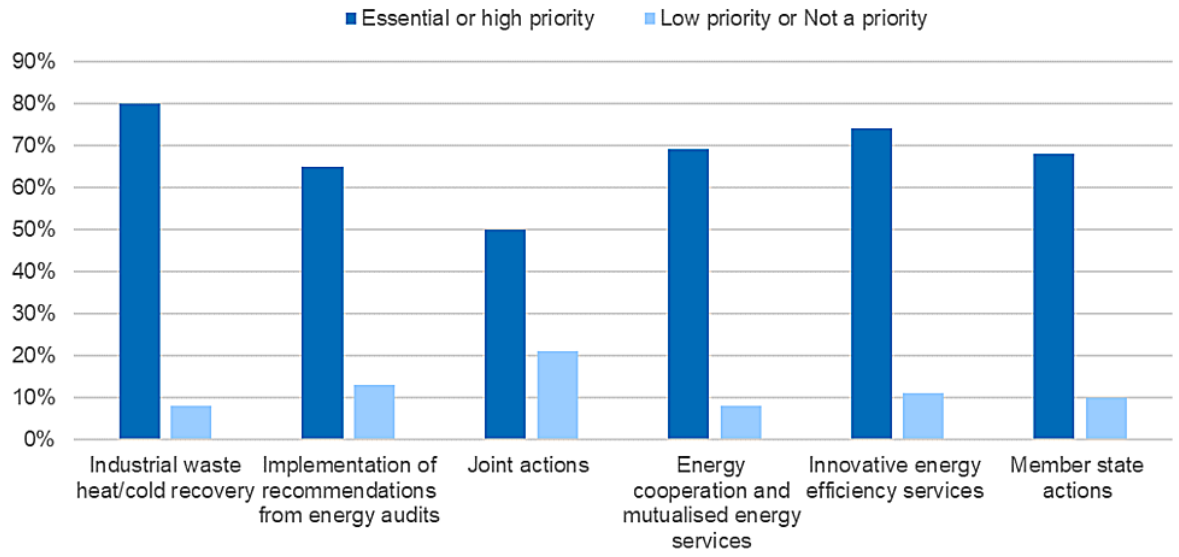



Figure 2: Overview of responses on existing topics

Respondents were also asked to point out further opportunities and challenges where the support from the Clean Energy Transition (CET) sub-programme of LIFE covering the period 2021-2027 could help make a difference. This section of the survey sought to understand the scale of challenge and opportunity that certain topics offered to progress the uptake of energy efficiency and renewable energy measures. Respondents were asked to consider the topics: digitalisation, electrification, industrial symbiosis, locally integrated partnerships and sustainable energy value chain. Regarding future challenges and opportunities, respondents appeared to be optimistic and consistently rated the topics presented as more significant opportunities than challenges. Figure 3 shows an overview of responses on future challenges and opportunities from this section of the survey. Opportunities considered to be significant by the greatest proportion of respondents are digitalisation for increasing energy efficiency and local energy partnerships for increasing use of renewable energy. The most significant challenge was considered to be industrial symbiosis for both increasing energy efficiency and the use of renewable energy.

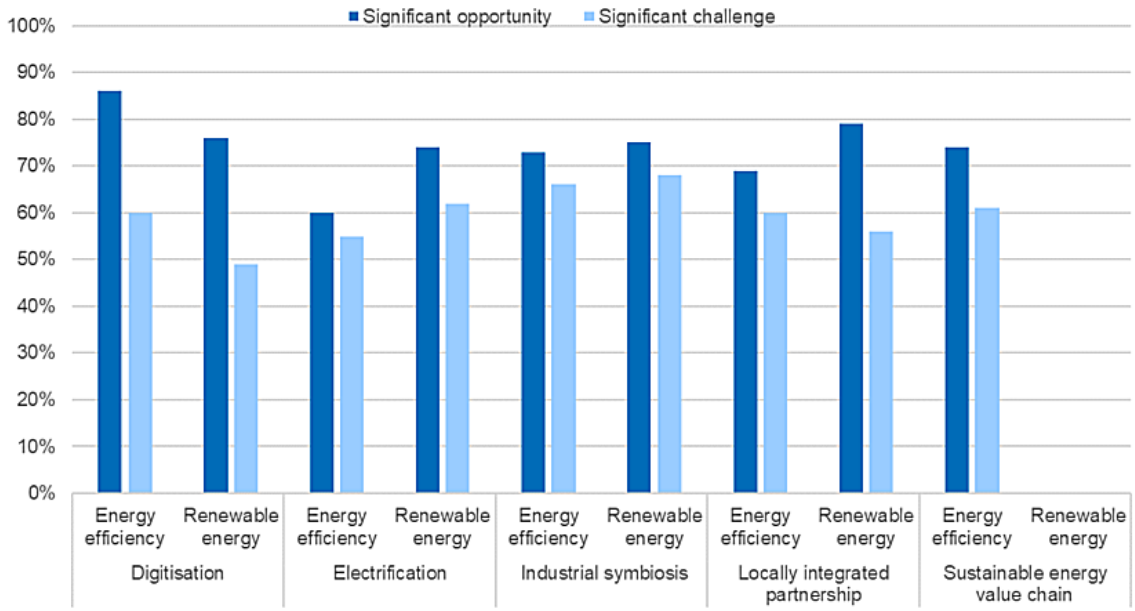



Figure 3: Overview of responses on future challenges and opportunities[31]

[31] Note that the question on sustainable energy value chain did not include questions on renewable energy.

The final section of the survey aimed to understand what types of measures should be prioritised for the LIFE programme, i.e. the type of activity that would aid overcoming barriers. The options were taken from past programmes (IEE-II, H2020), along with some new measures. All measures received a high level of support. As shown in Figure 4 below, the highest level of priority was given to the measure 'support for developing, demonstrating, and mainstreaming innovative technologies, methodologies, and processes', with nearly 90% of respondents ranking this as essential or of high priority. This measure is potentially relevant to all the topic areas of opportunity/challenge shown in Figure 3 apart from locally integrated partnerships. These partnerships are, with the exception of the measure on removing market barriers, potentially supported by all the other measures shown in Figure 4.

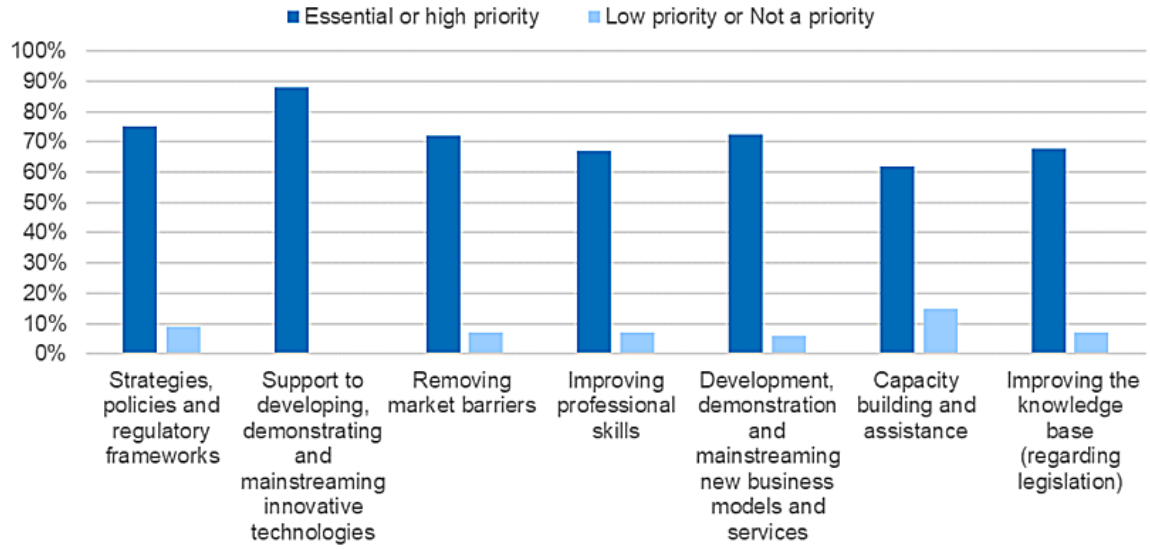



Figure 4: Overview of responses on prioritisation of measures for the upcoming LIFE programme

# 7 Lessons learned and conclusions

Through the investigation of the achievements and impacts of the 41 supported projects, including interviews with project participants and the evaluation of project reporting various lessons learned and conclusions were identified and these are described below.

This section summarises how the projects affected the market for energy efficiency audits and measures, how projects contributed to overcoming key barriers and what the key drivers were that encouraged companies to invest in energy efficiency measures. Throughout this section relevant success stories and key insights from projects and companies are highlighted to provide useful lessons to carry forward into future funding programmes.

**Lessons learned**

One of the key lessons learned was that projects found it challenging to engage SMEs in exploring their energy efficiency potential. This included challenges both with their initial recruitment to participate and also their ongoing involvement. This may be due to a lack of knowledge and awareness within SMEs of the benefits of energy efficiency, such as boosting competitiveness, but may also stem from company decision makers not considering energy efficiency improvements to be a strategic investment and/or not recognising the wider multiple benefits.

Moreover, some SMEs that participated did not fully deliver on their commitments within the project, such as sharing the full data sets they had been asked to, or having the data collection equipment necessary, such as smart meters, to gather such data. This is one of the reasons why projects may not have gathered detailed information on impacts achieved after the end of the project.

From the perspective of the project consortia, project participants indicated that they benefitted greatly from collaboration with project partners that have different expertise, work in different sector segments, have knowledge from different parts of the value chain or have insights into different geographic areas. Bringing together this range of skills proved valuable for the project as a whole and for the project participants individually, and in many cases forged the basis for long standing relationships between the partners. It was strongly felt that strong, long standing partnerships were the core of successful

project delivery, with innovative partners bringing new elements. Furthermore, projects can also benefit from knowledge sharing and synergies established between different projects.

Projects highlighted that to achieve successful implementation of energy efficiency measures in a SME, it is necessary for someone within a company to be responsible for taking the energy efficiency strategy forwards. Furthermore, support for SMEs must be practical at the point of delivery.

A focus of more recent calls for projects has been the sustainability of project learnings and outputs, beyond the lifetime of the project. The evidence from the stakeholder interviews suggests that previously it has often been assumed action will continue to be taken, but that it rarely does at the levels anticipated. The current focus on project sustainability has meant that the path taken by projects successful in this aspect, such as the EUREM family of projects, has attracted attention, with recognition that self-sustaining capacity building programmes achieve this position by creating a high value proposition with international recognition. A number of projects that are currently underway have sought to design training programmes that will be embedded in third party delivery providers beyond the project lifetime, with some being recognised as a qualification at a national level, such as within SMEmPower Efficiency.

**Barriers and how they were addressed**

These 41 projects have had a significant impact on the energy efficiency and energy audit market in Europe by addressing many of the barriers outlined in Section 3, and the lessons presented above indicate that there is significant potential for further improvement.

A key market barrier, often underpinning the challenges highlighted above, is the **lack of information or knowledge** in specific sectors. Available information on energy efficiency in industry will often be challenging for companies to interpret and to transpose to their own sector and company context. Many projects identified such gaps and focussed on establishing a knowledge base, building on direct interaction with the sector and energy efficiency experts, to develop benchmarks and tools that allow companies to identify the potential more intuitively for energy savings in their business. Projects funded under the IEE-II and H2020 programmes successfully developed this knowledge base in sectors that previously lacked dedicated energy efficiency information, thereby allowing companies in these sectors to recognise how they compare to the wider sector and how they can improve their performance. An early example is the GREENFOODS project which continues to make available the wiki-web and 'branch concept tool' for use by the sector. A more recent example is ENERWATER, which developed a methodology for assessing energy efficiency in wastewater treatment plants. This methodology considered all the intricacies and specificities of the wastewater treatment sector and is therefore more effective in encouraging implementation of measures. The success of ENERWATER's methodology is also reflected in its later adoption as a European standard.

One of the key barriers to energy efficiency in SMEs is the **lack of financing** available to them. To address this, sector specific performance benchmarks for the energy efficiency measures, alongside an overview of the best available techniques, can provide Energy Service Companies (ESCOs) or banks with more certainty over the potential return on their investment and thereby facilitate the financing of energy efficiency measures within SMEs. Multiple projects recognised this need and provided industry SMEs with key sector specific knowledge to unlock financing. Thereby the projects opened the door to more investment and potential future securitisation of SME energy efficiency investment, and the sustainability of their impact is shown beyond the project lifetime.

Next to a lack of outside financing, a further barrier is the **payback time** of some energy saving measures and a lack of appreciation for the potential savings and benefits stemming from investments in energy efficiency. To address this, the first step many projects took was to underline the energy and cost savings associated with the investment. One characteristic identified for projects that achieved high final savings rates through their activities was that they targeted specific sectors or market segments that had not previously benefited from dedicated energy efficiency knowledge. The projects thereby addressed a market gap in the energy efficiency market and were able to support SMEs in their implementation of energy saving measures with relatively low payback times. To address **longer payback periods** several projects highlighted the potential of recognising non-energy benefits, such as reduced maintenance costs, improved safety, as explored within STEAM-UP and recently within M-BENEFITS. Some projects addressed this from a cost side, identifying what further savings a company can unlock with investments in energy efficiency and thereby reduce the payback time associated with the investment. Another approach taken was to highlight the potential for revenue growth as a result of

a stronger value proposition that focuses on the improved sustainability of the companies' production, or on developing a unique 'green' selling point for companies. A further aspect addressed was future-proofing the business in an economy that will increasingly decarbonise in the coming decades, as highlighted by the STEAM-UP success story.

A further barrier many later projects focussed on was the **behavioural barrier** hindering companies from investing in becoming more sustainable. Such barriers may be, for example, a lack of commitment or resource from senior levels, a lack of interest, a reluctance to disrupt current operations; essentially energy efficiency's strategic value is not recognised. To address this, projects focussed on developing detailed insights into the wider benefits of improving energy efficiency and thereby forging an energy culture within a company that generates a willingness to continue pursuing energy efficiency beyond a momentary project interaction. Many projects found that one of the key drivers to build this energy culture is to develop knowledge and appreciation for energy efficiency within companies. Ensuring that the driver behind an energy audit is the company, rather than the auditor, will increase the likelihood of future implementation of suggested measures. This aspect was also highlighted in the survey, indicating that an energy audit on its own will not have the same impact in the absence of a positive energy culture within the company. Both the STEEEP and INDUCE success stories highlight the benefits of a more holistic company wide approach.

**Drivers for action**

There are a number of different drivers that may result in a company seeking out an energy audit and implementing the recommended measures. The primary driver for many companies is a desire to save energy and the associated costs. Other drivers include responding to the need to stay competitive within their field, providing the company with a green USP (unique selling point), responding to supply chain pressures or recognising the wider non-energy benefits.

All activities carried out by the 41 EU-funded projects had a direct or indirect effect in encouraging companies to reflect on their energy use. In some cases, these companies were already very much aware of the **growing tendency for energy efficiency** in their sector and in the wider economy, and saw that the resulting sustainability and productivity played a key part in staying competitive. Therefore, some of these companies had already started implementing measures, as with the STEAM-UP project, where the driver was the increased competitiveness in an international marketplace and the associated cost savings. In other cases, the interaction with projects acted as a trigger for companies to increase their efforts on energy efficiency, as shown by the SCOoPE success story. Many projects reported that companies found the interaction encouraged them to recognise energy efficiency beyond a financial decision, and also to see it as the right thing to do in a wider context by playing their part in decarbonising the economy. Furthermore, some companies recognised the potential for adjusting their strategic positioning in their sector by building their offer around a greener product or service.

Although it may not always trigger action on its own, the **financial benefits** resulting from energy efficiency are a major driver for implementing changes in a company. A stakeholder from a company involved in the STEAM-UP project highlighted that some sectors are under competitive pressure from outside Europe due to lower labour costs in other countries. The company identified the cost savings through energy efficiency as a necessary requirement for the European sector to remain competitive globally. However, for industry sectors with low energy intensity this driver may be lacking. In these sectors, less consideration is given to energy efficiency because the financial benefits are so much smaller.

A further driver identified is **supply chain pressure**. As the wider economy decarbonises larger companies that have to comply with energy efficiency regulation start to look beyond their own production. Industry sectors that need to align with **product policy regulations** will be experiencing increasing energy efficiency requirements. Furthermore, there is increasing attention paid to decarbonisation by customers generally. As companies consider the carbon intensity of their suppliers' products, they can apply pressure to improve energy efficiency. Therefore, although SMEs may not have to directly comply with energy efficiency regulations such as Article 8 of the EED, they are incentivised to improve their sustainability to align with their customers' sustainable supply chain ambitions.

# 8 Recommendations

This study has developed project level and programme level recommendations for the consideration of project participants, programme managers and policy makers. These recommendations outline steps to address the aforementioned barriers and propose additional approaches that may have a positive impact on encouraging the uptake of energy efficiency measures in industry sector SMEs and other companies.

**Recommendations at project level**

Good impact data is necessary to reliably measure success. While this is challenging, both in terms of what is available from the companies involved, and in terms of project timelines, it is possible. Projects that had identified the data requirements at the outset, and then implemented the data collection pathway as planned were better placed to demonstrate a reliable impact. Good data starts from the companies involved in projects having the appropriate metering solutions in place, smart meters able to extrapolate timely, disaggregated and reliable energy consumption data, and extends through to projects being able to collect before and after data to illustrate their impact.

The quality of impact data collected by projects has improved over the period these projects were implemented. Further improvements are of course possible, and additional guidance and clarification would benefit projects, as would sharing the common factors established and a period of discussion over impact data at project kick off with potential evaluators.

A key finding has been that a project with a **long term strategy** and vision for how its ouputs will be carried forward beyond the project lifetime has the greatest impact. There are various approaches to ensure long term impacts and the crucial first step is to outline a clear strategy on how it is to be achieved. This may include the integration of a project's outputs into existing programmes or tools or their exploitation through a self-sustaining entity. Hence, a preliminary business plan of how activities will continue after the project lifetime should be outlined at proposal stage and further elaborated during the implementation phase.

Project participants noted difficulties in supporting SMEs for a longer period in particular with the **implementation of identified measures**, due to scope, budget and time constraints. This meant in some cases that valuable work done by the project did not result in energy savings. Projects should consider if they can design a mechanism that will encourage SMEs to consider energy efficiency at points after the project completion, particularly if this involves continued use of project outputs. Connecting SMEs with relevant information hubs, national funding programmes or procurement options could help to drive a higher implementation rate after the project lifetime, and offers a way to facilitate companies to the next stage of support.

**Capacity building programmes** continue to be an effective tool in addressing the behavioural, information and financial barriers outlined above by building awareness for energy efficiency and in supporting the implementation of measures. There are often existing methods or tools for SMEs to overcome these barriers and these should be leveraged by building capacity within and across an organisation, encouraging SMEs to take the initiative and improve their own energy efficiency.

Projects have benefited from **establishing synergies** with other projects. In many cases projects funded under the same call will have some overlaps in their aims and activities. Exchanging ideas and knowledge can be valuable for all parties and the programme as a whole.

**Recommendations at programme level**

As was done through this study, evaluating projects on a programme level provides important insights into what has worked well or what could be improved in future programmes. An effective evaluation requires both good data from the projects themselves, as well as timely **monitoring and evaluation**. Providing clarification and guidance to projects with regards to what and how data should be collected would benefit both project and programme in monitoring progress and success. In parallel, a monitoring and evaluation strategy conducted by the individual projects or by a third party on a programme level could be introduced. To ensure smooth functioning, a pilot for such an approach may be useful. It is recommended that monitoring design is a focus at project/programme outset, and that evaluation is undertaken once all individual project data is available, potentially a set time after project completion.

A further recommendation is to leverage the value that **success stories** can bring by gathering materials for such success stories on a regular or pre-determined timetable. This should ideally occur within two years of the project's conclusion to ensure all the relevant information is still accessible, yet sufficient time has passed that implementation of measures has progressed.

Continued expansion of the topic of the **wider benefits** of energy efficiency may address a number of the identified behavioural barriers. Encouraging projects to gather information from companies on what non-energy benefits they associate with energy efficiency investments could significantly expand the knowledge base on wider benefits. This could be used to prepare examples and success stories and inform SMEs on how non-energy benefits can reduce payback times.

The **implementation phase** of energy efficiency measures is crucial to ensure a successful outcome from a project's interaction with an SME. However, this phase was often highlighted as challenging, and often occurring after the timeline of the original project had completed. One approach to address this at a programme level is to consider a dedicated follow-up phase, either as part of the project from the outset, or as a funded extension for certain projects. This could serve to both obtain accurate implementation rates and deliver implementation advice to SMEs. An alternative would be to consider a parallel programme that is dedicated to implementation support. This could be a collaborative effort by bodies such as chambers of commerce, for example, to link SMEs in each country to local funding programmes or relevant procurement routes. Such a programme could support SMEs in their next steps including securing funding, procurement, implementation and optimisation of the energy efficiency measures recommended by the original project effort.

**Recommendations for national policy makers**

Financing has been highlighted as a key barrier to energy efficiency investment. Stakeholder feedback clearly demonstrated that this topic should be addressed at national level. One approach that has proved promising is **energy service companies** (ESCOs). ESCOs can support the financing of energy efficiency measures and profit from the cost savings the company achieves. Encouraging such business could be most effective on a national, regional or municipal level. Creating local initiatives that build trust through establishing these relationships at municipal buildings for example, could kick start the market both from the perspective of SMEs and ESCOs.

Municipalities and governments could utilise **sustainable procurement** approaches in their own supply chains, addressing aspects that directly interact with the market, for example requiring energy management policies to be in place and asking about improvements made.

A further financial tool that could unlock large scale investments could be the **securitisation of energy efficiency loans** by SMEs. The considerable risk associated with loans to SMEs results in high interest rates for SMEs. Combining the risk of these loans across a large number of SMEs can lower the overall risk profile and unlock more investment at a lower interest rate. Supporting such an initiative on a national level could be a key driver for developing the market.

**Recommendations for EU policy makers**

These projects as a whole strive to strengthen the incentive for SMEs to implement energy efficiency measures, with **financial and knowledge support**. Such efforts continue to be identified as necessary, and further implementation support may yield higher implementation rates. One approach to increase the incentive could be to strengthen the synergies between different EU programmes, including the LIFE programme, through structural funds to foster the specific implementation of the recommended energy saving measures identified during a project. Financial support to SMEs may be most appropriate at the MS level, and the EC could support this by sharing best practice examples from the national level as it has for other energy efficiency priorities,[32] and through targeted support from the European Investment Bank (EIB).[33] This might involve partnerships between the EIB and commercial banks in Member States to offer credit lines specifically targeting energy efficiency in SMEs, enhancing existing

[32] Feasibility study to finance low-cost energy efficiency measures in low-income households from EU funds, 2016, https://ec.europa.eu/energy/sites/default/files/documents/low_cost_energy_efficiency_measures_-_final_report.pdf
[33] SMEs and mid-caps, https://www.eib.org/en/about/priorities/sme/index.htm
and When 'low-energy' is not an insult https://www.eib.org/en/cartoons/smes-energy-efficiency-finance#

EIB activities.[34] For example, low or zero interest rate loans could be made accessible to SMEs that have had an audit, and the support could be delivered as part of a revolving fund to ensure the sustainability of the finance.

A further aspect to consider is how to leverage large companies' aims for **sustainable supply chains**. As described above, this is a driver for the uptake of energy efficiency measures. Recent projects, such as IMPAWATT and ICCEE have considered how this aspect can be leveraged and will likely yield interesting results that can be built on. Reviewing how larger companies can be incentivised to support investment in energy efficiency in their supply chain could prove promising, and could be tied to the existing Product Environmental Footprint (PEF) and Organisational Environmental Footprint (OEF) methodologies. This may potentially create the beneficial situation for the end users whereby the costs within the supply chain are reduced through energy efficiency measures, hence products become cheaper as well as having a lower footprint.

One of the key findings from the analysis and interactions with stakeholders was that although projects generate a large amount of outputs and learnings with great value to the industry services sectors, they are not always used, or readily available, after the project lifetime. One approach to ensure that the outputs are not lost would be to set up a **knowledge hub** that captures these outputs so that they remain accessible to a wide audience. The benchmarks and best practice guides developed for different sectors could be offered through this hub, as could the success stories. Providing a centralised hub would offer companies and wider institutions, such as chambers of commerce, a one-stop-shop for energy efficiency information, all generated by the projects to date.

Furthermore, such a hub could be proactive with its content and mission, providing both the technical content and a network environment. The success stories, on the regular production timetable, could be developed within such an arrangement and the hub could facilitate the training programmes the projects developed, where there was still demand. The focus could be cross collaboration and engagement, seeking behaviour change, creating communities, dissemination and adoption, and activating the area at a national level. Examples of hubs that seek to deliver a similar service include the European Local Transport Information Service (ELTIS) and the Transport and Research and Innovation Monitoring and Information System (TRIMIS), both for DG MOVE

[34] Cleaner laundry for the Czech Republic, https://www.eib.org/en/podcasts/czech-energy-efficiency-laundries-pragoperun.htm

# A1 Success stories

**The ENERWATER H2020 project methodology was approved as a European Standard that will guide how wastewater treatment plants assess and improve their energy efficiency**

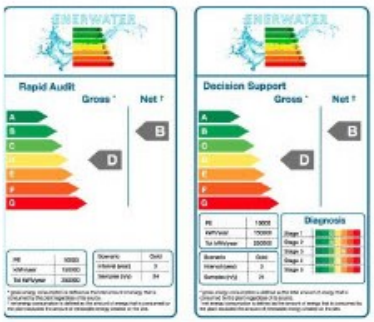
## ENERWATER

Wastewater Treatment Plants (WWTPs) are one of the **most expensive public industries** in terms of energy requirements, accounting for more than 1% of electricity consumption in Europe.

The main objective of ENERWATER was to **create, develop, validate and disseminate a standard methodology** for continuously assessing, labelling and improving the energy performance of WWTPs. No such supranational standard existed previously. To create this a collaborative network was established, including research groups, SMEs, water management companies, city councils, water authorities and industry.

The project activities included a study of WWTPs to **identify best practices**, establishment of energy consumption benchmarks, definition of a standard methodology, development of an online web application, dissemination of the methodology and supporting the transition of the ENERWATER methodology to a new European Standard.

Project duration: March 2015 to October 2018
Funding: €1,731,087
Grant agreement ID: 649819
Project website: http://www.enerwater.eu/
Cordis: https://cordis.europa.eu/project/id/649819




The energy label developed by ENERWATER for WWTPs

## The European Standard CEN/TR 17614

The ENERWATER methodology received a very positive reception by the CEN technical committee responsible for water and wastewater engineering (CEN/TC165). Turning the ENERWATER methodology into a Technical Report with support and feedback from the working group required significant extra effort and time from the project consortium, but the project participants knew that this action would greatly increase their impact.

The **CEN/TR 17614 Standard method for assessing and improving the energy efficiency of wastewater treatment plans** was approved January 2021. This means that the ENERWATER methodology is now the European standard for defining and measuring energy efficiency in wastewater treatment plants.

"The application of this Standard will bring a competitive advantage to the European water industry by facilitating evidence of energy reduction and by driving the adoption of new technologies, as well as the development and roll-out of new products."

| **Potential energy savings through improved energy efficiency in European WWTPs** | |
|---|---|
| Average potential energy savings per European WWTP | 0.24 GWh/year |
| Shifting all inefficient European WWTPs to average energy efficiency | 5,500 GWh/year |
| Shifting all European WWTPs to the 10th percentile of energy efficiency | 13,500 GWh/year |

Urban wastewater treatment plant

**STEAM-UP H2020 project helped Fahnen-Gärtner reduce their energy consumption by 1 GWh/year**

## STEAM-UP

The STEAM-UP project aimed to assess and target the energy saving potential of **steam installations in energy-intensive industries** across several countries.

STEAM-UP's activities included defining the "state of the art" of industrial steam to develop a **steam audit methodology and energy management system,** as well as developing a capacity building programme for energy auditors to learn about steam audits. A total of 393 energy auditors were trained using this programme during the project and more are being trained after the project.

*"There used to be a lack of interest and knowledge for energy efficiency for steam installations – STEAM-UP tried to address this."*

The project carried out detailed steam audits across 44 SMEs and 33 large enterprises, which triggered €6.8 million in investments and reduced energy consumption by 124 GWh/yr.

Project duration: March 2015 to February 2018
EU contribution: €1,528,655
Grant agreement ID: 649867
Project website: https://steam-up.eu/
Cordis: https://cordis.europa.eu/project/id/649867

The newly installed 600 m² PV system covers 20% of Fahnen-Gärtner's electricity consumption

## Fahnen-Gärtner GmbH

**Fahnen-Gärtner** is a market leader in the production of **promotional and national flags** and has 100 employees at its site in Mittersill in Austria. The company produces half a million square metres of fabric annually through screen and digital printing on fabric.

Fahnen-Gärtner is ambitious when it comes to sustainability and energy and is following an "Energy master plan" to reduce its greenhouse gas emissions.

The company benefitted from STEAM-UP's audit, which identified that its steam system was operating inefficiently. To address this, Fahnen-Gärtner **invested in several measures**: a new steam generation boiler, an exhaust gas heat exchanger with heat recovery and buffer storage. They also installed an Energy Monitoring System and a PV system to cover 20% of the total electricity consumption.

*"By implementing a comprehensive Energy Monitoring System, we now have an eye on all our energy needs and savings but can also connect this data with our production data to identify inefficiencies and optimise energy use."*

| **Fahnen-Gärtner savings due to STEAM-UP** | |
|---|---|
| Energy savings | 996 MWh/year |
| Cost savings | 35,000 €/year |
| Investment | 432,900 € |
| Payback time | 12 years |
| Year of implementation | 2017 |


Fahnen-Gärtner GmbH in Mittersill, Austria

Multiple benefits of energy efficiency

Swiss Workplace Solutions

# Nestlé's Swiss Workplace Solutions department have adapted their activities following participation in the H2020 project M-BENEFITS

'Swiss Workplace Solutions' is the department in charge of administrative buildings for Nestlé in Switzerland.

## Multiple Benefits (M-BENEFITS)

The goal of the M-BENEFITS project is to **train and build the capacity of energy-efficiency experts** to evaluate all benefits of industrial and tertiary sector-focused energy efficiency projects.

The project is aiming to deliver best-practice examples, tools and trainings on the **importance of multiple benefits for investment decisions in companies**. These tools developed within M-BENEFITS will allow energy managers and practitioners to improve the business case of energy-efficiency projects.

The approach takes into account three pillars that are critical to upper managers when considering project investment: contribution of energy-efficiency projects to cost reductions, the impact and improvement to value proposition, and risk reduction. Thanks to this broader approach, the contacts and champions of projects in companies will **cut across all company functions**, including top management.

Project duration: March 2018 to June 2021
Funding: € 1,866,490
Grant agreement ID: 785131
Project website: https://www.mbenefits.eu/
Cordis: https://cordis.europa.eu/project/id/785131

## Nestlé Swiss Workplace Solutions

Established over 150 years ago, **Nestlé** is the world's largest food and beverages company. The department in charge of administrative buildings for Switzerland, "Swiss workplace Solutions" has participated in the M-BENEFITS project.

A **retrospective analysis** was initially performed on the multiple benefits associated with refurbishment of a part of the HQ buildings (including the façade, technical distribution and lighting). Having seen the value of the approach and the additional benefits associated with energy efficiency improvements, the company are **currently using this method on two strategic projects**.

*"We are convinced that the M-BENEFITS methodology can be a useful tool to reinforce messages delivered to management regarding energy improvement actions."*

Participation in the project has shown the company that investing in energy efficiency measures resulted in **increased employee engagement and productivity** and reduced maintenance costs within the company.

Energy efficiency measures implemented by Nestlé

RICARDO

Multiple benefits of energy efficiency

Swiss Workplace Solutions

## The EUREMnext project helped the Olympic Sports Centre in Riga save 330 MWh/year

### EUREMnext

The EUREMnext project is part of a series of projects expanding the European EnergyManager (EUREM) training programme. The EUREM training is offered by about 60 training providers across **30 countries** and has trained over **6,000 participants**. On average, 75% of 'EnergyManagers' implement identified energy saving measures following participation in the qualification.

The EUREMnext project is aiming to transfer the training to **six more countries** (Albania, Bosnia and Herzegovina, Estonia, Latvia, Serbia and Turkey) by also establishing **national accreditation and recognition** for the EUREM training. Furthermore, it will revamp the curriculum and training materials to be more closely linked to the energy audit process and standards, as well as to cover additional up-to-date topics. It will also develop add-on implementation **support activities** for in-depth practical support on implementing measures.

Project duration: March 2018 to June 2021
EU contribution: €1,809,556
Grant agreement ID: 785032
Cordis: https://cordis.europa.eu/project/id/785032

### Olympic Sports Centre Riga

The Olympic sports centre in Riga is a multifunctional centre suitable for practice facilities and for organising national and international competitions in basketball, volleyball, handball, football, track and field athletics, gymnastics, wrestling, swimming, and other sports.

The head of technical operations of the sports centre participated in the 9-month EUREM training programme introduced to Latvia by the EUREMnext project.

*"The EUREM training unlocked significant energy savings for the company and allowed me to grow in my role as the company's energy manager."*

The learnings allowed the sport centre to install new circulation pumps for the swimming pool that improved energy performance by 44%. Furthermore, all halls were switched to more efficient lighting and switches were replaced with sensors.

Next to the energy-related benefits, the changes had positive impacts on productivity, security and overall product quality.

| The Olympic Sports Centre's energy savings | |
|---|---|
| Energy saved (GWh/year) | 0.33 |
| Investment in energy saving measures (€) | 200,000 |
| Payback period for investments (years) | 6 |
| GHG savings (tCO2/year) | 32 |
| Years of implementation | 2021 |

The new swimming pool circulation pumps

Basketball court in the sports centre

# The IMPAWATT project highlighted the importance of creating an energy culture within a company

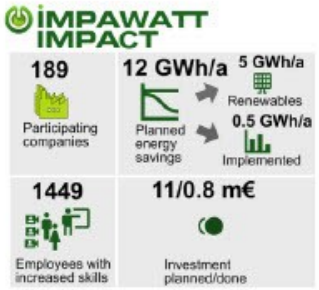
## IMPAWATT

The H2020 project **IMPlementAtion Work and Actions To change the energy culture** (IMPAWATT) created a staff training and capacity building programme to enhance corporate policy towards energy efficiency, energy culture and sustainable supply-chain initiatives. The aim of these activities is to address the barriers faced by actors in the industrial and service sectors with regards to implementing energy efficient investments.

The programme was developed into a web platform that provided tailored content adapted to each company's needs, covering **educational material** to raise awareness and train teams, and a **tool for monitoring energy use and implemented actions**.

A total of 189 companies and SMEs registered to the platform. As a result of the Covid-19 pandemic, IMPAWATT pivoted towards offering more webinars than in person trainings. As a result, over 50 webinars were held and recorded, covering topics linked to energy efficiency and management, and offer companies the expertise and tools to improve energy efficiency. **Almost 1,500 people were trained** as a result of the very successful webinars.

Project duration: June 2018 to March 2021
EU contribution: €1,101,264
Grant agreement ID: 785041
Cordis: https://cordis.europa.eu/project/id/785041
Website: https://www.impawatt.com/




Impacts of the IMPAWATT project

## Creating an energy culture

Energy culture in a company is shaped and determined by the energy policy defined by the management, but also **heavily depends on the energy behaviour of the employees**. Assessing the energy culture in a company and developing an understanding and roadmap for improvement is not an easy task.

To address this, IMPAWATT created exhaustive collections of information, motivational material, and guidelines on how to build a company's energy culture framework. Thereby, **IMPAWATT assisted companies in identifying the factors influencing the energy culture** and developing a strategy to improve it.


Areas covered by IMPAWATT Web platform (online toolbox)

## Swiss luxury watch company

A Swiss luxury watch manufacturer operating an optimised, high-tech ultra-modern factory participated in the IMPAWATT programme, but signalled they did not believe there would be any serious energy efficiency measures the project could identify. However, **IMPAWATT turned out to be a trigger moment for the company**.

*"The energy audit we conducted on site not only helped to identify several small and large measures to be implemented quickly, but also led to the management deciding to go further. It is currently discussing to deepen the energy optimization issues."*

INDUCE

GRUPO CARINSA

## The INDUCE H2020 project worked with Grupo Carinsa to reduce their energy consumption and change the culture surrounding energy efficiency in the company

Grupo Carinsa create flavours and ingredients for the food industry and fragrances for the perfume industry.

### INDUCE

The objective of the INDUCE project was to develop an **open access platform** where training materials, online lessons, guidelines and tools were available for companies aiming to increase their energy efficiency.

A **'human-centred design approach'** was used to develop the INDUCE methodology, including specific training courses and interventions that are tailored to companies' needs. This methodology was more focused on developing an energy efficiency culture within companies that enables actions to be carried out more effectively and with long-term impact.

*"INDUCE developed a toolkit for motivating and empowering key actors within the company towards a more energy efficient behaviour and culture."*

The INDUCE methodology was validated within the food & beverage sector during this project.

Project duration: February 2018 to July 2020
Funding: € 1,998,224
Grant agreement ID: 785047
Project website: https://www.induce2020.eu/
Cordis: https://cordis.europa.eu/project/id/785047

### Grupo Carinsa

**Grupo Carinsa** are a multinational company dedicated to the creation of flavours and food ingredient preparations for the food industry and fragrances for the perfume industry. During the INDUCE Project, multidisciplinary training actions on efficiency and energy consumption have taken place in the company.

Following participation in the project, Carinsa have implemented energy saving measures, including the **purchase of equipment for a new encapsulation production line**. The investment in this line has consisted of the installation of two, more efficient reactors for a total value of € 300,000.

Overall, the company estimates **energy savings of 10%**. The involvement of different departments of the company has been important in realising these changes.

*"Participation in this project has led to increased employee engagement and reduced maintenance costs"*

New encapsulation production line installed by Carinsa

RICARDO

INDUCE

GRUPO CARINSA

# The WaterWatt H2020 project helped Deutsche Edelstahlwerke reduce their energy consumption through optimisation of their water cooling pipelines

Cooling tower and water pump at Deutsche Edelstahlwerke

## WaterWatt

The WaterWatt project aimed to **improve energy efficiency in industrial water circuits** using online self-assessment, benchmarking and economic decision support.

*"Industrial water circuits are considered auxiliary systems and have therefore previously not been the focus of energy efficiency measures."*

Companies could evaluate potential improvement measures themselves by means of **online circuit modelling** provided through the project website, before engaging with the project partners.

During the project, 70 companies created 118 water circuit models, which is expected to have triggered €7.1 million in investments and reduced primary energy consumption by 62 GWh/yr.

Project duration: April 2016 to March 2019
Funding: € 1,782,533
Grant agreement ID: 695820
Cordis: https://cordis.europa.eu/project/id/695820

*"The approach of modelling water circuits proved a success. It allowed companies to visualise the potential savings in a comprehensive way and could be further used by the customer during circuit operation."*

## Deutsche Edelstahlwerke

**Deutsche Edelstahlwerke Specialty Steel** GmbH & Co. KG (DEW) is a leading producer and processor of stainless-steel products. With a workforce of 4,200 employees, it processes a total of about **one million tonnes of stainless steel per year**. Products from DEW are used in automotive, aerospace and mechanical engineering industries and energy and plant technology.

*"The WaterWatt project was a great opportunity to utilise industry expertise and evaluate our energy efficiency in comparison to benchmarks."*

Several investments were performed in order to optimise the flow of cooling water and reduce the amount of pumped water, and correspondingly energy demand. Furthermore, an **automated pump malfunction alarm** was developed based on the energy demand metering. When the specific energy demand of the pumps increases above a threshold, an automatic alarm is initiated, and the maintenance team is alerted.

Several alarm cases have taken place so far. Either one of the pumps had a malfunction or there were problems with the pipeline such as sand deposits. Due to the alarm the **malfunction was repaired at once** and increased energy consumption over longer time periods or total pump failure and replacement were avoided.

Flow meter installed following WaterWatt project at DEW

**The H2020 project SCOoPE conducted an audit for the Agriambiente Mugello cooperative which resulted in the installation of energy efficiency measures in their new stables**

## SCOoPE

The project objective was to reduce energy consumption, by implementing **cost-effective energy solutions in the targeted agro-food subsectors** (namely arable crop drying, meat and poultry, dairy, and fruit and vegetables transformation), and to further spread this knowledge within businesses technicians and managers of the 62,000 European businesses belonging to these subsectors.

**Audits and benchmarking reports** were completed for 84 agro-food companies during the project, more than originally planned. Clusters that enabled different industries and companies to share data were also set up during the project. This enabled information to be shared and stored in a database that could be accessed by project participants.

*"Some of the technical materials produced as part of SCOoPE have continued to be used as reference documents for relevant SMEs."*

Project duration: April 2016 to March 2019
EU contribution: € 1,796,004
Grant agreement ID: 695985
Cordis: https://cordis.europa.eu/project/id/695985
Project website: https://scoope.eu/


Inauguration of the new energy efficient stable at Agriambiente Mugello

## Agriambiente Mugello

**Agriambiente Mugello** is a multifunctional cooperative that carries out various activities including forestry interventions, hydraulic arrangements, naturalistic engineering and construction and maintenance of large green spaces.

The cooperative operates on about **1600 hectares** and produces cereal crops that are used to support livestock activities, with 1,400,000 litres of certified organic milk produced per year.

*"In agriculture, little attention is paid to energy efficiency as energy needs are not the most influential expenditure item in the company budget. However, in the long term, increased efficiency leads to many advantages such as waste reduction and impact on the environment, which is important in the context of our production."*

During the SCOoPE project, the cooperative was audited by technicians measuring energy consumption of a part of the company, the stable, and received a report with the results of measurements and some proposals of energy saving solutions.

Following the audit, the cooperative made a planned extension to the stables, with **a number of technical solutions aimed at improving energy efficiency**. In the new stable LED lighting and thermal insulation systems were installed. Furthermore, the previous electric motor in the cooling system was replaced by new, more efficient motors.

| ***Agriambiente Mugello* savings due to SCOoPE** | |
|---|---|
| Energy saved | 0.035 GWh/a |
| Investment | 60,000 € |
| Payback time | 5 years |
| Year of implementation | 2018-2019 |


# Overcoming challenges associated with the COVID-19 pandemic

The COVID-19 pandemic has caused disruption across European industry, causing significant economic hardship for SMEs and in some case disrupting their day-to-day activities.

## The challenge of COVID-19

For five ongoing Horizon 2020-funded projects, **SPEEDIER, E2DRIVER, ICCEE, SMEmPower Efficiency** and **INNOVEAS,** there are significant disruptions as a result of the COVID-19 pandemic. The pandemic has presented an additional barrier to engagement of SMEs, who have urgent competing priorities, and has meant project activities have had to be adapted in the wake of restrictions in travel and face-to-face contact.

Collaboration between project partners has been largely unaffected or even strengthened by the pandemic. Interviewees from ICCEE, INNOVEAS and SMEmPower Efficiency have stated that their projects have adapted well to the COVID-19 outbreak to date, with a successful **shift from physical to virtual modalities**. In this regard, the pandemic might have had a positive effect since people may be more inclined to participate in online meetings rather than travelling to physical sessions with the additional time requirements and travel expenses. By moving to virtual modes of communication, training activities in particular can be spread to wider audiences.

However, an interviewee from SMEmPower Efficiency has noticed the effect of COVID-19 on the **willingness of SMEs to participate** in courses. Interviewees from the E2DRIVER project also highlighted that, although they had been successful in recruiting 12 pilot companies, finding other replication companies in the later stages of the project may be more difficult now.

"The main obstacles faced by the project have been from COVID-19, particularly as trainings were planned to have a blended approach with a face-to-face component. Project partners have overcome this with the use of other technologies." - E2DRIVER

## Knowledge sharing

The ongoing projects periodically come together to share their status with each other, to support each other in identifying the most appropriate SMEs for their activities, and to **develop synergies** in their projed work. The projects also mutually support their **dissemination activities,** such as sharing survey links through each other's newsletters and presenting their findings together at the Sustainable Places 2020 conference.

This approach may have offered benefits as these projects continue to navigate the changing economic landscape of COVID-19 impacting Europe, altering their project approaches to deliver online rather than face to face trainings, to deliver remote data gathering and energy advice. The projects are able to **share approaches that work,** and those that are less successful. These steps have helped them continue to make progress with the project programmes, in spite of the challenging times being faced by European SMEs.

Ongoing projects have adapted well to the challenges of the pandemic

steeep
Support & Training for an Excellent Energy Efficiency Performance

Air Liquide HEALTHCARE

## The STEEEP project led to significant energy savings by providing training and guidance


Air Liquide Healthcare in Schelle, Belgium

### STEEEP

The **STEEEP** project provided 600 SMEs across various sectors with **tailored training and guidance on effective energy management tools and practices** targeted towards specific national or regional needs, with the intention of reducing their energy consumption.

Chamber of Commerce and Industry advisors exchanged their experience through **comprehensive training and regular cross-border learning network meetings**. Their support was provided to SMEs via workshops, bilateral coaching and helpdesks.

**Pilot projects** were implemented in seven different countries across Europe, setting up Local Energy Communities which aimed to shift energy management from an individual to a collective approach.

Project duration: March 2014 to February 2017
Funding: € 2,050,459
Grant agreement ID: IEE-13-844
Project link:
https://ec.europa.eu/energy/intelligent/projects/en/projects/steeep

### Air Liquide Healthcare

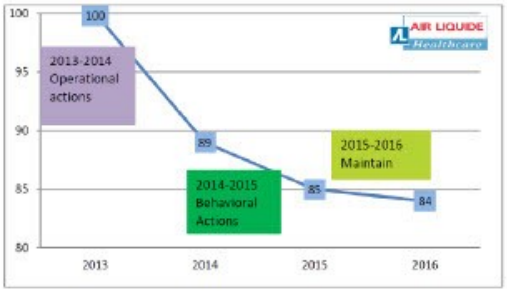
Participating SMEs received **individual company visits,** helpdesk support and participated in workshops covering energy management tools, financial incentives, and technical equipment.

**Air Liquide Healthcare** in Schelle, Belgium was one of 10 companies featured in a final Success Stories report upon completion of the project. The company produces medical equipment, including ventilation and respiratory equipment.

As part of the STEEEP project, the company participated in behavioural-based trainings to achieve energy savings.

From 2013 to 2014, the company undertook **operational actions,** such as automating lighting, and upgrading filling equipment such as pumps and compressors.

From 2014 to 2016, the company implemented monthly **awareness-raising actions and training.** Employees were encouraged to propose and implement energy saving actions. Some of the technical actions outlined by the energy scan and by the staff included technical programming of the air compressors, pumps, and lighting.




Percentage energy savings at Air Liquide Healthcare

## The IEE project COOLSAVE worked with the Nueva Pescanova group to reduce the energy consumption of their factory by 835 MWh/year

The COOLSAVE project focused on reducing energy consumption associated with refrigeration

### COOLSAVE

The COOLSAVE project aimed to reduce **industrial energy consumption in cooling installations** in the food and drink sector through the dissemination of cost-effective energy efficiency strategy implementation.

Energy efficiency strategies were developed from **cost-benefit analyses of real data** taken from a representative sample of 25 refrigeration plants covering all the different climates across Europe.

A **guide of good practices** was developed, tested and disseminated in order to make decision-makers in the food and drink industry aware of the different available options they have to improve their cooling systems.

Project duration: April 2012 to April 2015
Funding: € 1,313,658
Grant agreement ID: 615920

### Nueva Pescanova BAJAMAR7 factory

BAJAMAR7 is a factory situated in the northwest of Spain, in Galicia. This factory belongs to the Nueva Pescanova Group, a Spanish company specialising in the **fishing, farming, processing and commercialisation of seafood products,** specifically frozen prawns.

The energy consumption of the cooling plant in BAJAMAR7 was approximately 5.3 GWh/year before participating in the COOLSAVE project.

Studies performed during the project showed many **opportunities to improve energy efficiency,** including correct use of the compressor sequence and development of a personalised expert control system.

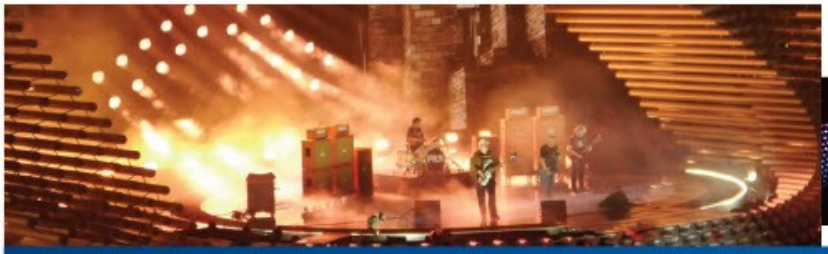
An **improved management plan** was also developed to ensure the cooling plant was used according to the real needs of production each day.

The BAJAMAR7 factory implemented these improvement strategies **without the need for investment.**

The result of these improvements was a **reduction of 28% of energy consumption** during 2015, corresponding to 835 MWh/year of energy savings.

| **BAJAMAR7 factory savings due to participation in the COOLSAVE project** | |
|---|---|
| **Energy saved** | 853 MWh/year |
| | 28% |
| **Year of implementation** | 2013-2014 |

*"It was very interesting to work with complementary partners with different approaches to the companies as well as different knowledge fields to obtain results that could benefit companies across the EU."* -ITCL



EE MUSIC

**The IEE project EE MUSIC performed an audit on the 2015 Eurovision Song Contest, which reduced the energy consumption of the event by 440,000 litres of diesel**

The 2015 Eurovision Song Contest was organised as a 'Green Event' and was watched by over 200 million people.

## EE MUSIC

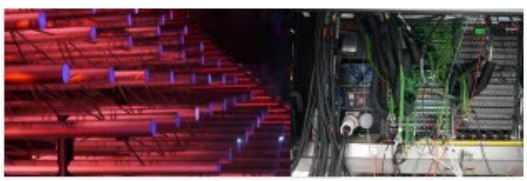
The aim of the EE MUSIC project was to achieve a change in the **European music event production market** by shifting its production processes to be more energy efficient and eco-friendly.

**Outreach, training, capacity building and energy audit** activities were carried out during the project. The project connected with key stakeholders by implementing 9 'Train-the-Experts' workshops with 111 participants and 5 Festival trainings with134 festival promoters and technical staff.

A comprehensive common **EU-knowledge base** was compiled, creating a valuable resource beyond the project's lifetime. Tools developed during the project are still being used today.

*"EE Music ambassadors are still doing work in this area and heading up new initiatives and projects, including a European consultancy helping venues with energy management."*

Project duration: May 2013 to January 2016
EU contribution: € 1,401,999
Grant agreement ID: 644763



## Eurovision Song Contest 2015

A special energy audit was provided by experts from the EE MUSIC consortium for the 60th edition of the **Eurovision Song Contest** (ESC) that took place in Vienna from 19th – 23rd May 2015.

The main scope of activities was related to the venue of the ESC finals 2015, the **Wiener Stadthalle**, and all of its associated processes such as catering, sound, light, energy supply, and cooling.

An **audit was carried out** following two workshops with members of the Austrian public service broadcaster and the ESC production team. Data was gathered in ten face-to-face meetings with the relevant service providers taking place during ESC production period and during the final TV broadcast.

*"The Eurovision Song Contest 2015 was certified not only by the Austrian ecolabel, but also by the City of Vienna's ÖkoEvent criteria."*

**Measures implemented** included:

- LEDs 15-times more efficient than conventional lamps, which were reusable after the event
- The power supply for the event came from 100% renewable electricity
- Collection and recycling of secondary materials and waste avoided 203 $tCO_2$ emissions

In total, around 862 MWh of electric energy was used at the ESC, which is **measurably less than what is typically used in an event of this size**.

| **Eurovision Song Contest 2015 savings due to EE MUSIC** | |
|---|---|
| Energy saved | 440,000 litres diesel |
| GHG savings | >1,000 $tCO_2e$ |
| Year of implementation | 2015 |

Using energy efficient LED lights and connecting to renewable power from the grid improved the energy efficiency of the event

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EE MUSIC ENERGY EFFICIENT MUSIC CULTURE

EUROPEAN ENTERPRISES CLIMATE CUP

Ekodoma

**The EECC project led to enterprises reducing their overall energy consumption through an energy savings "competition" and better energy management**

## EECC

The European Enterprises Climate Cup brought together **175 participating SMEs, from 10 countries (Austria, Bulgaria, Denmark, France, Germany, Ireland, Italy, Latvia, Malta and Spain)**.

Participants had one year to implement measures in their own enterprise in order to reduce their overall energy consumption in a competition to see which enterprise could achieve the largest energy savings.

Participating companies benefited from **free energy advice and access to the iESA energy management system,** while selected companies were offered funding opportunities and energy audits.

Through dissemination activities, companies' energy savings results were publicised and incorporated into their Corporate Social Responsibility (CSR) targets.[1]

Project duration: 26/02/2014 to 25/08/2016
Funding: € 1,412,064
Grant agreement ID: IEE-13-669
Link to project:
https://ec.europa.eu/energy/intelligent/projects/en/projects/eecc

## Uponor Latvia

**Uponor Latvia Ltd.** was one of the companies participating in the project. Uponor offers piping systems for various uses including water supply, heating and cooling, and infrastructure. Its Latvian office is located in Riga and had only 14 employees and was 220 m² in area when it participated in the project.

The following activities were implemented during the project, with the help of project partner Ekodoma:

- Installation of timers for electrical heaters
- Changing employee habits regarding use of lighting, resulting in around 30% of electricity savings
- Changing of lighting to LED solutions
- Installation of air heat pumps instead of electrical heating
- Installation of electrical monitoring devices
- Change to more energy efficient internet router and servers
- Workshop to disseminate information on energy savings in the company

These actions helped the company improve its indoor climate and encouraged employees to apply a similar approach in their own homes.

The total **energy consumption saved** during the competition timeframe was **36%.**

After the competition the company used its prize money as the third-place winner to co-finance a **2.23 kW PV system,** which cost **4,400 EUR.**

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EUROPEAN ENTERPRISES CLIMATE CUP

# The European EnergyManager (EUREM) training programme

Map of EUREM training providers

## European EnergyManager (EUREM)

The European EnergyManager (EUREM) training programme was initiated in 1999 by the Nuremberg Chamber of Commerce and Industry. Since then, the training and networking programme has grown considerably in scope and geographical coverage through various EU funded projects.

The EUREM training is now offered by about 60 training providers across **30 countries** worldwide. A partner institution is identified in each new country to customise the training to country-specific needs.

"EUREM is a truly European initiative that uses a tried and tested concept to expand its offerings globally."

More than **6,000 training participants** have benefitted from the EUREM training. These 'EnergyManagers' learn to describe technical and financial aspects of their measures in a standardised way to facilitate managerial decision making and, on average, **75% implement identified energy saving measures** following participation in the qualification.

| Average impact per training participant | |
|---|---|
| Energy saving potential | 750 MWh/year |
| Cost saving potential | 30,000 €/year |
| GHG reduction potential | 200 $tCO_2$/year |
| Investment in measures | 100,000 € |
| Payback period | 4 years |

(Based on EUREM.NET EU project results)

## EUREMplus (2013 - 2015)

The EUREMplus project made the EUREM training programme accessible to more businesses by bringing it to **six additional countries**: Bulgaria, Cyprus, Croatia, North Macedonia, Poland, Romania. It also helped EnergyManagers exchange knowledge and experiences and provided the basis for a **new governance structure** for the international EUREM training providers (EUREM International GmbH).

The course has continued to be offered in three of the new countries, and additional countries have joined the group in subsequent years (Belgium 2015, Slovakia 2015, Belarus 2016, Ukraine 2017).

EU contribution: €1,101,264
Grant agreement ID: 644736

Presentation of EUREM Awards at the 2018 EUREM Conference in Prague attended by 170 EnergyManagers.

## EUREMnext (2018 - 2021)

The EUREMnext project will transfer the training to **six more countries** (Albania, Bosnia and Herzegovina, Estonia, Latvia, Serbia and Turkey) by establishing **national accreditation and recognition** for the EUREM training. Furthermore, it will revamp the curriculum and training materials to be more closely linked to the energy audit process and standards, as well as to cover additional up-to-date topics. It will also develop add-on implementation **support activities** for in-depth practical support on implementing measures.

EU contribution: €1,809,556
Grant agreement ID: 785032
Cordis: https://cordis.europa.eu/project/id/785032


# How the GREENFOODS project continued to have an impact after the project time

## GREENFOODS

The IEE project GREENFOODS set out to foster the global competitiveness of the **European food and beverage (F&B) industry** by helping it achieve reduced production costs and greenhouse gas emissions. The project followed a clear standard and procedure on how to support SMEs in increasing their energy efficiency and uptake of renewable energy.

The **GREENFOODS branch concept** was a tool developed to help the F&B industry identify and evaluate energy efficiency measures and the uptake of renewable energy. This was supported by the **"wiki web"**, which comprises crucial information on operating units, process technologies, energy supply, energy efficiency, renewable energy and best practice examples.

GREENFOODS carried out **over 200 energy audits** and directly supported 11 F&B SMEs with the implementation of energy efficiency measures. The project also developed tailor-made **funding and financing schemes** for the European F&B industry. Further, GREENFOODS set up a **training course** with a focus on energy efficiency and renewable energy in the F&B industry and established a network of **Virtual Energy Competence Centres** (VECC) to act as one-stop-shops for all questions related to energy efficiency and renewable energy.

Project duration: January 2013 to July 2015
EU contribution: €1,495,353
Grant agreement ID: 645697
Website: https://www.aee-intec.at/greenfoods-122

Wiki Web - "Matrix of Industrial Process Indicators"
http://wiki.zero-emissions.at/

## Continued use of outputs after project end

Many projects struggle to capitalise on the work they do during the project with continued impacts after the project. This may be due to a lack of a plan on how outputs will be used and maintained after the project ends. To avoid this the GREENFOODS project plan set out a **strategy for how its outputs would continue to have an impact after the project ended**.

*"Every proposal should highlight what the strategy for continued impacts is and who is responsible for them. We are still using all the outputs from GREENFOODS."*

The **regularly updated "wiki web"** is a free database that supports identification and decision making on energy efficiency and renewable energy in industry. Contributing the project's learnings to expand the database's subsection on the F&B industry ensures the outputs find continued use.

Several components of the training module developed by the project were **integrated into the European EnergyManager (EUREM) training programme** in some countries, which is offered by over 60 providers worldwide. This means that the GREENFOODS training is still being provided annually. The GREENFOODS branch concept tool is also included in the training and is still in use by many SMEs and reaches 400 annual downloads. It was also expanded to other industry sectors.

| Energy savings triggered by GREENFOODS | |
|---|---|
| Energy saved | 409 GWh/year |
| Renewable energy triggered | 25 GWh/year |
| Investment in energy saving measures | 61 million EUR |
| GHG savings | 119 ktCO2/year |

Source: Ricardo estimates

Beverage factory conveyor belt

CANTINA SANTA MARIA LA PALMA

tesla
Transfering
Energy Save
Laid on Agroindustry

**The IEE project TESLA helped the Santa Maria La Palma winery reduce their energy consumption by 2.93 GWh/year and encouraged them to invest almost € 2 million in energy efficiency measures**

## TESLA

The objective of the TESLA project was to **extend best available practices** for the evaluation of energy efficiency and the adoption of measures aimed at improving energy efficiency amongst European SMEs in the **agrifood sector**. The project particularly focused on wineries, olive oil mills, animal feed factories, and fruits and vegetables processing plants.

For the fulfilment of this main goal, staff from the project partners were **trained in Energy Auditing**. The knowledge and practice acquired during the training courses and during the execution of the energy audits have contributed to **capability building and skills acquisition** throughout the sectors in the targeted countries.

In Italy some **synergies arose with the national policy** of boosting renewable energy, and some cooperatives took advantage of the work of auditors in order to assess the installation of Solar PV panels in their facilities.

Project duration: March 2013 to March 2016
EU contribution: € 1,570,318
Grant agreement ID: 644752
Cordis:
https://ec.europa.eu/energy/intelligent/projects/en/projects/tesla

Inverters and electrical cabinets of the PV plant and new building wing with thermal insulation on the roof at Santa Maria La Palma

## Santa Maria La Palma sc

The **Santa Maria la Palma Winery** is an Agricultural Cooperative Company based in the hamlet of Santa Maria La Palma, in the municipality of Alghero. The winery oversees the collection, processing, transformation and marketing of **over 700 hectares of vineyards** and has approximately 300 members.

During the TESLA project, the cooperative was **audited by technicians**, resulting in a report with the results of measurements, the analysis of flow production and total electrical and thermal consumptions, and proposals for energy saving solutions. The cooperative also participated in meetings with key actors organised by auditors.

*"We have learnt many lessons including greater awareness of the cooperative's potential to improve from a consumption, management and productivity point of view. Also, staff are more aware of these issues- at all levels from production to management"*

Following the audit, the company constructed a new building wing with **thermal insulation** and self-ventilation, as well as **LED lighting** and servers with thermal self-regulation. A **photovoltaic plant** for self-consumption of electricity and a **heat pump** for reuse of hot air were also installed.

Equipment on the bottling line was also replaced to enable **higher productivity at lower energy consumption**. Finally, lightning rod systems were installed to protect the electrical equipment in the cooperative.

| ***Santa Maria La Palma* savings due to TESLA** | |
|---|---|
| Energy saved | 2.93 GWh/year |
| Investment | 1,905,000 € |
| Payback time | 5 years |
| Year of implementation | 2014-2015 |

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tesla
Transfering
Energy Save
Laid on Agroindustry

CANTINA SANTA MARIA LA PALMA

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