



Improving Cold Chain Energy Efficiency
in food and beverage sector

Towards more energy efficient industry sectors

Results and policy recommendations, based on the findings from 9 EU projects



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About the projects



[Project website](#)

Objectives

- Enable companies to manage the energy transition by taking profit of multiple benefits and energy management approaches.
- Support the development and the implementation of EU policies on energy efficiency in the framework of art. 8 of EED beyond the project by providing national authorities with guidelines proposals and recommendations on how to strengthen the national schemes.
- Enhance the adoption of the DEESME approach by National Authorities beyond the project timeline through the implementation of institutionalization activities.

Target market

- National Authorities
- SMEs

Partners

- IEECP, FIRE, SOGESCA, Fraunhofer, Cleopa GmbH, SEDA, ECQ, KAPE, Energy Efficiency.

Objectives

- Develop a collaborative-cooperative training platform boosting the automotive supply industry collective intelligence on energy efficiency.
- Enable the development of specific training plan itineraries based on the company's needs and trainees' role in the company, which will increase the effectiveness of the training sessions and the awareness on energy issues among the staff.
- Be tested and validated in 40 companies from the automotive supply industry in four countries that represent over 50% of the EU employees in this sector: Spain, France, Italy and Germany.
- Certify a total of 60 trainers in E2DRIVER training methodology, which will ease the replication of the project results and the business consolidation of E2DRIVER platform.



[Project website](#)

Target market

- SMEs from the automotive industry.

Partners

- CIRCE, Fraunhofer, POLITO, SINERGIE, ENGIE, EPROPLAN, SERNAUTO, AEN, MESAP, MOV'EO, EPC, MERIT.



[Project website](#)

Objectives

- Design and deliver a dedicated cold supply chain energy efficiency tool to support the decision making processes of the supply chain companies in estimating their energy saving potential.
- Promote and facilitate investments in the viable energy efficiency improvement measures estimated with the tool.
- Create a capacity building program and a community dedicated to exchange experiences in cold chains' sustainability, supporting the change in the energy culture of companies and improving their energy performance through both direct training and e-learning.

Target market

- SMEs in the cold chains of the food and beverage sector.

Partners

- UNIBS, IEECP, FIRE, Adelphi, ATEE, Fraunhofer, RTU, ESCAN, SPES GEIE, Romalimenta, ANEPKO, USTUTT, ECSLA.

Objectives

- Consolidate a structured, permanent and expandable offer to help develop continuous self-sustainable services to raise awareness and build capacity in the field of energy auditing and related energy saving measures in SMEs.
- Design and deploy staff trainings and capacity building programmes to enhance corporate policy towards energy efficiency, energy culture and sustainable supply-chain initiatives.
- Identify and analyze the enabling conditions and non-technical barriers hindering the adoption of energy auditing practice.
- Systematise awareness raising procedures to overcome the psychological and organisational barriers to energy audits in SMEs, deliver a training offer to SMEs and formulate a capacity building programme targeting stakeholders.
- Create an institutional structure to sustain the project's objectives and results and lay the basis for the creation and consolidation of a pan-European network of enablers likely to support in the coming years the growth and expansion of the training offer to on energy efficiency for European business.



[Project website](#)

Target market

- SMEs in Construction, Chemical and Food Processing sectors.

Partners

- IIPLE, Confindustria Bergamo, Dr. Jakob Energy Research, UTBW, A3E, NAPE, LEAG, ESCI, K&I, CKA.



[Project website](#)

Objectives

- “Empower” SMEs to undergo energy audits and implement their proposals.
- Train 720 experts and apply their acquired knowledge to at least 160 pilot installations as practical action.
- Train a total of at least 800 SME persons.
- Reach 24.87 GWh/year primary energy savings and trigger at least 4 mil € of investments.
- Ensure that barriers to energy efficiency projects are removed by teaming between energy professionals and decision makers, Enable better implementation of energy-efficiency policies and enhance the digitalization of industry towards the fourth industry revolution.
- Promote, enable and support the Energy experts to use effective tools for energy optimization, new technologies and processes towards energy efficiency, in collaboration with top decision makers –CEOs, CFOs etc.

Target market

- SMEs

Partners

- IAUTH, TEES, SGZ, UTC, OEB, SERVELECT, ENERGIADA, UPV, Adelphi, UOWM.

Objectives

- Facilitate the uptake of energy audits and implementation of the resulting energy conservation measures in SMEs in each of the 4 pilot regions by offering a programme of outsourced energy management.
- Demonstrate the effectiveness of the self-financing mechanism as a means of driving investment in energy conservation measures among SMEs and large enterprises.
- Enhance the energy culture of SMEs through a series of engagement awareness and capacity building activities leading to SMEs that are fully aware of the multiple benefits of energy auditing.
- Demonstrate the SPEEDIER Service as an innovative & effective tool in SMEs and large enterprises.
- Increase the skills of the key market stakeholders that will enable the long-term delivery of the SPEEDIER Service beyond the end of the project.



[Project website](#)

Target market

- SMEs and large enterprises.

Partners

- IERC, Sustainable Innovations, TUS, CTA, PCT, Politecnico di Milano, ITeC, TFC, AEEPm.



[Project website](#)

Objectives

- Make energy efficiency investments more transparent, predictable and attractive for investors / financiers and project developers.
- Provide Standardised Triple-A Tools and Benchmarks to effectively assess sustainable energy investments and integrate energy efficiency in investors and financiers' overall investments strategy.
- Identify "Triple-A" energy efficiency investments, aiming to reduce the respective time and effort required at the crucial phase of the investments conceptualization, as well as to increase efficiency of respective decision making

Target market

- Financing Bodies
- Companies/ Project Developers
- Policy Makers and Policy Support Institutes
- Researchers and Academia in Business and Techno – economic Fields
- Other: Technology suppliers, property valuers, real estate agents, Technical chambers

Partners

- EPU-NTUA, ABN AMRO, IEECP, JRC, GFT, CEARA, ADELPHI, PB, UPRC, SEVEN, VIPA, NTEF.



[Project website](#)

Objectives

- Identify main barriers for unlocking the potential of energy efficiency measures through energy audit recommendations.
- Propose solutions for policy makers for energy efficiency schemes with energy and non-energy benefits.
- Mobilise and inform private stakeholders of existing opportunities, facilitating discourse with policy makers.
- Research, analyse and involve stakeholders in the current debate for a new definition for SMEs within Article 8 of the Energy Efficiency Directive.

Coordinated by ENEA, LEAP4SME aims to support Member States in establishing or improving effective policies for small and medium-sized enterprises (SMEs) to undergo energy audits and implement cost-effective, recommended energy-saving measures through identifying the barriers for unlocking energy efficiency measures, mobilising private stakeholders, and proposing effective solutions to realise both energy and non-energy benefits.

Partners

- ENEA, REVOLVE, Energy Saving Trust, KAPE, AEA, CRES, EIHP, Adene, SIEA, The energy and water agency.

Stakeholder engagement



Why?

To tailor the project activities and capacity and training programmes on the needs and expectation

Input on the identification of the risks that hinder the implementation EE investments

Review and feedback on reports and findings from the projects

Help with identification of policy obstacles

Increase the outreach and engagement potential, among wider groups of different stakeholders

Benefit of stakeholders networks and contacts

Engagement of main stakeholders in the project's activities

Enable synergies with and data exchange among relevant tools and platforms on sustainable financing

Creating a network trying to match demand and offer, and for long term continuation of results

Increase of awareness and skills by participating to the capacity building programme (i.e., national and EU trainings, e-learning, ...)

Participation in events and webinars as speakers in order to provide valuable feedback on key topics

A diversity of stakeholders

- Intermediary organisations: industrial and trade associations, associations addressing the topic of energy efficiency, smart city-portals, technical chambers
- Energy auditors, energy experts, energy managers, environmental managers, energy efficiency professionals in SMEs, researchers and academia in business and techno – economic fields
- Policy makers, local/regional/national authorities, local and regional governments, policy support institutes: EC Directorates & Units, governments and local authorities, ministries
- Financial institutions, ESCOs, technology providers, consultancy firms, training entities, engineering firms, project developers: energy companies, property valuers, real estate agents, notaries
- Other projects financed by the EC

How?

Through online platforms & tools, events, official channels of the projects, publications, interviews & surveys, dissemination actions, training material, etc.

Examples from our projects:

Definition of a new European Alliance for Energy Audit in SMEs

Automotive national association per demo country

A network for the match of demand and offer for improving energy efficiency in the cold chain

Free editions of E&T courses in 8 countries

SMEmpower energy analytics, M&T and M&V tools developed within the project and the energy management platform

Computerized decision support tools, knowledge database to illustrate results of EE financing status quo analysis

Companies undergoing an energy audit and an EMS

**At least 5000
people received
trainings from the
7 projects!**



What ?

How are stakeholders' inputs integrated in the results ?



DEESME: Challenges in implementation have already been identified in cooperation with key stakeholders from national authorities, inputs are planned in the work with SMEs.

E2Driver: Different surveys and interviews have been performed to the automotive sector companies and they have been key to determine the content of the E2DRIVER courses as well as the format.

ICCEE: Stakeholder's input contributed to the definition of case studies, for the toolbox development (i.e., information gathered from the stakeholders have been used for tailoring the toolbox), stakeholders are directly involved in filling the industry informative network.

Innoveas: The evaluations and feedbacks of trainees collected after the implementation of the capacity building programme will be included in the deliverable Validation Report on Trainings.

SMEmpower : Energy data from the engaged SME pilots courses trainees to conduct energy checks and to propose Energy Efficiency measures using the M&T and M&V tools developed by the project.

SPEEDIER: Surveys are being used to inform the development of the SPEEDIER concept and replication approach.

Triple-A: Results include stakeholder inputs with briefing notes, Report on Risks of EE Financing and Mitigation Strategies Typology, on the Cost of Capital Estimation of EE Projects across Member States, Web-Based Database, Standardised Triple-A Tools...

Long-term effects of stakeholder engagement



Networking

- Continuous connection among the energy experts involved in the project through the SMEmPower platform.
- Immediate communication with project developers.

Up-scaling

- Spread the structure and contents of the capacity building programme thanks to networking (for example European Alliance).

Salency

- The stakeholders involved are relevant and influential intermediaries with SMEs, and could therefore stimulate an increasing interest in the field of energy efficiency and adoption of energy efficiency measures.

Acceptance

- The purpose of the involvement is to ensure a high impact of the project even beyond the end of the project.

Institutionalisation

- Signing of 10 SEAPs or MoUs with local governments in the participating countries,
- Policy recommendations .
- Incorporation of Triple-A methodology in MS governments or regulators' national strategy for EE financing,
- Adapted national guidance documents for the implementation of Article 8 in SMEs.
- Implementation of Energy Efficiency in SMEs - A shared approach to help SMEs to overcome the barriers to the adoption of energy efficient solutions.

Barriers and solutions to Energy Efficiency in SMEs

Main barriers that hinder the adoption of energy efficient solutions by SMEs

It must be considered that it is not a single barrier in itself that hinders the start or strengthening of an improvement process. Every SME, every entrepreneur, in reality, is always faced with a multiplicity of barriers, of which one barrier alone, often, would not be decisive. What is decisive, instead, is the “accumulation” of the many barriers that, more or less at the same time, the entrepreneur is facing.

Therefore, capacity-building activities, albeit with different facets according to the various contexts and types of SMEs, should deal with all these aspects in an integrated way.

FINANCIAL

- Low availability of capital;
- High investments costs for energy efficiency upgrades in SMEs;
- Low financial profitability of intervention, with regards to the energy consumptions costs;
- Long payback time of the energy efficiency interventions.

COMPETENCES

- Divergent priorities and limited in-house capabilities of the different actors;
- Different perceptions of risk (for instance Risk of production disruptions when implementing energy efficiency measures in SMEs);
- Lack of external technical support for SMEs;
- Lack of awareness and proactivity in SMEs;
- Lack of interest and motivation.

REGULATIONS

- Varying regulations on country level and administrative burdens;
- Lack of standardization in calculation of energy consumptions, due to a lack of common available energy performance indicators.

Different perceptions of risk as well as different priorities are reinforced by the **cultural variety of the international actors**. Organizational challenges mentioned occur due to a lack of transparency in the Cold Supply Chains. In addition, many interviewees point to **cooperation and coordination issues**.

Moreover, difficulties in measuring the effectiveness and economic benefits of EEMs due to a lack of common available energy performance indicators have been experienced. Dense dynamic regulation and administrative burdens are perceived as adding to the problem (“when companies are focusing more on passing the audits than on actually becoming more energy efficient”). Resources represent a major challenge in the individual companies as well as for the SC where a sustainable financing solution for the whole network is perceived as missing.

Financing EEMs is not always seen as easy due to short payback requirements.

Policies related with Energy Efficiency in Europe focused on industry and SMEs and ways to improve them

Energy Efficiency Directive 2012

Amended in 2018 as part of Clean energy for all European Package

Article 8: Energy Audits and Energy Management System

32.5% energy efficiency target by 2030 for EU

National Climate Action Plan

Previously known as the National Energy Efficiency Action Plan

For the period from 2021-2030

10-year integrated plan to achieve 2030 target

Energy Performance of Building Directive 2010

Highly efficient and decarbonised building stock in EU by 2050

Amended in 2018

All new buildings must be NZEB from 31 December 2020

Despite these policies, most SMEs have not had an energy audit in the last 5 years, do not have an energy manager or energy policy, and have only implemented "easy" energy conservation measures. SMEs are uninformed and the COVID 19 context makes this less of a priority as businesses are trying to survive.

We need policy to support energy efficiency in SMEs.

Gap Analysis

EU Level

- No quantitative target for SMEs
- No mandatory obligations for SMEs
- 2020 target likely to be missed

National Level

- Varied transposition of EED Article 8
- Lack of financial support for SMEs
- Support limited to information

Company Level

- Lack of resources (time, money, knowledge)
- Poor understanding of multiple benefits of EE
- Competing business priorities

How do projects evaluate the effectiveness of activities to overcome the barriers?

Impacts produced by project activities

Number of stakeholders involved in the project activities and consultations

Number of companies involved in the pilot studies (i.e. SMEmPower)

Number of tools developed during the project

Number of legislative recommendations

+

Training activities

Number of SMEs, workers, energy managers involved in the capacity building programme

Number of SMEs which, after the trainings, have implemented investments focused on boosting energy efficiency

Evaluation of questionnaires collected after the trainings

Takeover & lessons learnt from common experiences shared by sister projects

Policy recommendations after the end of the project

Sustainability plan for the accredited Educational & Training Program

Platform for the collection and display of training materials

Process of energy transition, shifting the focus from financial benefits of EEM adoption

Big companies can play a role in the process, by encouraging SMEs in adopting EEM

The focus must be extended to the whole supply chain, not only on the single company

The energy auditor has the key role of leading and supporting companies towards a (more) green culture

Indicators used to demonstrate the effectiveness of tools and activities implemented to overcome the barriers

Number of companies and participants to workshops (national and EU)

Number of subscribers to the e-learning course

Number of visits to the website

Number of newsletter subscribers

Number of downloads

Questionnaire to participants

Short-term strategies implemented by Sister projects

Participation to national and international dissemination and awareness events

Updated database of best practices

IIN for sharing information between technology and solutions providers and companies in the cold chains

Newsletter

Long term strategies and actions

Capacity building activities: national workshops and e-learning platform on the following topics: supply chain management, (ii) life cycle assessment and costing, (iii) NEBs non-energy benefits and behavioural aspects, (iv) financial aspects and funding opportunities

Design and implementation of a Capacity building programme (local workshops, synchronous and asynchronous training, pre-audit simulations for the identification of EEM) this should then ease the implementation of energy efficiency measures based on the availability of high skilled employees

EU workshops for supporting collaboration and information sharing among cold chains

Participation to national and international conferences to disseminate awareness and knowledge

Development of a toolbox supporting decision-makers to assess energy performance and to increase the implementation rate by defining lifecycle cost and benefits (energy-related and non energy benefits)








Valorization of the relevance of non-financial benefits from investments for energy savings (auditing and voluntary certification, green reputation and marketing, new market possibilities linked with supply chain...)

Spread the concept that the energy transition in all industrial and tertiary sectors is strictly linked with the fight to climate change (energy audit = climate audit)

Networking between SMEs and external actors, to overcome the barriers (development of standardize tools to facilitate the implementation of EEM, information on public or private funding opportunities)

Support SMEs in this process of transition, by connecting them with strategic partners to advise them on their options, help them to focus on priority, finance their projects, communicate results, etc... (set up an "Alliance for energy transition")

Barriers tackled by the projects

WHICH BARRIERS DO THE PROJECTS TACKLE?	 SPEEDIER	 SME Power Efficiency	 e2DRIVER	 innoveas	 DEESME	 TRIPLE-A	 ICCEE
Lack of time	✓	✓			✓		✓
Lack of finance	✓				✓	✓	
Poor internal knowledge & skills		✓	✓	✓	✓	✓	✓
Poor understanding of multiple benefits of EE	✓	✓	✓	✓	✓	✓	✓
Competing business priorities	✓						
Poor energy culture		✓	✓	✓			✓
Lack of suitable training on EE		✓	✓	✓	✓	✓	✓
No external support for EE implementation	✓	✓	✓	✓		✓	✓
Only 'easy' EE measures are implemented	✓						

Recommendations for policymakers

Training is required at all levels including SME staff, energy experts, finance providers, industry associations. Everybody needs to be aligned / involved.

Encourage a range of support mechanisms to meet different needs. Information alone is not enough, SMEs need support through the implementation phase too.

Develop (and promote) suitable financial mechanisms for SMEs. Joined up tax incentives, grants, revolving funds and energy tariff structures could incentivise investment.

Promote the multiple benefits of energy efficiency. Thermal comfort, staff health, building value, reduced maintenance and brand image also have value for SMEs.

Consider mandatory energy audits for SMEs to create a demand driven-market for both internal capacity building and external energy auditors.

ICCEE recommendations at EU and national level



Support continuing learning and further upskilling of the workforce

Look at ways to stimulate the reduction of food waste and food nutritional intake through a proper cold chain management.

Harmonizing Common Performance Indicators such as, single methodologies for calculating impacts of food and beverage cold chain energy impact and LCA constituents

+ The European Commission can have a role in concrete ways to achieve this

Funding projects for knowledge and skills development as well as projects with a strong awareness-raising component aimed at the general public

Support awareness raising campaigns - Public authorities should support or create (via a specialized communications / marketing consultancy) an awareness raising campaign to communicate with citizens on food and beverage cold chain energy efficiency issues and reduction of food waste and food nutritional intake through a proper cold chain management

Foster communication and awareness raising, of both food supply chain SMEs as well as the general public, concerning the importance of energy efficiency in cold supply chain



Promote innovative solutions for funding and financing of energy efficiency measures and renewable energy sources especially for SMEs.

+ Potential measures for National Authorities

