Audit Plus Integral Energy Efficiency Consultancy Service

Co-funded by the European Union

This project has received funding from the European Union's LIFE-CET environmental and climate programme under grant agreement N°101120511 Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

Tailored to your needs

The Audit Plus Project funded by European Commission under LIFE CET 2022 call, is offering **free of cost integral energy efficiency consultancy service vouchers** to Energy Intensive Industries (EIIs) to **guide through energy efficiency measures identification and implementation** for 1-2 energy consuming processes or equipment recommended/demanded by participating EIIs that will offer several **energy and non-energy benefits**. The service will be offered by the project's consortium members who are leading organizations with expertise in energy efficiency and decarbonization of energy systems and will be tailored to cater the needs and demands of the participating EIIs. The aim of this service voucher is to create awareness about the energy saving potential of 1-2 industrial process or equipment and inspire them to continue their journey of energy performance assessments for all the industrial processes and equipment withing their premises.

Audit Plus integral energy efficiency consultancy service will act as **one stop shop solution for EIIs** and will offer structured support including the following services. One or more elements below listed services will be delivered (according to needs of the participating EIIs) as part of project pilot implementation.

1. Technology assessment

- Technical audits to assess energy performance of 1-2 industrial processes and energy consuming equipment recommended/demanded by the participating EIIs and accordingly suggest applicable energy efficiency measures to cater their needs.
- Simulation of electricity and heat & mass transfer to forecast the real impact of proposed measures on the total energy consumption profile and on the energy bill.
- Identification and analysis of parameters for improving predictive maintenance and energy efficiency of 1-2 recommended/demanded industrial processes and energy consuming equipment (for example, but not limited to refrigeration, heat generation, lighting, electric generation, HVAC, boilers, air compressors, heat pumps and water pumps etc).

2. Cost benefit analysis

- Preliminary evaluation of implementation costs and payback time of the suggested energy efficiency measures for the industrial processes and energy consuming equipment.
- Evaluation of cost-effectiveness indicators including, e.g., costs of staff time for training, costs of training courses, costs of energy management system implementation activities, costs of assistance by external experts and auditors, costs of additional energy monitoring system, costs for measurement and verification of energy savings, costs for equipment maintenance.
- Evaluation of benefits including, e.g., energy related savings deriving from no-cost, low-cost and high-cost energy efficiency measures.
- Support to perform cost-benefit analysis using cost-effectiveness indicators.
- Evaluation of the influence of energy/fuel prices and interest rates on the selection of the most convenient energy efficiency measures (sensitivity analysis).

3. Engineering support

- Supervision of technical offers of the most suitable and suggested energy efficiency improvements.
- Optimisation of energy consumption in the industrial and manufacturing processes.
- Integration of electrification, alternative sustainable fuels, and renewable energies in the industrial and manufacturing processes.
- Engineering consultancy assistance for design and implementation of renewable energies and energy efficiency measures including Photovoltaics, HVAC, Heat Pumps, Energy Storage, Geothermal Energy, Variable Speed Drives, Biomass Boilers, Combined Heat Power generation, Waste2X, and Power2X.

4. Identification of public and private financing support

- Provide participating EIIs with information about regional, national, and European most suitable public and private incentives and financial supports for implementing suggested energy efficiency measures.
- Guide and support participating EIIs in preparing proposals to apply and avail above mentioned financial supports.

5. Matchmaking with technology/service providers

- Identify the most appropriate engineering companies, ESCOs, technology providers or energy auditors for each participating EIIs in each region.
- Put in contact EIIs with appropriate consultants and/or engineering companies to address any needs of the EIIs identified by the Audit Plus team when delivering the consultancy service related to, e.g., business models, deployment of renewable energy sources, cost-benefit analysis of different energy efficiency measures, life cycle analysis, social life cycle analysis, engineering support.

6. Guidance for implementing energy audit recommendations

- Strategies and recommendations to provide post audit technical and financial advice support to the businesses and monitor the impact of the energy efficiency measures implemented.
- Validation of the implementation of after energy audit plans.
- Implementation of Measurement and Verification Protocols for Energy Performance evaluation of implemented Energy Efficiency Measures.

7. Developing corporate energy management strategies

- Support companies in performing the self-analysis of barriers limiting the implementation of energy audits recommendations as well as drivers that could help overcome those barriers.
- Assist participating EIIs to create a corporate energy strategy and establish organisational energy policy.
- Assist participating EIIs in using available energy information to develop corporate energy management strategies, which improve efficiency (use of resources and productivity) and/or consistency (replacement of environmentally damaging resources with cleaner resource) and/or sufficiency (reduction of resource consumption by reducing or minimizing the company's need of such resources).

Moreover, the EIIs will be provided with an exclusive access to **Audit Plus Knowledge Hub**, where they will have access to:

1. Good practices white book for energy audits

- Good energy efficiency practices from the energy audits performed by the Audit Plus consortium members.
- Recommendations for EIIs from the stakeholders received in the operational groups discussions for overcoming financial barriers.
- Policy recommendations to create corporate energy efficiency strategies, implement energy manager profiles and establish energy policies in EIIs.
- Examples of decision paths carried on by EIIs.

2. Training materials and webinars

- Specific training for participating EIIs tailored to their needs about energy auditing, energy performance certificates, energy purchasing, and implementation of Energy Management Systems.
- Training on the usage of Energy Measurement Equipment and Energy Efficiency Calculations.

3. Available tools for calculating energy and cost savings

- Compilation of various commercially available or developed tools as part of previous research projects that will help EIIs for calculating and estimating the energy and cost savings for various energy saving measures.
- Practical use cases and short trainings to enable companies using the best tool in each case up to the final stage of implementation of the energy saving measures.

4. Success stories of implementing energy efficiency measures

- Compiled news and interviews from EIIs, public authorities or other entities regarding successful energy efficiency stories.
- Success stories from EIIs at different levels of energy audits implementation with the aim of encouraging similar EIIs to implement after audit energy efficiency measures.
- Reviews from personnel participating in the project, both from partners and external stakeholders.

5. Relevant energy efficiency KPIs

- Definition and list of energy efficiency KPIs
- Practical data from energy efficiency and energy audits evolution in the involved sectors.

The energy efficiency consultancy service voucher will guide EIIs through several **energy and cost saving opportunities** in the energy systems and industrial processes identified as more interesting. To facilitate the process a comprehensive list of potential energy saving measures for each category of energy systems and industrial processes has been created. Few examples of potential energy saving measures are listed below:

1. Heating, Ventilation and Air Conditioning Systems

- Change Set Points of thermostat.
- Change damper position.
- Adjust pressure in compressed air systems.
- Upgrades to dampers, actuators and controls.
- Install Suspended ceilings, as it makes the volume of space you need to heat smaller area.
- Insulate condensate tank and pipes.
- Install VFDs for motors.
- Replace boiler jacket.
- Replace or repair steam trap.
- Repair leaks and adjust pressure in compressed air systems.
- Optimal start-up and shut-down controls.

2. Motors and Drives

- Upgrade to Energy Efficient Motors.
- Upgrade to Variable Speed Drives (VSDs).

3. Renewables energy generation

- Install photovoltaic panels.
- Install solar thermal collectors.
- Install wind turbines.
- Install air-source, water-source, or ground-source heat pumps.
- Install geothermal system.

4. Lighting

- Install occupancy sensors.
- Install timers for lights.
- Install day light sensors for the lights.
- Install task lights.
- Upgrade to LED.
- Upgrade to dimmable LED.
- Install a skylight to take advantage of natural daylight and ensure to keep them clean.
- Install light fittings with reflectors so that light is directed to specified areas.

5. Building envelope

- Exterior Door Replacement.
- Use thermal insulated curtains for windows and/or front door to avoid draught and heat loss.
- Increase envelope insulation.
- Install Cool or Green Roof.
- Replace windows with more energy efficient options (double/triple glazing). You may also consider refilling or resealing your existing windows.

6. Process heating and cooling (heat/cold generation, heat/cold transfer, heat/cold storage, heat recovery)

- Control the air-to-fuel ratio in the boiler.
- Preheat the combustion air before feeding to boiler.
- Preheating boiler feed water with heat from flue gas (economizer).
- Use the oxygen enriched combustion air.
- Improve heat transfer with advanced burners and controls.
- Reduce wall heat losses.
- Furnace pressure control.
- Maintain door and tube seals.
- Reduce cooling of internal parts.
- Reduce radiation heat losses.
- Fluid or load preheating.
- Heat cascading.

- Absorption cooling.
- Recovery of heat from boiler blowdown.
- Waste heat recovery from flue gas.
- Replace Boiler with high efficiency boiler.
- Replace fossil-fuelled boilers with combined heat power unit.

7. Compressed air system

- Reduction of leaks (in pipes and equipment).
- Reduction of demand.
- Install Electronic condensate drain traps.
- Reduction of the inlet air temperature.
- Optimizing the compressor to match its load.
- Proper pipe sizing.
- Heat recovery from compressor.
- Install Adjustable speed drives (ASDs).

Contact information:

IERC

Ruchi Agrawal, Luciano De Tommasi: audit.plus.euproject@gmail.com

Visit IERC's website (knowledge hub): https://www.ierc.ie/auditplus/

LAWLER SUSTAINABILITY

Dylan Aylward, Energy Engineer: dylanaylward@lawlersustainability.com
Daniel Ring, Managing Director: danielring@lawlersustainability.com
Zoe Shinkins, Communications Lead: zoeshinkins@lawlersustainability.com

Visit Lawler Sustainablity's website: https://lawlersustainability.com/services/audit-plus/