FINDINGS

AUDIT2MEASURE

Energy efficiency in companies: implementation gaps and decision-making processes

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INTRODUCTION

This report focuses on the implementation of energy saving measures (ESM) in industrial manufacturing companies. The main goal is to present insights on the top management mindset and decision-making process on energy efficiency investments in companies.

METHODOLOGY

An in-depth survey of 31 industrial manufacturing companies was carried out across five countries in the form of multiple-choice questionnaires. In order to corroborate findings, a complementary questionnaire also gathered information from 35 energy auditors.

IMPLEMENTATION GAP

Some Energy Saving Measures appear to be recommended more often in audits

67% of companies were advised to implement an Energy Saving Measure (EMS) related to lighting. This is followed by process improvement measures, in particular relating to heating and cooling, followed by general heating of the premises, ventilation and air conditioning (HVAC), and power generation.

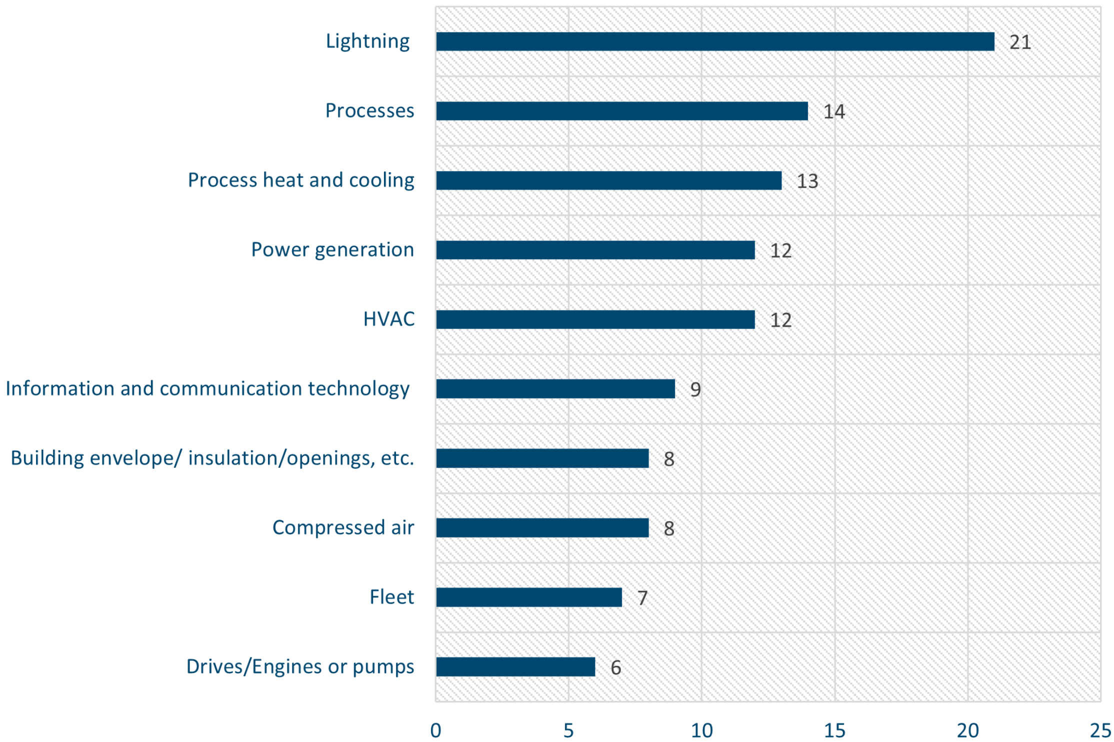

Figure 1: Recommended ESM (categories) in 31 surveyed companies

Auditors appear to be consistent in their arguments to recommend ESM

The internal rate of return (IRR) and the net present value (NPV) were the most cited metrics, outranking the simple payback period (SPP) calculation. IRR and NPV help compare investment scenarios and account for the time value of money, they provide more accurate and practical information as compared to SPP and can, therefore, ease decision making.

Across all countries, national requirements and guidelines appear to have a significant impact on the thoroughness and consistency of economic assessments of ESM in audit reports.

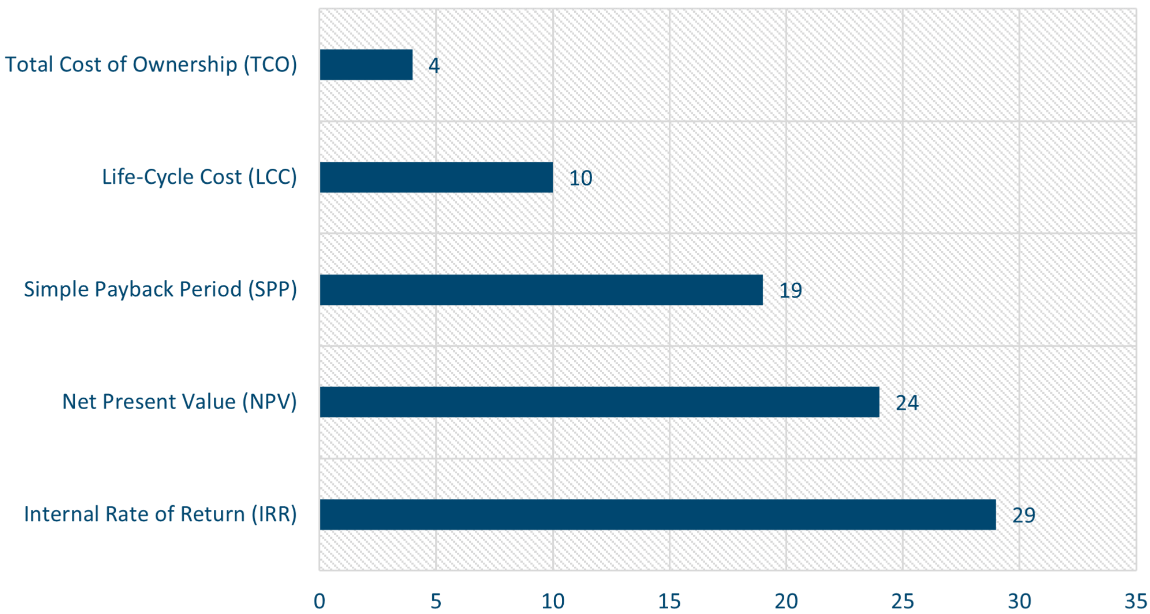

Figure 2: Use of economic performance indicators for ESM recommendations according to 35 surveyed energy auditors.

Non-energy benefits (NEB) seem to be gaining momentum

Of the 21 companies that carried out a mandatory or voluntary energy audit, over a half reported that NEBs were mentioned in their audit reports and less than 25% reported that they were not. Also 60% of the surveyed auditors reported mentioning NEBs in their audit reports.

Auditors and companies seem to prefer different NEB

The most frequently mentioned NEB was carbon footprint reduction or climate change mitigation. However, "reducing maintenance", was selected much more frequently by auditors than by companies.

NEB are not totally new to companies, yet awareness can improve

The comparison shows that companies have a good general awareness of the environmental, health and safety benefits of energy saving measures; while awareness of ESM's contribution to reducing hidden costs of companies could be improved.

Companies tend to implement less ESM than recommended in the audits

Surveyed companies have so far mainly implemented measures in the area of lighting.

In all areas except lighting and HVAC, more measures in terms of numbers are recommended than actually implemented. The largest gap is in the area of process heat and cooling, where there are significantly more companies which were recommended to implement measures (13) than companies that actually implemented them (5).

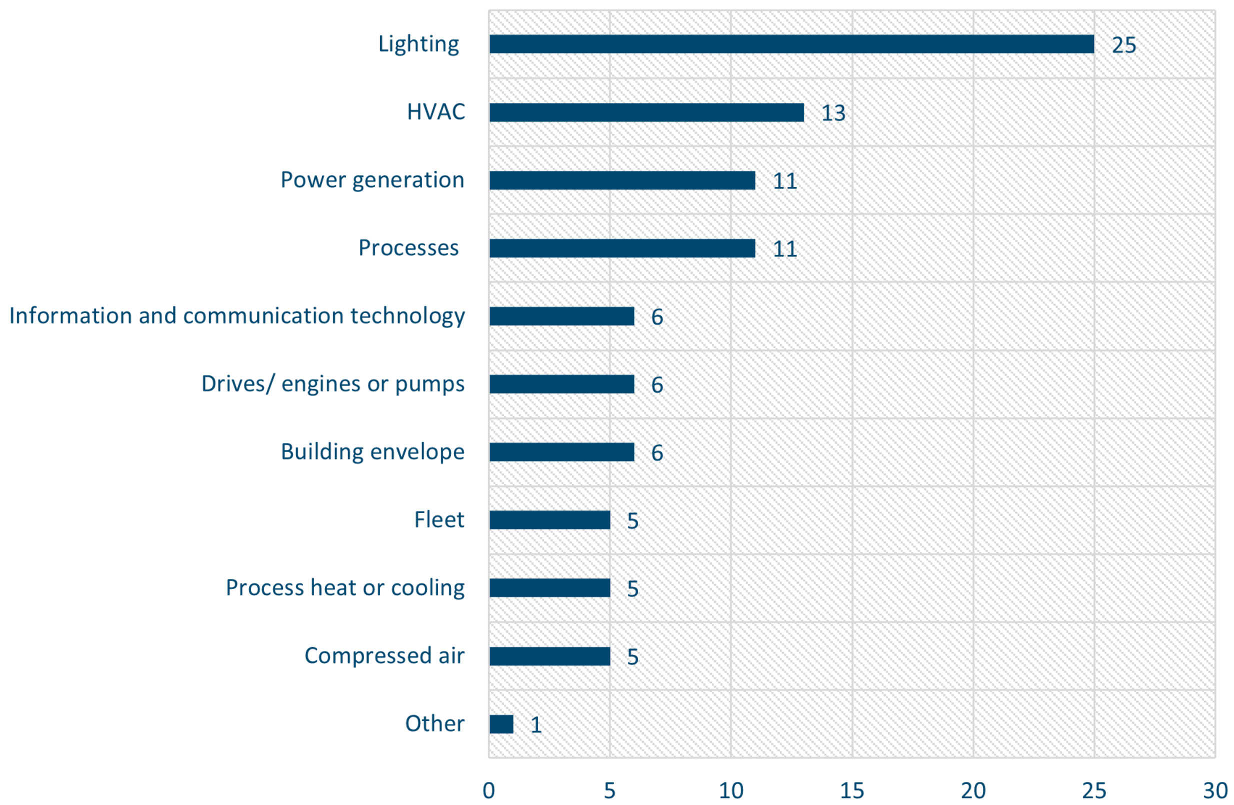

Figure 3: Implemented ESM (categories) in 31 surveyed companies

The amount of the investment is not always a deal-breaker

Reducing energy costs and short payback periods were the most frequent reasons for implementation of Energy Saving Measures. It indicates that the profitability of the investment is the priority of most companies. Low investment costs were less often mentioned as a driver. However, available subsidies do appear to play a role in choosing which ESM to implement once the decision to invest in energy efficiency was taken.

12 out of 31 companies used grants or loans to finance the ESM.

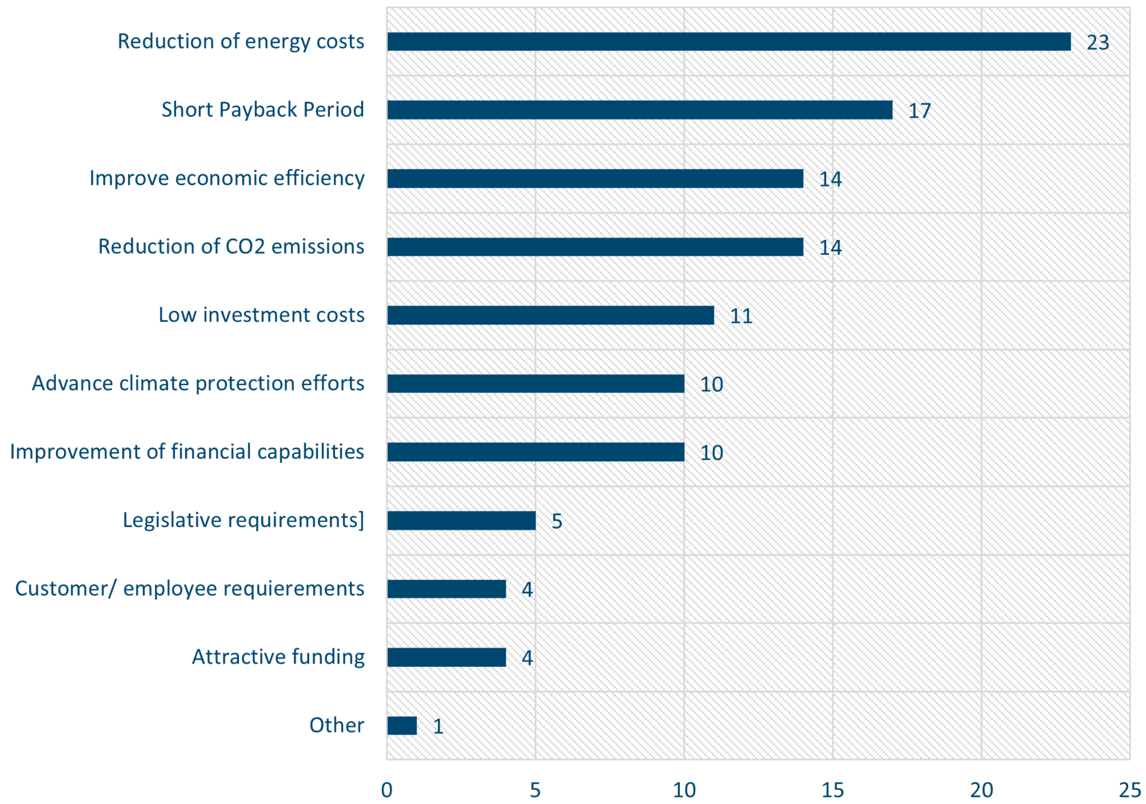

Figure 4: Reasons for the implementation of ESM according to 31 surveyed companies

Energy audits are not the only criteria for the investment decision

About half of the companies stated that investment decisions in ESM are partly based on the energy audits. Only a few companies said this was entirely true, while a third (11) of the surveyed companies said their investment decisions did not depend on the audits.

Some Energy Saving Measures tend to be implemented less often

ESM related to process heat and cooling, processes and energy generation tend to be implemented less often. Long payback periods, high investment costs and lack of resources are pointed out as impediments to ESM implementation in power generation.

Mean investment cost in ESM is often close to what auditors suggest

The indicated investment costs of implemented ESM vary widely between 1,000 EUR and 10,000,000 EUR, similarly, to suggested measures. However, the mean investment cost lies around 620,000 EUR which is close to suggested measures mentioned by auditors and lower than the cost of suggested measures previously cited by companies.

Only few ESM exceed 10 years of simple payback period

The simple payback periods (SPP) of exemplary measures according to companies range from less than a year to 8 years. The SPP of exemplary measures according to auditors represented a wider range, from a few months up to 35 years, however, with only few measures exceeding 10 years. In both cases, the median value of exemplary SPP is similar, at about 5 years.

COMPANY MINDSET ON ENERGY EFFICIENCY

Most companies claim high energy costs compared to turnover

The companies were first asked to give a self-assessment of their energy costs and their investments in energy efficiency and climate protection. When asked whether their energy costs are very high in relation to their turnover, 40% of the companies stated that this does apply and 35% said it rather applies. Only 4 companies indicated that the statement does not apply, while another 4 said it rather does not apply (see Figure below). For the majority of companies surveyed, high energy costs are at least a serious factor that could potentially have a negative impact on their turnover.

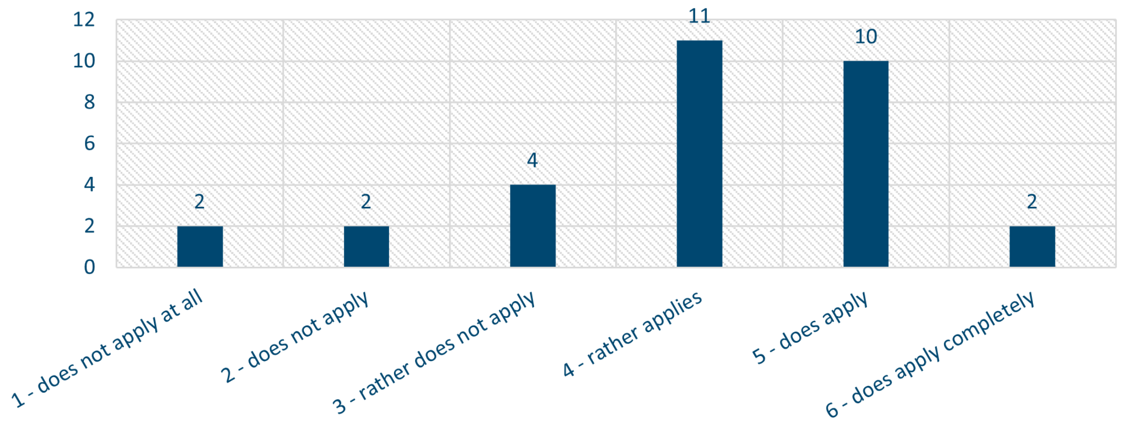

Figure 5: Survey responses to the statement "Our energy costs are very high in relation to our turnover" from 31 companies.

Companies care about the environment even before legal obligations apply

Almost all companies stated that they usually adapt to environmental regulations before they came into force. The majority also stated that they go beyond minimum environmental and climate protection standards. In addition, climate protection was considered important internally by most companies.

Companies accept significant costs to protect the environment

More than half of the companies said that their costs for coping with the crisis and climate protection will be significantly higher than the cost savings they can achieve through further ESM.

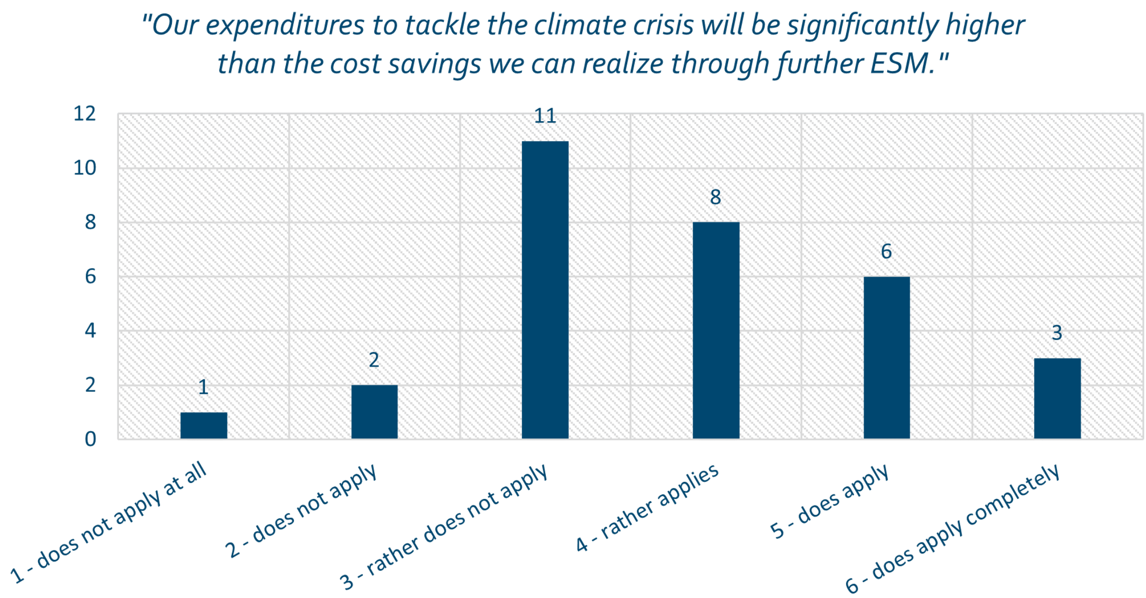

Figure 6: Survey responses to the statement "Our expenditures to tackle the climate crisis will be significantly higher than the cost savings we can realize through further ESM." from 31 companies.

Companies are planning to go the extra mile to protect the environment

Almost all companies stated that they usually adapt to environmental regulations before they came into force. The majority also stated that they go beyond minimum environmental and climate protection standards. In addition, climate protection was considered important internally by most companies.

Companies confirm energy costs savings due to ESM implementation

21 companies stated that they had been able to save the energy costs they had planned to save by implementing ESM, of which a third (11) were even able to save a little more than they had planned.

Savings achieved with ESM are only partly reinvested in energy efficiency

A large proportion of respondents indicated that they would mainly invest the costs saved in other types of investments not related to energy efficiency. In fact, only just over half said they would reinvest in new ESM.

Many companies don’t set energy saving targets

Of all 31 surveyed companies, less than 10 said they had internal energy saving targets, while another 10 said they had none. 7 companies said they had set a target to reduce CO_2 emissions.

DECISION MAKING

The management board usually holds the power of decision

Despite the comparatively large number of employees and additional staff involved, the management board is still responsible for the decision-making process in almost all of the large companies. The situation is similar for the (15) medium-sized companies. Here, 74% of companies reported that decisions on the ESM were taken by the board of directors. From the 4 small companies surveyed (less than 50 employees), 2 companies take their decisions based on the board of directors and 2 companies take decisions based on lower management levels.

Auditors do not always have direct contact with decision makers

The majority of auditors reported either energy management or technical staff as their main contact. In most cases, however, the decision to carry out an energy audit is taken by higher levels of management or the board of directors. Comparing the auditors' statements with those of the companies, it is clear that management, despite having the final decision-making power, is still not sufficiently informed or aware of the relevance of the EMS to their operations. Management, therefore, needs further training on energy efficiency.

Auditors often try to fulfill company's decision criteria

Decisions are based, for example, on a cost-benefit analysis of the different measures and an estimate of the complexity of the effort. Another indicator for a decision is the availability of funding. Furthermore, measures are only implemented if there is a need to improve certain processes. Auditors often try to fulfill these criteria by putting companies in direct contact with service providers who can implement the measures immediately; and by identifying funding opportunities, such as subsidies and grant schemes.

Legal obligation is not the only driver of energy audits in companies

The main reason for carrying out audits in companies, according to the auditors, is the legal obligation. Other relevant reasons include the opportunity to reduce energy costs, the implementation of a management system and, in some cases, the use of funding programmes.

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