

BEST PRACTICES – ENERGY GENERATION

FACTSHEET



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Environmentally friendly renovation

Changing the way of energy generation can require some reconstruction measures. Thus, a renovation is a perfect opportunity to become more energy efficient, as discovered by a medium-sized sales facility in Germany. They took the opportunity to rebuild and remodel their entire store and made sure to take environmentally friendly options into account. All equipment was replaced with energy efficient and climate-friendly alternatives.

With a large investment like this one, the store's managers gained themselves a complete energetic renovation of the building, including façade insulation, new windows and doors and modern LED lighting, as well as a new central ventilation system with a heat recovery system. To ensure the use of green energy they additionally installed a PV-system and a combined heat and power unit with a fuel cell. This enables them to consume less external electricity and therefore reduce the amount of CO₂ and other greenhouse gases. They also use sustainable materials for storing and packaging.

Description

Every now and then, a building needs to be renovated. When that time came for a medium-sized store in Germany, the environmental aware managers took the opportunity to ensure that not only the processes

inside but also their whole newly remodelled store is as environmentally friendly as possible. With a total budget of 361 thousand euros, they were able to halve energy costs and decrease climate gas emissions significantly. In 2013 an

energy consultant was hired and the renovation started with the installation of LED lighting and adding heat-insulating layers to the roof. A central ventilation system was installed, which uses a heat recovery mechanism and thus improves the

'Energy-efficient make-over'

Germany

Retail

Investment

361,000 €

Savings

50% in heat and electricity costs

Main NEBs (other benefits)

Reducing greenhouse gas emissions

Environmentally friendly



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effects of energy and greenhouse gas savings. Just one year later around 20 % of the store's energy consumption was covered by a new PV-system, which was installed on the roof of the store.

The complete make over was done in 2016, when windows and doors were replaced by high efficient models and the building's façade got a complete make over, using a thermal insulation composite system.

The store invested further, in a combined heat and power unit with a fuel cell to further improve their use of green energy.

Additionally, in order to save plastic and use sustainable materials, the store owners started a cooperation with a producer of recycled paper bags and donate all the incomes from those bags to a social reforestation project.

What is the improvement focus?

The additional insulation, that was done during the renovation enabled the store owners to reduce their energy losses and improve their

energy efficiency by using excess waste heat. This was further improved by changing the windows and doors. Those parts are usually the most common sources for heat losses. These measurements reduce the need for additional energy, save energy and thus reduce carbon emissions.

By producing their own energy with renewable technologies, such as PV and the combined heat and power union with a fuel cell, further climate gas reductions were achieved and even less additional energy was required.

Additionally, the store is now being lit with LED lighting. Compared to traditional bulbs, light emitting diodes (LED) typically use about 25%-80% less energy and their lifetime is 3-25 times longer. The main reason that LED lighting is more energy efficient than traditional bulbs is that LEDs emit very little heat, whereas conventional bulbs emit around 80% of their energy as heat.

Benefits

The energy-saving measures introduced during the renovation have

reduced the store's energy consumption by 50%, which means that its costs and carbon emissions have also reduced accordingly.

The renovation helped the store improve its physical appearance as well as showcase its green identity, while preserving the quality of its service and products. It could work as a role model for many older stores.

Investment in energy efficient technologies, as well as in sustainable materials is even more advantageous, if considered from the very beginning of the planning of a business. This does not only apply for the food industry but all sorts of industries.

The measures implemented here are cross-sectional technologies that can be implemented in companies of different industries and sizes. But it can only be renovated by retailers with own properties, in case of a rental this measurement will not be implemented.

Opportunities and barriers to implementation

<i>Opportunities</i>	<i>Barriers</i>
Lower electricity consumption and related cost	extensive measures that are most sensibly implemented during a major renovation
Lower energy losses in winter due to façade insulation	investment costs for renovation
Environmentally friendly and sustainable technologies and materials	Retailers who rent the property for their shop will not invest in renovation
Cross-business technologies	

Calculations

The calculations show a quick idea of the costs and returns of this practice, as well as the economic impact after the implementation and renovation. For transparency's sake, the initial situation is directly compared with the final situation



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and a table of differences is shown broken down into the different key points of savings, using an average price of electricity and emissions taking into account their expected evolution.

	Initial situation	Final situation
Productive capacity	<i>No data</i>	
Annual energy consumption [kWh/year]	150,000	-50%
Annual energy cooling consumption [kWh/year]	<i>No data</i>	
Annual economic energy expenditure [€/year]	45,000	-50%

Total investment (€)	361,000
Energy savings [kWh/year]	70,000 (-50%)
Average electricity price [€/kWh]	0.3147 ¹
Average emission price [€/tCO ₂]	25 ²
Emission reduction [tCO ₂ /year]	50 (- %)
Energy economic saving [€/year]	22,000 (- %)
Emission economic saving [€/year]	1.250 (- %)
Total economic savings [€/year]	23.250 (- %)
Return period (years)	16

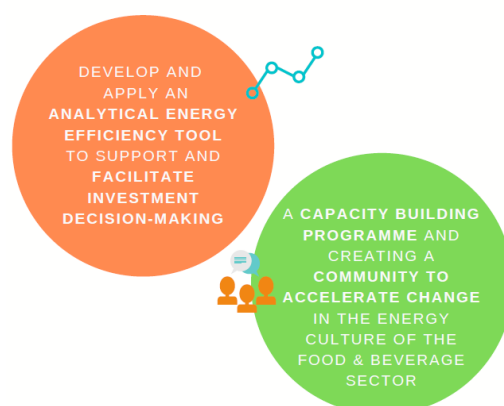
[1] Handelsverband Deutschland: Klimaschutzoffensive des Handels: Erfolgsgeschichten: INTERsport Postleib, Landau. Zuletzt eingesehen am 25.06.2020 unter:

<https://www.hde-klimaschutzoffensive.de/de/kampagne/erfolgsgeschichten/intersport-postleib-klimaschutz-mit-leib-und-seele>

About ICCEE

The project ICCEE, www.iccee.eu, funded by the EU programme Horizon 2020, aims at improving energy efficiency in the cold chain of the food & beverage sector and making it easier for the sector to undertake energy efficiency measures across the entire supply chain and accelerate the implementation of energy audit results.

ICCEE follows a holistic approach that moves from a single company perspective to the assessment of the entire cold supply chain. Existing financing schemes for SMEs will be assessed: the optimal ones will support the implementation of energy efficiency measures. ICCEE objectives build on 2 pillars:



¹ This is the average retail electricity price in Germany in 2018.

² This will be the carbon price in Germany in 2021.

