

# Energy guide for companies

Find out if your business has  
potential to save energy



Vipuvoimaa  
EU:lta  
2014–2020



Uudenmaan liitto  
Nylands förbund



Posintra

TURKU  
SCIENCE  
PARK Oy Ltd

# Are the company premises energy efficient?

Even if various energy-saving measures have been implemented in the company's premises and processes, it is possible that full energy-saving potential has not yet been realized. The energy saving potential of operations can be determined in various ways. After this, it is easy to take steps to minimize the company's energy consumption.

**//** Waste heat is worth utilizing!

It is possible to reduce electricity consumption in many different ways, but the most cost-effective way to utilize the property's entire energy saving potential is to find out the amount of waste heat generated in the property and thereby solve the property's energy efficiency problem. Waste heat is worth utilizing.

**The energy saving potential of a property is easy to find out yourself as follows:**

Calculate how much your business premises consume per year

- electricity
- heat or other fuels

If more electricity is consumed each year than heat or other fuels, your property has energy saving potential.

# How much energy can be consumed in a minimum?

For example, in industrial properties, it is possible to achieve energy savings of up to 80% by first finding out how much energy, i.e. electricity, heat or possible other fuels, is consumed in the property. It is then possible to calculate how much it should be consumed in the property when the full energy saving potential has been utilized.

1.

First, find out what the energy in the property is consumed on. You should use an expert for this, so that the entire property can be mapped accurately. Simulation is a suitable method for this purpose, for example.

2.

Once everything has been mapped, it is worth making an action plan to improve the energy efficiency of the entire property. In a correctly made plan, the entire energy saving potential of the property has been taken into account and the action plan has been calculated to be economically viable to implement.

Finding out the energy saving potential of a property is rather simple to determine.

---

A rational plan takes into account the entire energy saving potential of the property and is economically viable.

# How much savings?

According to calculations, for example, in an industrial hall of 24,262 m<sup>2</sup>, the energy saving potential was as follows:



	BEFORE	AFTER
<b>Need for heating power</b>	<b>2787 kW</b>	<b>1758 kW</b>
Purchased energy A	6,53 GWh	4,34 GWh
Energy expenses A	461.161 €	327.666 €
Investment expenses	0 €	234.050 €

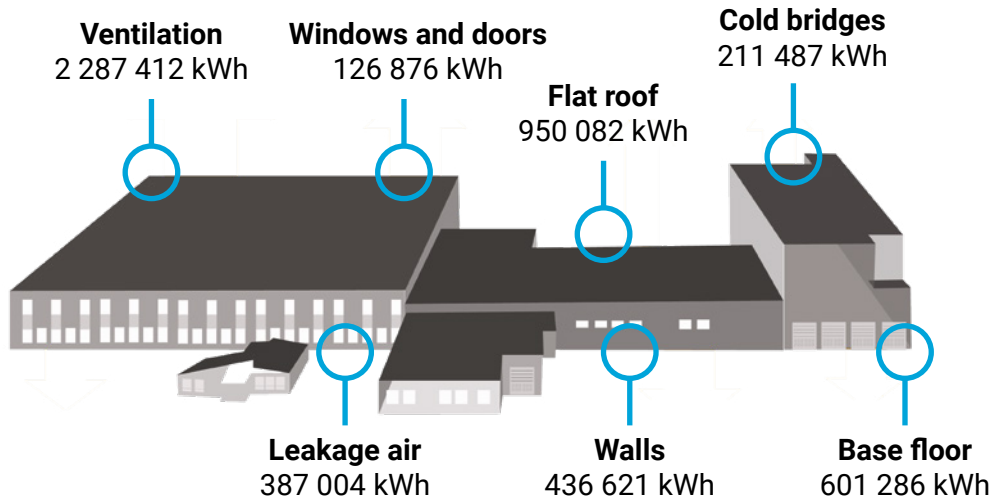


The need for heating power in the property decreased **1029 kWh**



The need for purchased energy in the property decreased **2,19 GWh/year**

## Heat losses mapped by simulation



Examples:  
NollaE



Property energy expenses  
decreased **133.495 €/year**



Payback period for energy efficiency  
investment costs **less than 2 years**

# How much savings?

In a 5,100 m<sup>2</sup> industrial property, the energy saving potential was calculated with the following results:

	BEFORE	AFTER
<b>Need for heating power</b>	<b>475 kW</b>	<b>323 kW</b>
Purchased energy A	1,26 GWh	0,53 GWh
Energy expenses A	88.189 €	29.143 €
Investment expenses	56.658 €	358.122 €

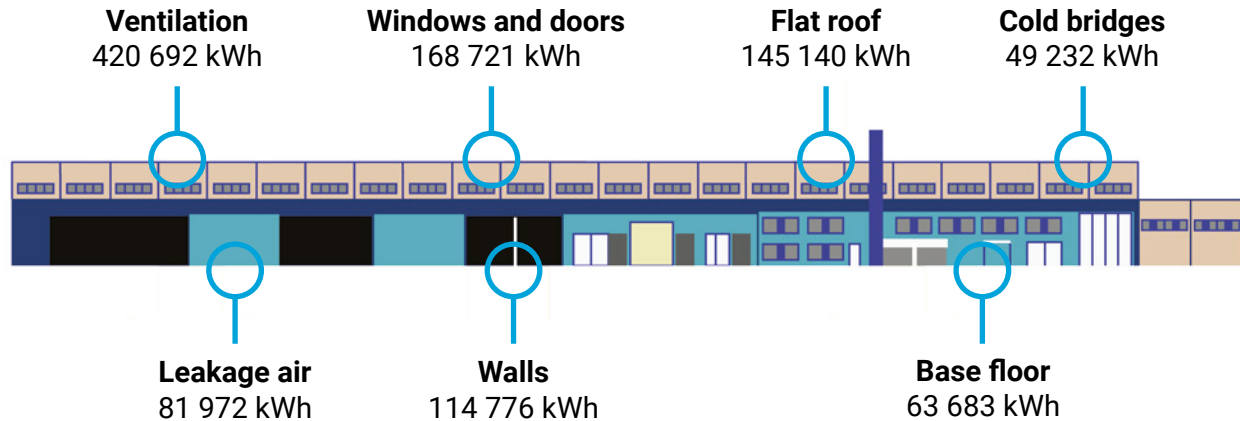


The need for heating power in the property decreased **152 kWh**



The need for purchased energy in the property decreased **0,73 GWh/year**

## Heat losses mapped by simulation



Property energy expenses decreased **59.046 € / year**



Payback period for energy efficiency investment costs **6 years**

# Utilize technology

There are many ways to improve the energy efficiency of buildings. For example, various heat pump solutions, heat recovery, process heat recovery, utilization of solar energy, LED lighting, ground cooling, new lift doors or additional thermal insulation can promote energy efficiency. In addition, heating, ventilation and lighting can be controlled according to the need with the help of modern automation. There are thousands of options. However, individual solutions are rarely economically viable.

In reality, there is only one, most economically viable energy efficiency solution for each building. Usually this is a combination of 15-25 energy efficiency measures, which take into account the individual characteristics of the property and the processes that take place there.

Monitoring and the right attitude ensure smart use. //

## **Energy efficient use of the property and monitoring of energy consumption**

Despite technologically advanced equipment and calculations utilizing artificial intelligence, energy efficiency is done by people. In terms of both design and use. Once the property and processes have been made energy efficient, their energy efficient use still needs to be ensured.

Although energy systems today are highly automated, it is still important that the property users take care of sensible, energy-efficient use of both the building and the processes. Attitude has a significant effect.

Monitoring provides both real-time and long-term data that can both be used to make quick corrective actions and to verify the savings generated by energy efficiency measures.



# Are individual measures worthwhile?

Individual measures to improve energy efficiency, such as changing lighting or installing solar panels, will not be as viable in the long run as a comprehensive investment in energy efficiency. For example, solar panels reduce the need for purchased energy, but they do not reduce energy consumption.

You also need to be able to calculate savings correctly. For example, changing lighting from fluorescent tubes to LED lights not only saves electricity but also maintenance costs, as it no longer takes as much time to service the lighting, i.e. to replace the lamps. On the other hand, LED lighting heats the space less, which must be taken into account in heating as well as in cooling.

In buildings where heating and cooling are done with heat pumps, switching to LED lighting affects the flow water temperature and thus the efficiency of the heat pump.



The most viable way is to improve the energy efficiency of the entire property.


# Do the processes result in waste heat? Do devices consume energy unnecessarily?

Waste heat can be caused by the company's operations and various processes. The possible recovery of this waste heat should be clarified. Excess heat can be utilized elsewhere on the property or stored to compensate for seasonal variations.

## **Find out if your business produces excess heat**

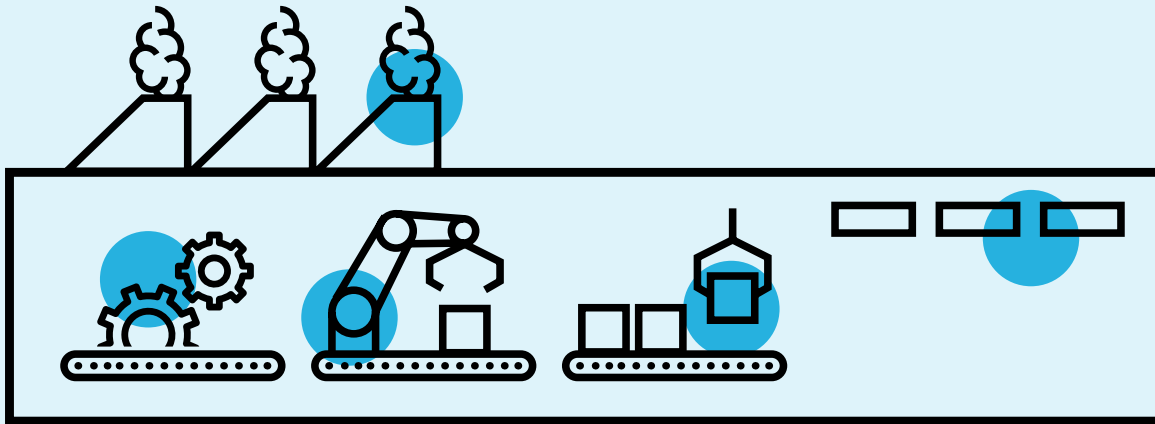
For example, steam generated in industrial processes or warm process waters can produce heat that can be used for other purposes.

It is also possible to store waste heat for later use, for example by collecting it in an underground heat storage. However, for each property, it is necessary to find out what is the most suitable energy efficiency solution for it.

Waste heat can be stored   
for later use.

## **Maintain the equipment and find out if they consume energy unnecessarily**

In addition to waste heat, it is also worth paying attention to other possible unnecessary energy consumption. The equipment should be kept serviced. For example, leaking compressed air equipment wastes energy.



## How much energy does cooling consume?

There are many ways to cool a property. How much energy cooling consumes depends entirely on how it is done. Cooling technology can generate waste heat that can be utilized. On the other hand, cooling technology should be renewed to be energy efficient if it is smarter in terms of the property's overall energy consumption.

It is a good idea to use an expert to find this out, as the most economically viable energy efficiency solution for each property is a calculation that takes the individual characteristics of the building and processes into account.



This guide has been made in the Huima-project  
in collaboration with NollaE.