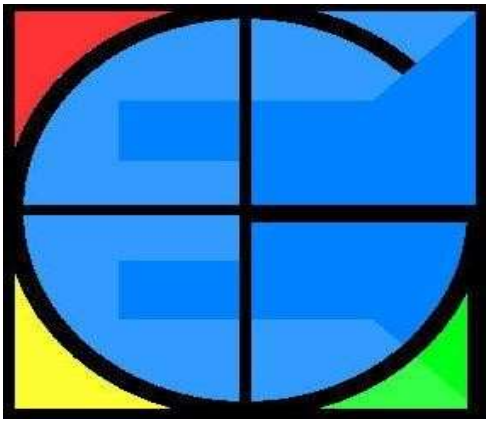


17 September 2023

B&B in the Netherlands

It has been agreed with the B&B owner that no details of the B&B will be published. All data are therefore fictitious, but do indicate approach an actual situation again.

ADVICE ENERGY PRESERVATION

Contents

Contents 1

1. Design and background of the research and reporting 2

1.1 Energy Advisor Data 2

2. Introduction 2

2.1 Customer data 2

3. Data for the purpose of applying for a grant 3

3.1 Business premises 3

3.2 Energy balance 4

4. Analysis of annual figures for electric vehicles 5

5. Possible energy-saving measures 11

6. Elaboration of energy-saving measures 16

7. Ten slotte 17

APPENDIX A: In what ways can an SME entrepreneur save energy? 19

APPENDIX B: Conversion factors to CO2 21

APPENDIX C: Overview of possible subsidies or tax benefits 21

1. Design and background of the research and reporting

This energy advice gives you a clear overview of the sustainability possibilities for your business premises and your business operations and is partly intended to encourage you to implement the identified measures in order to save energy, emit less CO2 and have to pay lower energy costs.

This energy advice contains all the information prescribed by the SVM scheme. The advice has been coordinated with you and is therefore clear and does not contain any ambiguities regarding the measures elaborated. As an entrepreneur, you can make a motivated decision to implement one or more measures in the near future on the basis of this energy advice. EG Delft would be happy to facilitate you further in this process, if necessary.

1.1 Energy Advisor Details

Name of energy consultancy	EG Delft
Address	Hendrik Marsmanlaan 136, Delft
Opsteller advies	Guy Gadiot
Mobile	06 – 1299 5885
Enamel	g.gadiot@outlook.com
Chamber of Commerce number	90905806
VAT number	N/a.

2. Introduction

With this energy advice, you can make use of the 'Subsidy for Sustainability for SMEs' (SVM) scheme. With this scheme, the government aims to improve energy efficiency among small and medium-sized enterprises by granting a high subsidy for energy advice commissioned by an entrepreneur and a possible support programme for further support in the implementation of energy-saving measures. As a precondition, the government stipulates that the entrepreneur implements at least one energy-saving measure. The energy advice is therefore an incentive for the entrepreneur to implement all the measures identified in the energy advice.

In the following chapters you will find the energy-saving and sustainable measures that EG Delft considers possible in your company to save energy and reduce CO2 emissions. The payback period was also taken into account. The payback period is the period during which you earn back your investment and the energy measures provide you with financial benefits.

You can find more information about this scheme at: https://www.rvo.nl/svm.

2.1 Customer data

Date of visit	16 Sept 2023
Date of advice	19 Sept 2023 -
Trade name	B&B

Name of contact person	
Mobile	
Enamel	
Address of business premises	in the Netherlands
Address for correspondence	

3. Data for the purpose of applying for a grant

Address of the business premises surveyed	Table data has been removed.
Chamber of Commerce number applicant	
Electricity consumption of business premises in kWh*	
Electricity consumption in kg CO2	
Gas consumption in m3 natural gas equivalent*	
Gas consumption in kg CO2	
Applicant's IBAN number	

*) Attach the most recent annual statement from the energy supplier as an attachment to the application.

3.1 Commercial premises

Figures have been removed.

Top view Land register

The B&B *** Text has been removed.

The property consists of a living area (built in 1960) and a B&B area with four guest rooms and facilities. The residential/B&B complex has an area of *** m2 (ground area **** m2) and has been thoroughly renovated in the period 2016-2020 with, among other things, double glazing, wall insulation, roof insulation, floor insulation, installation of solar panels and heat pumps. There is also a large unheated barn and a small office space on the property.

Roof insulation (sandwich panels) HR++ insulating glass [1]

3.2 Energy balance

The energy balance sheet (2022 figures) gives a clear picture of the energy consumers within your company. This includes all installation/equipment that accounts for more than 5% of the annual energy consumption. Table data has been removed.

Energy balance	**Energy consumption [kWh]**	**Emissions CO2[2] [kg]**
Heating/tap water[3]	****	****
Air conditioners	***	***
Lighting[4]	***	***
Equipment[5]	****	***
Remainder	****	***
Total electricity	*****	****
Central heating	--	--
Remainder	--	--
Totaal gas (Nm3 aeq)	**0**	**0**

[1] *Manual ventilation of guest rooms via grille*
[2] *See Appendix B for conversion factors.*
[3] *Heating of the complex by means of 2 heat pumps.*
[4] *All lighting is LED.*
[5] *Washer/dryer; refrigerators, coffee machine.*

Total transport (litres)	--	--
Total CO2 emissions		****

4. Analysis of annual figures for electric

Analysis based on annual figures
For the B&B there is data from the years 2020 – 2023 (is still incomplete).

Table has been removed.

A first look at these annual figures shows:

- In 2021, there will be more consumption than revenue.
- The average production over 2020-2022 is slightly less than expected (i.e. based on the expected yield of the 39 zone panels 0.85*39*350Wp[6] = 11.603 kWh).
- On average, the consumption corresponds fairly well to the total production. But that also depends on the occupancy of the B&B.
- There are, of course, good and not so good years.

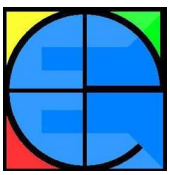
Feeding into the grid is in the summer avg. 70% of production. That 70% can then be used in the winter without (energy) costs based on the net metering scheme.

[6] *Assumed power solar panel.*

However, if the net metering scheme is abolished (start in 2025), the customer will receive significantly less for his electricity, on the other hand, he will have to pay the higher rates in the winter. This means that his solar panels will yield much less after the abolition of the net metering scheme.

Charts 2020-2023

Based on the energy consumption data supplied by the customer, a number of graphs have been drawn up. In the following graphs, the years 2020 to 2023 are placed one after the other and the values per month are given.



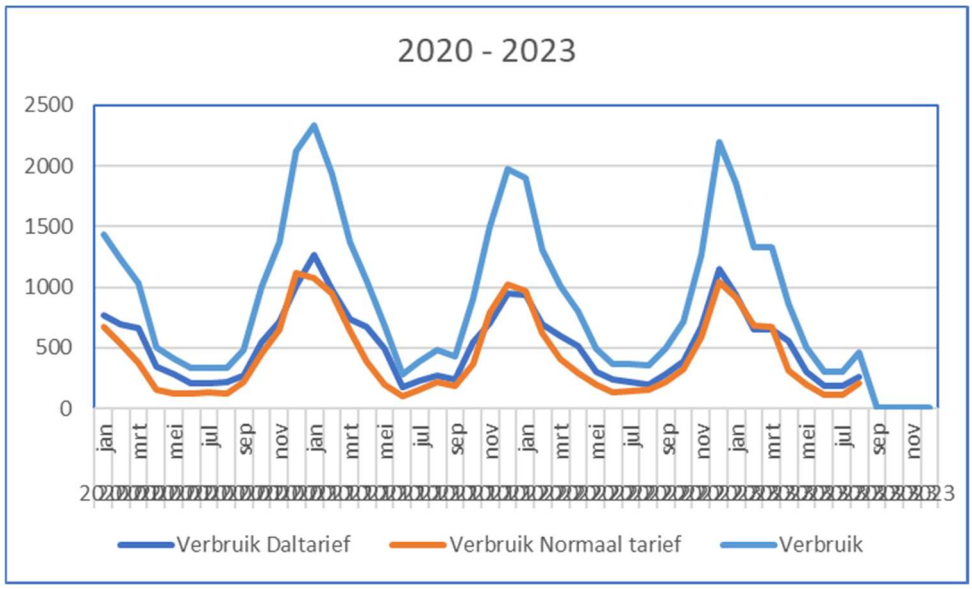


Fig.: Consumption figures

The electricity consumption in the off-peak period and the consumption in the normal[7] period are corresponding. The difference between day and night consumption is small. In 2022, there was a mild winter.

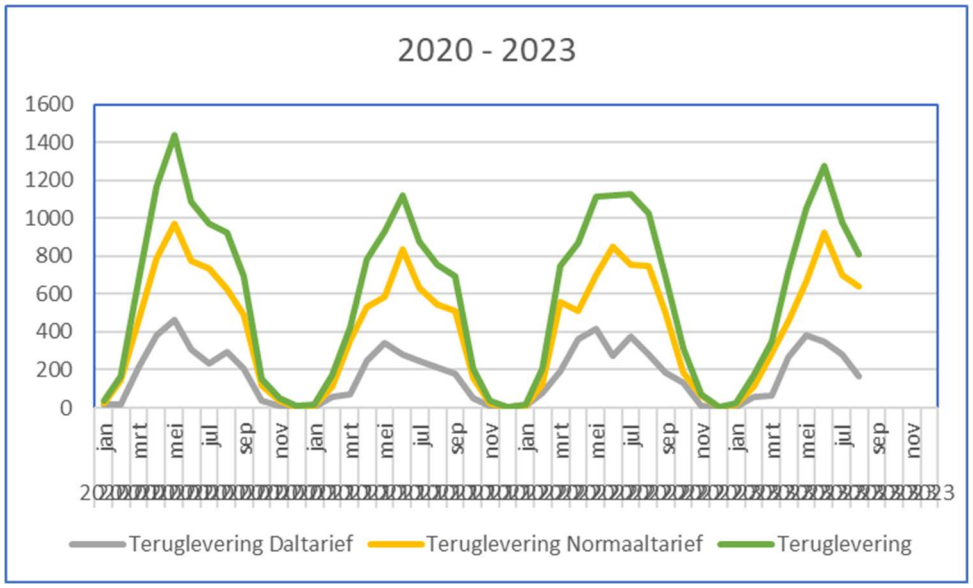


Fig.: Feed-in figures

Normal feed-in is higher than off-peak. The sun shines during the day!

[7] *The normal period is during peak hours. That is in Noord-Brabant and Limburg from 07.00 to 21:00 and in the other provinces of the Netherlands from 07:00 to 23:00 (there are exceptions). The off-peak period is the remaining hours.*

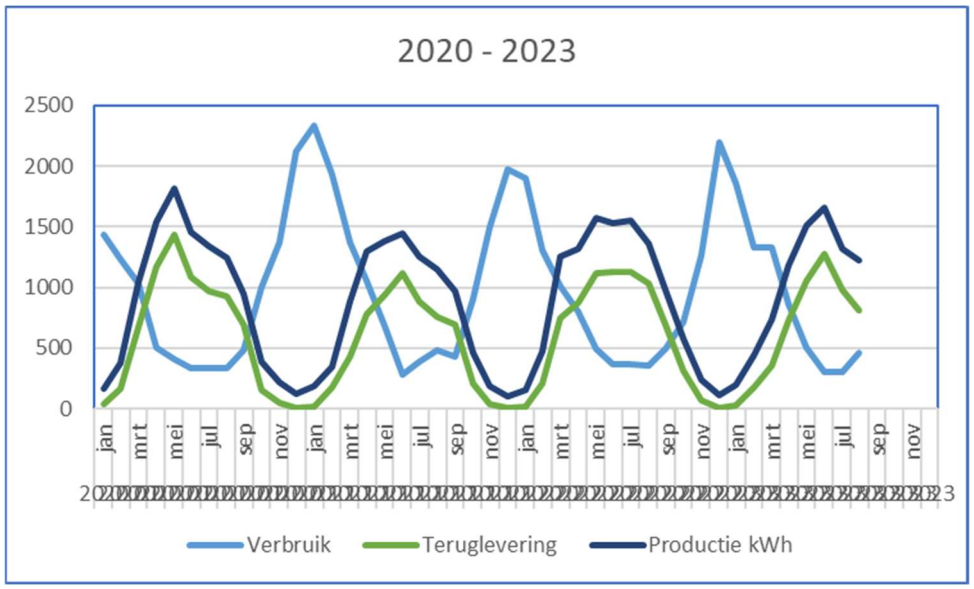


Fig.: Consumption vs. feed-in vs. production

This figure clearly shows that consumption is high in the winter months, when the solar panels do not deliver.
Production and feed-in to the grid are mainly in the summer. Relatively little of the electricity produced is used directly (30% on average).
The use in the winter is actually applied in the summer. The caveat to be made here is that the net metering scheme now makes this possible. There is overproduction in the summer to be able to use it in the winter.

Forecasted change in costs at the end of the net metering scheme
We take the data from 2022 as an example and for the sake of convenience do not distinguish between normal and off-peak rates. We use fixed[8] tariffs for all years up to and including 2031, and set the costs for electricity at € 0.40 per kWh (supply) and € 0.12 per kWh for feed-in. At the moment, these are realistic values, which do differ significantly from the values at the end of 2022 and the beginning of 2023. Unfortunately, extreme fluctuations are unpredictable and cannot reasonably be included in a simulation, but when they do occur, they do have a major effect on actual costs.

[8] *Much higher rates, but also lower rates are possible.*

Table: The data of 2022
Table has been removed.

The table above lists the reference values for 2020. In the following table, the costs that occur annually during the phasing out of the net metering scheme are calculated using the following formula:

Costs = consumption * delivery tariff **-** % netting * production * delivery tariff **+** (1 **-** % netting) * feed-in tariff **+** feed-in * feed-in tariff

In the years 2023 to 2024, the net metering percentage is still 100%, but the percentage will be reduced to 0% from 2025 to 2031. The table shows per year what effect this has per month and on an annual basis within the preconditions of this simulation.
It is clear that the costs in the long term will be a multiple of what they are now.
The course of the dismantling is also graphically shown

Table: Effect of phasing out net metering on energy costs (simulation) Table has been removed.

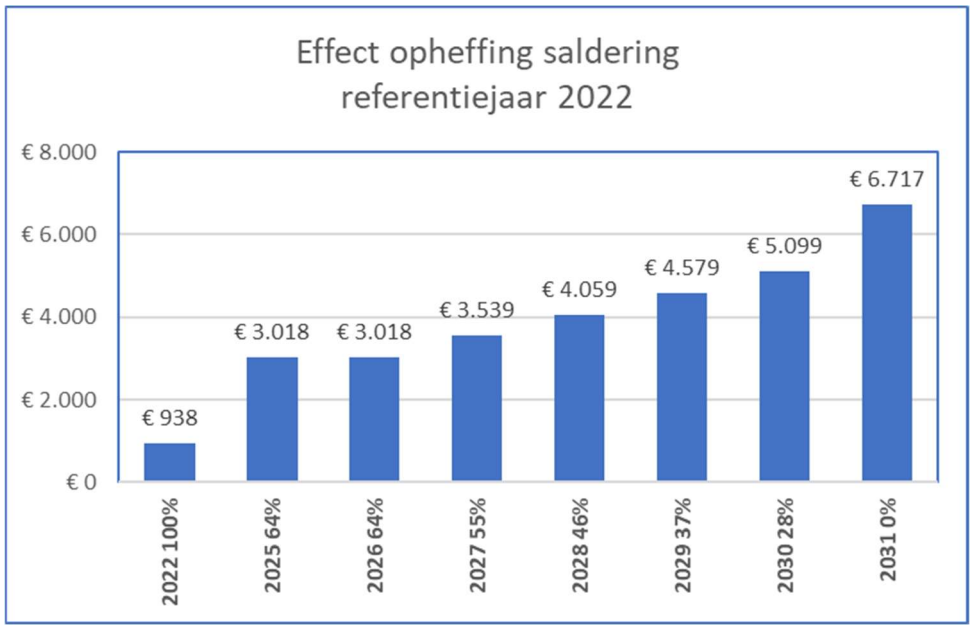


Figure: Effect of phasing out net metering on energy costs (simulation)

A solution for the low remuneration for the feed-in power is to feed in less power or store the power. See elsewhere in this report for the limited possibilities to make better use of self-generated electricity.

Depreciation Expense

If the solar panels have already been depreciated, this is beneficial, because the payback period will be longer after the net metering scheme is phased out.

5. Possible energy-saving measures

The following describes the various starting points for possible energy-saving measures and the proposed implementation. In addition, the required investments, the intended savings and the payback period are given.

Insulation
The B&B and the house seem to be sufficiently insulated at the moment.
Better insulation when possible is the best remedy for energy loss in a house/B&B.

Lighting
The lighting is almost entirely LED. In the common room there are 2 large ceiling lights with fluorescent lighting. Although the lamps are only used to a very limited extent, it is still recommended to replace them with LED lighting in the long term.

The B&B uses mood lighting in the common area; which is on when guests are staying. The lighting can be turned off, but that seems less practical because it has a direct effect on the atmosphere in that room.
A good approach for this situation may be to use motion sensors such as those used in other places with a common function.

Heat pumps
The three guest houses all have underfloor heating and are equipped with air conditioning. Guests can heat or cool themselves whenever they wish. Experience shows that an average guest feels most comfortable at 21 ^{oC}. Given the function of the B&B, it therefore does not seem practical to strive for a lower temperature as advised by the government. However, it is advised to lower the temperature on those days when the room is not in use.

Ventilation
The B&B does not use forced air exchange. Visitors to the B&B can open their own window when they need to. Just like the desired room temperature, this is something that the B&B can only influence to a limited extent. See also influencing behaviour.

Exterior door
The outside door is not always closed by the guests. As a result, heat loss from the room occurs. A good solution to minimize this heat loss is to use a door closer. For guests, a door closer is often unpleasant/heavy to operate. But it is technically possible to set the closing force, to use a closing delay and with the so-called CAM technique a low opening resistance can be achieved; Very suitable for public entrances, care centers, etc.

Influencing behaviour
Hotels and to a similar extent B&Bs are major consumers of energy, water and detergent, not least to wash all used towels and prepare them for the next guests. Behavioural research[9] has

[9] *Goldstein, Cialdini en Griskevicus.*

shown that it is possible to have almost 50% of the guests use their towels at least 2x based on the "social norm".
For example, by posting a message in the bathroom that says:

Hang your towels on the rack and say: "I'll use them again"
Put the towels on the floor and say: "I would like new towels"

Or even sharper:
"Join other guests to help save the environment. In a recent survey, almost 50% of the guests who stayed in this room (room number XXX) that we asked to participate used their towels more than once. You can join them by using the towels a second time and thus saving the environment."

Washer/dryer
The use of towels and sheets in the B&B leads to an average of 3 washes per day. The washing machine was recently replaced by a Samsung 11 kg machine. Current washing machines are almost all energy-efficient and consume between 45 and 55 kWh per 100 washes (eco wash cycle). For hygiene reasons, the B&B itself washes the towels at 60 ^{oC} and the sheets at 40 ^{oC}. This means that the preconditions of eco-washing recommended by washing machine manufacturers are met instead[10].
A washing machine is usually used in conjunction with a dryer. This Samsung washing machine has a max. speed of 1400. Some washing machines can spin up to 1600. At 1600 rpm, the dryer doesn't have to work as long and this saves energy. With frequent use of a washing machine, this results in energy savings.

Refrigerators
The B&B has several small and large refrigerators in use, all of which are of recent manufacture. One large refrigerator is more than 10 years old. Refrigerators have become considerably more energy-efficient in recent years[11] . It is therefore recommended to consider replacing this large refrigerator.

Nowadays, it is quite possible to measure the power consumption of individual devices with a Smart Wifi plug. The Consumers' Association has tested the best smart plugs with an energy measurement function. The report is on their website.[12]

[10] *https://www.consumentenbond.nl/wasmachine/wasprogramma-eco-40-60*
[11] *Old refrigerators that are 15 years old consume about 360 kWh of electricity annually. A new refrigerator with label C consumes an average of 150 kWh annually and a refrigerator with label A only 110 kWh. At a rate of €0.40, this means a saving of €100.*
Payback period is between 8 and 12 years, depending on the specific type of refrigerator. With a fridge-freezer combination, the advantage is greater.
[12] https://www.consumentenbond.nl/energie-compare/the-best-smart-plugs-with-energy-metering function

In the test, the TP-Link Tapo P115 plug comes[13] out on top. It's very affordable, easy to connect to the Wi-Fi network, and can handle high-power devices like a washing machine.
A comparison of the consumption figures of the current refrigerator with the specifications of new versions will then show how much profit can be made and what the payback period is.

Coffee machine

In the common room there is a DeLonghi PrimaDonna Elite fully automatic espresso machine[14] (1450 W). It is possible to set automatic shut-off so that the device turns off after 15 or 30 minutes or after 1, 2 or 3 hours of non-use. The current setting is 2 hours. When the start-up time of the device is short, the device can be turned off automatically sooner. This saves energy.

Better utilisation of self-generated electricity

On average, you use 30% of the electricity generated by the solar panels. The rest is returned to the grid. Solar panels mainly provide electricity in the middle of the day, while consumption is more spread out throughout the day at other times.
The net metering scheme currently makes it favourable to deliver back, but is expected to be phased out from 2025. Until then, you can purchase the returned electricity for the full 100% free of charge when it suits you. After 2025, you will receive a lower amount for your feed-in electricity. This makes it attractive to use more of your own solar power. Examples include:

- Do not turn on the washing machine, dishwasher and dryer until the solar panels are supplying power. Many of these devices have a delayed start capability.
- Turn on the devices one after the other. Otherwise, you're likely to use more power than you generate. You can set this up.
- If you have an electric car, charge it as much as possible when you generate electricity. Also check the possibilities of your car, charging app and charging station to set this up automatically.
- Heat the water in the cylinder of your all-electric heat pump with solar power during the day.

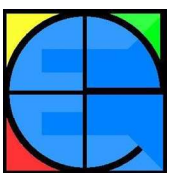
Home battery

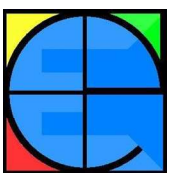
A home battery stores the power generated by the solar panels that you don't use immediately for later use. A typical home battery stores about 6 kWh of power. In the summer, that's not enough to store the 70% solar power that you don't use right away. In the winter, your solar panels don't produce enough to fill the home battery. So with a home battery, you can't become self-sufficient for the time being. With a home battery, you can improve the consumption of your own solar power by up to 60%.
If you own an electric car, you can use the car battery to store the solar power generated. Small electric city cars typically have a battery capacity of 40 kWh. Large and therefore more expensive models have batteries between 50 and 80

[13] *EG Delft has tested this plug and comes to the same conclusion as the Consumers' Association.* [14] *Manual: https://www.delonghi.com/nl-en/manuals/ecam650-55-ms-ex-1-primadonna elite-volautomate-espressomachine/p/ECAM650.55.MS%20EX%3A1*

kWh[14]. Such a battery therefore offers sufficient space to store self-generated electricity. You can also extract that power from that car later. Modern cars have that function.

[14] https://ev-database.org/nl/cheatsheet/accu-capaciteit-elektrische-auto





6. Elaboration of energy-saving measures

The following possible energy-saving measures will be further elaborated with a view to implementation. In addition, the required investments, possible savings and the payback period are given.

The following 4 energy-saving measures are advised:

- Use electric car for storage of self-produced electricity
- Replacement of old refrigerator
- Influencing guests' behaviour
- Doorway entrance

1. Use electric car for storage of self-produced electricity

Description	Some electric car models can be used as a home battery. These have a converter from alternating current (home current) to direct current (for use by car) and vise versa. The car is charged/tapped with a bi-directional charging station. Storing the excess electricity generated by solar panels in an electric car is an interesting possibility. You use your own generated electricity more efficiently.
Measure	Buy a suitable electric car and purchase a flexible charging station.
Execution	Unknown.
Investment	Depends on many factors.
Saving	Possibly about 35 kWh / day in the summer[15].
Payback	--

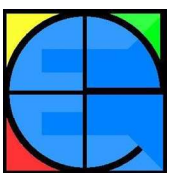
Proposal EC Delft

This energy-saving measure still requires a considerable amount of research. This includes, among other things: what type of cars are suitable now and what are the expectations in the future, who supplies suitable charging stations, what exactly are the advantages for the B&B and what are the disadvantages, and what are the costs and what the payback period is. EG Delft would like to investigate this possibility further for the B&B. EG delft would like to make a quotation for this, but also foresees that it will take quite some time to find out and analyze and report on this case. B&B would possibly finance this together with other interested parties.

2. Replacement of old refrigerator

Description	The B&B has a large refrigerator that is more than 10 years old. Refrigerators have become significantly more economical in recent years.
Measure	Replace the refrigerator with an energy-efficient one (label D).

[15] *Charging the battery of an electric car costs an average of €30.*



Execution	If necessary, first measure the consumption of the current refrigerator and compare the consumption with modern ones (e.g. Liebherr). The Wi-Fi plug mentioned earlier in the text is very suitable for this.

Investment	€ 800 - € 1200
Saving	The savings on an annual basis are € 100.
Payback	8 – 12 years

3. Influencing guests' behaviour

Description	B&Bs use a relatively large amount of energy, water and detergent. Behavioural research shows that it is possible to reduce the number of towels by almost 50% of the guests based on the "social norm". 2x to do.
Measure	Hanging behaviour-influencing communication material in the guest (bath) room.
Execution	See previous section for ideas for an approach.
Investment	Drafting and production of communication materials.
Saving	The necessary washes on an annual basis.
Payback	Within 1 year.

4. Doorway entrance

Description	The outside door is not always closed by the guests. As a result, heat loss occurs from the central space. A good solution to minimize this heat loss is to use a door closer.
Measure	Installation of a door closer at the entrance of B&B.
Execution	Take a door closer with CAM technology and has a low opening resistance. It is then easy to use by guests. Installing and setting up a door closer requires expertise.
Investment	€50 for a conventional door closer and €200 for a CAM version.
Saving	No reference values found on the internet. A few percent on an annual basis (e.g. 2%).
Payback	Depends on the energy saving. Heating is expensive.

7. Finally

This report gives an indication of possible energy-saving measures within your B&B. In addition to the expected annual cost savings, with perhaps an attractive payback period, CO2 emissions of the B&B are also reduced, which is good for the environment and the wallet. For many energy-

saving measures, there are subsidies from the government (RVO) or tax-attractive schemes: more information on these can be found in Appendix C.

Good luck with the implementation!

Name of energy advisor

Guy Gadiot

APPENDIX A: In what ways can an SME entrepreneur save energy?

There are several ways in which a hair salon can save energy. Reducing energy consumption will not only save costs but will also contribute to more sustainable operations. Opportunities for savings are:

No	Subject	Description	Saving
1	LED lighting	Replace traditional incandescent bulbs and fluorescent lighting with energy-efficient LED bulbs. LED lights use less energy, last longer, and produce less heat, which can help to reduce cooling costs.	50 - 80%
2	Energy-efficient equipment	Invest in energy-efficient hair dryers, hair straighteners, sinks, and other equipment. Choose appliances with an energy label that indicates that they use less energy.	20 - 30%
3	Thermostat and climate control	Set the thermostat to a reasonable temperature to avoid unnecessary energy consumption. Make sure you have good insulation and seal any cracks and holes to minimize energy loss.	10 - 30%
4	Timers & Motion Sensors	Install timers for lights and equipment so that they automatically turn off when not in use. Also, use motion sensors for less-used areas, such as storage areas and washrooms.	20 - 30%
5	Daglicht benutten	Take advantage of natural light by opening curtains and blinds during sunny days. In this way, artificial lighting can be limited.	20 - 50%
6	Equipment Maintenance	Ensure that all equipment is regularly serviced and cleaned. Well-maintained appliances perform more efficiently and use less energy.	5 - 10%
7	Saving water	Install water-saving shower heads and faucets and make sure there are no leaks. This not only helps to save water but also reduces energy consumption when using hot water.	10 - 20%
8	Rethink Decoration	When choosing decorating materials, consider materials that reflect natural light and require little to no additional lighting.	--

9	Economical ventilation	Use high-efficiency ventilation systems to optimize air circulation while minimizing energy loss.	15-30%
10	Workforce awareness	Involve staff in energy-saving efforts and encourage them to act in an energy-conscious way, for example by turning off equipment when not in use.	--

APPENDIX B: Conversion factors to CO2

Unit Energy Source	Corresponds to .. kg CO2
1 kWh of electricity	= 0.405 kg CO2
1 Nm3 aardgas	= 1.785 kg CO2
1 GJ heat	= 32.53 kg CO2
1 liter benzine (E95)	= 2,269 kg CO2
1 liter diesel	= 2,606 kg CO2
Passenger transport / kilometre	= 0.163 kg CO2
Freight transport / kilometre	= 0.895 kg CO2

APPENDIX C: Overview of possible subsidies or tax benefits

1. Energy Investment Drawdown (EIA)
   With the EIA, you can deduct a maximum of 45.5% of your sustainability investment costs from the taxable profit. The condition is that the investment must be on the Energy List. The EIA provides an average benefit of 11%.

2. Milieu Investment Drawdown (MIA)
   With the Environmental Investment Allowance (MIA) you benefit from an investment deduction of up to 36%, on top of the usual deduction.

3. Vamil
   The Random Depreciation of Environmental Investments (Vamil) allows you to depreciate 75% of the investment costs at a time to be determined by you. By depreciating faster, the taxable profit decreases, so you have to pay less tax in that year.

4. Small Scale Investment Deduction (KIA)

If you invest in business assets, you can deduct an amount from the profit with the investment deduction and qualify for the Small Scale Investment Deduction (KIA). The amount depends on the amount that has been invested.

5. Netting scheme
   The net metering scheme applies to the small-scale generation of sustainable energy (usually via solar panels at private individuals or small companies). They can offset the generated electricity (offset it against their own energy consumption) or return a surplus to the energy company for a fee.

6. Sustainable Energy Investment Subsidy (ISDE)
   As of 2021, the ISDE subsidy is interesting for business users (companies, governments, corporations, etc.) who invest in a heat pump, solar boiler, solar panels or a small-scale wind turbine. The grant must be applied for in advance.

7. Subsidy Scheme for Emission-free Commercial Vehicles (SEBA)
   Subsidy for entrepreneurs who buy a new fully electric company car or lease it financially.

8. Local subsidies
   To make generating their own energy attractive to entrepreneurs, the government provides subsidies. These are national, but also local incentives. Check with your own municipality.

More information can be found at Saving energy now and in the future (rvo.nl).