



Energy Efficiency Solutions

Energy consumption monitoring

General information on the solution –

“Targets”:

- Hotel area: General
- End-use: All

Related criteria of the EU Eco-label:



Monitoring of energy consumption (electricity, energy used for heating...) & water consumption is a mandatory criterion of the EU Eco-label (#27).

Installation of additional energy and water meters to allow consumption monitoring of different activities or machines counts as an optional criterion of the EU Eco-label.

About its implementation:

- Ease: Easy (*)
- Best moment: can be done at any time.
- Relevant initial situation: the hotel does not monitor its energy use.

Indicative cost:

- Reading energy consumption: 0 €
- Submeters: approx. 40-50 € + workmanship

Indicative return on investment time:

< 1 year. *Note that costs and return on investment may vary greatly depending on the local context and on the hotel's initial situation*

Description of the solution —

Principle

Energy consumption monitoring is highly recommended to establish **fundamental information on energy use in the hotel**. It can help reveal problems (e.g. abnormal changes in energy consumption), identify energy saving opportunities, and verify the effectiveness of the energy conservation measures you have implemented.



Energy bills are generally the main source of data, which is why it is important to keep track of your energy bills and to analyse them regularly. If you are running a large hotel, it can be useful to determine the energy consumption of some individual areas and departments (e.g. office, kitchen, rooms per floor, apartments...).



The easiest way to access this information is to install **energy sub-meters**. But before deciding to install sub-meters, you should have a scheme in mind so that staff can take simple corrective actions based on the sub-metering information.

Recommendations

How to proceed to analyse your energy consumptions?

▪ Data collection

Gather your monthly energy bills and check that each energy bill contains information on: total amount of energy consumed, cost per unit, total cost. Also gather your energy bills from the two previous years.

▪ Data analysis

Annual consumption assessment: For each year you have data, prepare a table showing the total annual Consumption and cost of each type of energy (electricity, gas, etc.). Also indicate the main end-uses of the different energy sources used. Use this data to calculate the energy performance index (per m² of indoor area) and the energy consumption per guest night sold (to compare with other hotels).



How much energy does your hotel use and where does it go?

Energy source	Main end-uses	Annual consumption (KWh) (*)	% of total annual consumption	Cost
Electricity	Lighting...	(...)	(...)	(...)
Natural gas	(...)	(...)	(...)	(...)
Gas oil	(...)	(...)	(...)	(...)
District heating	(...)	(...)	(...)	(...)
(...)	(...)	(...)	(...)	(...)
Total energy consumption & cost		(...)	100%	

- Annual energy consumption per m²: (...)
- Energy consumption per guest night sold: (...)

To help you convert the different energy units into kWh, prepare a conversion table to keep in your records. (see below)

Conversion table (typical conversions are indicated as rough estimates):

Energy source	Unit generally used	Equivalent in kWh
Natural gas	m ³	1 m ³ = 11.9 kWh
Gas oil	Litre	1 litre = 10.9 kWh
Heavy fuel oil	Litre	1 litre = 11.4 kWh
Wood	Kg	1 kg = 4.1 kWh

Note: Ask your energy provider for other conversion factors.





Evolution of energy consumption with time:

See if your energy consumption (total consumption and consumption of each energy source) has changed significantly from one year to another (and then from one month to another). Investigate if there is a correlation between energy consumption and occupancy (i.e. guest nights sold) or weather conditions.

Total energy consumption for the time period considered:

Time period considered (month / year)	Occupancy	Energy consumption (kWh or other unit)	Cost
(...)	(...)	(...)	(...)

Reproduce the same table for each energy source (electricity, gas, etc.).

How to find out the energy use of individual areas or pieces of equipment:

- The most obvious solution in many cases is to install a sub-meter which can measure the energy use in just one separate circuit. Where many circuits are to be monitored, sophisticated systems which network these meters together and feed data back to a computer can be used.
- For monitoring equipment or sub-circuits which are 'hard-wired', energy monitors with sensors which can be wrapped round the connecting wires can be used. These log energy use over an observation period and store the data for download to a computer for analysis.

Link with other solutions in the database

Solution n°I (energy consumption monitoring) can be followed by a more in-depth energy audit of the hotel (solution n° II)





Benefits for the hotel



Cost reduction

Energy saving

Corrective actions resulting from energy monitoring can lead to 8-10% of energy saving.

Get the right contract from your energy supplier:

Knowing your energy consumption patterns will help you get the best possible energy deal in the future.



Staff involvement

Involving your staff

Informing your staff on hotel energy consumption is a good way to encourage them to take part in energy conservation measures.

Note that some hotels have decided to offer their staff a bonus when energy consumption is decreased.

Benefit for the environment

CO₂

Carbon emissions reduction

For a 1,000 m² hotel with an annual energy consumption of 250 kWh/m² (47% electricity and 53% of gas), and if French emission factors are applied, a 10% energy saving on electricity and gas represents:

4.05 teq CO₂ avoided each year

French emission factor for electricity: 84.3 gCO₂ / kWh.
French emission factor for gas: 231 gCO₂ / kWh
(Source: ADEME).

Market availability

Maturity of the solution: mature.

Manufacturers / suppliers of energy sub-meters :

- Delta Dore www.deltadore.com,
- Schneider Electric www.schneider-electric.com

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