Nearly Zero Energy Hotels - case studies and the definition of a NZEH

prof. Stefano Paolo Corognati,
TEBE group
Energy Department
Politecnico di Torino
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Network of European Regions for Sustainable and Competitive Tourism

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ESPECIALISTAS EN EFICIENCIA Y AHORRO ENERGETICO

EIHP
Nearly Zero Energy Building

- High Energy performance
- Low energy demand
- Residual demand covered by RES
Nearly Zero Energy Hotel

Limit of energy performance related to «European Climatic Zones»

Indicator: Primary Energy

What is it considered?

«hosting functions»

Basic functions

- including energy uses for rooms, offices, hall
- not included spa, laudary, swimming pool, etc.
Nearly Zero Energy Hotel

Limit of energy performance related to «European Climatic Zones»

Map of European climatic zones

Legend
- Zones 1&2
- Zone 3
- Zone 4
- Zone 5
Nearly Zero Energy Hotel

Primary Energy Limit (Italy)

\[ \approx 70 \text{ kWh/m}^2\text{anno di energia primaria} \]

Considered final energy uses:

- Heating
- Cooling
- DHW
- Ventilation
- Lighting
- Electric equipments
Nearly Zero Energy Hotel

nearly Zero Energy Hotel

Primary Energy [kWh/m²anno]

70 kWh/m²anno
Nearly Zero Energy Hotel

70 kWh/m²anno
Nearly Zero Energy Hotel

Global Cost [€/m²anno]

Cost Optimality ??

Primary Energy [kWh/m²anno]

70 kWh/m²anno
Year: 2009
Subject: retrofit of an historical building (42 rooms) and new building (38 rooms)

Dettagli tecnici dell’intervento:
• Water-water heat pumps
• FV panels
• ST panels
• Thermal mass activation

Heating energy demand: 13 kWh/m²anno

Investment: 4,200,000 €

Hotel Manager = Hotel Owner
Best-Practice: Boutique Hotel Stadthalle
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- 35% water reduction by water-saving-bulbs
- Press the button: BITTE DRÜCKEN! PLEASE PRESS!
- 1W for standby, saves energy
- No minibar in all hotel rooms saves 21024 kg of CO2 per year (assorted drinks at the reception desk)
- Please use dual flush system to save water
- LED start-up light, 14W in total
- Lichtschalter light switch
Best-Practice: Boutique Hotel Stadthalle

- **Investment**: 2,190 €/m²anno
- **Target Primary Energy**: 70 kWh/m²anno
- **Primary Energy**: [kWh/m²anno]
STADTHALLE BOUTIQUE HOTEL
- VIENNA (AUSTRIA) –

- First eco-friendly hotel in Vienna
- Awarded with the European eco-label
- Member of SleepGreenHotels network

- Located in an Urban area
- Year of construction/Fist opening: 2001/2002
- Number of guest bedrooms:
- Number of guest beds:
- Type of package offered:
- Hotel official rating [stars]:
- Occupancy rate

Hackengasse 20, 1150 Wien, AUSTRIA
0043 1 9824272
office@hotelstadthalle.at
www.hotelstadthalle.at

A Conversation with Michaela Reitterer, owner of the Stadthalle Hotel
ENERGY PROFILING

Implemented Measures To Prevent Energy Losses:

- Lighting: 90% of LED lighting and 10% of low consumption bulbs, light switching controlled by sensors
- Energy Efficient Equipment: yes
- Heat Production: district heating (in the old building), groundwater heatpump (in the passive house), solar thermal panels
- Temperature Control: Programming HVAC according to occupancy and temperature, energy-saving key

neZEH KEY SELLING POINTS

1. Reduced energy costs
2. Independence from energy suppliers
3. Access to new market segment; the sustainability market
4. Guest are given the opportunity to experience new innovations in hotel sustainability; experiencing the philosophy
5. Provides a competitive advantage over rivals. Sustainability is growing in stature as guests demand it.
6. Some guest sectors may be willing to pay more for the investment in sustainability, although increased room rates may not be a selling point

HOTEL FACT SHEET

- Total Floor Area Of The Hotel [M²]: 2,271
- Total Floor Area Of Guest Rooms [M²]: 1,316
- Swimming Pool Dimension: no swimming pool
- Presence Of Air Condition And Ventilation: only ventilation
- Type Of Air Conditioning Used: none

RENEWABLE ENERGY PRODUCED BY THE HOTEL

- Installed Renewable Energy Sources: photovoltaic (13 kWp) and solar thermal panels (130 m²), groundwater heatpump
- Total Electricity Production From Renewable Energy Sources [Kwh]: N.D.
- Share of Electricity from Renewable Energy Sources [% of total electricity use]: N.D.
- Total Electricity From Renewable Energy Sources Exported [Kwh]: N.D.
- Total Heat Production From Renewable Energy Sources [Kwh]: N.D.
- Share of Heat production from Renewable Energy Sources [% of total heating need]: 100% in the passive building, N.D. in the old building
- Energy Savings/Renewable Energy Sources Integration [%]: N.D.
- Existing Plans For Res Installation (Yes/No): (If Yes, Which One?) Yes, installing 3 wind turbines
- Lighting: 90% of LED lighting and 10% of low consumption bulbs, light switching controlled by sensors
- Energy Efficient Equipment: yes
- Heat Production: district heating (in the old building), groundwater heatpump (in the passive house), solar thermal panels
- Temperature Control: Programming HVAC according to occupancy and temperature, energy-saving key
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“Achieving an acceptable return of investment (ROI) only for the material benefits does not mean it is a successful investment. For instance, thanks to our retrofit actions, we gained a one page article in the Financial Times and a 4 pages reportage on the National Geographic, which, of course, gave us a lot of unexpected (and free) visibility”.

“It is the different way of thinking, not the figures that make you a best practice”. 
"Our criteria and goal was to be independent from the energy supply because of the increasing uncertainties in the energy market, and to be responsible towards the environment."

Increase of Employment: due to the widespread reputation of zero energy hotel, extra staff was needed to answer to the guests’ requests for guided tours of the hotel (staff number before refurbishment: 16 / staff number after refurbishment: 31-33)

Main Barriers
1. Social network
2. Fairs/public events
3. Media (TV, newspaper)
4. Joining organizations promoting green/sustainable tourism
5. Promotional events at the hotel
6. Brochure

BECOMING A NEARLY ZERO ENERGY HOTEL - TIPS FROM STADTHALLE HOTEL

Budget & Return of Investment
The budget included the construction of the new part of the hotel (the passive building) and the retrofit of the existing building. The connection between these different bodies was the most cost intensive action undertaken.

“There is not a retrofit action, we gained a lot of unexpected (and free) visibility, which allowed us to reduce the cost of the conventional aspects as publicity, visibility and media exposure.”
THANK YOU