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No. 135

Pollution Prevention Case Studies

Geothermal Energy in a French Hotel

Company	Accor Group
Industrial sector	Short term accommodation activities ISIC Rev. 4 no. 5510 (International Standard Industrial Classification of All Economic Activities)
Environmental considerations	Energy consumption is one of the main environmental impacts of the hotel sector. As part of its commitment to supporting renewable energies, Accor Group is always looking for innovative combinations of renewable energy sources with which to supply its hotels.
Background	Accor Group is the world's leading hotel operator and market leader in Europe. It operates in 90 countries with 145,000 employees, offering more than 500,000 rooms in more than 4,100 hotels. The group offers its clients and partners nearly 45 years of know-how and expertise.
Summary of actions	<p>The Etap Hotel Toulouse Aéroport is designed to be three times more energy efficient than current heating regulations require. The hotel's heating, air conditioning and domestic hot water systems partly run on renewable energy (a geothermal heat pump and solar panels).</p> <p>Under normal operating conditions, total energy consumption (ventilation, heating and lighting) is 60 kWh/m² per year. The hotel has 106 rooms (with a total net floor area of 2,200 m²) and a breakfast room.</p> <p>Energy conservation principles</p> <ul style="list-style-type: none"> • Extra-thick insulation throughout the building (high-performance external insulation, double glazing, etc.) • Energy-efficient systems (e.g. energy-efficient pumps, etc.) • Heating and air conditioning systems powered by a geothermal heat pump • Domestic hot water production via solar panels and a geothermal heat pump <p>System overview: heat pump + geothermal probes + solar panels</p> <ul style="list-style-type: none"> • 24 probes at a depth of 80 m • 110 m² of solar panels • 1 heat pump for heating and air conditioning • 1 high-temperature heat pump for domestic hot water production • Underfloor heating/cooling in the hotel <p>In summer</p> <ul style="list-style-type: none"> - The heat pump cools the hotel - The recovered heat is stored in the probes - Solar panels: <ul style="list-style-type: none"> • produce domestic hot water • store surplus heat in the probes

	<p>In winter</p> <ul style="list-style-type: none"> - The heat pump: <ul style="list-style-type: none"> • heats the hotel • produces domestic hot water - The panels cool down - The solar panels produce some hot water <p>In the winter, energy is transferred from the ground to the hotel. The reverse happens in the summer.</p>
<p>Diagram</p>	<p>Not available</p>
<p>Balances</p>	<div style="border: 1px solid black; padding: 5px;"> <p>INVESTMENT</p> <p>The additional capital expenditure came to €285,000, or around 6% of the total construction cost of an Etap 106-room hotel (excluding land). ADEME (French Environment and Energy Management Agency) allocated €130,000 to this project.</p> <p>The maintenance cost is estimated to be around €3,000 a year.</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>SAVINGS</p> <p>The energy savings are estimated to be €15,000 a year (270,000 kWh/year).</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>RETURN ON INVESTMENT</p> <p>The return period, taking into account the ADEME subsidy, should take around 13 years.</p> </div>
<p>Conclusions</p>	<p>The implementation cost of geothermal energy is not low, but in many cases subsidies from regional or international organisations can be raised. In this case, Accor Group has established a partnership with ADEME to aid in the reduction of the overall cost. Return-on-investment periods are still lengthy, but with the increasing price of energy from traditional fuels, geothermal energy is already a profitable investment.</p>

NOTE: This case study seeks only to illustrate a pollution prevention example and should not be taken as a general recommendation.



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