

## Ecological hotel

### Etap Hotel Toulouse Aéroport An energy-efficient hotel



#### Presentation

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The Etap Hotel Toulouse Aéroport has been designed to be three times more energy efficient than current heating regulations require. The hotel's heating, air conditioning and domestic hot water systems run partly on renewable energy (geothermal heat pump and solar panels), and the hotel looks set to receive THPE EnR 2005 certification for very high energy efficiency from renewables. Eventually, total energy consumption (ventilation, heating, lighting) will be **60 kWh/m<sup>2</sup> per year**.

The hotel has 106 rooms (with a total net floor area of 2,200 m<sup>2</sup>) and a breakfast room due to open in February 2009.

#### Implementation & Results

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##### Energy conservation principles:

- 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:
  - o By solar panels
  - o By a special geothermal heat pump

##### System overview: heat pump + geothermal probes + solar panels

- 24 probes at a depth of 80 m
- 110 m<sup>2</sup> 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

In summer	In winter
<ul style="list-style-type: none"> <li>- The heat pump cools the hotel</li> <li>- The recovered heat is stored in the probes</li> <li>- Solar panels:                             <ul style="list-style-type: none"> <li>• produce domestic hot water</li> <li>• store surplus heat in the probes</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- The heat pump:                             <ul style="list-style-type: none"> <li>• heats the hotel</li> <li>• produces domestic hot water</li> </ul> </li> <li>- The panels cool down</li> <li>- The solar panels produce some hot water</li> </ul>

#### Financial Aspect

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##### Investment

The additional capital expenditure comes to €280,000, or around 6% of the total construction cost of an Etap 106-room hotel (excluding land).

ADEME has allocated **€120,000** for this project.

##### Operation: energy saving and maintenance

The energy saving is estimated to be €12,000 a year (290,000 kWh/year).

The maintenance cost is estimated to be around €2,000 a year.

#### Outlook

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To monitor building energy efficiency, gauge the response of customers to underfloor heating/cooling and flag areas for improvement in terms of cost accounting in partnership with the French Environment and Energy Management Agency (ADEME).