

Granada Luxury Belek hotel

Antalya Turkey



Thanks to their large consumption of electrical and thermal energy, hotel resorts are an optimal place for the installation of CHP units as a local energy source. This is doubly true if such a resort, provides another energy-intensive service for its guests (wellness, conference hall, etc.). Thanks to the combined production of power and heat, the cogeneration technology has great potential to reduce energy costs in this type of operation.

In addition, the installation of a CHP unit increases the hotel's independence from the supply of power from the grid, and by doing so, contributing to the overall comfort of its guests. The hotel provides its services 24 hours a day and often there is a sudden increase in consumption, for example, when guests arrive or during social events. Cogeneration is sufficiently flexible in this respect and it can easily cope with these obstacles.

ABOUT THE PROJECT

The Granada Luxury Belek Hotel in Turkey is located on a plot of land with a total area of more than 100,000 m² and can accommodate up to 5,000 guests. With a size of 12,000 m², the hotel resort also has one of the largest outdoor swimming pools in Europe. The energy consumption is therefore enormous here, especially in the summer months when the power is also needed for the operation of the air conditioning system. The hotel was built in 2017 in the Turkish city of Antalya and its total annual consumption of power amounts on average to 14,255 MWh while the heating and hot water require approximately 12,355 MWh. Energy costs amount on average to 1,275,000 € per year. The transition to cogeneration technology was not only a way to save energy costs for this type of operation, but it was also an opportunity to significantly reduce it's environmental burden.



5x 200 kW
electrical output

5x 250 kW
heat output

230 000 €
saved per year

2 510 tons
of CO₂
saved per year

SOLUTION FOR COGENERATION

Instead of one large unit, we opted for a more flexible combination for service: 5 TEDOM CHP units with a total electrical output of 1,000 kWe are located in a separate building next to the transformer and the high-voltage switchboard. Due to the extreme climatic conditions in the summer months (temperatures exceeding 40°C, air humidity over 90 %), an additional cooling system is installed in this building to reduce the indoor air temperature below 35°C and keep its humidity below the limit of 80%. Furthermore, stronger and more durable ventilators were installed in order to ensure a generally better air flow. All this is to ensure the optimal operation of the CHP units.

CURRENT SITUATION

The current solution is designed so that the CHP units are in operation all year round only with necessary service breaks. This brings maximum utilization of the cogeneration technology with an emphasis on efficiency. During the year, cogeneration covers approximately 57% of the total power consumption and 75% of the total heat consumption of the entire resort. Thanks to the implementation of the CHP units in its energy system, the hotel saves approximately 230,000 € per year which represents an 18% savings compared to the previous solution. At the same time, the hotel saves 2,510 tons of CO₂ per year compared to the previous situation.



Installed CHP Units

CHP unit type	5x TEDOM Cento 200
Fuel	Natural gas
Electrical output	5x 200 kW _e
Heat output	5x 250 kW _t
Total efficiency	88.7 %



SIMILAR REFERENCES

TEDOM has many years of experience in the use of cogeneration in hotels. In its 30 years of operation, TEDOM has delivered more than 210 applications to 23 countries around the world. In Turkey, all hotel projects were developed and implemented by our Turkish partner, Arke Energy Systems, with whom we have been cooperating since 2005. Together, we have put into operation more than 40 CHP units with a total output of 22,900 kWe during that time.

ABOUT COGENERATION

Cogeneration is the combined production of power and heat. The biggest advantage of cogeneration is highly efficient utilization of energy in the fuel, which amounts to more than 90%. Cogeneration saves not only fuel resources but also a significant amount of CO₂ emissions.

As compared to conventional power plants where the heat generated during the production of electrical energy is usually wasted into the atmosphere, this heat is utilized by CHP units for heating which makes the production of electrical power a great deal more efficient.

Due to their flexibility, the CHP units are also convenient complements to the renewable energy sources in the period without solar radiation or wind.