



Category: Energy efficient hotel
Case Study: Hotel “La Marquise”



GREECE

Development Agency of South Aegean Region «READ S.A.»

Project cofinanced by



Lead Partner



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Kallithea, illustrated in the
map of Rhodes

General Information

The luxurious Hotel “La Marquise” is located on the north eastern side of the island, constitutes one of the largest hotel complexes of Rhodes and covers an area of 120.000 square meters. The hotel was constructed in an area close to the sea, at Kallithea and is surrounded by vegetation that makes the accommodation of the visitors even more pleasant.

Presentation

La Marquise applies a specific environmental policy which covers a series of daily activities and operations. More specifically, osmosis technique is used in order to produce clean pool water that is 100% chlore- free. It has a special energy management system, uses energy saving lights and warm water is produced from recovering energy coming from air-conditioning system without using any extra energy consumption for this operation.



The hotel “La Marquise”

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The special ceramic tiles used in the exterior spaces.

In the exterior area and around the pools, the ceramic tiles that have been used are covered by a special material which interacts with the sunrays and reduce air pollution. In addition, the irrigation system is placed under the ground so as to reduce water consumption and they use composting and organic fertilizers. The hotel tries to save energy, recycle water, paper, aluminium and glass and the personnel uses environmentally friendly detergents. Towels are replaced only upon the guests' request, wherever it is possible recycle packaging materials are selected.

The most important characteristic of this hotel is the energy management system that was applied by the Electrical Engineer Mr Prousaloglou Pantelis and his company Smart Building Solutions based in Rhodes, that won the first prize in a Smart building contest which took place in Germany in April 2012 in the framework of the exhibition “Light + Building 2012”. The contest was organized by KNX Association and the Greek company “Smart Building Solutions” took the first place in the category “INTERNATIONAL – EUROPE” among 43 countries for the project "La Marquise hotel”.

Due to the structural characteristics of the hotel that is expanded in a large area like a village, the Engineers used KNX technology, since it offers flexibility and expandability of the system, decentralized control and efficient energy management.

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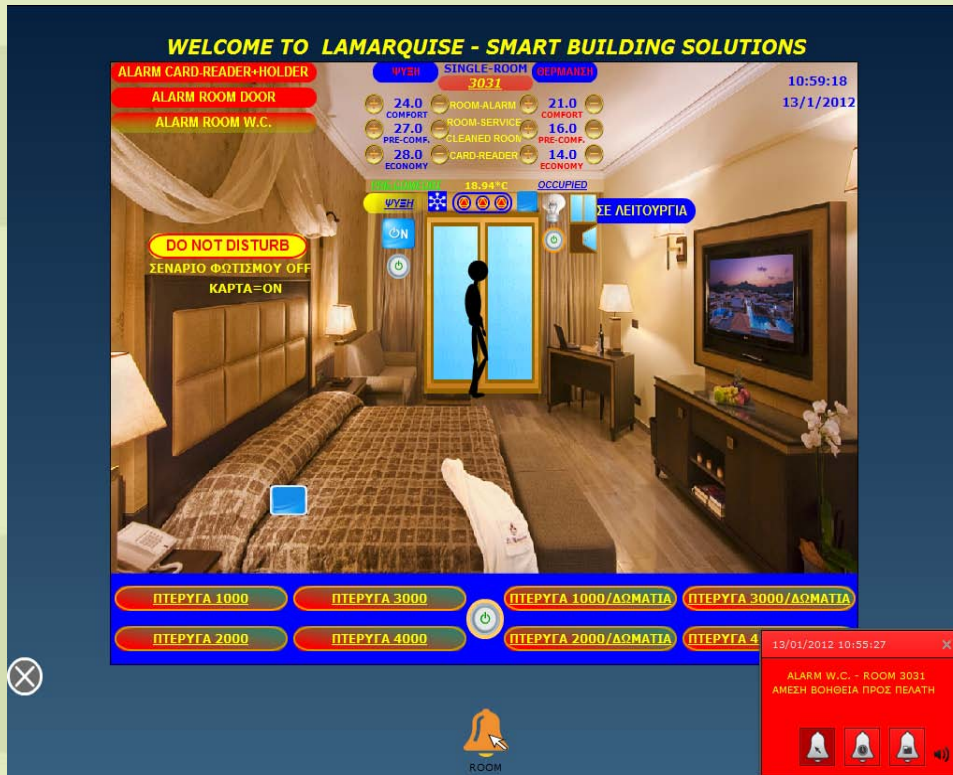
The pool of the resort

Through a single touch panel, the managers have the opportunity to control all the applications of the building and access all the appliances, increasing comfort, safety and energy saving. The team that was responsible for KNX system, created various scenarios applied for air-conditioning, lighting, water treatment, sound system, client service etc. In this way, the responsible staff can control and programme the whole system even if they are not in the hotel, resulting in less workforce, fast resolution of problems and less power cables.

The functions that are controlled through KNX system are the following:

Lighting control: Due to the fact that the hotel covers a very large area and consists of many rooms and facilities, the team has identified a series of lighting scenarios. The building has the ability to choose the most suitable and efficient way to use lights as soon as the card holder inserts the card in the entrance of the room. The room and the building is aware of the presence or the absence of people and set the various scenarios that regard air conditioning, lighting and hot water. Special digital ports are placed inside the rooms for the function of switches and panels indicate every lighting function that can be operated by the visitors.

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Visualization of the interior of a room

Rollers control: In guest rooms electric curtains are placed at the windows. In the multi function room the projectors are established in a special place at the ceiling, which opens at request and the system is ready for use. The level of the lighting is automatically adjusted to the desired conditions. In addition, lighting functions are controlled by dimmers that can be easily set to various scenarios according to each circumstance.

Ventilation, cooling, heating: These functions are controlled via a RXB controller taking into consideration a series of different scenarios and adjustments. Fan coils are installed for air conditioning needs. The complex has nine central cooling units that are divided in the following three sections:

1st section (4 units): Wing 1000 which consists of the central building and one division of the village.

2nd section (3 units): Wing 2000 and 3000 which consists of one part of the buildings of the complex.

3rd section (2 units): Wing 4000 which consists of another division of the village.

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Alarm systems: A special alarm system is established in the hotel, which joins the card reader and the card holder with the IP router of the KNX line and various logics. Moreover, each room has a second alarm that is related to W.C. assistance and a third one, that concerns safety issues and is set when someone with malevolent intentions is detected. The hotel also has conventional alarm systems regarding machine rooms, safety personnel during the night, water tanks, boiler rooms and pumping stations. Whenever an alarm is activated, a special sign appears on the alarm system panel and the personnel has the ability to intervene.

Technical surveillance: The complex covers a significantly large area and consists of a large number of buildings. For this reason, the constructors have created a network consisting of last-generation optical fibers. There are seventeen control rooms which are connected to one another as well to the central control room.



Audio and video system

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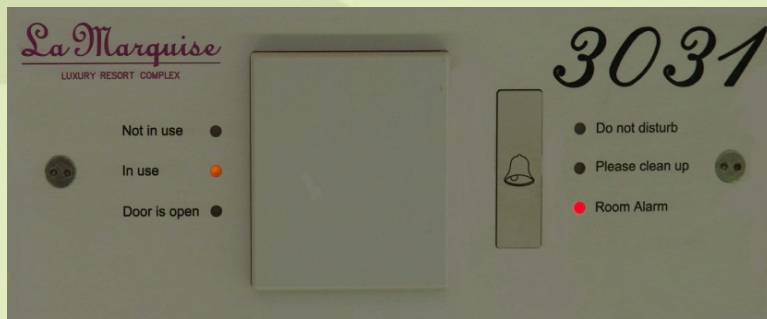
Control room

Energy management: The personnel and the managers have the possibility to measure the consumption at a specific time based on contract and detect the activities that consume the largest loads. Another technique that is applied in the complex is the one of “grey water” that results in serious water resources saving. The system collects the used water from bath tabs, sinks etc., processes it and channels it to special tanks with grey water.

Smart measurement: The waterfall’s water is controlled via a special system that measures the speed of the wind and is adjusted accordingly. The building has a system through logic which “understands” the presence of people and chooses the right scenario of operation. Rooms are connected to one another and in this way air conditioning and hot water are activated according the needs of each wing. As a result, energy saving is achieved in the whole complex.

Audio/ video: Music system operates according to a time plan and all functions are being managed through visualization. In addition, sound can be transferred to any part of the hotel, even inside the rooms.

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The system that is used for card reader

Visualization: Various functions, indications, alarms, controls can be managed through the web-based visualization. Based on the needs of the building, the engineers have established ComBridge Evolution of IPas and it is accessible by an internet connection. Every person that has access to this system can control the status of each room or facility through a computer or tablet. In this way they have access and information of every alarm or function status.

Communication with other systems: Thanks to the connection that is created between the card holder and the card reader, each visitor has each own scenario of functions regarding lighting, air conditioning, hot water, which the smart building remembers and activates it whenever the client visits the hotel. Also due to the large size of the project, there are interconnection with Logo type interface which applies for mechanical installations in the machine rooms, pump stations, various applications and logics so that the KNX connects through the Logo and the managers have various alarms, functions and logics.

Remote control: All the functions that were mentioned above may be subject to remote control, programming and monitoring through networks. As a result, the personnel and the controllers have tremendous flexibility resulting in better management of human resources, fast and qualitative service, time and money saving and the operation of the hotel can offer more with less human resources and reduced operating costs which leads to a more competitive position in the market of tourism.

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● ● ● Evaluation

Nowadays, modern societies are characterized by an increasing awareness concerning the protection of the environment, because of strict regulations, financial and other influences, as well as the environmental consciousness expressed by consumers. In a highly competitive environment, everyone must be aware of the urgency of our compliance with the new conditions and the need to turn nature's protection into a part of our everyday life.

The advantages of the bioclimatic and energy efficient design are the following:

- Environmental protection through the reduced pollutants and greenhouse gas emissions
- Energy saving, thermal and visual comfort
- Money saving thanks to the reduced need for fuel and cost of heating, cooling, ventilation, lighting
- Improvement in the quality of life

Basic elements of bioclimatic design are passive solar systems that use environmental sources, such as sun, air, wind, vegetation, water, for cooling, heating, lighting the buildings. The energy consumption of a building depends not only on the quality, the materials of the construction and the technical installations, but also on the rational behavior of its users.



The system's appliances for the control of the offered applications

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One of the resort's wings

The appropriate planning and design of a building leads to great energy savings, regarding the orientation, the size and the location of the windows and openings, the protection of the building's shell with the right type of insulation etc. Particularly important is adequate shading and natural ventilation during the period of summer and the opposite techniques in winter, in order to achieve a stable temperature.

Energy savings through bioclimatic design vary depending on the type of the building, the region's climate and the technologies used. The application of energy efficient techniques does not increase the construction's cost if the systems are simple. The implementation of more complicated techniques can increase the total cost by 10-15%. As for interventions in existing buildings, there is always an additional cost, which can be considered as part of the overall cost of renovation or reconstruction of the building.

To sum up, the application of environmentally and energy friendly techniques in the island of Rhodes is rather encouraging and sets a very interesting example for other initiatives, too. More motivations from the state's side are required, especially during this period that the financial conditions are extremely difficult and prohibitory for renovations or construction of new energy efficient buildings.

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●●● **Potential for transferability**



One of the hotel's machine stations

The presented good practice constitutes an undisputed proof that even islands have realised the importance of this shift towards building techniques. In a sector that is responsible for the 40% of total energy consumption in the European Union similar steps have to be made in order to achieve a significant limitation in the use of energy in everyday life.

The sector of hotel business constitutes one of the major representatives of the tourism industry. Therefore, it has to adapt to new market conditions and to the requirements of sustainable growth. Rhodes hosts every year a large number of tourists and visitors, since it constitutes one of the largest Greek islands. For this reason, it is crucial for other hotels and rooms for accommodation, to exemplify by these efforts and adopt some of the techniques of energy efficiency. The dissemination of the good examples could be a solution, as well as the creation of networks for exchanging experiences regarding energy efficient building and their function.

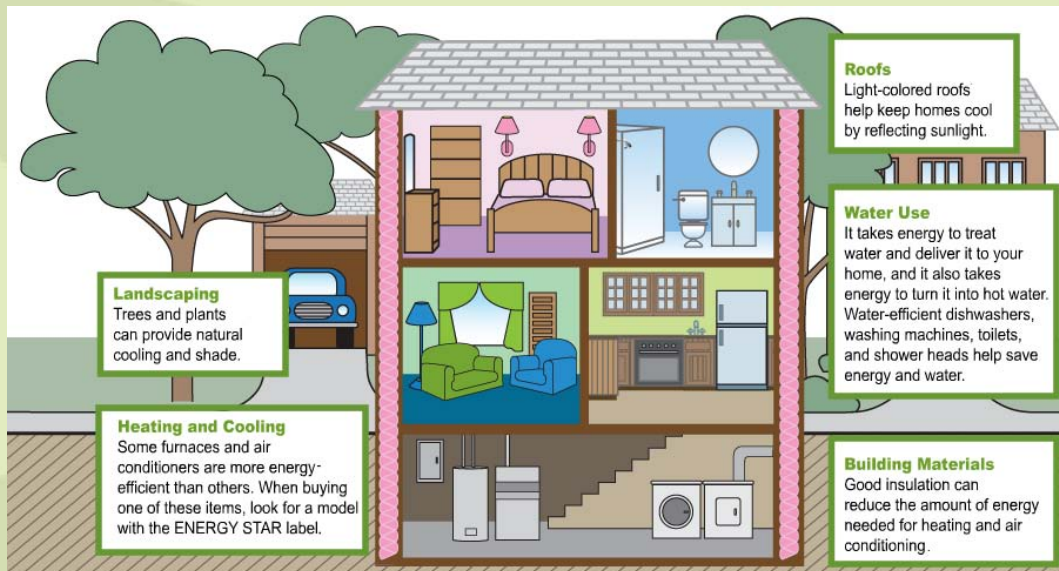
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The improvement of the energy performance of a building is achieved thanks to the three categories of interventions:

- Extended reconstruction that can be done in case of total renovation, like the replacement of windows and frames, adding insulation materials, installation of exterior passive systems or conversion of conventional building materials in passive components (e.g. transforming a simple wall in solar wall), external shading systems (stable or mobile), etc.
- Small low-cost interventions such as limitation of cracks, indoor shading systems, ceiling fans, planting for shading, replacing incandescent light bulbs with low energy consumption bulbs, etc.
- Non-technique interventions, such as proper operation of building systems, including proper use of windows (natural heating in winter, shading and night ventilation in summer), rational use of electric devices in order to avoid thermal charge of the building (e.g. avoid cooking during the hours that the temperature is high).



Green Building applications

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Visualization of the KNX system

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Project cofinanced by



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Lead Partner

- Province of Savona (ITALY)



Project Partner

- Region of South Aegean (GREECE)
- Read S.A. (GREECE)



- Local Energy Agency Pomurje (SLOVENIA)



- Agência Regional de Energia do Centro e Baixo - Alentejo (PORTUGAL)



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