



Lebanon Energy Efficiency & Renewable Energy Finance Facility



LEEREFF

SUPPORTED BY Banque du Liban

Sustainable Energy Investment ➤ *Improved Business Results*

***Energy Efficiency and
Renewable Energy in
Hotels and Guest Houses***

The hotel sector is diverse, comprising hotels, motels, guesthouses, hostels and tourism apartments. Energy is one of the main cost factors, which greatly influences the establishment's profitability. At the same time, energy use is often difficult to control, as guests and staff have a direct influence on the energy consumption. Efficient performance hotels operate sustainably, using energy more effectively than hotel buildings that are simply operating in line with legislation. Efficient performance hotels capitalize on the opportunity to enhance their positioning in the hotel market vis-a-vis both, customers and potential investors. Travellers are increasingly aware of the environmental impact of tourism and like to use hotels that are making an effort to minimize energy consumption and carbon emissions. Investors and owners benefit from the positive financial impact that results from energy saving.

This is NOT difficult!! And it is made much easier with a LEEREFF loan:

- very competitively priced
- includes free technical assistance helping hotels, guest houses and restaurants find the best solution.

OVERVIEW OF EXAMPLES FOR ENERGY SAVING AND RENEWABLE ENERGY INVESTMENTS IN THE HOSPITALITY SECTOR

GENERAL BUILDINGS

Building Insulation (exterior walls and roof)
 Efficient windows
 Efficient boilers
 VRF systems or efficient chillers and split systems
 LED Lighting (inside and outside areas)
 Occupancy sensors for lighting systems in halls, utility rooms, common bathrooms, etc.
 Motion sensors on outdoor lighting
 Solar PV
 Solar Water Heaters
 Building energy management system

GUEST ROOMS

Key card systems (to switch off electricity in guest rooms)
 Motors with variable frequency command in HVAC applications
 Sensors on windows and sliding doors – switching off heating and cooling automatically when open (linked with building energy management system)

KITCHEN

Energy efficient cookers and ovens
 Refrigerators
 Cold storage and walk-in freezers
 LED Lamps (also in refrigerators)
 HVAC
 Heat recovery
 Biogas (from food waste)
 Energy efficient extractor fans

LAUNDRY

Highly efficient laundry machines
 Ozone laundry machines
 Heat recovery from laundry room air extractors

SPORTS FACILITIES

Efficient pumps for swimming pools
 Spa boilers

Hotels are among the top five energy consumers in the tertiary building sector. Operating in a 24/7 environment, there is much energy saving potential. **The biggest energy wasters in hotels are:**

- Space conditioning (cooling and heating)
- Lighting
- Domestic hot water
- Laundry (if not outsourced)

SPACE CONDITIONING

The ambient air temperature and quality directly influence guest comfort and largely define the guests' experience. Key card systems and window sensors, which enable shut-down of cooling/heating together with a building energy management system minimize losses and maximize savings, while maintaining high guest comfort.

LIGHTING

Lighting represents about 25% of electricity costs in hotels. But effective lighting is essential for safety and comfort in hotels. The financial arguments for implementing a full LED retrofit are compelling and result in

MINI CASE – BIOGAS



A hotel chain with integrated restaurants catering for a total of 2,000 customers per day piloted the possibility of using food wastes for biogas production. Waste used included plate scraps and

food preparation waste. An anaerobic digester was installed in a central location serving outlet restaurants. The result of the pilot showed that approximately 600 lb of food waste per day produces almost 44 m³ biogas per day, which is equivalent to almost 27 m³ natural gas per day. This amount of gas produced per day is equal to one week's worth of natural gas consumption of an average British household. The biogas, without any cleaning, can also be bottled and used directly for cooking again, vastly reducing the restaurant's need for purchasing cooking gas.

MINI CASE – ENERGY CONTROL SYSTEMS



A hotel installed an Energy Control system in the kitchens of one of its properties. Previously, the extractor fan ran 24 hours a day at full speed, using about 220.67kWh/day.

The new equipment continuously monitors cooking activity and, based on the conditions, adjusts the following:

- speed of the extractor and supply fans
- adjustment in air conditioning requirements

As a result, energy consumption drop to 105.59kWh/day. Together with the reduction in the need for conditioned air, the hotel's total annual savings are around USD 6,301 or 42,004kWh/year

MINI CASE – SOLAR INSTALLATION



A hotel location planned to reduce its costs associated with heating the outdoor swimming pool for use in the winter, while using the same solar thermal collectors to preheat water for use in

indoor showers April through November. The 320m² panel array produced a 35% reduction in annual gas consumption with a 1.8 year Rol.

two impacts:

1. a substantial reduction in energy bills
2. a significant increase in the asset value.

DOMESTIC HOT WATER

Domestic hot water is commonly the second largest user, accounting for up to 15 per cent of the total energy demand. Solar Hot Water Heaters can easily cover most of hot water needs, especially in a country like Lebanon.

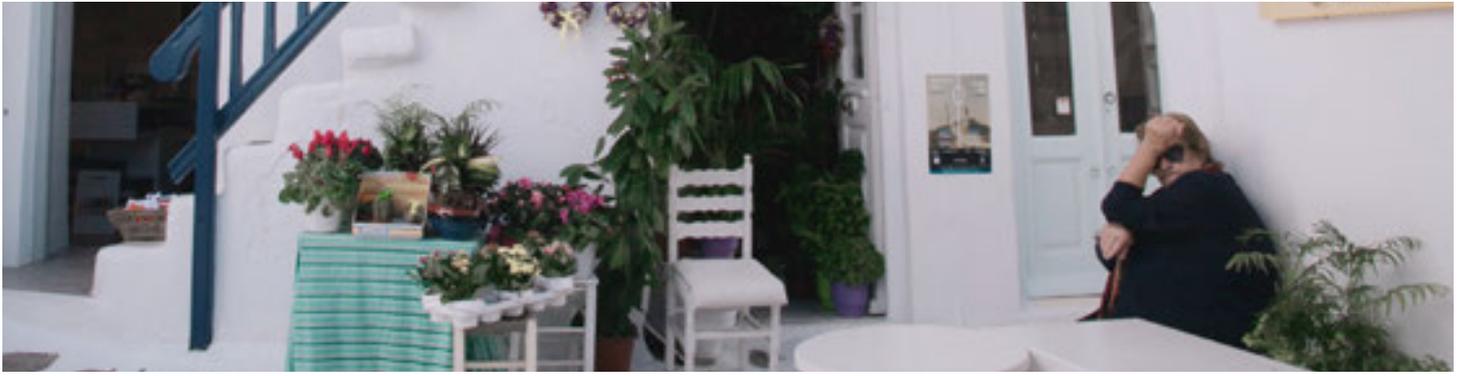
LAUNDRY

Laundry services in general account for roughly 15-20% of the **TOTAL** energy consumption of a full-service hotel and are also responsible for 16% of a hotel's total water consumption. High efficiency commercial washing machines use 63% less energy and half the water of conventional washing machines.

The case for **Ozone Laundry Machines**: In the least 10 years however, ozone laundries have become popular for diminishing the overall environmental impact of the laundry while achieving significant reductions in energy costs. The process of an ozone laundry involves completion of the wash cycle by using water saturated with ozone, instead of standard tap water. Laundry disinfecting has been traditionally accomplished by bleaching with chlorine at high temperatures along with agitation. This bleach is normally a slow reactant at cold temperatures, so hot water is used in conventional washers to enhance the oxidation reaction of chlorine bleach. Ozone, which carries an electrical charge, does the disinfecting without hot water. Ozone works well in cold water and reacts very rapidly, dissolving soil on contact. Hot water is unnecessary for most ozone laundry systems. By eliminating the need for hot water (85-100%) and reducing both washing and drying times. Ozone laundering can generate **energy savings of up to 75%**. In addition they reduce overall water consumption by about 20% and detergent/chemical usage by around 40%.

QUICK-WIN EXAMPLES FOR HOTELS

- Installing efficient ice makers generated annual energy savings of 230,400 kWh
- Installing water efficient shower roses and a temperature setback system: capital cost of USD 3,600, generating annual energy savings of 75,035 kWh, delivering annual costs savings of USD 11,255.
- Filling north facing rooms first: capital operating cost of USD 3,200, generating annual energy savings of 182,400 kWh, delivering annual costs savings of USD 27,360.
- Installing timers on external lighting: capital cost of USD360, generating annual energy savings of 26,280 kWh, delivering annual cost savings of USD 3,942.
- Installing timers in hallways: capital cost of USD 883, generating annual energy savings of 14,717 kWh, delivering annual costs savings of USD 2,208.



WHAT IS LEEREFF?

LEEREFF stands for 'Lebanon Energy Efficiency & Renewable Energy Finance Facility'. LEEREFF is a dedicated credit line for companies who wish to invest in sustainable energy including:

- Renewable energy
- Energy Efficiency in industry and commerce
- Green Buildings (Commercial)

LEEREFF offers investment support through loans from The European Investment Bank (EIB) and Agence Française de Développement (AFD), with interest rate subsidies provided by the Banque du Liban (BDL), and free technical assistance provided by an international team of engineers, financed by the EU.

Please visit our website to find out how you can benefit from and apply for a LEEREFF loan: www.leereff.com



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