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 Healthcare

Hospitals and clinics are complex organizations from a sustainable energy point of view. They comprise wards, treatment facilities and equipment, kitchens and common areas, all aspects of building energy efficiency, and at the same time they have to fulfill stringent health and safety requirements. Hospitals and clinics are very energy-intensive. Hospitals operate 24 hours a day and aim to provide patient comfort and optimum health care at the push of the emergency call button. And hospitals are bound by stringent medical standards and ventilation and air cleanliness requirements. Hospitals have higher requirements for outside air, heating, cooling, dehumidification and humidification than other building types. As a result, their energy consumption is substantially higher than e.g. office or retail buildings. Electricity alone accounts for over 50% of a hospital's energy costs and with the constantly increasing use of specialist medical equipment that generally relies on electricity, consumption is set to increase. The specialist nature of a hospital environment means that there is a significant amount of energy-intensive equipment, such as medical fridges, mortuary and pharmacy cold stores, laboratory equipment, and X-ray machines.

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

GENERAL
Building energy management systems
Building insulation
HVAC
Heat recovery
CHP
Solar PV
Solar Hot Water
Lighting

ADMINISTRATIVE AREAS AND OFFICES
Lighting
Occupancy sensors

TREATMENT FACILITIES
Compressors
Specialized HVAC
Lighting
Refrigeration

SUPPORT FUNCTIONS
Hospital kitchens
Ovens & cookers
Refrigerators and freezers
Food distribution service
Laundry

MEDICAL TREATMENT DEVICES
Many treatment facilities require compressors. Applications may range from the distribution of medical gases, via inflation/deflation of special air mattresses used in treatment facilities, blood analyzers, etc. Efficient compressors can generate significant energy savings.

LAUNDRY
High efficiency commercial washing machines use 63% less energy and half the water of conventional washing machines. As an alternative, also consider Ozone Laundry systems, which can significantly reduce 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%.

COMBINED HEAT AND POWER (CHP)
In an appropriate application, CHP can reduce a hospital's energy bill by around 20–30%. Hospitals are good candidates for CHP due to their year-round demand for heat.

MINI CASE – FOOD DISTRIBUTION

A Hospital tested insulated 'hot boxes' as replacements for traditional, electrically-heated food trolleys. After making a few minor adjustments to working routines, it was possible for food to reach patients at the correct temperature without the need for trolleys. The hospital withdrew 33 traditional trolleys at a saving of almost 145,000 kW per year.

MINI CASE – SOLAR POWER

A Community Hospital installed solar power on its roof and cut its energy consumption by 30%.

MINI CASE – MULTIPLE MEASURES

A large hospital complex uses waste biogas created of a nearby landfill site to create electricity and heat that fully powers one of its multiple building healthcare sites. A geothermal heat pump system heats and cools one hospital, and a biomass boiler at the main hospital's site takes care of 38% of the system's energy needs. In addition, solar panels power the underground parking garage, and a solar hot water unit offsets 85% of the Child Care Center's hot water needs.

LIGHTING

In a typical hospital, lighting can account for over 20% of the total energy used or over 35% of the electricity used in a typical hospital. Good lighting design can reduce costs and have the added benefit of decreasing internal heat gains, thus reducing the need for air conditioning too. Upgrade lights to the most efficient suitable options. For example, any 'standard' tungsten light bulbs can be upgraded directly to energy saving compact fluorescent lamps (CFLs) which use 75% less energy, produce less unwanted heat and last 8–10 times longer.

OCCUPANCY SENSORS

Occupancy sensors can achieve savings of up to 30% on lighting costs because ensure lights only operate when there is somebody there to require them. These are especially useful in, for example, the following spaces:

- Intermittently used office areas
- Toilets and washroom facilities
- Storerooms
- Areas where lighting is zoned and/or corridors

Occupancy sensors can also be used to lower light levels in corridors at night time, which can be an effective cost-saving measure. However, it is imperative to maintain minimum light levels so as not to compromise health and safety standards. This measure not only saves energy, but also helps to prevent the spread of disease because staff no longer needs to touch switches.

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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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European Investment Bank | AFD Agence Française de Développement | مصرف لبنان Banque du Liban | LCEC Lebanese Center for Energy Conservation المركز اللبناني لحفظ الطاقة

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