



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
Restaurants, Cafés and Canteens***

The catering and restaurant services industry is very complex in its diversity and establishment sizes. Restaurants are extremely energy intensive. Normal restaurants use up to 7 times more energy per m² than other commercial buildings, such as office buildings and non-food retail stores. High-volume and quick-service restaurants use even more energy than that. The lion's share of energy consumption is in food preparation. However, HVAC and lighting together consume up to 45% of a restaurant, whereas refrigeration consumes only 6%. Energy used in sanitation represents around 18%.

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

IN THE KITCHEN

- Highly efficient **combination ovens save 30%** over old models
- **Convection ovens** reduce the cooking time and consume **20% less energy** than conventional ovens
- Replacing old hot **food holding cabinets** can save up to **70%** energy
- Replacing old **commercial dishwashers** against efficient new models can save up to **40%** energy
- Modern efficient **steam cookers use 60% less** energy than their predecessors
- **Highly efficient freezers and fridges** use **30%** less energy than older models. Pick solid door models and the energy saving increases
- Maintain compressors and/or exchange **compressors on walk-in fridges and freezers** regularly. Also, install **LED lighting** as that saves energy AND reduces the heat emitted by the light.
- Use **heat recovery** on extraction fans and use for air/water heating
- Hot water preparation: install **solar hot water heaters** to cover as much as possible of your hot water requirement by solar power
- Investing in energy efficient lighting such as **LED** can reduce energy consumption up to 75%
- Install **solar PV**, if you have your own roof, and substitute part of your energy needs with solar energy

IN THE SERVING / GUEST ROOM:

HVAC: ambient air temperature and air quality are very important in catering establishments. Ensure correct equipment sizing (industry estimates show that at least 25% of all rooftop HVAC units are oversized, resulting in increased energy consumption). Replace fans against energy efficient models to save 70% energy. Consider that ceiling fan/light combinations are more than 50% more energy efficient than conventional units.

Fast food outlets also require heating/cooling to optimise guest comfort, but this can be costly. Even if you implement 'zones' within the building where separate timers and temperature controls can be adjusted, it's difficult to maintain a steady temperature whilst ensuring complete energy efficiency.

One of the simplest ways for food outlets to optimise the efficiency of their heating system is to seal the building against potential drafts, and keep external doors and windows closed whenever possible to reduce the amount of heated or cooled air allowed to escape. If your business hasn't already done so, consider adding a self-closing entrance door. When the business is closed, ensure that all doors, windows and vents are closed to capture and store any residual heated or cooled air overnight, reducing the amount of energy required to heat or cool the building the next day.

Install a **building energy management system**.

MINI CASE – MULTIPLE EQUIPMENT UPGRADE



A Burger restaurant saves 20,000 kWh annually by:

- Replacing existing pre-rinse spray nozzle with a low-flow pre-rinse spray nozzle. The energy saving is generated by the reduced

water heating requirements.

- Replacing standard fryers with highly efficient gas fryers
- Fitting the exhaust fan with a variable speed controller
- Replacing the walk-in freezer with a smaller more efficient model

MINI CASE - LIGHTING



The owner of a hip café, had two goals for energy efficiency improvements:

- Create a cozy, inviting atmosphere for customers
- Save energy

In the main seating area alone he was able to cut energy used for lighting by 85% by investing in LED lighting. Throughout the rest of the café, energy consumption for lighting has been cut in half, reducing the café's annual energy use by over 10,000 kWh. The lighting upgrade will have paid for itself after just eight months, and because LEDs last up to fifty times longer than older light sources, the change is generating other savings too. It's not just the cost of buying the light bulb, but needing to drive to the store, spending time to install it... time and maintenance savings are vastly undervalued. Furthermore, LEDs produce significantly less heat than most traditional light sources, reducing the load on the cooling systems.

MINI CASE – REFRIGERATION



In a restaurant, refrigeration systems, a vital food and wine storage component, are typically amongst the biggest energy consumers. After conducting a detailed on-site audit, the restaurant

identified: inefficient and poorly maintained reach-in freezer, un-insulated suction pipes, inefficient and poorly maintained remote condensing units, and inadequate strip curtains. Through replacement and upgrades, energy consumption for the refrigeration was reduced to 53% of the old installations.

MINI CASE – LEBANESE RESTAURANT



The restaurant used a very large underfired conveyor broiler to produce their specialty grilled meat kebabs with their signature charred texture. The broiler emitted substantial amounts of heat, making the kitchen too hot for staff comfort. Optimisation in kitchen comfort without sacrificing the classic kebab flavor was achieved by replacing the existing underfired broiler with an enclosed, energy-efficient conveyor broiler with burners above and below the conveyor belt. The new broiler features dual modulating conveyor belts, allowing for

different cooking times of multiple food products. With this investment, the restaurant achieved more than 80% reduction in energy consumption due to a decrease in energy required for kitchen exhaust, ventilation and cooling systems and a drastic decrease in the broiler's energy consumption.

In-door Lighting

Effective lighting is central to the success of a fast food restaurant or takeaway, affecting not just practical elements such as health and safety, but also the comfort of customers. Lighting may be one of the most expensive energy costs food outlets face, but by implementing efficient lighting controls and investing in innovative lighting technologies, businesses could reduce their lighting costs by more than 50%, depending on the lighting chosen.

One of the simplest things your business can do to improve its lighting efficiency is to install low-energy bulbs. By upgrading traditional light bulbs to compact fluorescent lamps (CFL) or LEDs, you can expect to use 75% less energy. It's a good idea to consult a specialist lighting technician before upgrading the lighting setup of your premises. They will be able to help you choose the correct bulbs and systems from the LEEREFF List of eligible technologies (LET) to adequately illuminate your business whilst saving on energy costs.

Another tip to save on the cost of lighting is to install occupancy sensors in halls, staff rooms and bathrooms. These systems detect movement, and will only trigger the light to switch on when someone steps inside. Occupancy sensors are excellent when used in rooms like the ones listed above, helping to achieve savings of up to 30% on the cost of lighting a particular space.

Lighting of Parking Lots and Signage

The same advantages described above can be gained by installing LED lighting in the parking lot. Consider digital signage, which is at least 20% more efficient than conventional signage.



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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