



Lebanon Energy Efficiency & Renewable Energy Finance Facility



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*Sustainable Energy Investment* ➤ *Improved Business Results*

# ***Energy Efficiency and Renewable Energy in Retail***

The retail sector spans a wide variety of businesses. However from an energy conservation point of view, there are two main differences: food retailers, i.e. those that require on-site refrigeration of perishable goods and non-food retailers, i.e. those who don't. No matter which of these two categories your business belongs to, all retailers benefit greatly from becoming energy efficient whilst increasing the comfort of customers and the productivity of their employees. Higher profitability is the reward that retailers enjoy as a result of sustainable energy investments. Hard to believe? According to evidence presented by the Carbon Trust, a **20% cut in energy costs generates the same profit as a 5% increase in sales**. This means that retailers can improve their profit margin simply by reducing their energy costs.

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

### ALL RETAIL BUILDINGS

Insulation of building envelope  
 General building HVAC  
 LED lighting of common areas, outside lighting, LED signage  
 Solar PV  
 Solar Hot Water

### WAREHOUSING (NON-FOOD)

Warehousing (non-food) can account for more than 10% of a retail company's revenue, with heating and lighting as the two largest energy users. The implementation of an energy management system can save up to 20% on energy bills without significant capital investment.

Lighting: for heights below 6 meters, consider high performance T8 lamps. For higher ceilings, high performance T8 or high-output T5 are the most efficient choice. BUT – LED lighting is the most efficient and has dropped sufficiently in price to be cost-effective for many warehouses.

HVAC: warehouses are often unoccupied by humans. Evaluate which comfort level is really necessary in the warehouse and size the HVAC accordingly.

Large warehouses: Conveyors and/or efficient motors on conveyors

### FOOD RETAIL

#### Sales Floor:

LED lighting  
 HVAC  
 Refrigerators and freezers – with doors, tight covers  
 LED lighting in refrigeration cabinets and freezers (do not emit heat)  
 Compressors  
 Efficient ovens for in-store bakeries

#### Warehouses:

Insulation and doors in cold storage rooms  
 LED lighting  
 Compressors  
 Conveyors and motors

### ALL ADMINISTRATIVE AREAS

Occupancy sensors in addition to LED lighting for halls and bathrooms  
 Sensors on windows and building energy management system

## HEATING, VENTILATION AND AIR CONDITIONING

Upgrading heating, ventilation and air conditioning (HVAC) systems presents another major opportunity to manage energy consumption in retail space. HVAC accounts for 47% of energy use. HVAC rooftop units (RTUs) are the standard equipment used by retailers and their performance is key to energy consumption.

- Replacing a 15 year old RTU can save 20-30% of energy, assuming the unit is well maintained, or even 40% if it is not.

For small format retailers, rental agreements with landlords can limit opportunities beyond simple temperature setting procedures, which are difficult regarding HVAC upgrades.

Regardless of the approach taken, upgrades should be strategically staged to occur **after other energy efficiency measures are complete** to ensure that new units are properly sized based on facility heating and cooling loads. See below for 'Other Measures': Building Shell, Refrigeration, Lighting, Solar PV.

### MINI CASE - LED LIGHTING



Major UK food retailer goes all LED in one of their Express Stores: All external signage at the new store, as well as lighting on the sales floor and in staff areas is made up of energy-efficient LED fittings.

In addition, the store's cold rooms, fridges and freezer are lit by LEDs, which are even more efficient compared with standard lighting in cold temperatures. The only place in-store where standard lighting is retained is in the bakery oven, where temperatures are too high for LEDs to function. The company expects the LED lighting to produce a 30% energy saving for this Express store.

### MINI CASE - REFRIGERATION



A small Dutch retailer with six stores in the southern Netherlands installed an integrated CO2 transcritical system (natural refrigeration) in its central warehouse. The installed unit has a capacity of 100 kW at medium

temperature and 16 kW at low temperature. The system also provides heating in the winter thanks to a heat recovery unit that uses the waste heat from the refrigeration rack.

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### CHECK YOUR PIPING

A supermarket refrigeration system consists of many components that act together as one system. Display cases, compressor racks, condensers, and walk-in refrigerators and freezers are the major energy consuming components. Walk-in cold storage chambers and compressors are located in the back of the store, with condensers typically on the roof. In the conventional "remote condensing" refrigeration system configuration, an extensive network of piping delivers refrigerant gas from the compressor to the condenser to the display cases and back to the compressor, posing substantial opportunities for refrigerant leaks along the way. While the display cases and compressors together account for about 85% of the system's energy consumption, engineering studies have identified "win-win" opportunities within extensive piping system to improve energy efficiency at net cost savings.

Low or no-cost energy saving tips on refrigeration:

- Remove anything that might restrict the airflow around the fridge
- Use insulating blinds and covers
- Keep condensers (sometimes installed at the back of the display refrigerator or sometimes externally mounted), free from dust

### BUILDING SHELL

This refers to the basics of energy efficiency in retail. Ensure that the building is insulated. Strike a balance between maximization of day-lighting (to reduce the energy cost on lighting) and energy saving by using low-e glazing.

### REFRIGERATION

Commercial refrigeration systems account for 40 to 60% of electricity consumption in food retail (compared to 7-8% for non-food retailers).

Reduce energy consumption by:

- Replacing refrigeration and freezer unit lighting with LED technology. They generate less heat waste. Energy savings of over 40% from the use of LEDs are possible
- Installing refrigeration cabinets with doors can reduce energy consumption by 60% as compared to conventional models

### LIGHTING

Lighting can represent up to 35% of energy use. But, retailers rely on lighting to attract customers and maximise sales. Energy savings from changing your approach to lighting can be achieved by:

- Installation of Compact fluorescent lamps (CFLs) – save 20-25% of the energy
- Installing LEDs can save up to 60-80% of lighting costs if they replace traditional lighting fixtures
- Use occupancy sensors in staff and utility areas (including corridors, bathrooms, storage rooms) to reduce the cost of lighting
- Additional savings come from reduced maintenance due to the longer bulb lifespan (nearly double the lifespan of traditional fluorescent lighting)



## 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](http://www.leereff.com)



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