

Feasibility Studies with the Aim of Developing  
Joint Crediting Mechanism FY2014

# **Introduction of Energy-Saving Systems to Supermarkets in Myanmar**

New Energy and Industrial Technology Development Organization (NEDO)  
Fukushima Industries Corp./Franchise Advantage Inc.

## Introduction of Energy-Saving Systems to Supermarkets in Myanmar

Implementing Agencies: Fukushima Industries Corp./Franchise Advantage Inc.

Approximately 60% of energy usage by supermarkets are accounted for by cold storage, but inefficient equipment is often used in developing countries. Modern retail trade in Myanmar which is opening explosively can expect a big CO<sub>2</sub> emission reduction in the future by introducing high energy-saving machineries such as "High Efficiency Showcase" and "Inverter Refrigerating Machine".

### Summary

Possibility of future CO<sub>2</sub> reduction by introducing energy saving systems (remote controlled energy management system for refrigeration equipment) for supermarkets in Myanmar.

### Survey Items

- 1) Investigate Myanmar government's policy and its intentions towards JCM
- 2) Investigate market prospects of supermarkets
- 3) Investigate the situation of refrigeration and frozen machinery in supermarkets and conduct actual measurement of its electric quantity
- 4) Investigate obstacles to adopting the energy-saving system
- 5) Establish a MRV methodology and conduct a validation survey

### Partner/Site

Local Super Markets in Myanmar



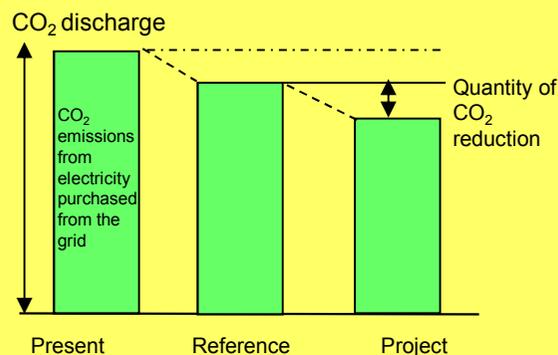
### Estimated Reduction Amount

**4.4 ktCO<sub>2</sub>/year** (in the case of applying to 20 stores)

The reference will be set in a case where conventional refrigerators are replaced with refrigerators that are efficient to some extent\* and are available in the targeted markets. Power consumption will be measured by power meters.

\*The efficiency is assumed to be about the same as the models that were used in Japan ten years ago

Reference



Expected to achieve reduction of CO<sub>2</sub> emissions by reducing electricity consumption by introducing Japan-made high-efficiency energy-saving refrigerators and energy control systems using BEMS. Energy consumption is expected to be reduced by 30% compared to the reference. The amount of power consumed will be measured and recorded in an integrated manner by BEMS.

Project

Technology Outline

High Efficiency Showcase

**Energy Reduction and Conservation Efforts**

**Send-you**

**Fukushima has created unprecedented energy saving effects while protecting the freshness and beauty of the food.**

Refrigerated and freezer showcases account for approximately 60% of the electricity used in a store. Switching energy saving refrigeration and freezer equipment is effective in reducing the amount of electricity used by the entire store.

In-store power  
Air conditioning equipment  
Refrigeration and freezer equipment  
Store lighting / electrical circuit  
**60%**

By installing <Send-you>, in comparison to 10 years ago, refrigeration and freezer equipment electricity consumption can be reduced by approximately 43%.

Series	Power (kWh)	Lighting (kWh)
Nextar series	732,839	298,482
Send-you series	447,801	138,418

**Approx. 43% reduction in electricity**

Comparison of electricity consumption volume in a model store

**Multi-deck type**  
Approximately 15~20% energy savings by changing the airflow outlet position and revised horizontal.

**Freezer island type**  
Newly designed duct structure and refrigeration unit resulting in 15~30% energy savings in comparison with conventional models.

**Semi multi-deck type**  
Double layer air curtain and a newly designed refrigeration unit resulting in 15~30% energy savings in comparison with conventional models.

**T5 tube lighting (Optional)**  
Replaces FL tube lighting with T5 tube lighting for an approximate 20% energy saving.

**Send-you Features**

**Send-you**  
To the next stage  
Fukushima Refrigerated and Freezer Showcases

**NEW PART 1 Newly designed air curtains**

Approximately 15~30% energy savings by changing the airflow outlet position and increasing the size of the Transycomb structure.

- Multi-deck type NS 5 series
- Low multi-deck type LH 5 series
- Island type IC 0 series

**NEW PART 2 NS-LH series Improved night cover**

- The right cover has been changed to achieve an even more secured roll-up.
- The right cover handle can now be attached on either the inside or outside of the air depending on the volume of the merchandise inside.

**NEW PART 3 Temperature detection controller**

Send-you showcases employ a sensor at the air outlet and able to sense temperature inside the case at these two points. Intra case temperatures are safe and for open air control during daytime and it right to reduce running costs. When problems or abnormal data are detected, Send-you showcases provide an automatic backup capability which can protect the food and the comprehensive alarm function sends out a alarm digitally.

Diagnose Defective sensor  
Air outlet sensor  
The heater controller main body

Up to 45% reduction in electricity consumption is possible compared with models used in Japan 10 years ago

Features

- **Changes of the expansion valve specifications**  
Updated to electronic expansion valves from conventional thermal expansion valves. By fine-grained control, high accuracy control of  $\pm 0.2$  °C is achieved. Also it reduces unnecessary energy consumption.
- **Change in the air curtain structure**  
Achieved approximately 15-50% of energy saving by increasing the size of the structure.
- **Implementation of optimal heater control**  
The heater output is optimally controlled to match the in-store environment. Reduces unnecessary consumption of heater power, achieving about 20% of the energy saving compared to conventional products.

High Efficiency Inverter Refrigerating Machine

In response to changes in the refrigeration load, the inverter controls the rotational speed of the compressor. Compared to conventional refrigerators with compressors controlled at a constant speed, energy can be saved up to 22-40%. By mutual communication control with the latest model of showcase, the effect is further increased.

