

Seminar on the Joint Crediting Mechanism (JCM) Implementation in Thailand

- Accelerating Low Carbon Development through JCM Scheme -

Installation of Energy-efficient Refrigerators Using Natural Refrigerant at New Cold Storage of Better Foods Co., Ltd.



11th September 2018



prepared by

Kanematsu Corporation and Better Foods Co., Ltd.



BETAGRO at a glance

One of Thailand' Leading in integrated agriculture and food business



Betagro Head Office

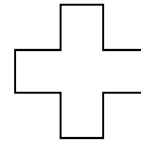
- **First company in Betagro Group was founded in 1967**
- **3 Major business lines:
Agro - Food – International**
- **31 Subsidiary Companies**
- **Consolidated Sales 2.5 Billion USD in 2017**
(Domestic 80%, Export 20 %)
- **Employees 34,000**
(Staff 12,000, Worker 22,000)

Background of the Project



Thai Government's Policy on

1. Energy Saving
2. CO2 Emission.



Better Foods Co., Ltd.

(BETAGRO Group)

Thailand 20-year energy efficiency development plan

Promotion of energy conservation is considered to be one of the most important policies especially in the industrial sector.

Betagro's Policy on Sustainable Development

Betagro Group adheres to ethical business practices in order to bring about results that benefit the entire community. That includes to create less impact to environment through the entire business to make sustainable society. Better Foods was looking for a particular advanced refrigeration technology that could give less environment impact.



Searching for the most advanced technology that has not been commonly used in Thailand

JCM Model Project



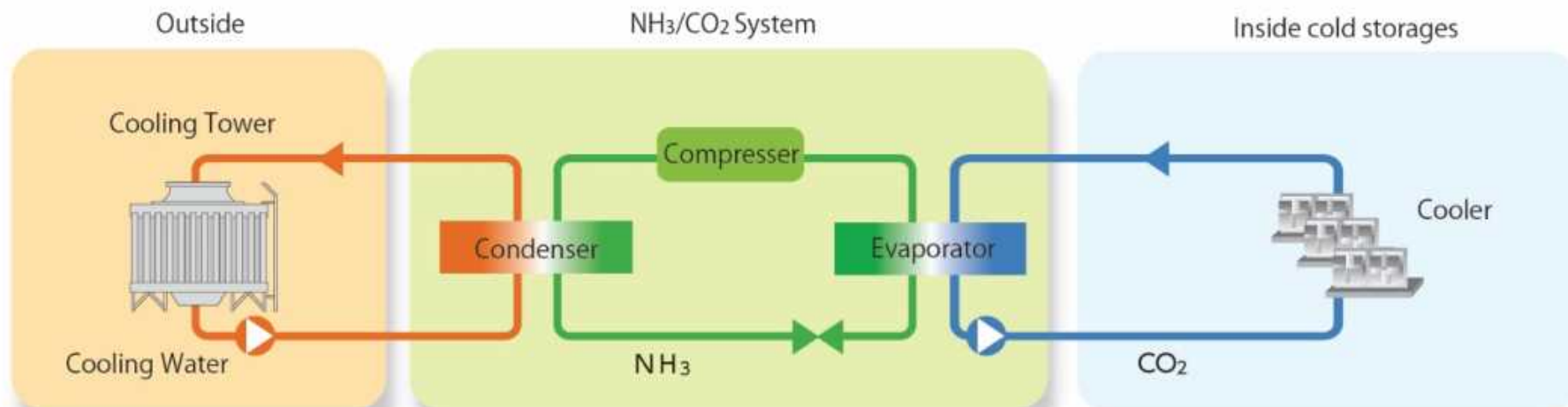
Introduction of Energy Efficient Refrigeration System in Industrial Cold Storage

PP (Japan): KANEMATSU CORPORATON / PP (Thailand): Better Foods Co., Ltd.

Outline of GHG Mitigation Activity

The proposed JCM project aims to save energy by installing a refrigeration system with natural refrigerants (NH₃ and CO₂) in new cold storage of Better Foods Co., Ltd. in Lopburi Province, Thailand.

The project refrigeration system employs an “indirect cooling method,” which uses ammonia to cool CO₂ and then CO₂ is transported to a cooler in a cold storage. Also, by this method, ammonia is contained in the machine room alone and only CO₂ is circulated in the cooler, ensuring the occupational safety.



JCM Model Project



Introduction of Energy Efficient Refrigeration System in Industrial Cold Storage

PP (Japan): KANEMATSU CORPORATION / PP (Thailand): Better Foods Co., Ltd.

Energy Efficient Refrigeration System

- NewTon R-8000 (HSC-120L-NN4I-03) (3 units)
- NewTon R-3000 (HSC-45L-NN4I-01) (2 units)
- NewTon C (HSC-65H-PR4I-02) (1 unit)

Manufactured by MAYEKAWA MFG. CO., LTD.



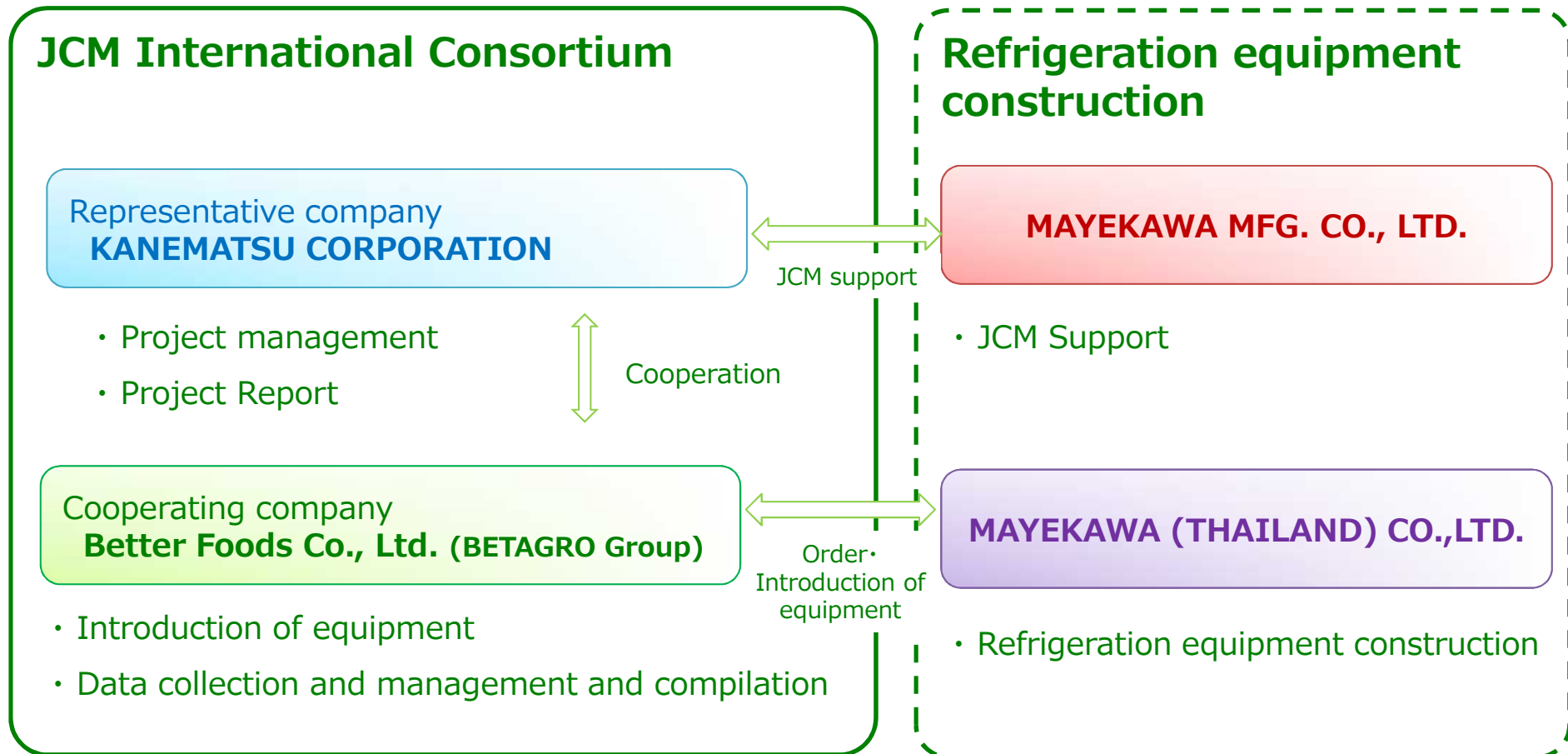
NH3/CO2 cooling system

Sites of JCM Model Project



Better Foods' new cold storage in Phatthana Nikhom District, Lopburi

Project Consortium



Installation schedule and Future schedule



Tentative JCM Schedule

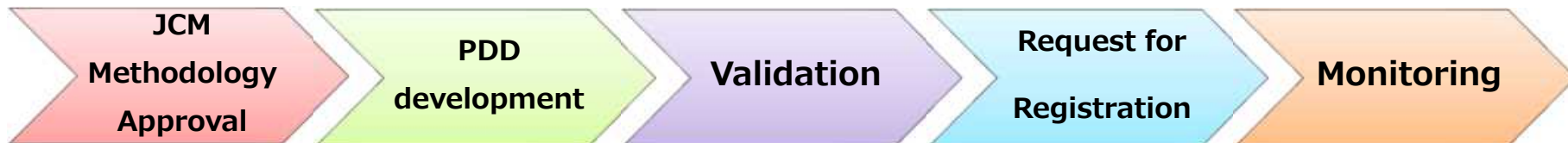
Refrigeration System

From July 2017



Methodology

Starting after JCM registration
2018



Company Profile

MAYEKAWA

MAYEKAWA MFG. CO., LTD.

Founded : May 1924

Capital : 1 billion yen

Headquarters : Botan Koto-ku, Tokyo JAPAN

Sales of the group : Over 110 billion yen)

No. of employees : 2,400 (Japan)

1,900 (overseas)

Business places : 60 offices (Japan)

2 laboratory (Japan)

40 countries with 100 office

6 overseas factories

Plants in Japan : 3 in Japan (Moriya, East Hiroshima, Saku Plant)



Business Activities

■ **Manufacturing** and sale of Industrial Refrigeration Compressors and various gas compressors, as well as food processing robots.

■ **Plant Engineering**

■ **Consulting and After-Sales Service**

Thailand Office

MAYEKAWA

MAYEKAWA (THAILAND) CO., LTD.

Founded : 1988 (2531) ~

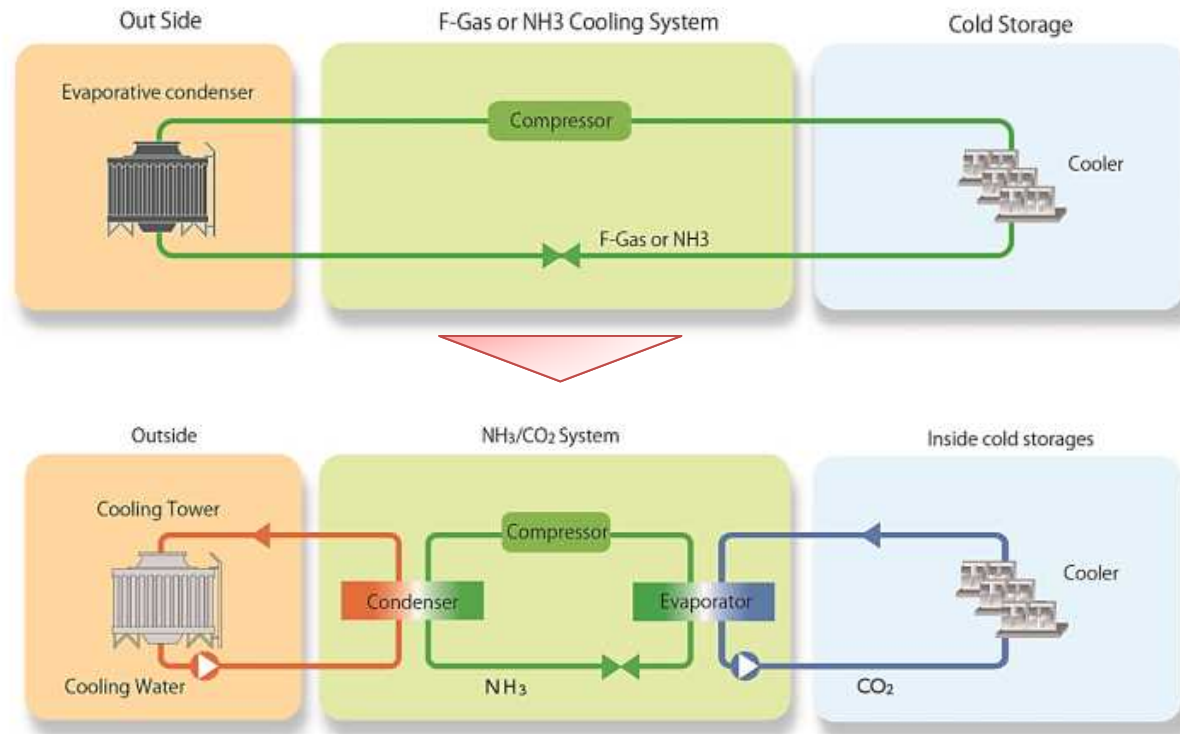
- Sales : 1,500 million baht ~
- No. of employees : 140 +@
- 9 Japanese (as of Dec 2016)
- Branch office : Trang

Business Activities

- Sales of **MYCOM Compressors** and other refrigeration component
- Sales of **Food Robots** (Deboning machine)
- **After-Sales Service (Component)**
- **After-Sales Service (Refrigeration System)**
- **Design/installation** of refrigeration plant
- Food **Process Engineering** (Automation)
- **Consultation Service**
- **Design & Manufacture industrial freezers (IQF tunnel / Spiral / Flow / Batch / Blast)**
- Support business activities in the region



Proposed System



High-efficiency refrigeration equipment
NH3/CO2 cooling system

- Water cool condenser**
- **Low NH3 Volume**
 - **Free layout**
 - **Easier maintenance**

- NH3 Refrigeration Package**
- **Better efficiency**
 - **Auto operation,**
 - **Network control (AI & IoT)**

- CO2 Brine Circulation**
- **Harmless and safe**
 - **Better efficiency**
 - **No trouble by oil**

Safety + Energy Saving + Easy Maintenance + Compact + Quick Installation

Overview

MAYEKAWA

