Case Study: Project 2 Development Process

Project of Introducing High Efficiency Refrigerator to
Food Industry Cold Storage & Frozen Food Processing Plant

PT Mayekawa Indonesia
REZA ARYADITYA
MAYEKAWA MFG.CO.,LTD.
Established in: 1924
Capital: 1 billion yen
Sales: 1.1 billion U.S.D (group)
President: Tadashi Mayekawa
Employees: 2,300 in Japan
1,700 overseas
Offices: 60 in Japan, 94 overseas
Plants: 3 in Japan, 6 overseas

PT MAYEKAWA INDONESIA
Established in: 1985
Headquarter: Jl. MT Haryono, Jakarta
Branch: Surabaya, Medan

Contents: Manufacture and sales of various kinds of gas compressors mainly for industrial refrigeration, plant engineering and service engineering related to agriculture, meat and seafood processing industries, food distribution and energy fields.
We are involved in various industries, systems and products by contributing to facilitate eco-friendly and energy-saving production.
Sustainable Refrigeration Systems

- Zero Ozone Depletion Potential
- Energy saving
- Low Global Warming Potential
- Low Carbon

Natural Refrigerants
# NATURAL FIVE

## Refrigerants and Product Solutions

<table>
<thead>
<tr>
<th>Temperature</th>
<th>NH₃</th>
<th>CO₂</th>
<th>HC</th>
<th>H₂O</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>120°C</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>60°C</td>
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<tr>
<td>10°C</td>
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<td></td>
<td></td>
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<tr>
<td>-15°C</td>
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<td></td>
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<tr>
<td>-40°C</td>
<td></td>
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<tr>
<td>-50°C</td>
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</tr>
<tr>
<td>-100°C</td>
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</tbody>
</table>

- NH₃
- CO₂
- HC
- H₂O
- Air
Indirect Systems with NH3/CO2

Conventional Type
F-Gas Refrigeration system

Direct method
• Potential leak in storage room
• Requires large amount of F-Gas
• Simple system

Indirect method
• Least potential of leakage in storage room
• Uses very small amount of ammonia at 25kg
• A bit more complicated system

Safest Approach of NH3 Refrigeration Systems with NH3/CO2 (Indirect Systems)

Package

NH3
-25degC

F-GAS
-25degC

CO2
JCM Project in Indonesia using NewTon

Energy Efficient Refrigeration Technology To Support Cold Chain Industry

PT Adib Global Food Supplies

Bekasi Cold Storage
- The 1st JCM project by MOEJ in FY 2013
- Completed in 2014
- 1 unit NewTon R-6000, capacity 187 kW
- Cold storage dimension: 14,000W×23,000 L×11,000H
- Expected CO₂ reduction: 96 t CO₂/year

Karawang Food Processing Plant
- Completed in 2014
- 1 unit NewTon F-300, capacity 66 kW
- Mayekawa also installed Intelligent Quick Freezer (IQF)
- Expected CO₂ reduction: 26 t CO₂/year
Implementation Result

Comparison of electricity consumption before and after installation of NewTon at the Karawang Food Processing Plant

- **2015**
- **2014**
- Reduction rate (%)

1. The energy in this table shows values for the entire cold-storage facility, including office equipment, lighting, and conveyance equipment.
2. Because the production volume for May 2014 was significantly different than other months, it has been excluded.

Results after adopting NewTon:

*Power consumption per pallet has been reduced approximately 25 to 30%*

MOEJ introduces NewTon as Japanese Good Practices
JCM MRV (Monitoring, Reporting, Verification)

Note: The above diagram reflects a contractual model where the project proponent is independent from the project entity. The frame for "project participants" only shows an example. Other relationships are possible, such as a direct contractual relationship between project entity and the TPE.
### JCM MRV – Monitoring, Reporting

**Monitored Items:**

![Diagram of refrigeration system]

**Reported Items:**

<table>
<thead>
<tr>
<th>#</th>
<th>Item</th>
<th>Monitoring Point</th>
<th>Unit</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Refrigerator consumed electricity</td>
<td>Electricity Meter Equipped with Refrigerator</td>
<td>kWh</td>
<td>Daily</td>
</tr>
<tr>
<td>2</td>
<td>Monthly grid electricity imported</td>
<td>Electricity Invoice from Electricity Provider</td>
<td>kWh</td>
<td>Monthly</td>
</tr>
<tr>
<td>3</td>
<td>Elapsed time of onsite power generator</td>
<td>Elapsed Time Indicator</td>
<td>Hours</td>
<td>Daily</td>
</tr>
</tbody>
</table>
Verification process consists of:

- Document Review Before On-Site Assessment
- On-Site Assessment
- Resolution of outstanding issues (if any)

Thank you for your attention