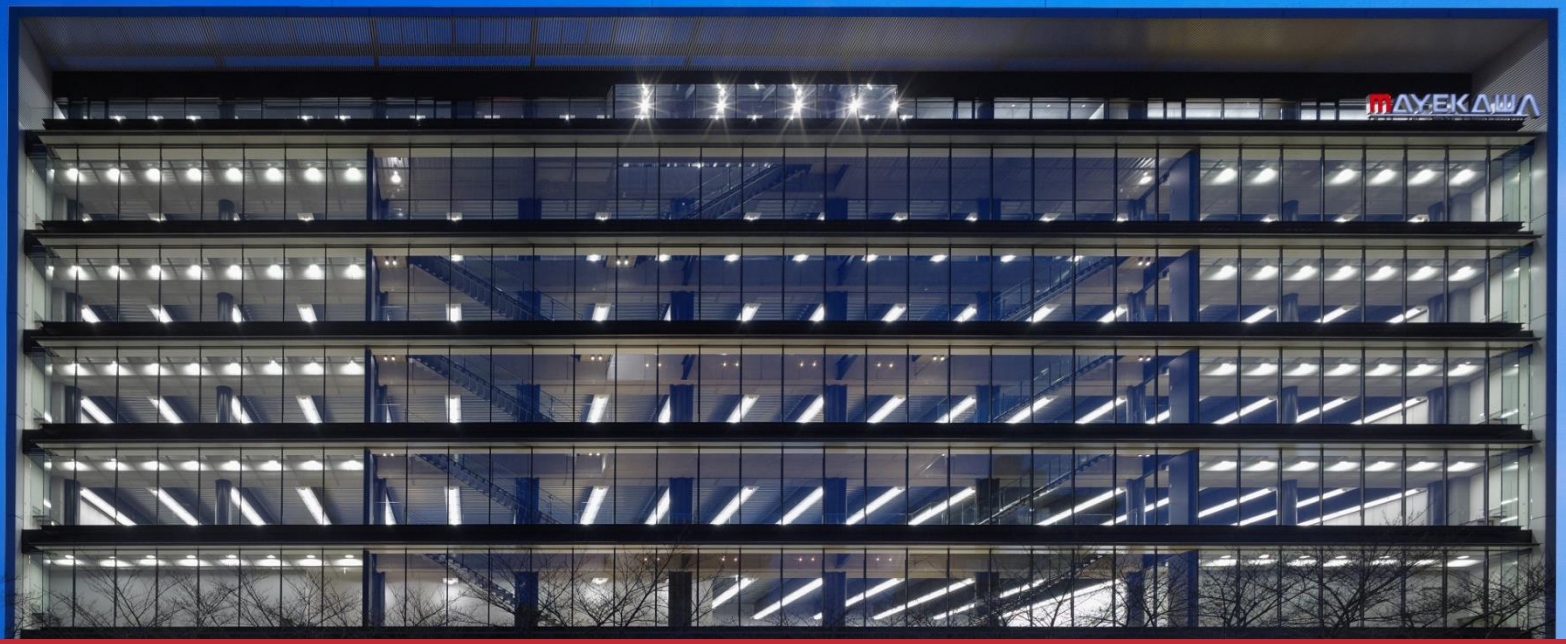
Case Study : Project 2 Development Process

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

PT Mayekawa Indonesia

VICKY OKTAVIANUS



Company Profile

MAYEKAWA

MAYEKAWA MFG. CO., LTD.

Founded:	Since 1924 （ in Tokyo, Japan. ）
Corporate offices：	3-14-15 Botan, Koto-ku, Tokyo 135-8482,Japan
	Established in 1924
Capital：	1 billion yen
Employees:	4407　(12/2015 31, including group companies.)
President：	Tadashi Maekawa

Operating Bases

Domestic Plant：Ibaraki / Nagano / Hiroshima
Overseas Plant：U.S.A. / Mexico / Brazil / Korea / Belgium

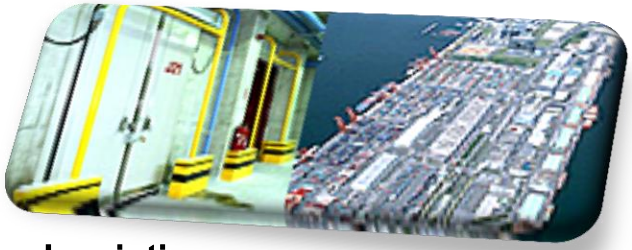
60 Domestic Offices / **3** Domestic Plants / **37** Countries / **93** Offices / **6** Plants

2015/9月 現在

Scope of Activity

We are involved in various industries, systems and products by contributing to facilitate eco-friendly and energy-saving production.

Food Robotics



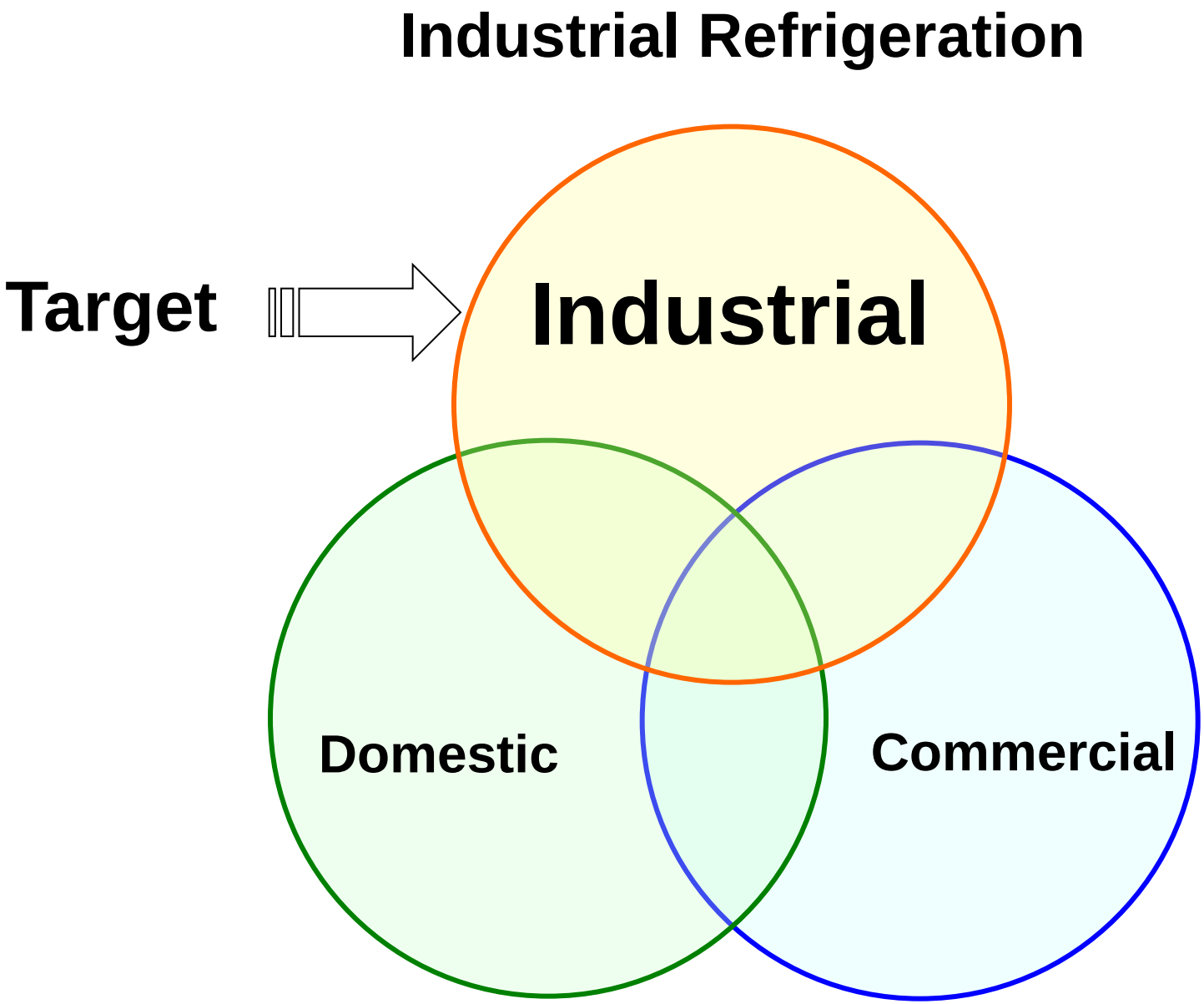
Logistics

Food

Breweries Oil, Gas & Chemical

Environment

Scope of Activity



Sustainable Refrigeration Systems

Zero Ozone Depletion Potential

Energy saving

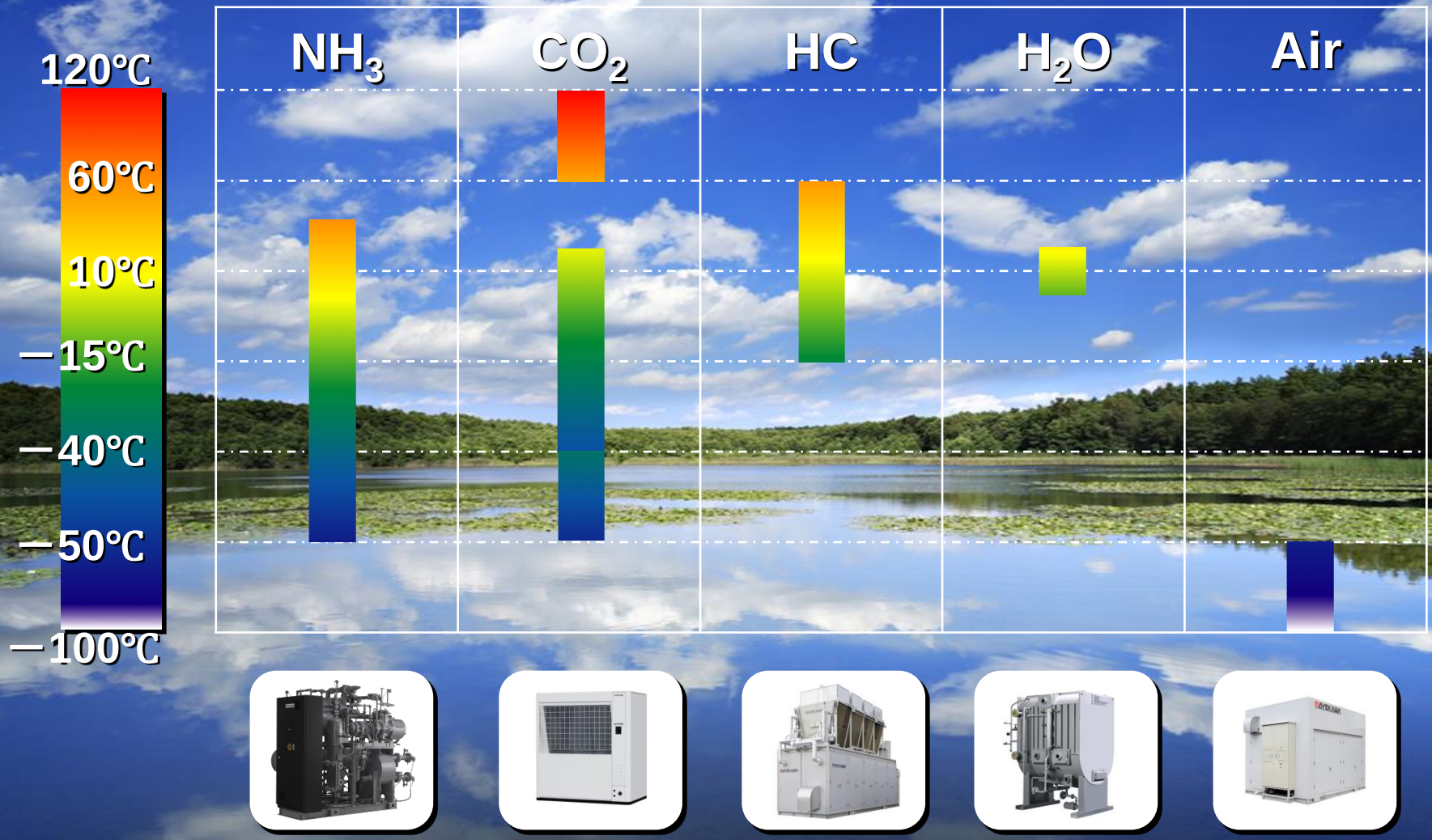
Low Global Warming Potential

Low Carbon

Natural Refrigerants

NATURAL FIVE

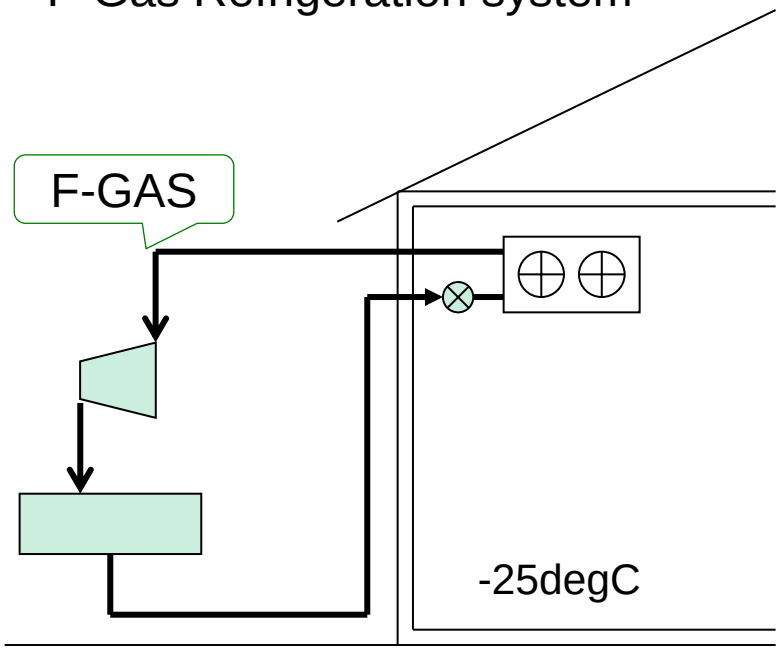
Refrigerants and Product Solutions



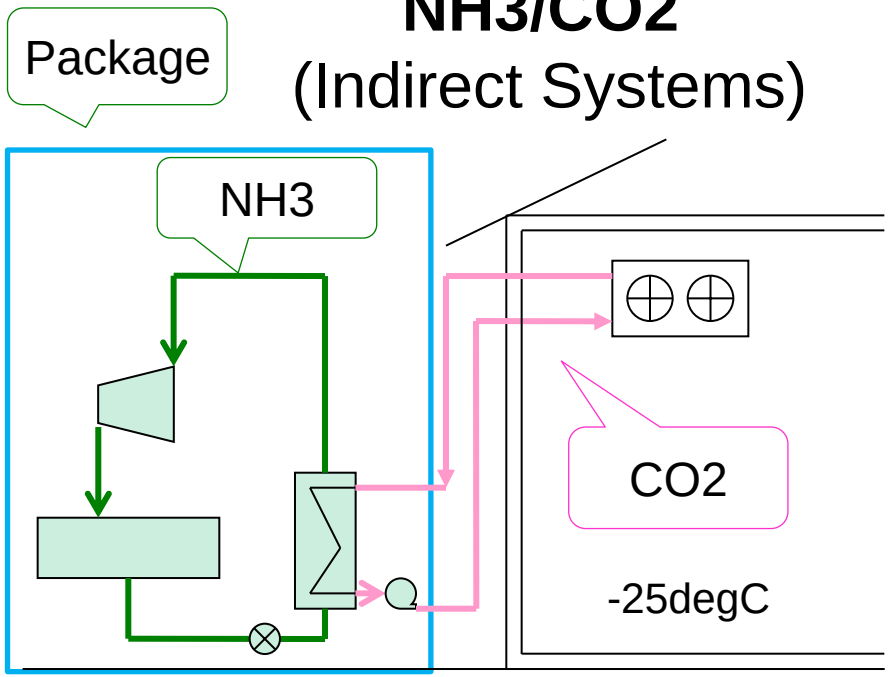
Indirect Systems with NH3/CO2

Conventional Type

F-Gas Refrigeration system



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



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

NewTon

Shaping Refrigeration Systems for Tomorrow

MAYEKAWA
MYCOM

Thai Yokorei Co., Ltd., Bangpakong distribution center phase II


Toyo Suisan Kaisha, Ltd., Chubu distribution center


Japanese Consumers' Co-operative Union, Tosu refrigerated distribution center


Matsuoka Co., Ltd., Tokyo Bay logistics center


K.R.S. Corporation, Tokorozawa distribution center

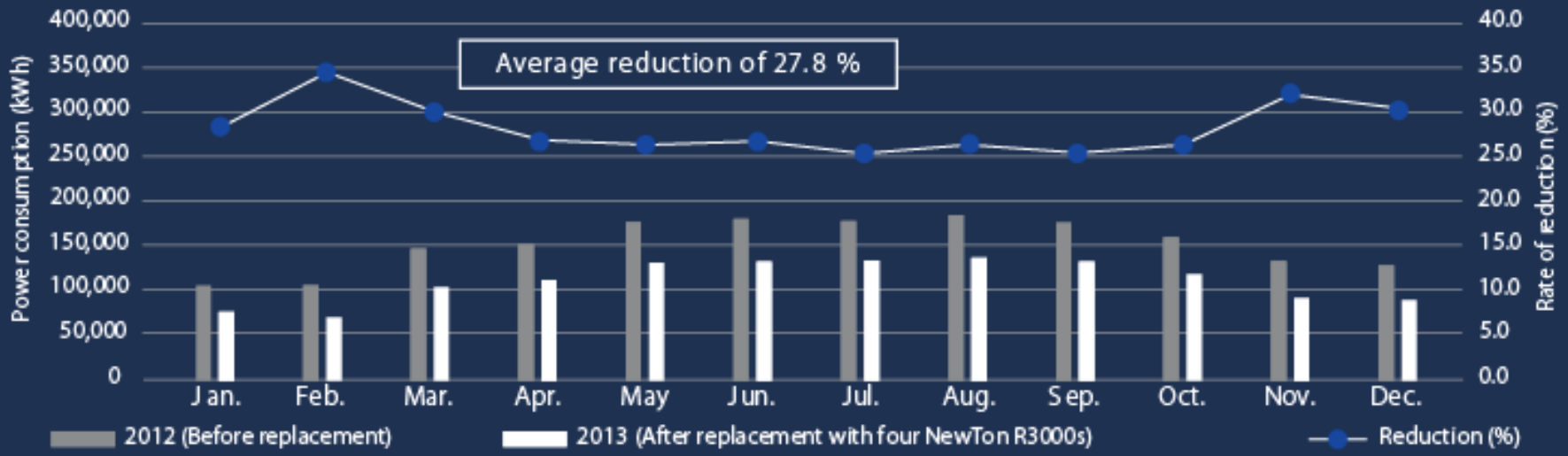

Maruha Nichiro Logistics, Inc., Kawasaki No.3 logistics center


Examples of upgrades	Capacity (m^3)	Years in operation (years)	Previous equipment		Date upgraded (year)	Number of NewTons (units)	Reduction in electricity consumption (%)
			Refrigerant	Compressor			
Tokyo Toyomi Refrigeration Co., Ltd., Funabashi distribution center	50,000	29	HCFC-22	Screw	First stage of work 2008 Second stage of work 2009	8	31.1
Niigata Reizo Co., Ltd.	11,100	33	HCFC-22	Reciprocating	2009	2	41.2
K.R.S. Corporation, Marugame office	18,100	27	HCFC-22	Reciprocating	2009	2	24.9
Sensui Reizo Co., Ltd.	6,810	38	HCFC-22	Screw	2009	2	29.3
Maruha Nichiro Logistics, Inc., Funabashi logistics center	39,200	24	HCFC-22	Reciprocating	2013	4	22.0
Maruha Nichiro Logistics, Inc., Chikuko logistics center	27,800	26	HCFC-22	Reciprocating	2014	3	—
Maruha Nichiro Logistics, Inc., Rokko logistics center	38,600	24	HCFC-22	Screw	2014	2	—

* The power consumption listed in this table are those for the entire cold storage facility, including office appliances, lighting, and conveyor equipment.
* The power consumption have been calculated based on bills from electricity companies.

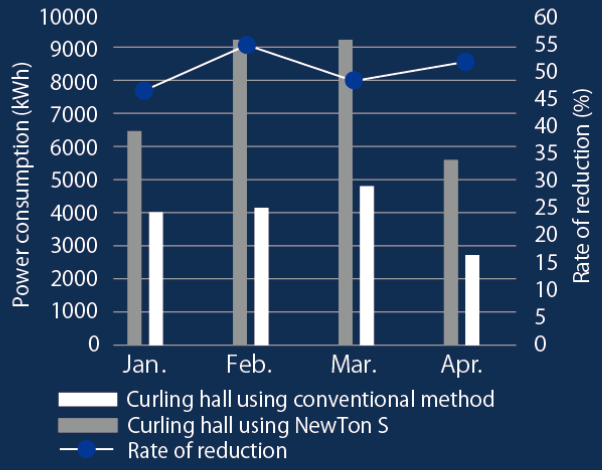
For cold storages NewTon R / NewTon C

Comparison of the electric power consumption before and after switching to NewTon



* Electricity consumption is for the whole factory (including elevators and lighting)
* Capacity 39,200 m³

For ice arenas NewTon S

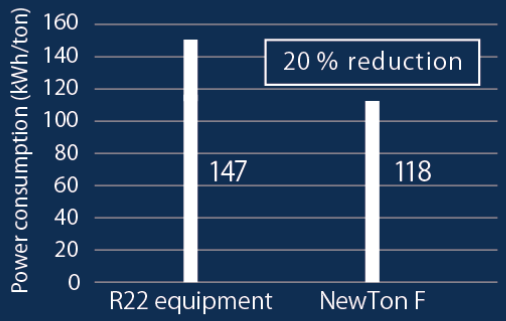


* The two facilities are three-sheet curling facilities in the same area

For freezers NewTon F

Energy saving achieved by switching from R22 equipment to NewTon F

Example of use with frozen cooked food
Comparison of electricity consumption by the cooling equipment used in the production of 1 ton of frozen food



* In the comparison, the R22 equipment and NewTon F were each used in combination with a freezer.
NB) The volume of electricity consumed may vary according to food product type, temperature upon introduction into the equipment, and freezer type.

"NewTon

"1st NewTon system" has been installed to P.T. ADIB Global Food Supplies in Indonesia.

P.T. ADIB

A cold storage warehouse nearby Jakarta

Joint Crediting Mechanism — Host Country : Indonesia

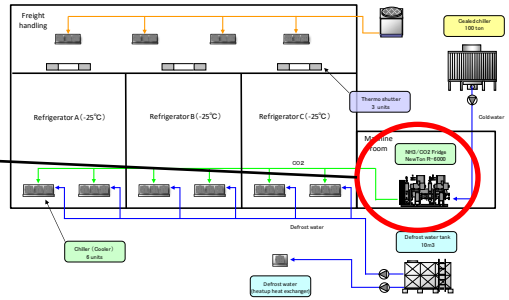
JCM Project for Cold Chain Industry in Indonesia with "*NewTon*"

This project was funded by the MOEJ in FY 2013 as the 1st project to Joint Crediting Mechanism .

Most advanced Japanese energy efficient non-fluorocarbon cooling system

Indonesia
On August 26, 2013
(Jakarta)

NewTon R-6000



Entity:

Mayekawa Mfg CO. Ltd

Demonstration Site:

PT.ADIB Global Supplies

Energy Consumption reduction	570,000 kwh /year	Estimated GHG reductions	Without consideration of HFC leakage emissions: 213 (tCO2/year) With consideration of HFC leakage emissions: 902 (tCO2/year)

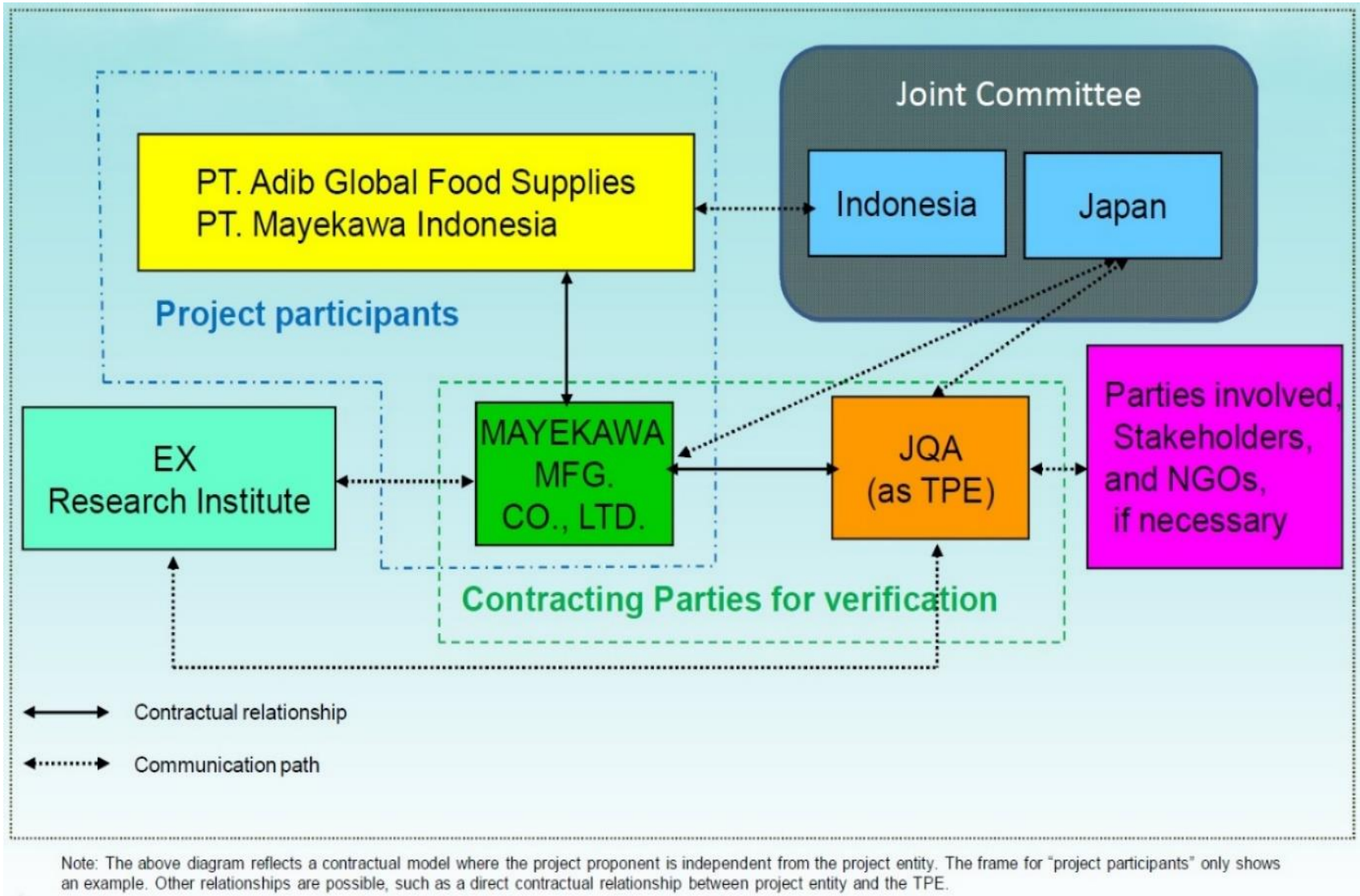
Energy Efficient Refrigeration Technology

- MOEJ introduces the Energy Efficient Refrigeration Technology of "NewTon" as Japanese Good Practices.

http://www.env.go.jp/en/earth/ozone/goodpractice/full.pdf

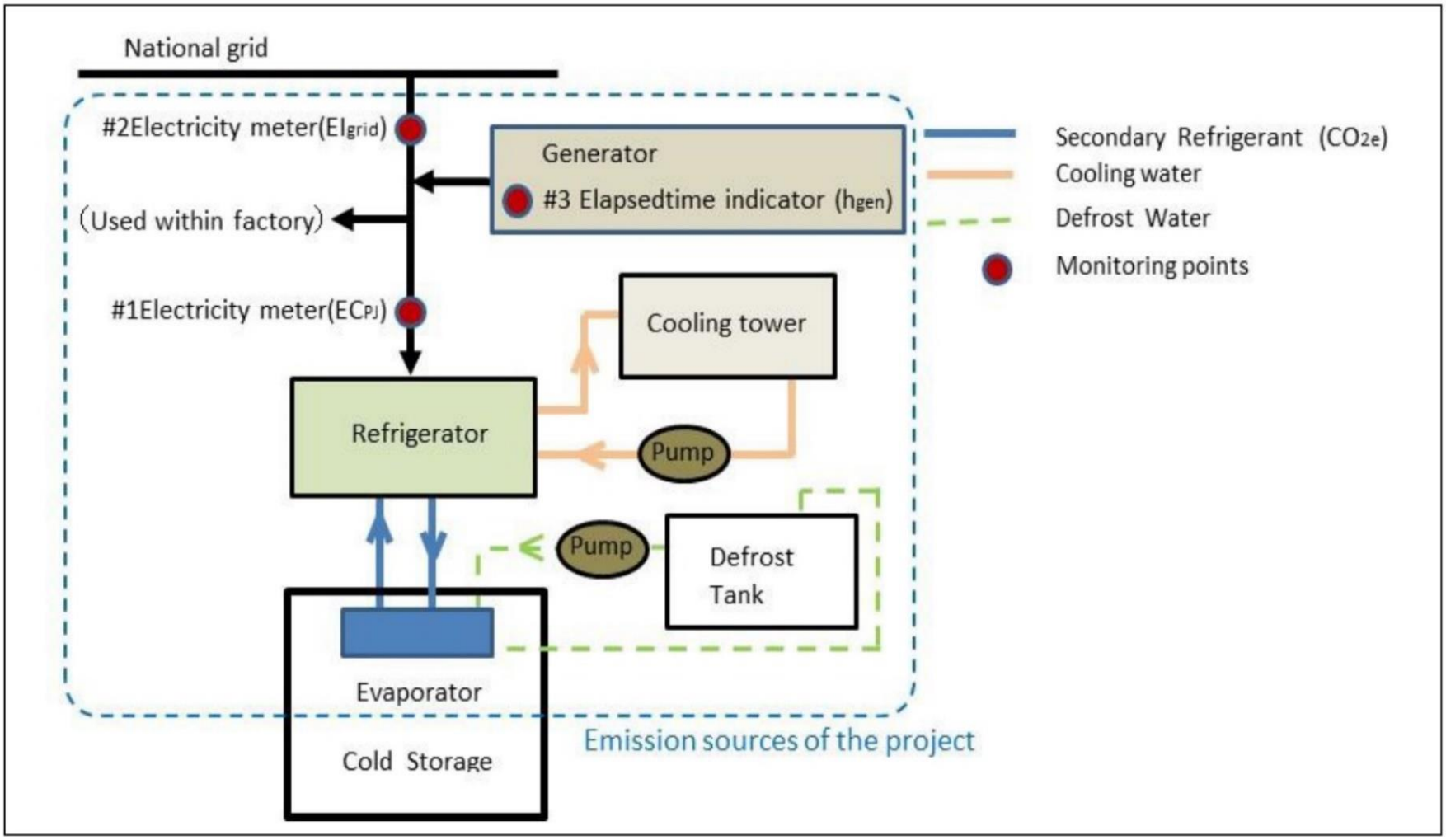
MAYEKAWA MYCOM

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



JCM MRV – Reporting

Items & Points to be Reported :

#	Item	Monitoring Point	Unit	Frequency
1	Amount of electricity consumption of refrigerator	Electricity Meter Equipped with Refrigerator	kWh	Daily
2	Monthly grid electricity imported	Electricity Invoice from PLN (Electricity Provider)	kWh	Monthly
3	Elapsed time of onsite power generator	Elapsed Time Indicator	Hours	Daily

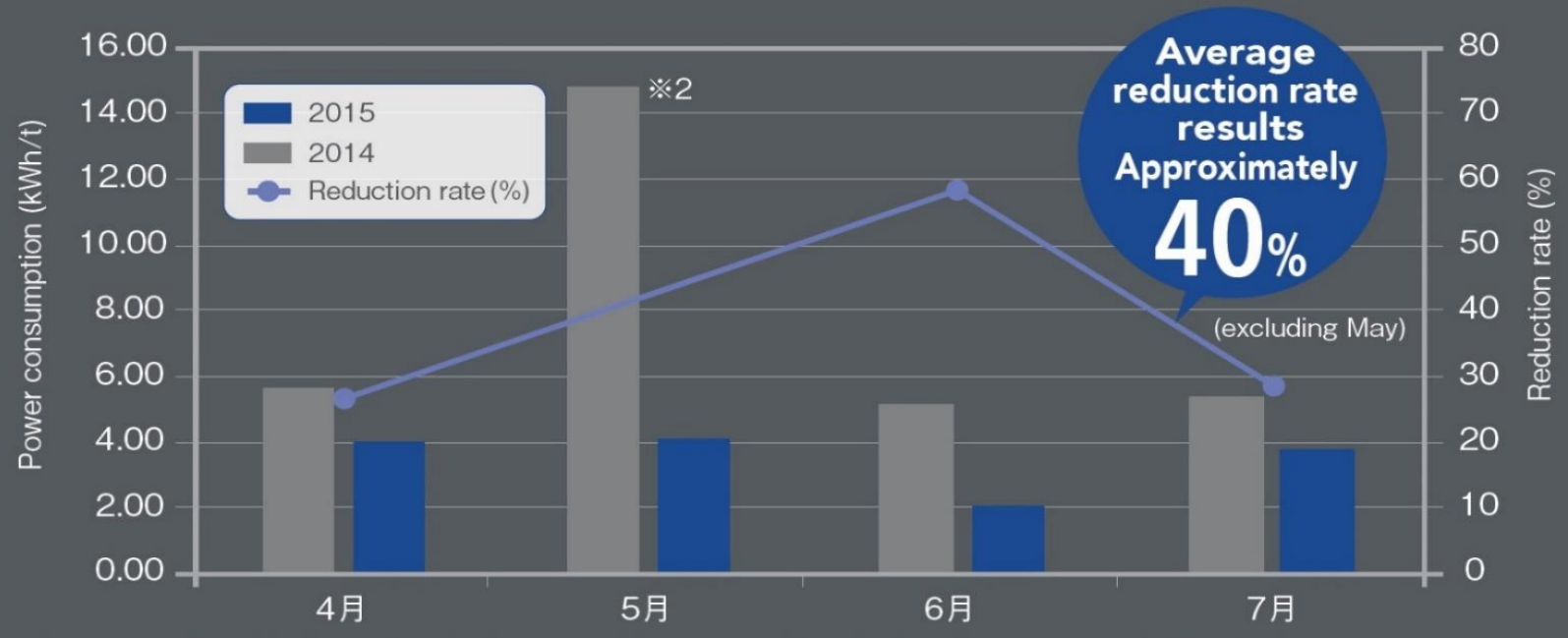
JCM MRV – Verification

Verification process consists of :

- **Document review**
- **On-Site Assessment**
- **Resolution of outstanding issues (if any)**

Implementation Result

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



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%

Thank you

for your attention

MAYEKAWA