The Market Trend of Natural Refrigeration system In Japan

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Contents

1. Big Wave to Atmosphere

- IPCC Report in 2014
- ICEF in Oct.2014 (Innovation for Cool Earth Forum)

  Prime Minister Abe Promised half co2 emission in 2050 in Japan
- CO2,GWP → Natural Stock Evaluation (Watar,Land,GHG,Atmosphere, Waste material)

2. Market trend in Japan

2.1 Government Support to Natural refrigeration system.(MOE 2014-)

- 2014 50 MUS$ support

  About 30 Refrigeration plants

  under construction using this support

- 2015 60 MUS$ support expecting

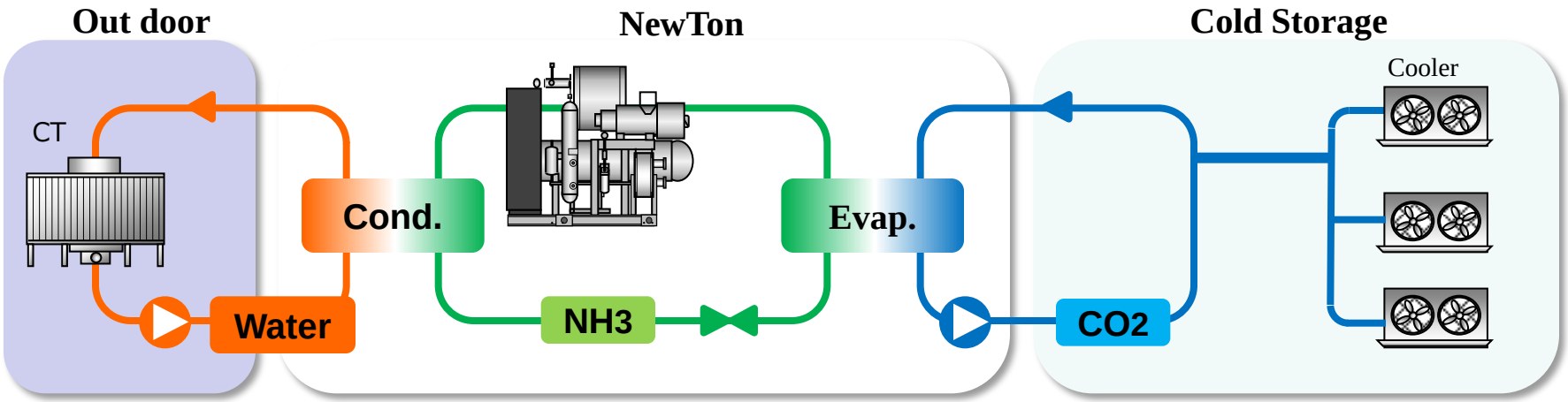
2.2 Natural refrigeration system update

- NH3/CO2 Refrigeration system(Newton)

Semi-hermetic Refrigeration Package

2007 Ministry of the Environment
[Enterprise of Technical Develpment Against Global Warming]

Basic Concept of *NewTon*



Water cooled

- Energy saving
- NH3 charge min.
- Free layout
- Easy Maintenance

NH3 Package

- New Screw compressor
- Semi-hermetic IPM motor
- Flooded Evaporator
- Double economizer
- Automatic operation

CO2 brine

- Safety
- Low pump power
- No trouble by oil
- High heat transfer

「Safety」「Energy saving」「Easy maintenance」

Main Installations of *NewTon*

Customer	Volume (m3)	Newton sets	installed
Nissui Logistics / Kawasaki	35,000	3	2008
Toyo Suisan / Nagoya	80,000	9	2009
Hosui / Atsugi	20,000	2	2010
Yokohama Reito / Osaka	68,000	8	2011
Coop / Onomichi	75,000	8	2012
Matsuoka / Kawasaki	200,000	11	2013
Nichirei Log. / Kawasaki (for one floor)	100,000	1	2013
Maruha-Nichiro Log. Net. / Kawasaki	75,000	6	2014

500 are running

Nisui Log. ／Kawasaki

Toyo Suisan / Nagoya


Yokohama Reito / Osaka


Coop ／ Onomichi

Matsuoka/Kawasaki


Nichirei / Kawasaki

Power reduction through renewal with NewTon

Customer	Volume	Age	Refrigerant formerly used		Power reduction
	(m3)	(year)	Refrig.	Comp.	(%)
Tokyo Toyomi (Case 2)	**45,000**	**29**	**HCFC-22**	**Screw**	**31.1**
Niigata Reizo	10,000	33	HCFC-22	Recip.	41.2
QP “Kewpie”	16,250	27	HCFC-22	Recip.	24.9
Sensui Reizo	6,125	38	HCFC-22	Screw	29.3
Ajinomoto	7,500	25	HCFC-22	Recip.	28.0
Gliko	30,000	30	HCFC-22	Screw	19.8
Showa Reizo	32,500	22	HCFC-22	Recip.	28.0
AMB Funabashi	30,000	25	NH3/Brine	Recip.	34.0

"NewTon" for ASEAN

"1st NewTon system" will be 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"

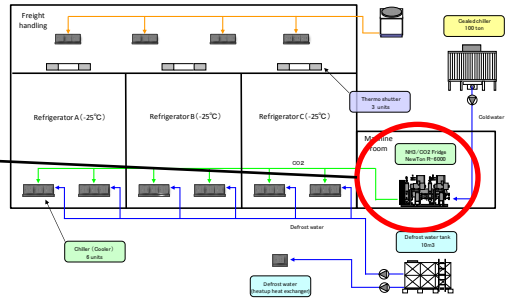
This project was funded by the MOEJ in FY 2013 as the 1st project to Joint Crediting Mechanism .

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 introduce the Energy Efficient Refrigeration Technology of **"NewTon"** as **Japanese Good Practices**.

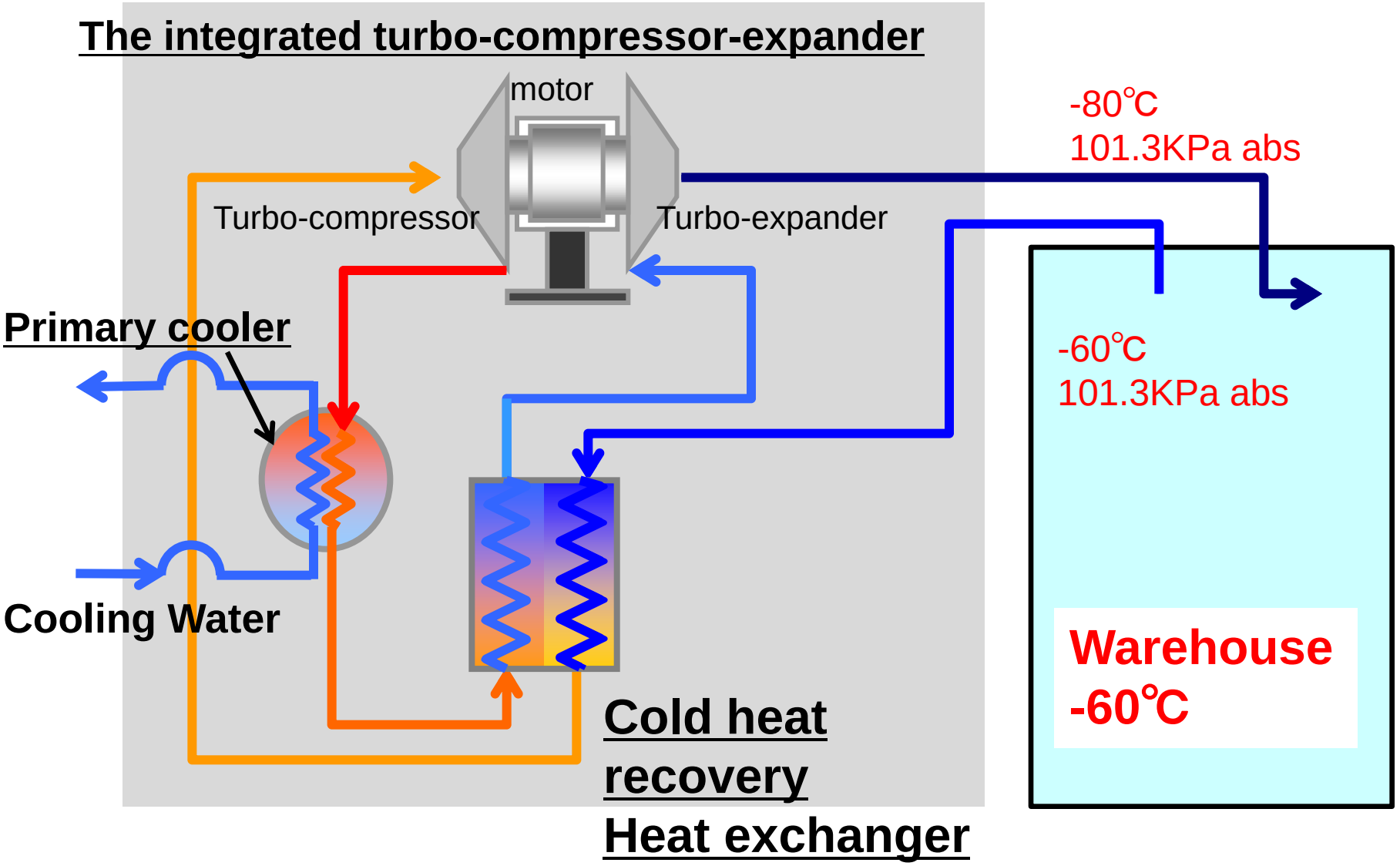
http://www.env.go.jp/en/earth/ozone/goodpractice/full.pdf

- Air cycle (Pascal-Air）

Air Cycle Refrigeration Packaged Unit

2003 Developed at
~2005 NEDO
[Technical Strategy for Rationalization of Energy Consumption Project]

Direct Air circulation



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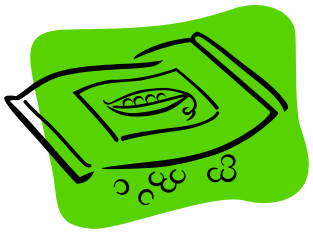
Installed and other applicable areas

(1) Installed areas

Ultra-low temperature warehouse for bonito/tuna

(17 units already installed -50～-60℃)

Food rapid freezing system



(3 units- freezers -50℃)

Chemical process cooling

(2 units –pharmaceutical -70～-80℃)

(2) Other applicable areas

Vacuum Freeze-dry

Semiconductor manufacturing

Low temperature Milling　　etc.

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2.3 Future Trend

- There are still about 10,000 of HCFC refrigeration plants operating in Japan.
- Replacement to natural refrigeration system are needed.
- We expect continuous government support.

Thank you very much for your Attention.

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NATURE IS WHAT WE DESIGN FOR