

《 ATMOsphere Asia 2016 》

Lawson's Action against Global Warming



 **ATMO**
sphere
solutions for asia
natural refrigerants

9 & 10 February, 2016 - Tokyo

2016/2/9 LAWSON, INC.

As of end-February 2015

Company name	Lawson, Inc.
Head office	East Tower, Gate City Ohsaki 11-2, Osaki 1-chome, Shinagawa-ku, Tokyo 141-8643 Japan
President and CEO, Representative Director	Genichi Tamatsuka
Date established	April 15, 1975
Capital	58,506.644 million Yen
Employees	7,606
Business activities	Franchise chain development of "Lawson", "Lawson Store 100" and "Natural Lawson"
Total net sales	1,961 billion yen
Number of stores	12,276 (Japan)
Operating regions	47 prefectures of Japan, cities of Shanghai, Chongqing, Dalian and Beijing in China, Indonesia ,Hawaii in USA, Thailand

* The total number of stores refers to the number of convenience stores operated by the consolidated group and includes stores operated by Lawson Mart, Inc., Lawson Okinawa, Inc., Lawson Minamikyushu, Inc. and Lawson Kumamoto, Inc.

<Group Companies> ■ Consolidated Subsidiary ◆ Affiliated Company

■ Lawson Mart, Inc. ■ Lawson HMV Entertainment, inc.

■ Lawson ATM Networks, Inc ■ Best Practice Inc. ■ Smart Kitchen, Inc.

■ Shanghai Hualian Lawson, Inc. ■ Chongqing Lawson, Inc. ■ Dalian Lawson, Inc.

◆ Lawson Okinawa, Inc.

Natural Refrigerant (CO₂) Technology

Action for “Energy Conservation”

Lawson group makes “Lawson group environmental policy” to create sustainable society and recognizing to take action for it is a part of the company mission.

“Constructing low carbon society” is one of the policies, so we aim “20% energy saving in each shop from 2010 record by 2020” as our mid-range target. To decrease shop energy consumption, we adopt energy saving equipment like CO₂ refrigeration system, air-conditioner and LED light actively.

基本理念

私たちローソングループは、豊かな地球の恵みを次世代へ引き継ぐため、常に環境に配慮した事業活動を行うとともに、地域社会との共生と持続可能な発展に向けて積極的に行動します。

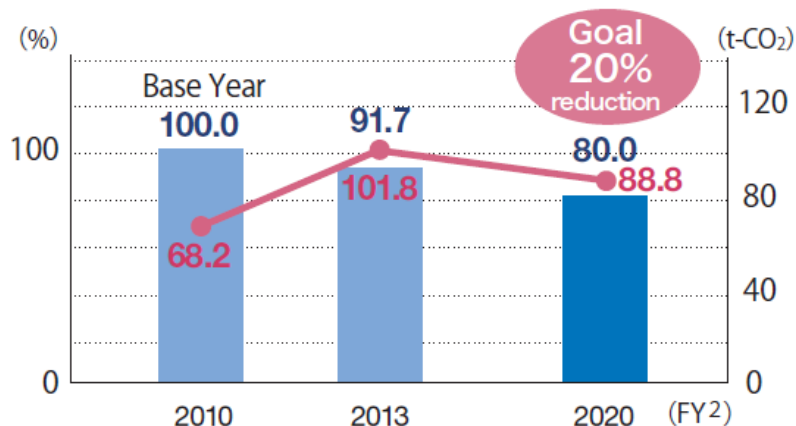
方針

- 1. 従業員社会の構築に向けて**
地球温暖化防止に向けて、事業活動における省エネ対策、省資源、廃棄物の削減に取り組めます。
- 2. 商品・サービス等の開発における配慮**
調剤材料の調達から販売、廃棄までの全工程において、自然環境や地域社会への影響を十分に配慮します。
- 3. 社会貢献活動への積極的な参加**
地域社会の一員として、緑化・美化活動に取り組むなど、社会貢献活動への積極的な参加を推進します。
- 4. 継続的な改善の実現**
環境マネジメントシステムを導入し、自然・資源を尊重、積極的に取組むことにより環境保全に努めます。
- 5. 安全等の遵守**
環境保全活動に際しては、法令及び自主的ルールを厳守します。
- 6. コミュニケーションの積極**
教育の推進による環境保全に対する意識の向上を図るとともに、ステークホルダーとのコミュニケーションを推進します。

2010年5月

Per-Store Electricity Use (Index) and CO₂ Emissions

■ Annual electricity use index (left scale)
● CO₂ emissions (right scale)



Notes: 1. The power-receiving end coefficient after adjustment identified by the Federation of Electric Power Companies of Japan is used to measure CO₂ emissions. Figures for fiscal 2020 are calculated using the coefficient for fiscal 2013.
2. Calculated in line with the administrative year from April 1 to March 31.

【Advantages of CO₂ System】

① Low GWP Refrigerant

Minimum 1/4000 Compared with HFCs

② High Energy Efficiency from Superior Thermal Properties

【Impact by CO₂ System】

① HFC Refrigerant Emission Reduction (CO₂ Equivalent)

19.38ton-CO₂/Store/Year

② Energy Saving from High Efficiency

Electricity Consumption Reduction:

22,920kWh/Store/Year

(12% in Store Total, 27.4% in Refrigeration System)

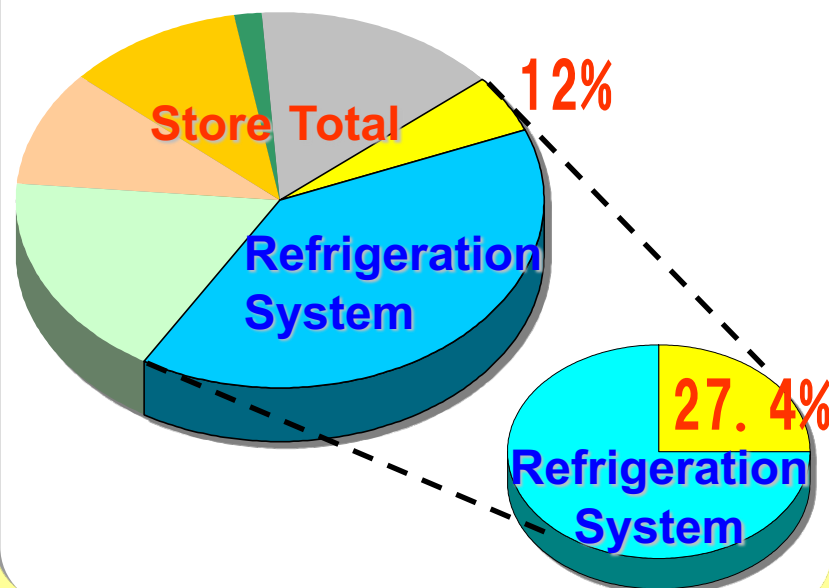
① GWP(Global Warming Potential)

Natural Refrigerant (CO₂) : 1

HFC (R404A) : 3,920

HFC (R410A) : 1,730

② Electricity Reduction Ratio from Efficiency Improvement



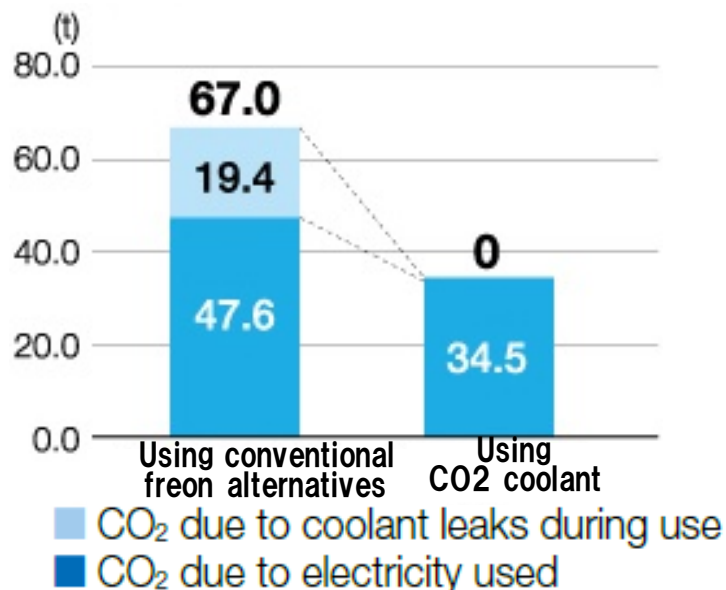
Merit of adopting natural refrigerant

We have started to adopt CO₂ refrigeration system and corresponding showcases from 2010.

Comparing refrigerant leakage effect to the global warming, CO₂ is maximum 1/4000 of Freon refrigerant.

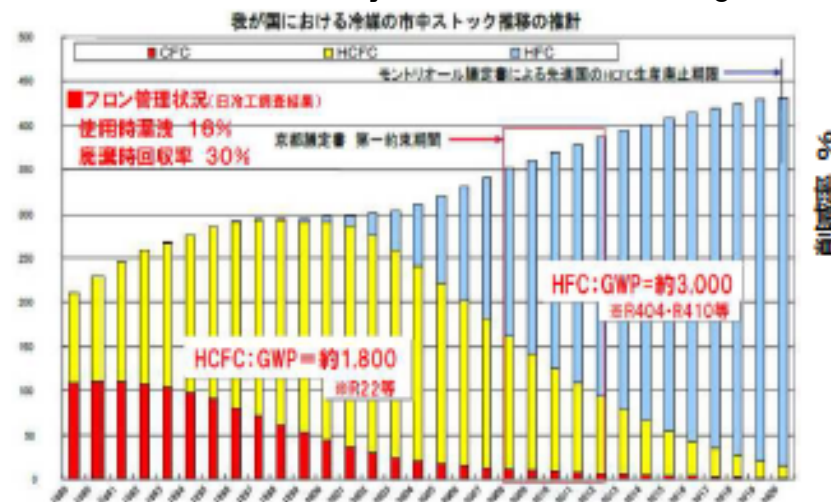


CO₂ emissions reduced using CO₂ coolant



Regulations Reducing HFCs Emission

- HFC ⇒ Montreal Protocol: Phase-out in 2020 (Developed Countries)
- HFC ⇒ Necessary to be controlled: High GWP



Up until 2016 the annual CO₂ emission reduction results at Lawson stores which have CO₂ refrigeration installed have been 40,000 t-co₂ per year.

★ Long-term Action for Cost Reduction

[Preferable Action]

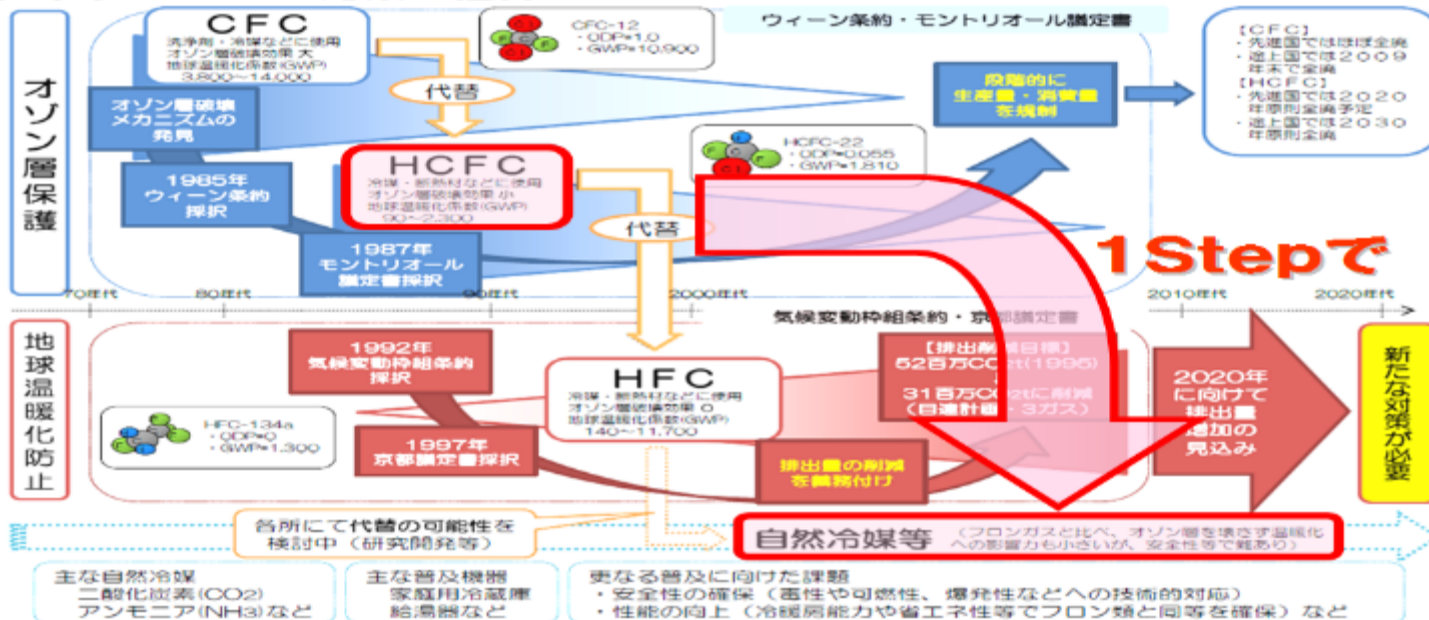
Required Shift to Non F-gas

HCFC ⇒ HFC ⇒ Non F-gas(CO₂ and Other NRs)

Frequent Capital Investment for Each Step

"1 Step" Change Saves Capital Cost

これまでのフロン対策の経緯



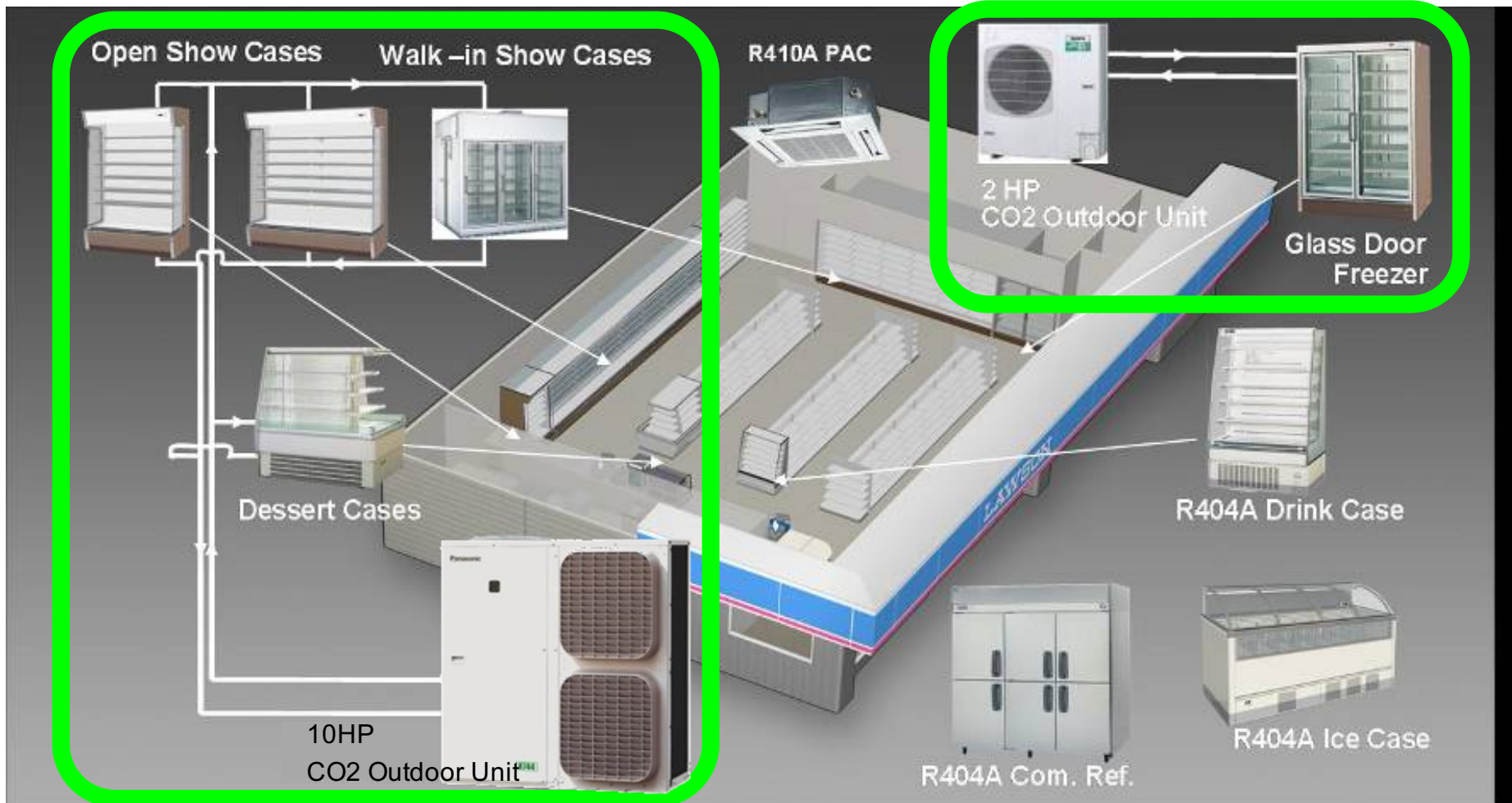
※出典:平成22年4月27日経済産業省資料 代替フロン等3ガスの排出抑制に係る現状と今後の見通し

Japanese proven CO₂ technology for CVS (Lawson&Panasonic)

Outdoor units for Refrigerators and Freezers were replaced by Panasonic CO₂ Units (10HP and 2HP)



The Total Energy Save: **27%**



Expansion of Natural Refrigerant (CO₂) Technology

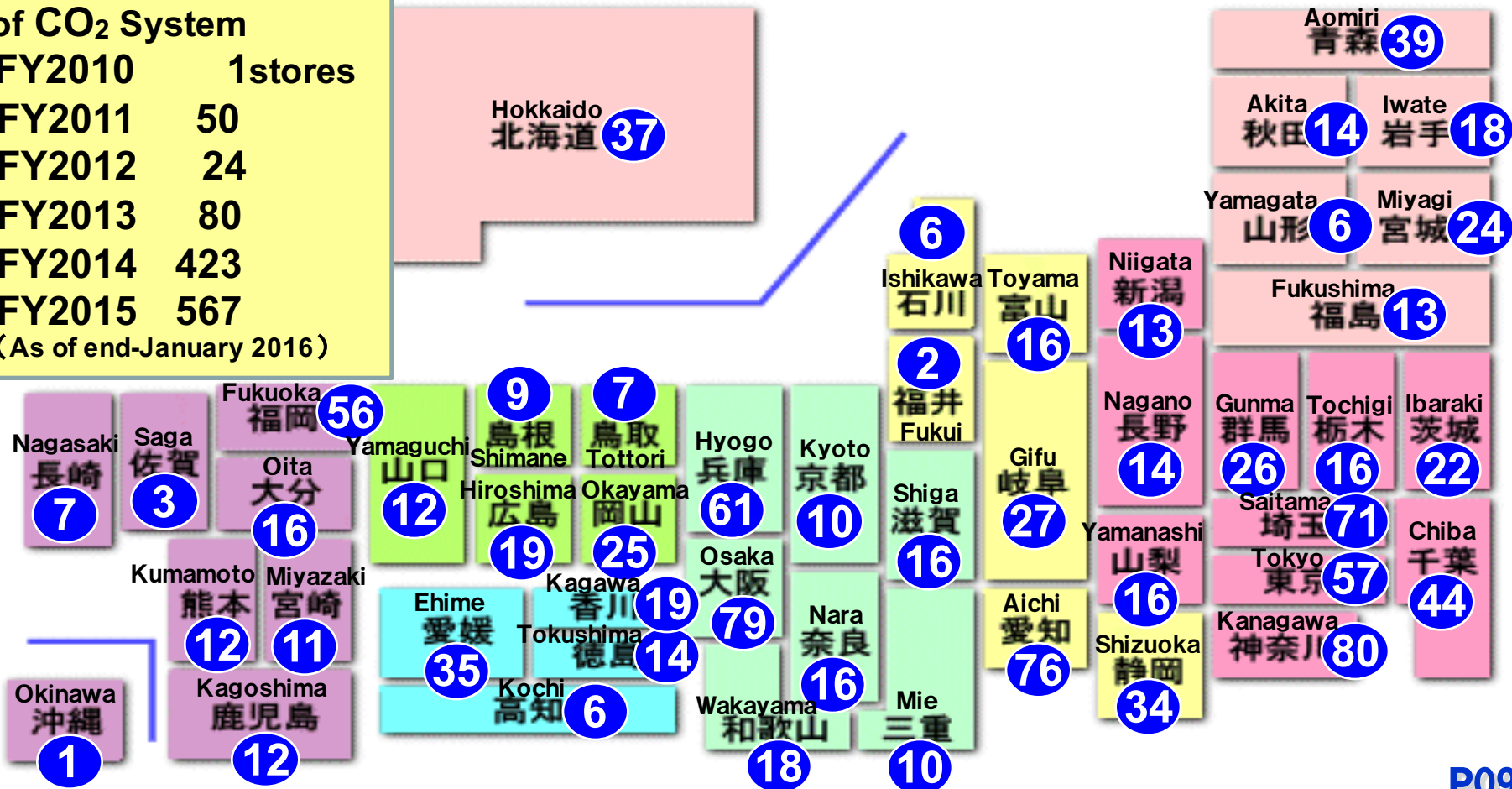
CO₂ System Installation Result (FY2016)

1,145 Stores in 47 Prefecture (at the End of Jan. 2016)
About 1,300 Stores Expected at the End of Feb. 2016

■ **1,145 stores** installation of CO₂ System

FY2010	1 stores
FY2011	50
FY2012	24
FY2013	80
FY2014	423
FY2015	567

(As of end-January 2016)



【Installation Technician Training】

Installation technician training by manufacturer (Continued)

Technician training which provide the knowledge and skills required for safe and quick installation at various type of stores. is provided to increase the number of skilled technicians.

【Maintenance System】

Remote monitoring makes it possible to quickly respond to the problems. Remote monitoring is installed at every CO₂ store, the data taken are utilized for commissioning, pre-maintenance and failure analysis.

【Government Policies】

Classification in “High-pressure gas safety law” is a barrier for more spreading of CO₂ refrigeration systems. Installation of middle capacity range CO₂ unit (>3RT) needs a reporting to the authority. Application term of the subsidy doesn't match well to retailer's business cycle.

General public relations like "Freon visualization" are important about global warming caused with conventional refrigerants.

The showcase with doors (Toyohashi akemi kogyodanchi shop)



Expansion into overseas of Natural Refrigerant (CO₂) Technology

【Overseas expansion】

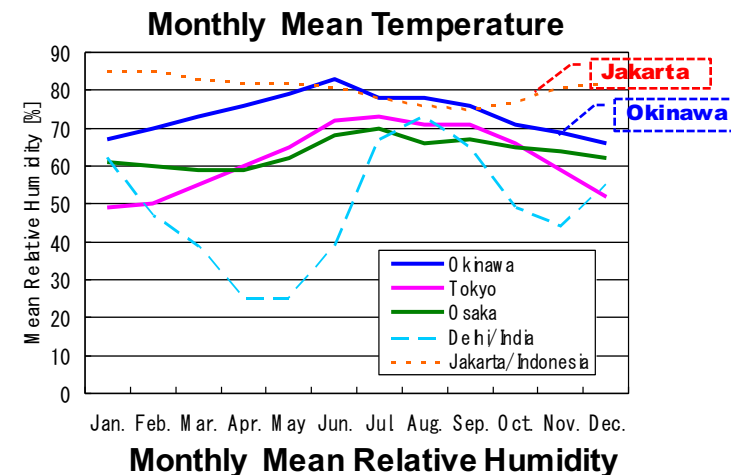
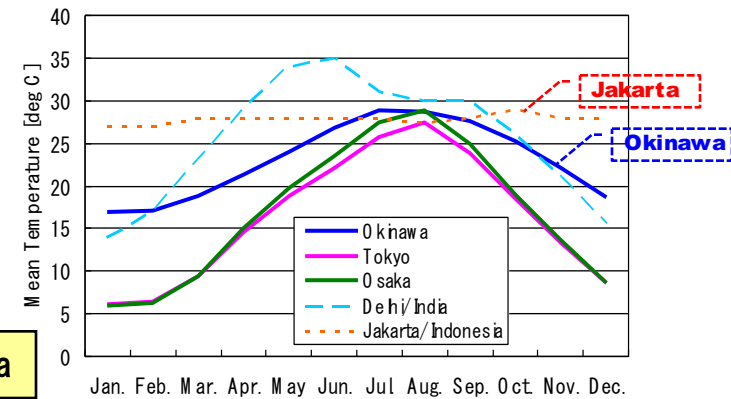
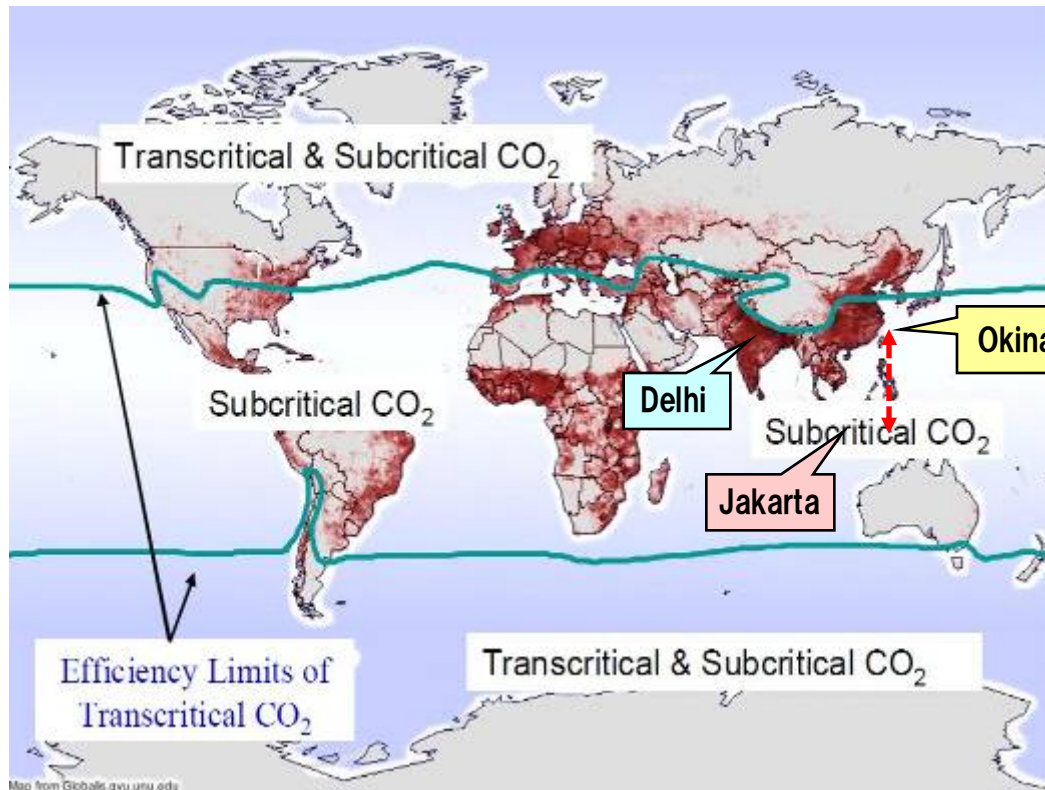
In FY2010, non-CFC refrigeration equipment was introduced experimentally, and from the verified results which were obtained, standardization has been implemented from September 2014 onward, and we are making efforts to continue with the expansion of these systems.

In addition to their use domestically, from FY2013, CO₂ refrigeration systems which incorporate the latest in Japanese technology have been exported overseas to developing countries which mainly use coal-fired thermal power. By expanding the use of non-CFC systems from an early stage, to prevent global warming, these systems are expected to help prevent global warming by reducing energy consumption and suppressing the release of atmospheric pollutants. As a result, we launched the “CVS Energy Saving Project in Indonesia” as a project under the Japanese Ministry of Economy, Trade and Industry’s 2013 FS Demonstration Project and under the Ministry of the Environment’s Joint Crediting Mechanism (JCM) project funding program. Through cooperation with PT Midi Utama Indonesia Tbk (MIDI), a major Indonesian-based retail company, we have been introducing LED lighting system and air conditioners incorporating CO₂ refrigeration systems to stores in the “Alfamidi” minimarket chain. From the end of March 2013, these systems have been fully installed in 13 stores (including new and existing stores) in Jakarta.

In the future, we aim to continue our efforts until FY2020 to obtain credits by taking advantage of the JCM system to register projects, take measures to reduce CO₂ emission and register emission allowances.

Validation-Annual Electricity Reduction Compared with R404A

CO₂ refrigeration system efficiency is relatively low at high outdoor temperature compared with conventional refrigerant systems. Power consumption measurement will be done to verify how much efficient CO₂ system is, **in sub-tropical climate.**

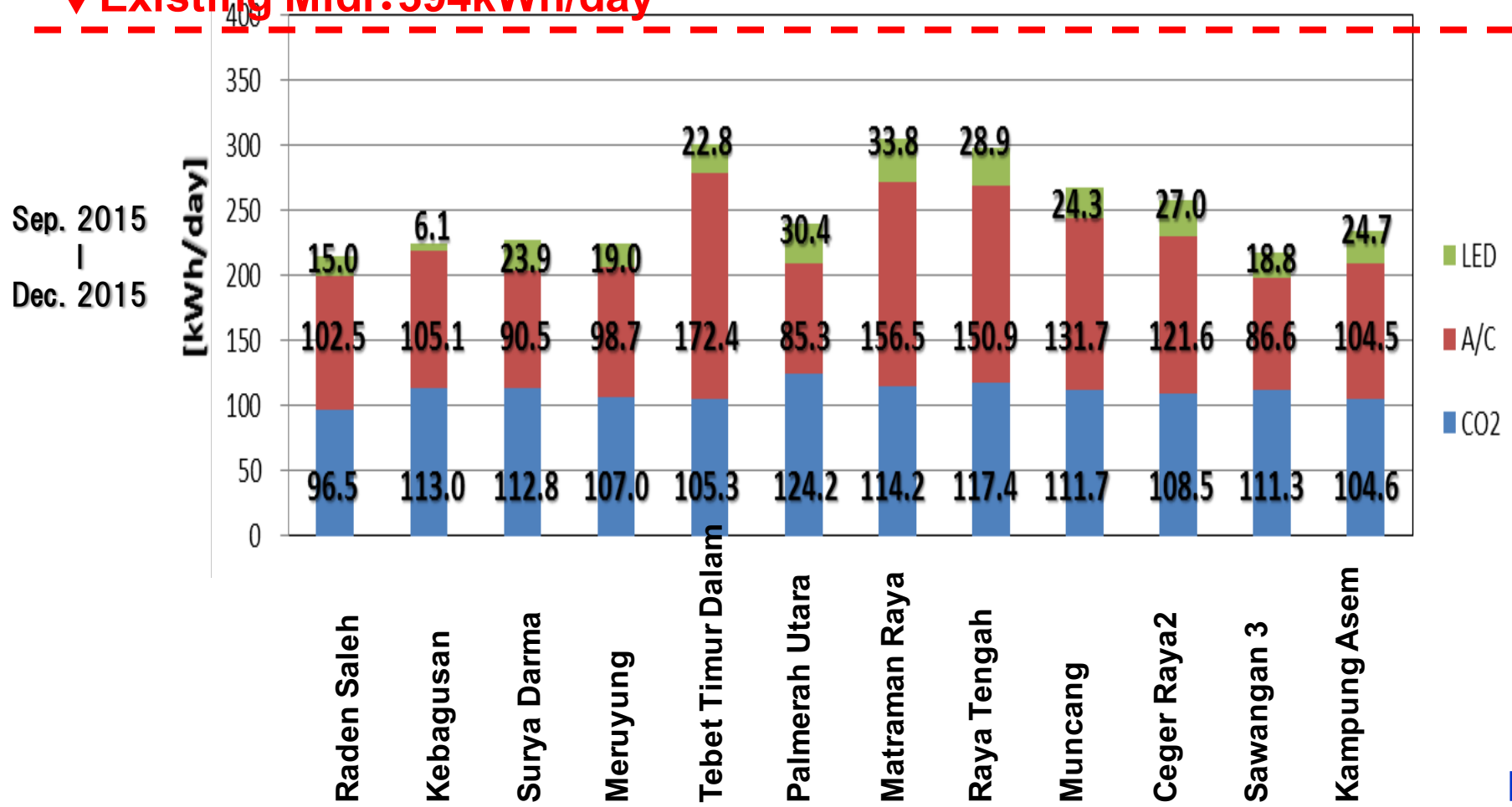


Result of Energy Saving Project in Indonesia



Verification of energy saving is ongoing at 12 Stores in Jakarta, the measured saving results as expected. (2 stores from Mar. 2013, 10 stores from Mar. 2014)

Existing Midi: 394kWh/day



Receiving "Minister of the Environment's 2015 Commendation for Global Warming Prevention Activity"

Since 2013, we have been introducing CO₂ refrigeration systems incorporating the latest in Japanese technology into Indonesian stores, and as a result of our contribution to the prevention of global warming and to a reduction in the release of atmospheric pollutants, we received the "Certificate of Merit for International Activities" for introducing CO₂ refrigeration systems to Indonesia.

In the future, we aim to continue our efforts to obtain credits by taking advantage of the Joint Crediting Mechanism (JCM) system to register projects, take measures to reduce CO₂ emission and register emission allowances, until this program ends in the 2020 financial year.

Award ceremony (Attended by Environment Vice-Minister Hiraguchi)

Date: 2nd December 2015 (Wed)

Place: Iino Hall & Conference center



国際貢献部門
インドネシアへのCO₂冷媒冷凍機システム導入について

2013年度からCO₂冷媒冷凍機システムを途上国に輸出、石炭火力発電が主である途上国における地球温暖化防止及び省エネルギー化、大気汚染物質排出抑制にも大きく貢献。インドネシアでは、大手小売企業MIDI社の協力を得て、ミニスーパー業態「Alfamidi」を対象に、CO₂冷媒冷凍機システムを含めたLED照明や空調機等の省エネ設備の導入を進め、2015年3月末迄にジャカルタ市内13店舗への設置が完了。今後はJCM制度を利用し、2020年度まで取組を継続、クレジットの獲得を目指す。

株式会社ローソン

The first issue of “ACCELERATE JAPAN” published by Shecco Japan

Publishing article about Lawson aiming world No.1 CO₂ refrigerant adopting action

BECOMING THE WORLD'S BEST

Japanese convenience store operator Lawson is leading a revolution in the commercial refrigeration sector, with plans to operate more than 1,300 stores with CO₂ trans critical refrigeration stores and become the world's number one retail user of natural refrigerants



***Lawson
Environment Consideration Shop Project***

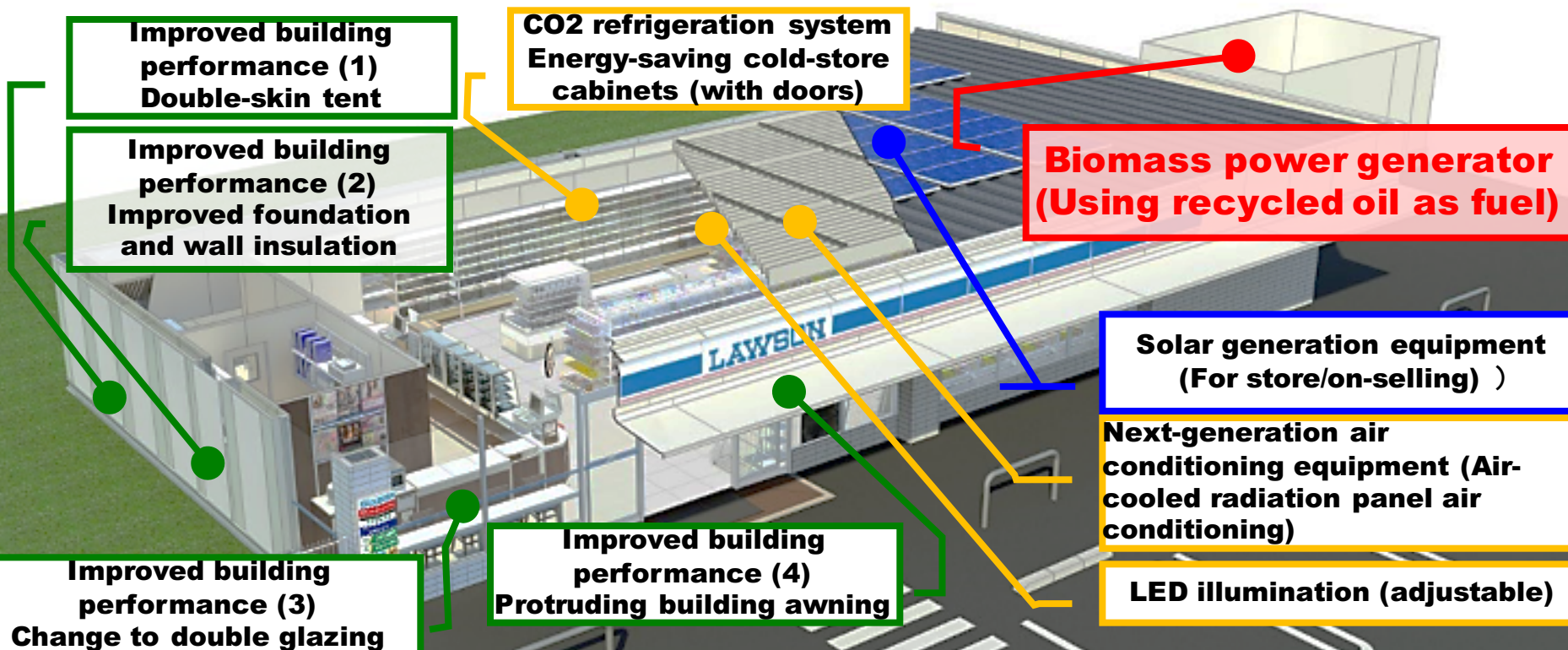
● Target: Power consumption reduction of 70%

By using power generation facilities with reduction rates of 30%, and energy-saving facilities with reduction rates of 40%, in 2010 our target is to achieve a 70% reduction in power consumption compared to standard stores. * Power consumption for standard stores in 2010: 186,000 kW/year

[Reduction target]

Power Generation ▲55,000 kWh/year Energy saving ▲75,000 kWh/year
⇒ Total ▲130,400 kWh/year

We will be looking at standardization from the next year onward, to carry out verification and analysis of results.





solutions for asia
natural refrigerants

9 & 10 February, 2016 – Tokyo

Finally, we received your support and cooperation upon proceeding with this project.

Ministry of Economy, Trade and Industry

Ministry of the Environment

Panasonic Corporation

PT. Midi Utama Indonesia Tbk

To everyone how of each partner companies,

We are extremely grateful from the bottom of our heart to all those who have taken part in this project.

Thank you for your attention.