<< ATMOsphere Japan 2017 >>

LAWSON's Efforts for Non-Freon

ATMO JAPAN sphere

February 20, 2017 LAWSON, INC.

Kigali Amendment and countermeasures

The Kigali Amendment and countermeasures

In order to fight against global warming, HFC phase-down was agreed on Oct. 15, 2016 in the 28th Meeting of the Parties to the Montreal Protocol held in Kigali, Rwanda.

HFC phase-down schedule (total emission control) Reference year: 2011-2013

- 2019 and after: 90%
- 2024 and after: 60%
- 2029 and after: 30%
- 2034 and after: 20%
- Abolishing HFC completely in the medium and long term

Reference: EU F-GAS regulation

- 2016 and after: 93%
- 2018 and after: 63%
- 2024 and after: 31%
- 2027 and after: 24%

In response to the amendment, we need to take an approach of implementing the viable measures as soon an possible.

Reference: Fluorocarbons Emission Control Law that was revised in Jun. 2013 and took effect in Apr. 2015

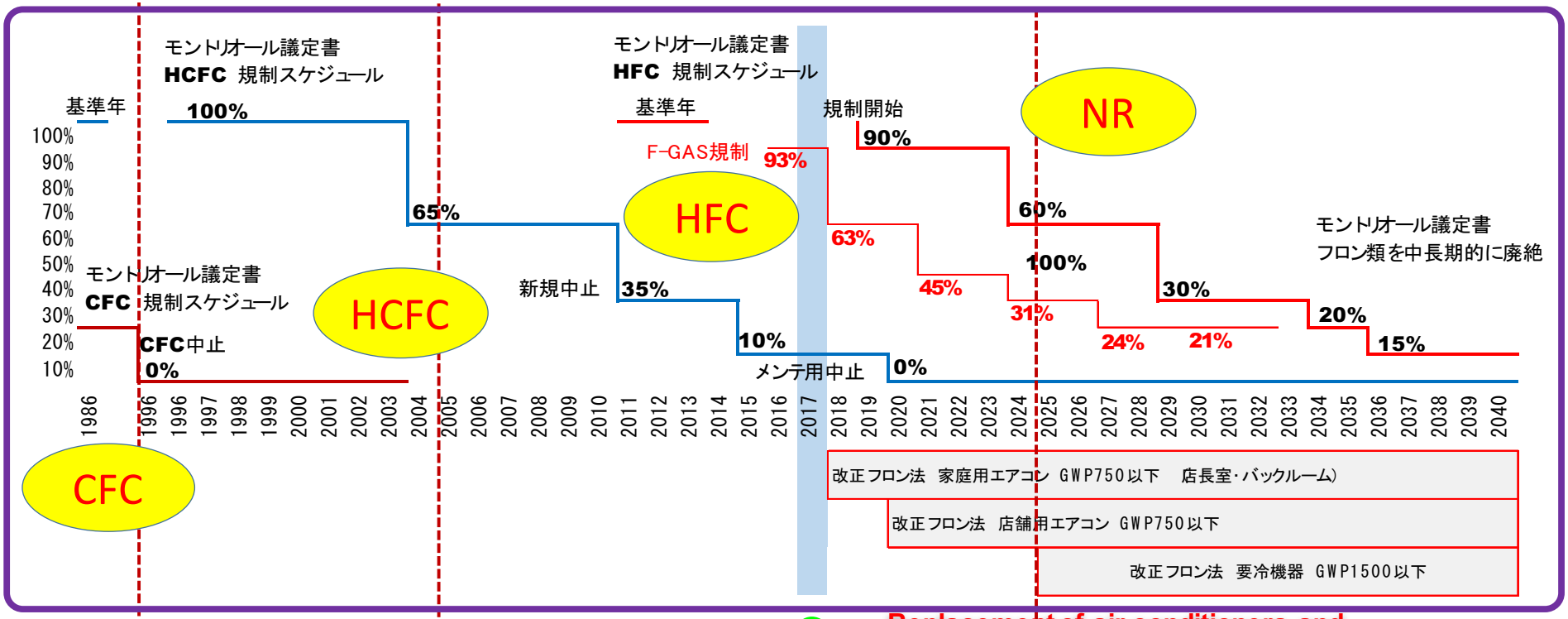
Specified products' effect on the environment related	target value	target year
Household air conditioner	GWP 750 or less	2018
Industrial air conditioner	GWP 750 or less	2020
Stationary refrigerating equipment	GWP1500 or less	2025

What are the differences between the measures to meet the Fluorocarbons Emission Control Law and the Kigali Amendment?

We need immediately the framework to pursue a medium-term goal in the food retail industry (leakage in the use of the equipment introduced in 2013 through 2028 is less than 30% level in 2029) for steady implementation of the amended protocol.

Refrigerant conversion, life cycle and future measures

Flow of refrigerant conversion



Introduction of HCFC → Abolishing existing HCFC in 8000 stores completely

Replacement of air conditioners and refrigerating equipment

Introduction of HFC → Abolishing existing HFC in 10000 stores completely

Additional introduction of HFC → Abolishing added HFC completely

Retirement obligation?

Introduction of CO_2

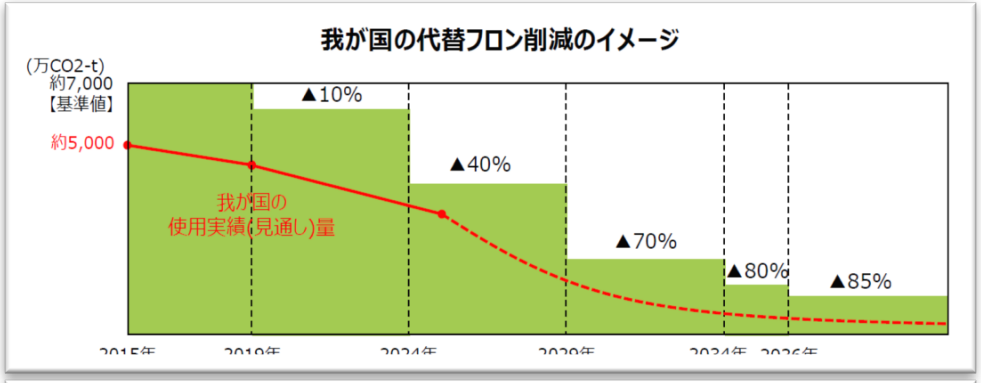
Additional introduction of CO_2

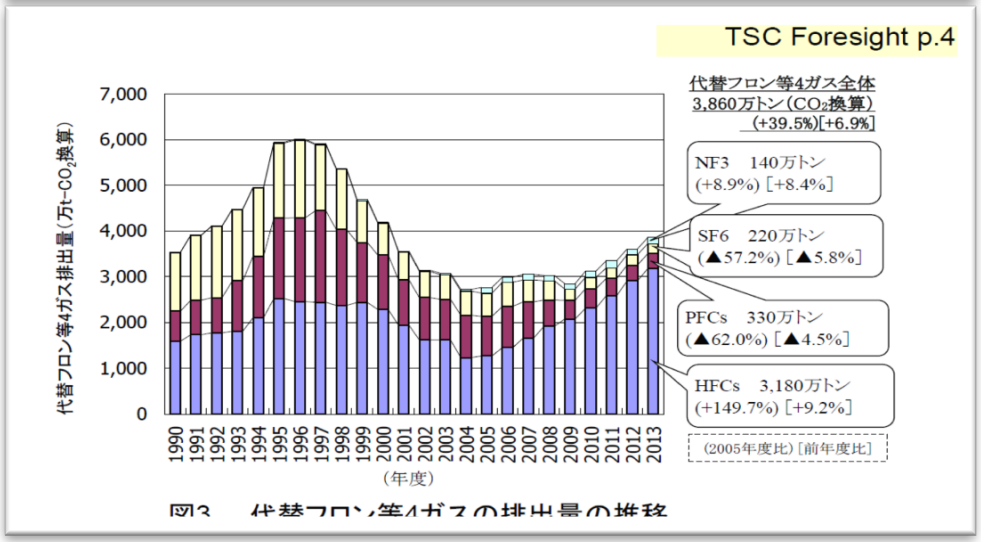
Introduction of CO_2

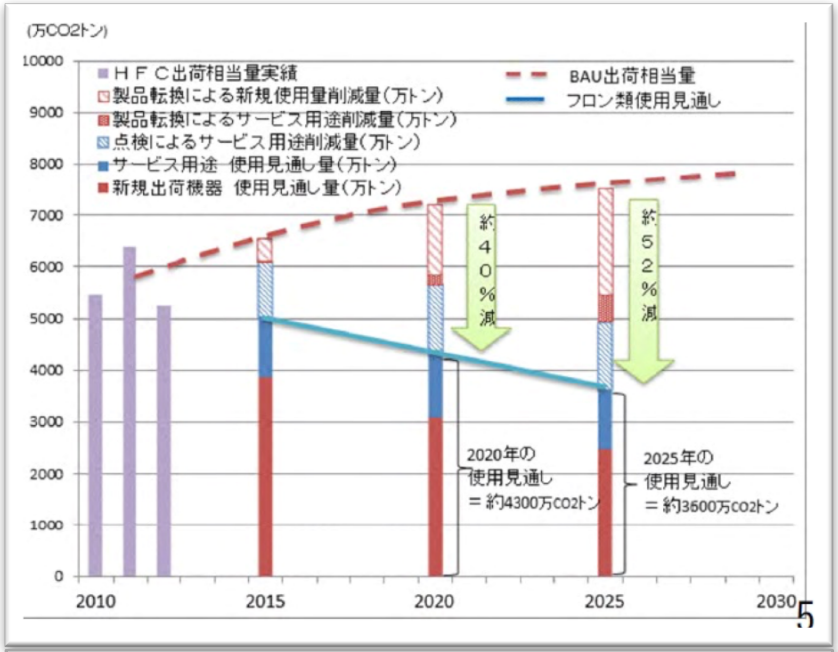
Which of HFC and natural refrigerant should we introduce to meet the Fluorocarbons Emission Control Law? Which to meet the Kigali Amendment?

HFCs demand forecast in the food retail industry

Forecasting the demands for HFCs in each industry is necessary to implement the Kigali Amendment securely







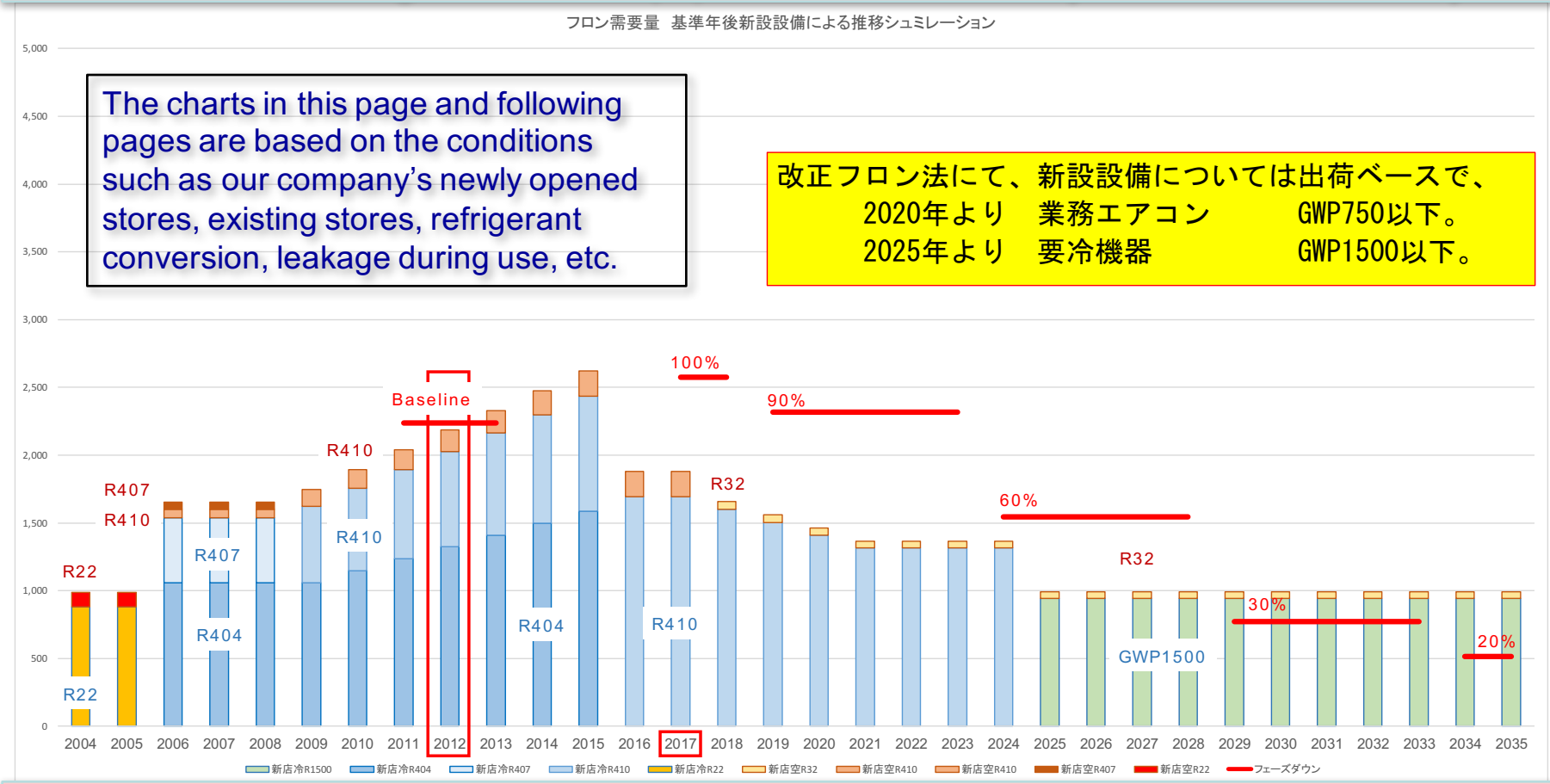
Assumptions of forecasting usage of HFCs

- Reduction of usage for new products
- Complete conversion in the year before the target year for the stock in the market
- 80% reduction of leakage during use of the equipment inspected regularly
- 50% reduction related to the equipment and showcases that are not inspected regularly

Particularly the food retail industry's constituent ratios of the HFCs used for refrigeration and the HFCs used for air conditioning and leakage during use are different from the same of the other industries. Therefore, it is important to forecast according to the measures and industry and consider also the premise of forecasting.

HFCs demand forecast for newly installed equipment – Scope of the manufacturers

The manufacturers' shipment seems to be OK in the framework of the Fluorocarbons Emission Control Law.
How about the leakage from the equipment installed newly after the reference year?



The charts in this page and following pages are based on the conditions such as our company's newly opened stores, existing stores, refrigerant conversion, leakage during use, etc.

改正フロン法にて、新設設備については出荷ベースで、
2020年より　業務エアコン　GWP750以下。
2025年より　要冷機器　GWP1500以下。

Most of the HFCs used in the food retail industry are for the refrigeration equipment.
Therefore, effects of refrigerant conversion of air conditioners are limited.
Taking measures for the refrigerant used for the refrigerating equipment is very important.

For implementation of the Kigali Amendment

HFCs demand forecast in each industry is necessary for secure implementation of the Kigali Amendment

1. In the food retail industry, more than 90% of the demands for HFCs are intended to be used for the refrigerating equipment.
   We need to expedite the measures for the refrigerating equipment rather than the measures for the air conditioning equipment.
   We focus on the refrigerating equipment in the description below.
2. In order to implement the frame of 30% in 2029 steadily, ①it is important to take measures for the equipment introduced and newly installed in and after FY2017. We should avoid that the negative legacy remains in and after FY2029.
3. At the time of installing new equipment, we will introduce as much as possible the equipment using the natural refrigerant. In addition, we will reduce costs by increasing variation of the compatible equipment.
4. For steady implementation of the frame of 30% in 2029, ②effects of the existing equipment is large and their economic efficiency is worse than the measures for new installation.
   We need urgent measures that are advantageous economically.
5. If development of the low-cost refrigerant with 1,500 or less GWP is advanced and the gas replacement becomes a useful measure, we will promptly replace the refrigerant of the existing equipment in turns.
6. When the existing equipment need to be replaced, we will introduce the equipment using natural refrigerant as much as possible and reduce their effects.

From the viewpoint of management	Selecting the equipment for new installation to reduce negative legacy in the future For the existing equipment, reducing not only leakage during use but life cycle emission Selecting refrigerants out of various selections not limited in HFCs

For popularization of non-Freon (CO_2 refrigerant) equipment

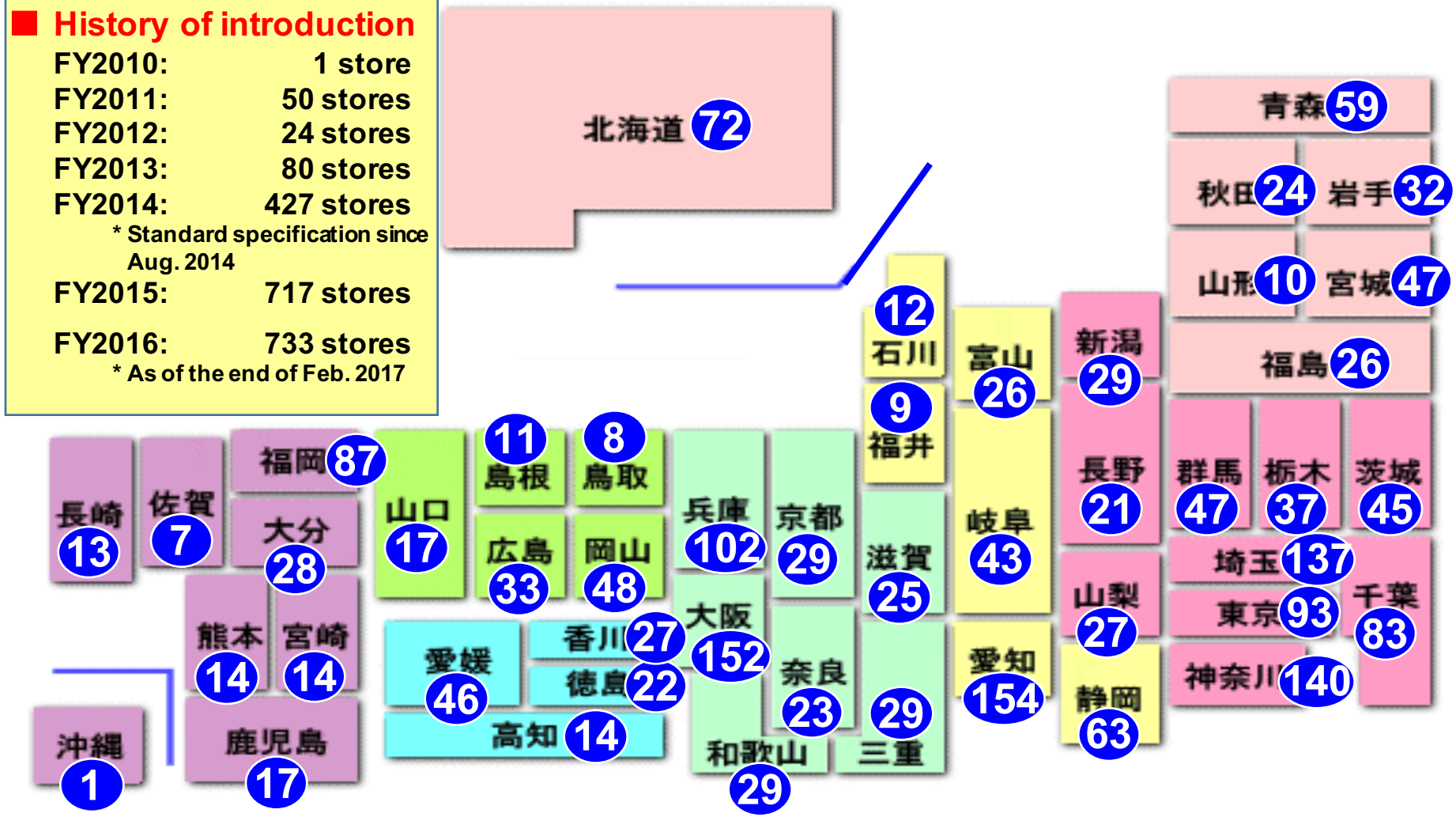
Non-Freon refrigeration systems having been introduced (by prefecture)

Non-Freon refrigeration systems will have been introduced into 2,032 stores in 47 prefectures in Japan (as of the end of Feb. 2017)

➔ They will have been introduced into about 2,700 stores before the end of Feb. 2018

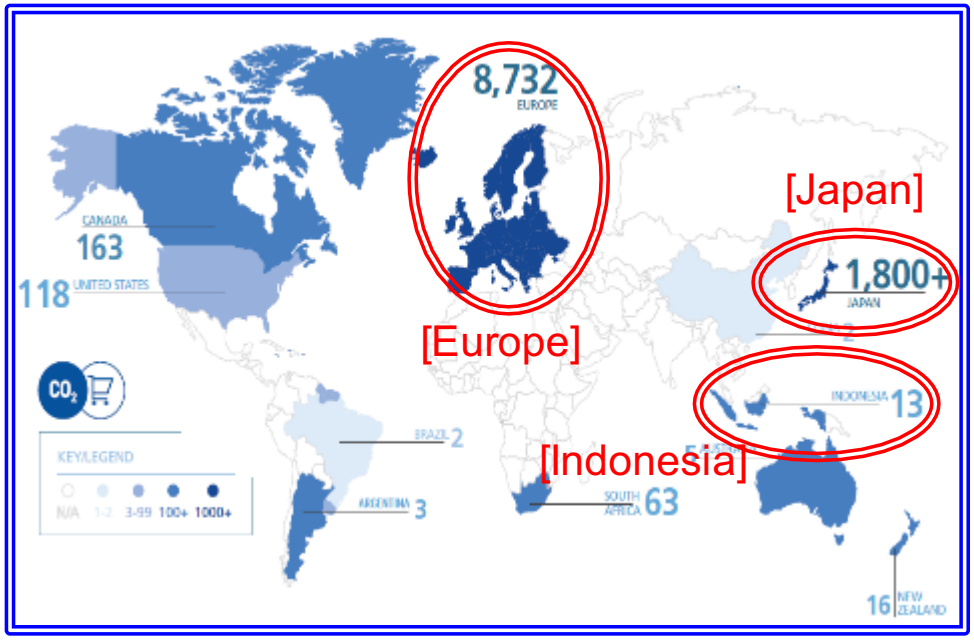
History of introduction

FY2010:	1 store
FY2011:	50 stores
FY2012:	24 stores
FY2013:	80 stores
FY2014:	427 stores
	* Standard specification since Aug. 2014
FY2015:	717 stores
FY2016:	733 stores
	* As of the end of Feb. 2017

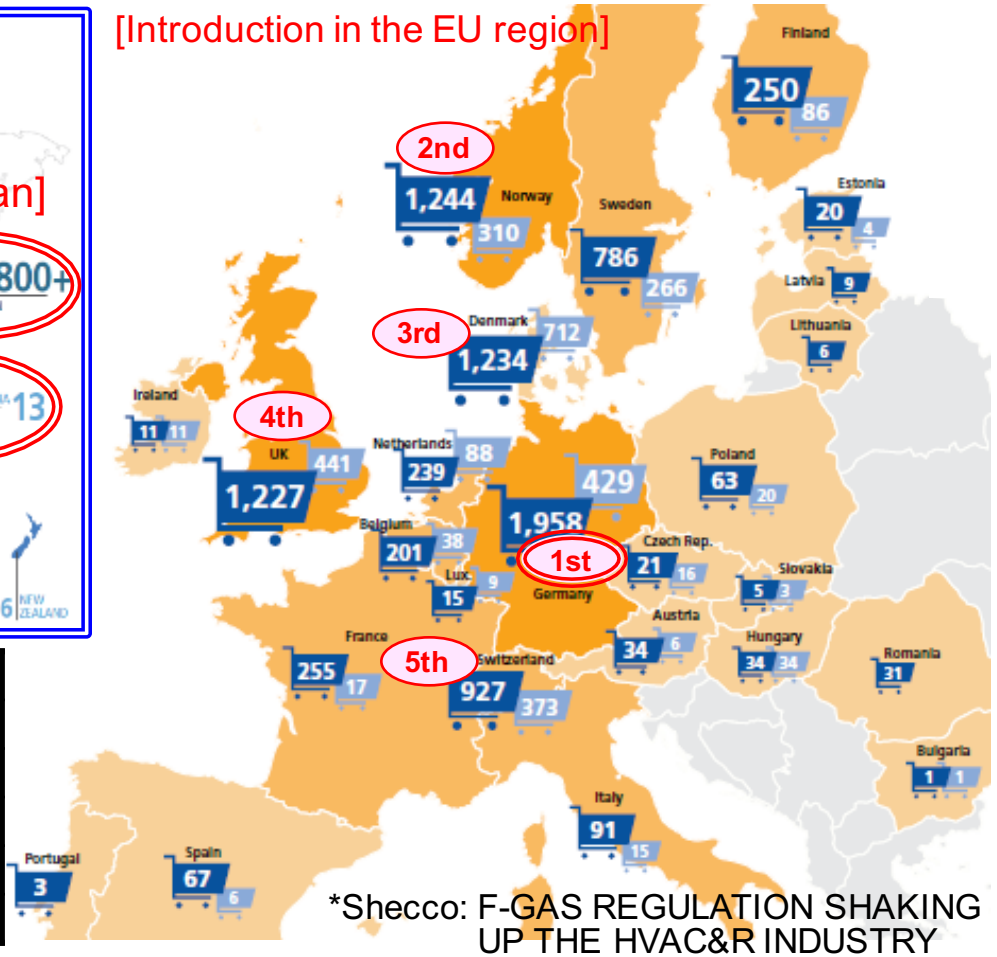


Introduction of natural refrigerant in the world

[Introduction of the trans critical CO_2 systems in the world]



[Introduction in the EU region]



*Shecco: F-GAS REGULATION SHAKING UP THE HVAC&R INDUSTRY

- Introduction of CO_2 systems in Europe
  2013: 2,885 stores
  ⇩
  2016: 8,732 stores
  * Germany was ranked top in place of Denmark.

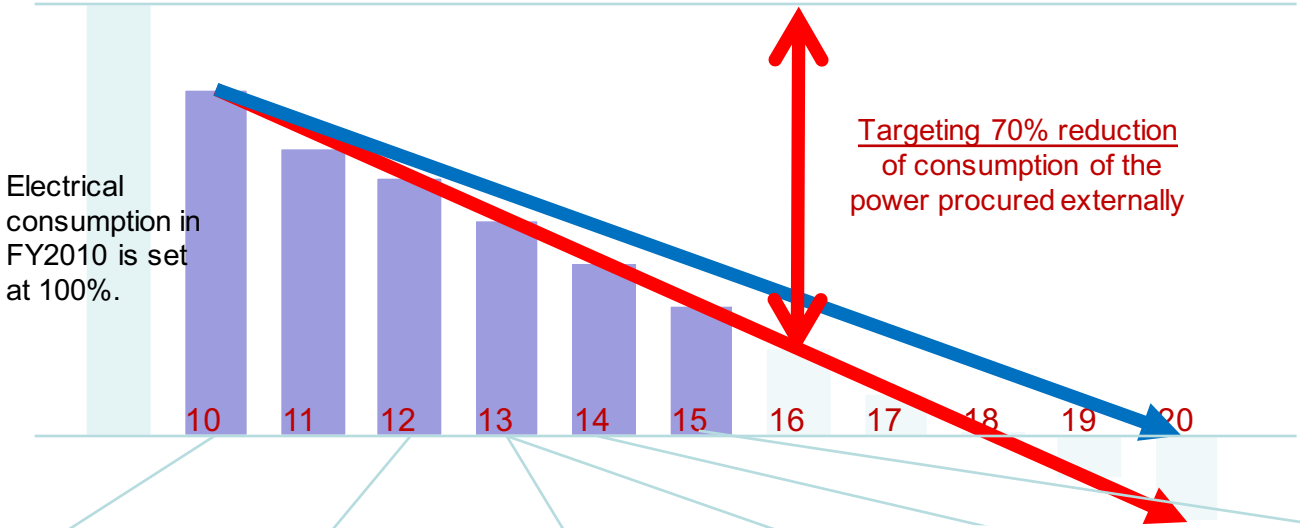
Rank	Country	Stores
1	Germany	1,958
2	Norway	1,244
3	Denmark	1,234
4	UK	1,227
5	Switzerland	927

Although it is said that European countries are advanced in terms of introduction of CO_2 refrigeration systems, the number of solely our company's stores having introduced the system is expected to exceed 2,000 in total at the end of Feb. 2017
➔**LAWSON aims at the world's No. 1 retail company through the non-fluorocarbon efforts.**

Deployment of eco-friendly stores

Efforts for realizing ZES (Zero Energy Store)

- In order to realize ZES in 2020, we are raising the reduction goal every year from 20% reduction in FY2010 and opening the stores for experiments of new technologies. As a goal this fiscal year, we set 70% reduction (similar to the previous fiscal year) and we will introduce new technologies, verify the energy-saving execution and management system and undergo evaluation of the energy-saving building for the third-party certification (BELS).
- We set 120% reduction in 2020 as a stretch goal (i.e. the electricity generating building PES: Positive Energy Store) and aim at becoming the local infrastructure bases that can supply electricity to neighboring communities.



FY2020

Goal	**Realization of ZES store**
Stretch goal	**Realization of PES store**

According to the result of experiment, the 20% reduction model has been achieved in the store and final costs are being adjusted in order to introduce the 30% reduction model.
40% reduction model is being developed.

2010
Kyotanabe Yamatenishi Store

Result: -28.4% reduction

2012
Ebina Kamiimaizumi 2-chome Store

Result: -46.7% reduction

2013
Yurihonjo Yamamoto Store

Result: -46.6% reduction

2014
Panasonic Mae Store

Result: Being checked

2014
Toyohashi Akemi Kogyo Danchi Store

Result: Being measured

2015
Yumesaki Smart Interchange Mae Store

FY2016 power consumption reduction target of model eco-friendly store

Target value: 70% reduction of power consumption

We implement the measure for creating the energy being equivalent to 20% reduction and the measure for saving 50% energy and aim at realizing 70% reduction of power consumption compared with the power consumption of standard stores in FY2010.

*Annual power consumption of standard stores in FY2010: 186,287 kWh

[Reduction target value] Annual energy creation -37,257 kWh, annual energy saving -93,143 kWh (Total -130,400 kWh per year)

We verify and analyze effects with a view to standardization in any of the following fiscal years.

< Outline of related store >

Store name:	LAWSON Kodaira Tenjincho 2-chome Store
Address:	Tenjin-cho 2-2-16, Kodaira, Tokyo
Area:	Tokyo Operation Div. Tama Branch
Site area:	1,036.03m^2
Gross floor space:	199.74m^2 (Storefront 19.8m × Depth 9.9m)
Building structure:	Steel construction
Opening date:	Feb. 17, 2017

■ Example of the eco-friendly store

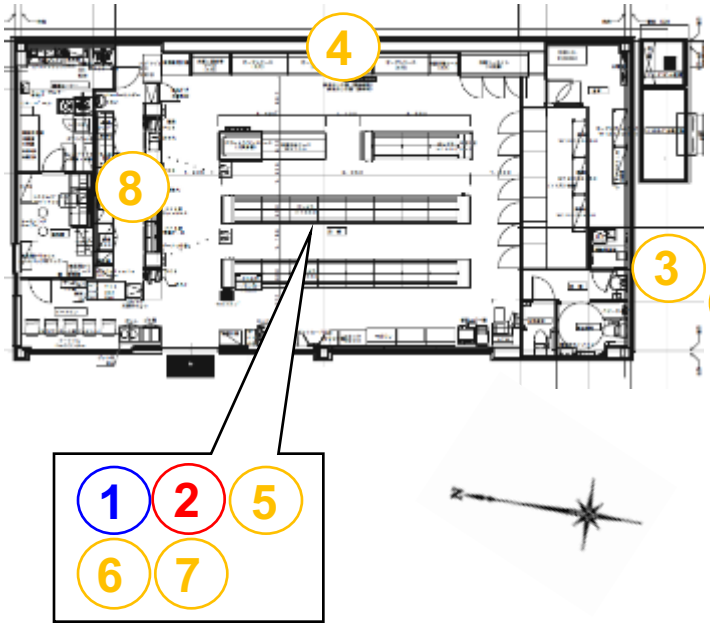
[FY2016 model eco-friendly store: Kodaira Tenjin 2-chome Store]

We not only establish the architectural design using the “natural energy” such as solar light, heat and wind but aim at a comfortable and energy-saving store with the up-to-date energy-creation and energy-saving equipment incorporated.

Example of the eco-friendly store

We introduce the following energy-creation and energy-saving measures to the store to achieve the goal of reducing 70% of consumption of the power procured externally and establish the model eco-friendly store.

[Important measures for realization]



<<Energy-creation measure>>

- Photovoltaic facility (selling electric power, using for store)

<<Energy-saving measure>>

- Saving energy with passive architectural design
- Introduction of energy-saving equipment

1 Photovoltaic facility (equivalent to 22 kW)

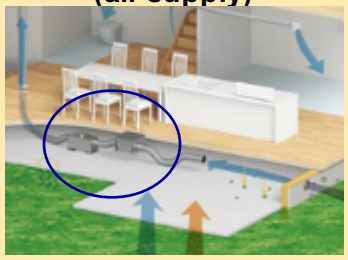
2 Passive architectural design

3 CO_2 refrigeration equipment

4 Showcases with doors

5 Air conditioning with dehumidification type radiation panel

6 Ventilation utilizing geothermal heat (air supply)



7 Dimmable LED lighting system

8 Implementation of energy saving support system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Thank you very much!