

Japan's GHG emission reduction target

	2030 *1	2050 *2
GHG reduction	26% (compared to 2013 level)	80%
Energy Efficiency	35% improvement	(40% reduction of consumption)
Renewables	22-24% in total power	(Approx. 50% of primary energy supply)
Nuclear	20-22% in total power	-

*1 2030 targets are in INDC in 2015

*2 2050 GHG target is by cabinet decision in 2008 and others are illustration by Global Environment Committee under the Central Environment Council in 2012

L2-Tech·JAPAN Initiative
(Leading Low-carbon Technology)

L2-Tech Standard for Supporting the Best

➤ **L2-Tech Standard = Commercialized Best efficient equipment**

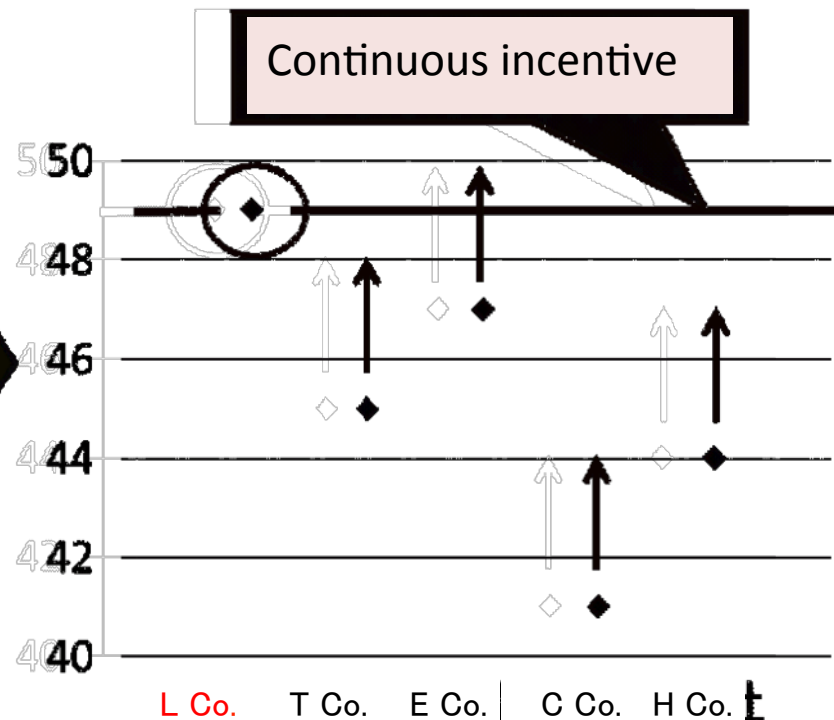
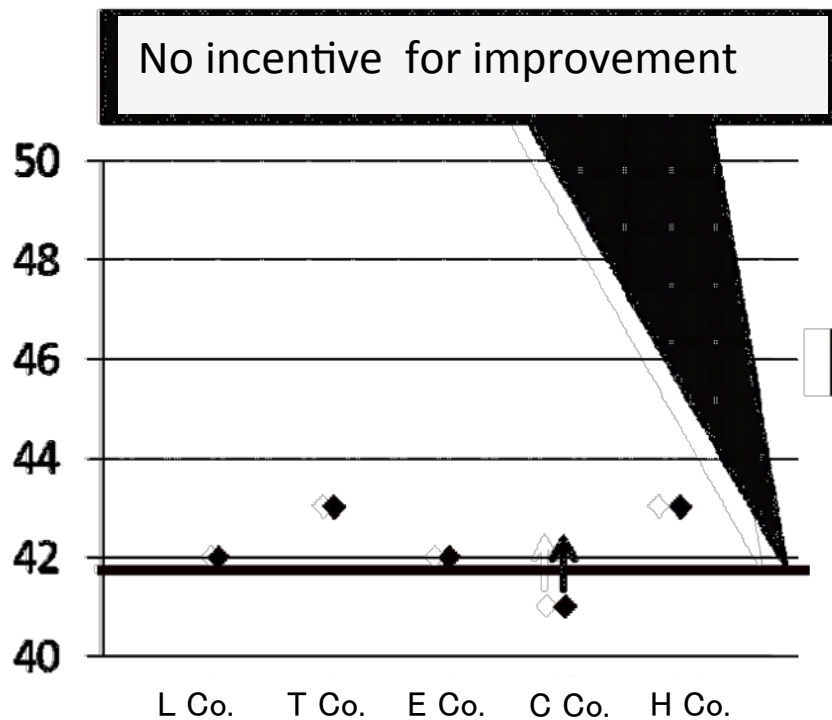


Image of the “Standardclearing Type”

(Fixed standard, passive)

Image of the “Pursuit of Best” Type

(Fluid standard (L²Tech Standard, proactive))

LCT Information Arrangement (user-oriented)

Low Carbon Technologies (700)

① Change to environmentally friendly lifestyle (e.g. Use of bicycle, car sharing)

COOLBIZ

COOL
SHARE

WARMBIZ

WARM
SHARE

② Reduce energy demand with maintaining satisfaction (e.g. Well-insulated building, Teleconference)

③ Reduce energy consumption with maintaining service level (e.g. High efficiency air-conditioning)

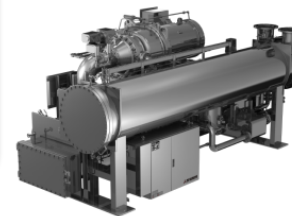


High efficiency gas turbine

Low-carbon energy utilization

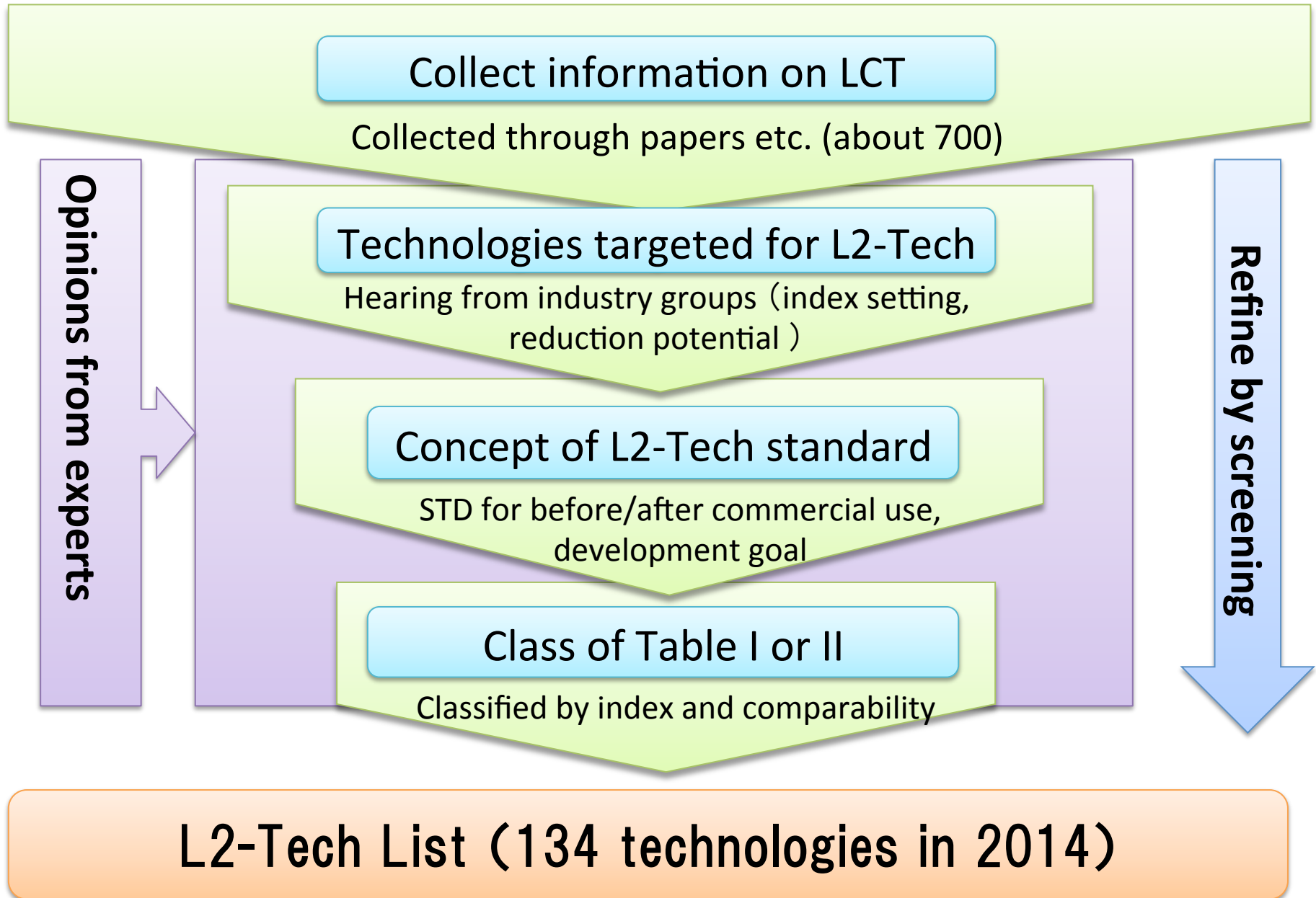
④ Low-carbon energy (e.g. Solar, Wind, Solar-powered hot-water heater, and CCS)

⑤ Energy management technology (e.g. demand response and battery)



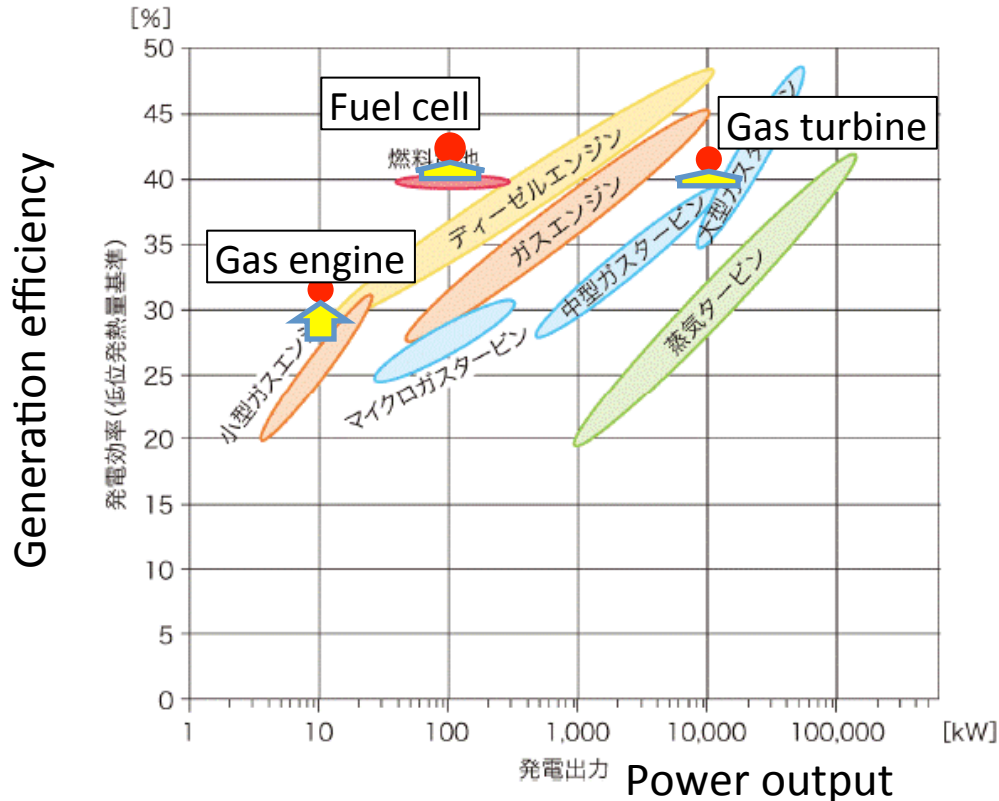
High efficiency centrifugal chiller

Review Process of the L2-Tech List



Example:L2-Tech level of co-generation system

Co-generation unit



【 Gas engine type 】

Generation efficiency	%
~10kW	31.5
10kW~100kW	34.0
100kW~500kW	41.6
500kW~1000kW	41.8
1000kW~3000kW	45.6
3000kW~	49.5

【 Gas turbine type 】

Generation efficiency	%
~3000kW	28.4
3000kW~5000kW	30.4
5000kW~7000kW	39.3
7000kW~10000kW	34.3
10000kW~	40.9

【 Fuel cell type 】

Generation efficiency[%]

42.0%

図 4-13 ガスエンジン、ガスタービン、ディーゼルエンジン、蒸気タービンの発電効率

出典：「天然ガスコージェネレーション計画・設計マニュアル 2008」，(2008,日本エネルギー学会) より NEDO 作成

Example:L2-Tech level for Air conditioning



Top Runner Standard (HES) for Air conditioning in 2015
(18% improvement compared with 2006 Standard)

業務用エアコン2015年トップランナー基準値 (APF値※1)

製品区分	形式	40	45	50	56	63	80	112	140	160	224	280	335	400	450	500	504
店舗用	4方向天井カセ	60	5.9	5.9	5.8	5.8	5.7	6.0	5.7	5.5	5.1	4.8					
	上記以外	5.1	5.0	5.0	4.9	4.9	4.8	5.1	4.8	4.7	4.3	4.0					
ビル用							5.7	5.5	5.2	5.0	5.5	5.1	4.8	4.8	4.6	4.4	4.3
設備用	床置直吹形										4.9	4.9					
	床置ダクト形										4.7	4.7					

※1 APF 2006

出典:一般社団法人日本冷凍空調工業会資料

L2-Tech level (For retail shops)

Cooling capacity	APF	
~4.0kW	6.7	12%
4.0kW~5.0kW	6.6	
5.0kW~11.2kW	6.3	
11.2kW~16.0kW	5.9	
16.0kW~	5.0	

12% more efficient than the HES

L2-Tech level (For buildings)

Cooling capacity	APF	
~14.0kW	5.7	
14.0kW~16.0kW	5.4	
16.0kW~22.4kW	5.9	7%
22.4kW~28.0kW	5.6	
28.0kW~33.5kW	5.5	
33.5kW~40.0kW	5.4	

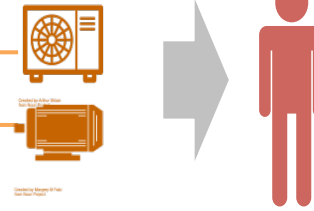
7% more efficient than the HES

Merits of L2-Tech Brings In

Approach to users of L2-Tech products

Introduction process by user

Equipment	L2-Tech product
Gas heat pump	XYZ123A-4
...	...



Offer information

【Increase public awareness】

- MOEJ make L2-Tech List and disseminate it

【Ensure producer reliability】

- Appeal performance certified by MOE.

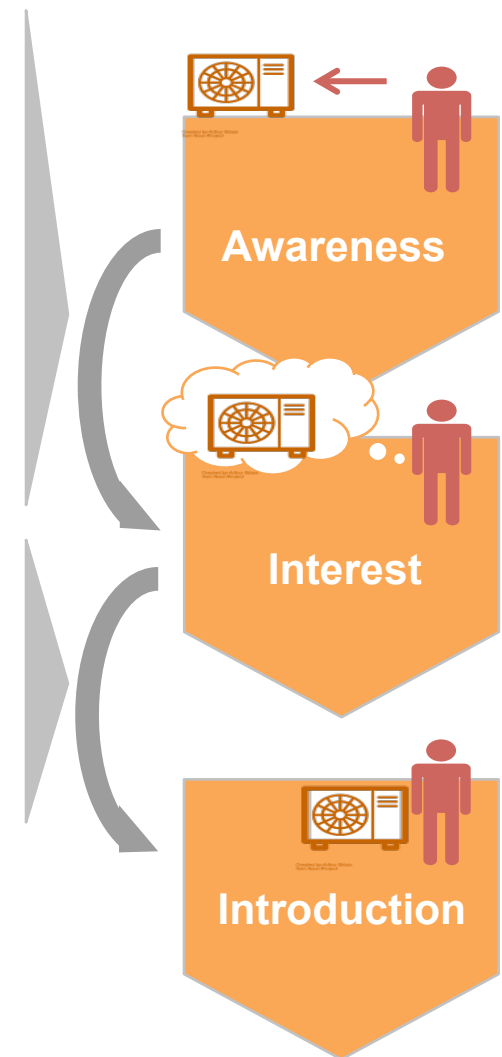
Support for introduction and sales of L2-Tech products



Strengthen support

【Possibility of support】

- Subsidy from revenue of CO2 tax
- Support for technology development

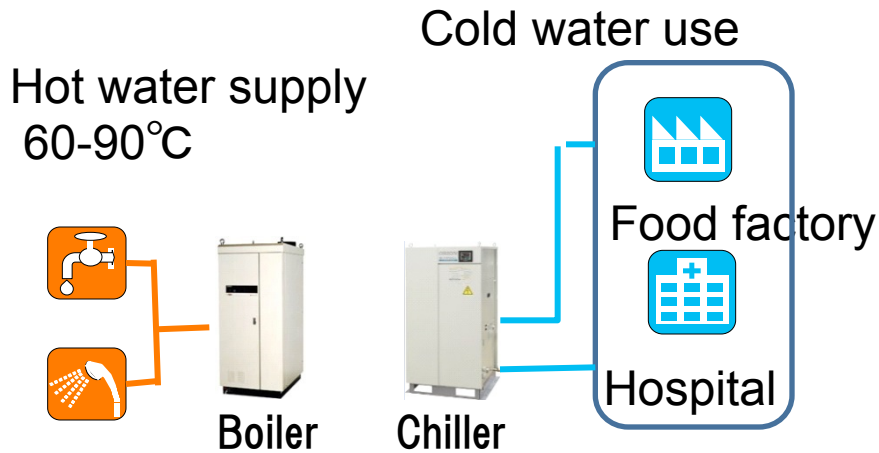


Promising L2-Tech (1) Heat Pump System

Food Production process in factory and hospital

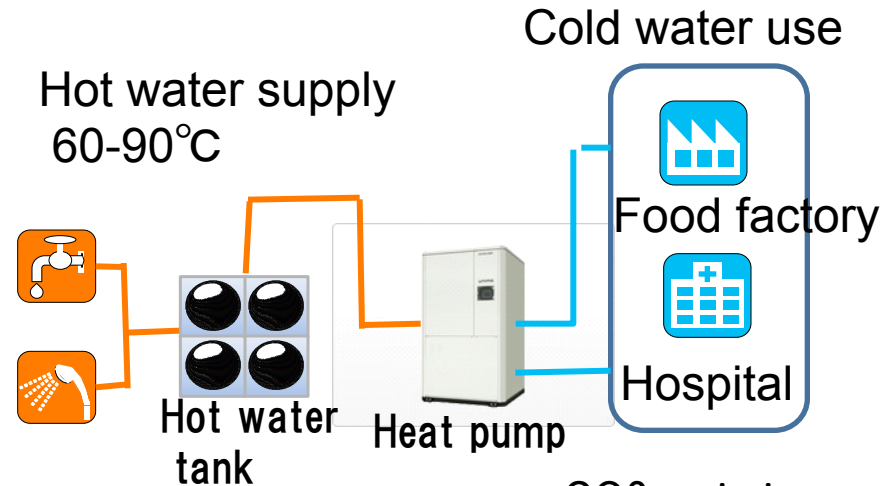
- Cooling around 0°C and heating around 100°C often coexist. Heat pump can increase efficiency and reduce CO2.
- Obstacle for rapid diffusion is High initial cost.

Before



Energy use by chiller:	100
Energy use by boiler:	150
Total	250

AFTER



Energy use by heat pump:	150
Total	150

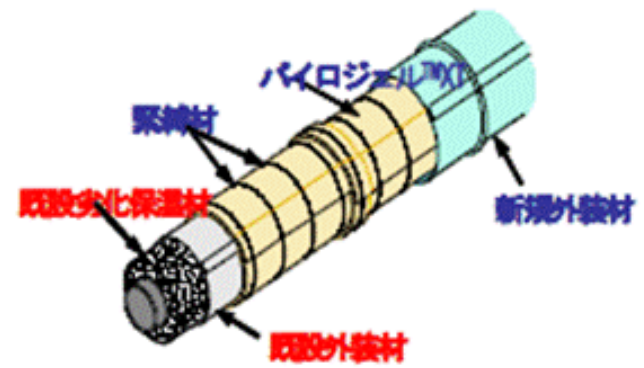
40% reduction

出典: 前川製作所

Promising L2-Tech (2) High thermal insulation

Prevent heat loss from steam pipes in manufacturing industry

- Heat loss due to degradation of insulating material consists of 11% of total energy consumption in manufacturing industry.
- Application of the Pyrogel XTR over existing insulating material prevents its degradation
- Obstacle for rapid diffusion of the technology is low priority of investment to maintenance of thermal insulation.



・既設保温材(外装材)の上から、パイロジェルXTを上巻き。
⇒既設保温材中の水分を水蒸気として排出。

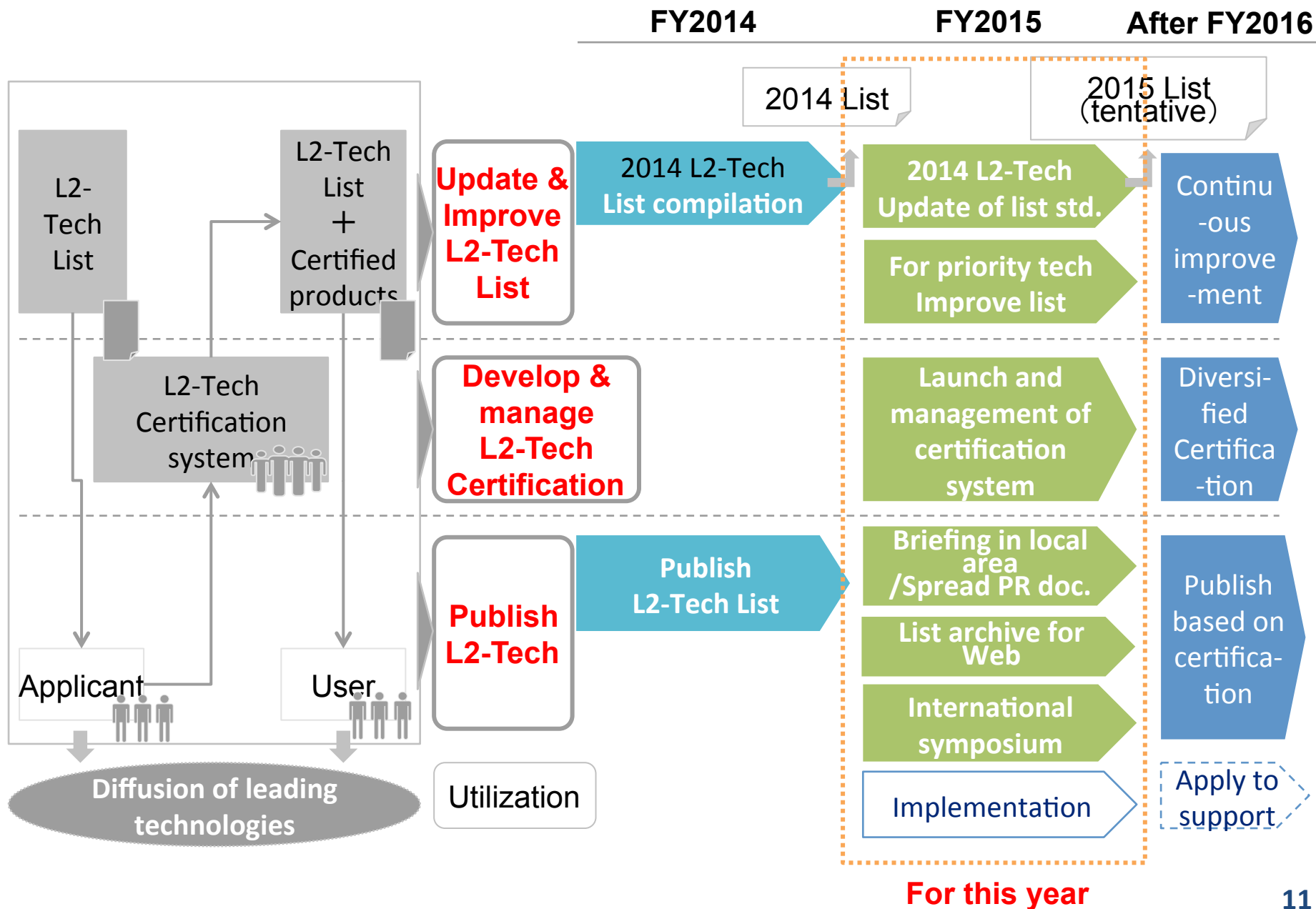


水蒸気は排出し、
雨水の浸入をシャットアウト

濡れた保温材の乾燥によりCUI予防保全効果、
および省エネルギー効果

◆ Pyrogel XTR; 米国Aspen Aerogel社

L2-Tech Initiative Roadmap



Joint Crediting Mechanism (JCM)

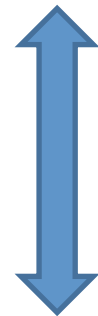
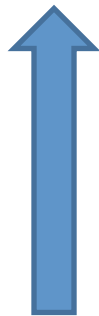
Joint Crediting Mechanism (JCM)

JCM is a new carbon market mechanism that complements the Clean Development Mechanism (CDM).

JCM Projects in DMCs

- i. Enabling GHG emission reduction and removals.
- ii. Using advanced low carbon technologies

Financial and
Technical Assistance



Certified GHG emission
reduction is used for host
country's and Japan's
target

Japan

Japan's INDC (Excerpt)

Japan's INDC

- Japan's INDC towards post-2020 GHG emission reductions is at the level of a reduction of 26% by 2030 compared to 2013 .

Treatment of JCM in 2030 Target

- The JCM is not included as a basis of the bottom-up calculation of Japan's emission reduction target, but the amount of emission reductions and removals acquired by Japan under the JCM will be appropriately counted as Japan's reduction.
- Apart from contributions achieved through private-sector based projects, accumulated emission reductions or removals by FY 2030 through governmental JCM programs to be undertaken within the government's annual budget are estimated to be ranging from 50 to 100 million t-CO₂.

JCM Partner Countries

➤ Japan has held consultations for the JCM with developing countries since 2011 and has established the JCM with 15 countries below.



Mongolia
Jan. 8, 2013
(Ulaanbaatar)



Bangladesh
Mar. 19, 2013
(Dhaka)



Ethiopia
May 27, 2013
(Addis Ababa)



Kenya
Jun. 12, 2013
(Nairobi)



Maldives
Jun. 29, 2013
(Okinawa)



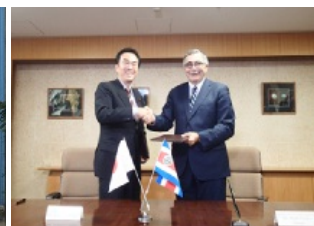
Viet Nam
Jul. 2, 2013
(Hanoi)



Lao PDR
Aug. 7, 2013
(Vientiane)



Indonesia
Aug. 26, 2013
(Jakarta)



Costa Rica
Dec. 9, 2013
(Tokyo)



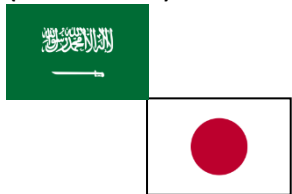
Palau
Jan. 13, 2014
(Ngerulmud)



Cambodia
Apr. 11, 2014
(Phnom Penh)



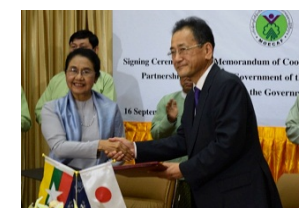
Mexico
Jul. 25, 2014
(Mexico City)



Saudi Arabia
May 13, 2015



Chile
May 26, 2015
(Santiago)



Myanmar
Sep. 16, 2015
(Nay Pyi Taw)

➤ 7 JCM projects have been registered and 44 projects have been supported (as of Oct 2015).

Registered JCM Projects

Country	Project
Indonesia	High-efficiency Centrifugal Chiller for Air-Conditioning and Process Cooling in a textile factory
Indonesia	High-efficiency Refrigerator to a Food Industry Cold Storage
Indonesia	High-efficiency Refrigerator to a Frozen Food Processing Plant
Palau	Small Scale Solar Power Plants for Commercial Facilities
Mongolia	High-Efficiency Heat Only Boilers in a school in Ulaanbaatar City
Mongolia	Centralization of Heat Supply System by Installation of High-efficiency Heat Only Boilers in public buildings in Bornuur soum
Viet Nam	Eco-Driving by Utilizing Digital Tachograph System

JCM Financing programs by MOEJ (FY2013/2014/2015)

Thailand: 4
(3 efficient air-conditioning, chiller etc.; 1 Solar)

Mongolia: 1 (HoB)

Viet Nam: 6
(3 efficient air-conditioning, chiller etc.; 1 solar)

Bangladesh: 3
(2 efficient air-conditioning etc.; 1 solar)

Cambodia: 1 (LED)

Myanmar: 1
(waste to energy)

Palau: 3 (solar)

Kenya: 1 (solar)

Mexico: 2
(1 geothermal, 1 energy saving)

Maldives: 2
(1 solar, 1 micro-grid)

Laos: 1 (REDD+)

Malaysia: 1 (solar)

Indonesia: 18
(12 efficient air-conditioning, chiller, pump etc.; 1 solar; 1 heat pump; 1 waste to energy; 1 LED; 1 cogeneration, 1 REDD+)

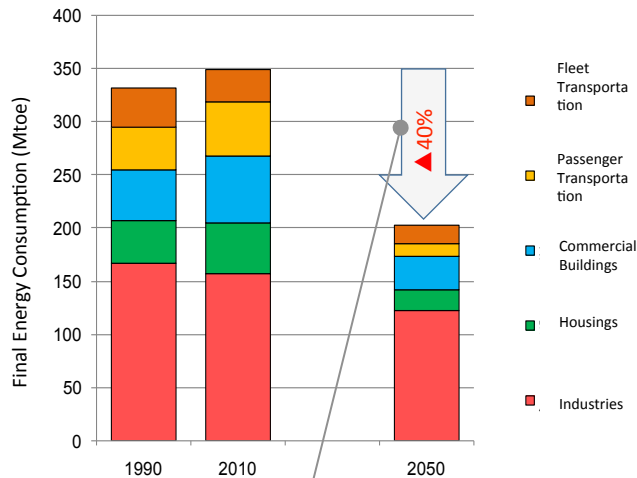
Total 13 countries, 44 projects

References

Japan's GHG reduction goal in 2050

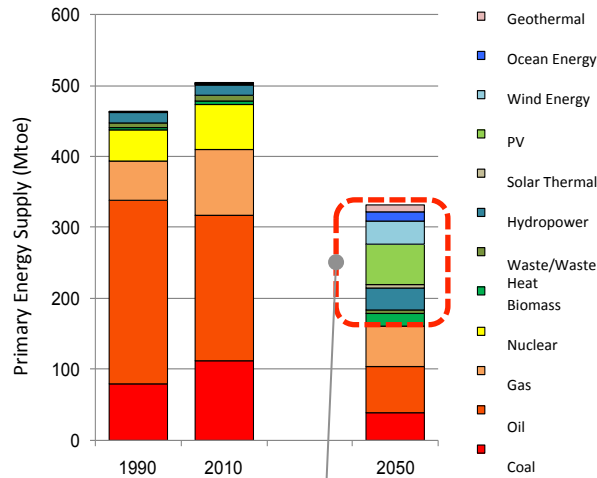
- Japan will pursue the goal of **80% reduction in GHG emission by 2050** in order to fulfill the responsibility as an industrialized country, as is stated **in the fourth Basic Environmental Plan** (revised in April 2012)
- Global Environment Committee presented the picture of 80% GHG reduction in 2050 as follows:
 - In the end-use sector, large-scale energy saving and electrification would be realized particularly in Building and Transportation sectors, which leads to approx. 40% reduction in final energy consumption.
 - Energy would be decarbonized, which leads to renewable energy deployment accounting for approx. half of primary energy supply.
 - 200 Mt-CO₂ would be captured and stored per year.

Final Energy Consumption



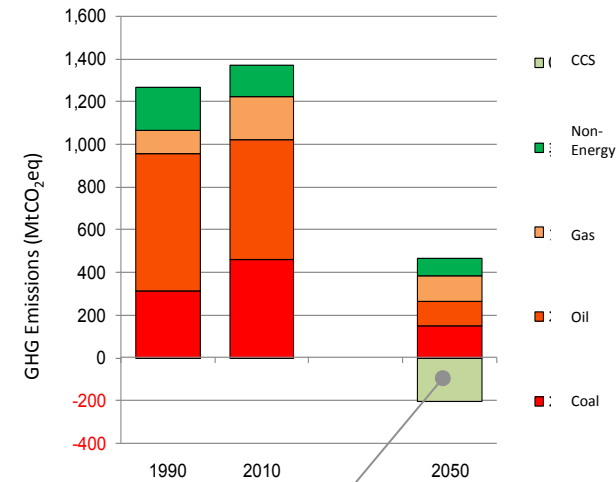
Innovative Energy Saving

Primary Energy Supply



Thorough Deployment of Renewable Energy

GHG Emissions

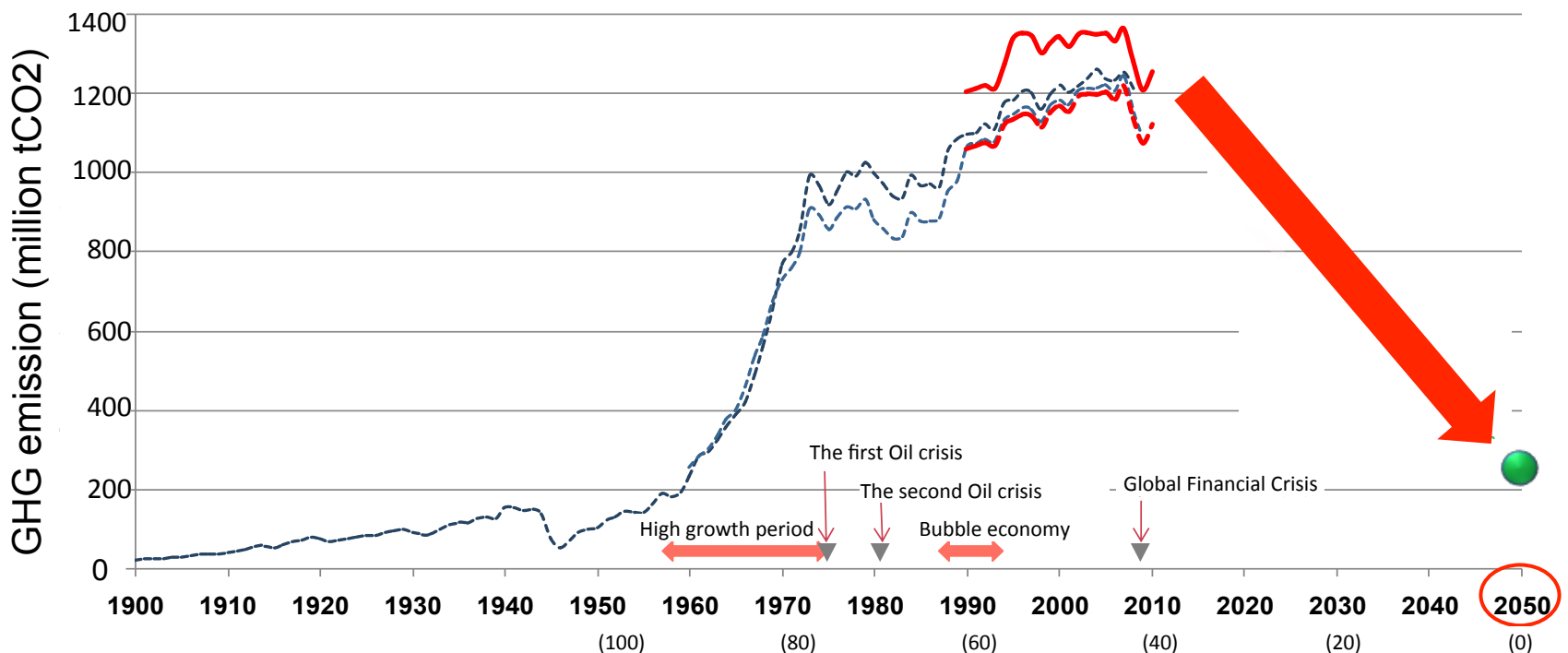


Capture and Storage of CO₂

Japan's GHG reduction goal in 2050

- Japan will pursue the goal of **80% reduction in GHG emission by 2050** in order to fulfill the responsibility as an industrialized country, as is stated in the **forth Basic Environmental Plan** (revised in April 2012)
- To achieve the 80% reduction goal, global warming measures including **innovative energy efficiency** and **maximum use of renewable energy** will be important

Japan's GHG emission trends and the long term goal



- Energy originated CO₂ emissions (US DOE Oak Ridge National Laboratory)
- Energy originated CO₂ emissions (IEA)
- Energy originated CO₂ emissions (Ministry of the Environment Japan)
- GHG emissions (Ministry of the Environment Japan)