Ministry of Economy, Trade and Industry
Agency for Natural Resources and Energy

Japan's Policy on Energy Conservation

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Trends in Final Energy Consumption in Japan

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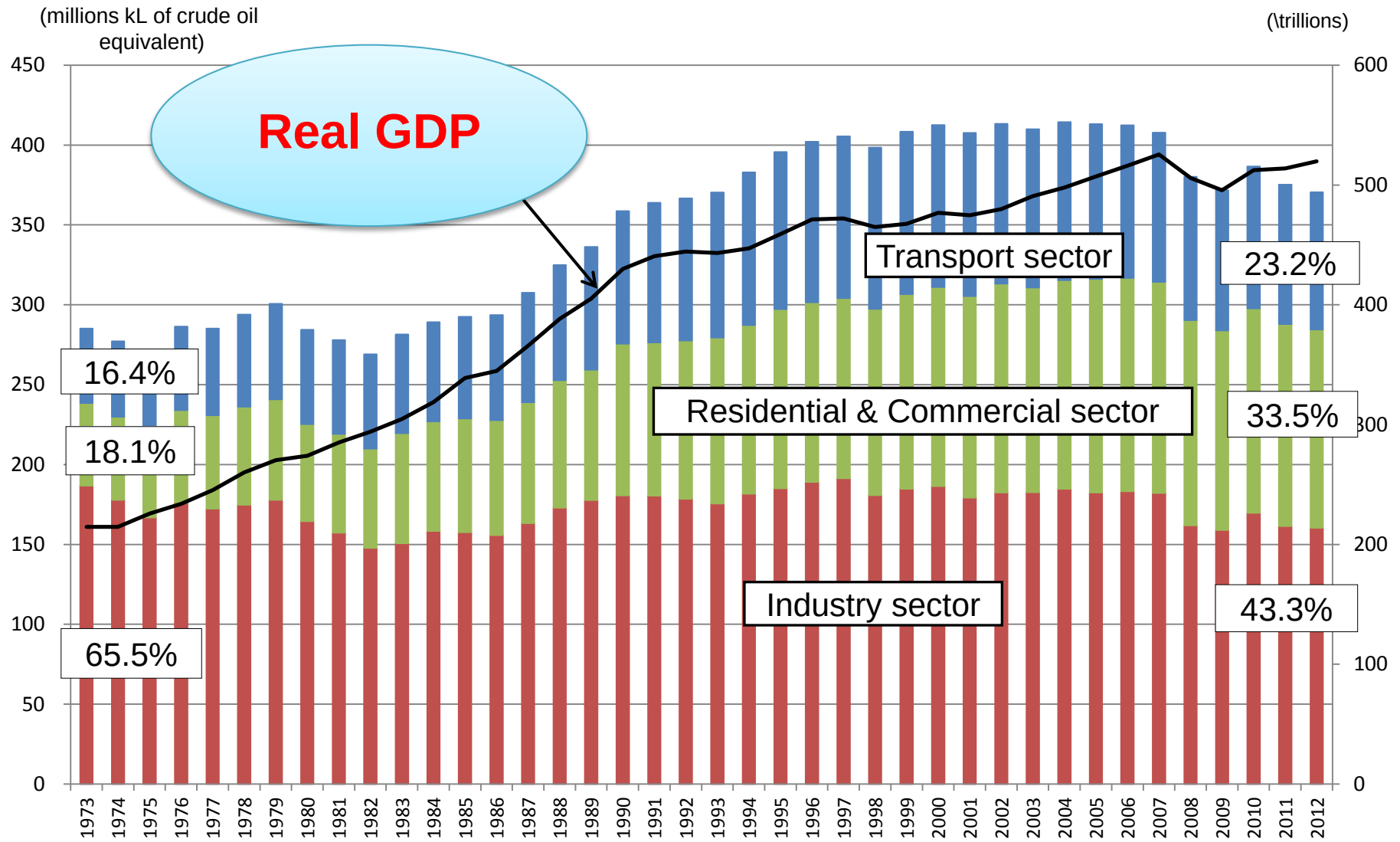
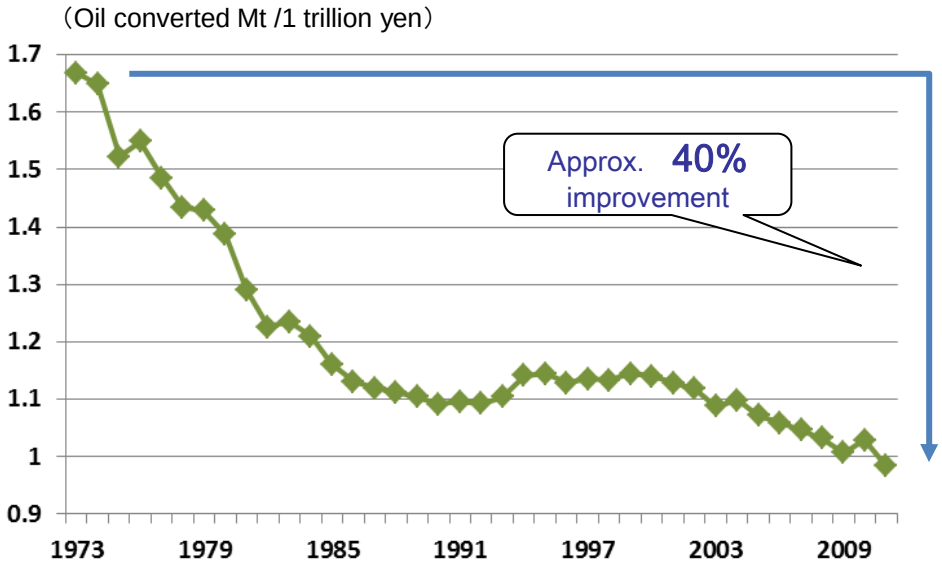


Sources: "Comprehensive Energy Statistics (Preliminary Report for 2012) "
and "Annual Report on National Accounts."

Energy Conservation Efforts of Japan after Oil Crises

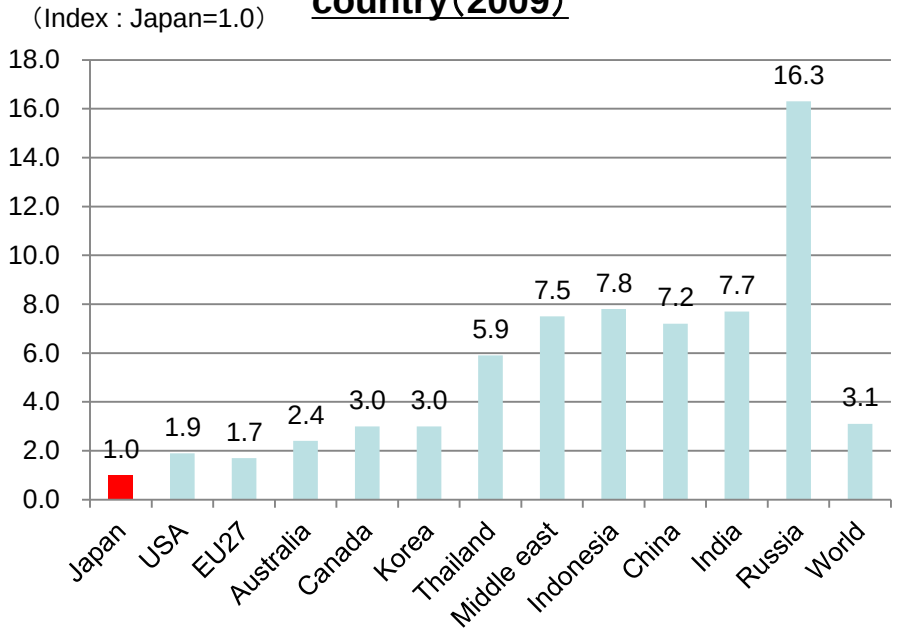
■ Japan has improved energy efficiency by approx. 40% after the oil crises since 1970s as a result of positive actions by both public and private industrial sectors.

Primary energy use per real GDP of Japan



Source) Total Energy Statistics by ANRE/METI

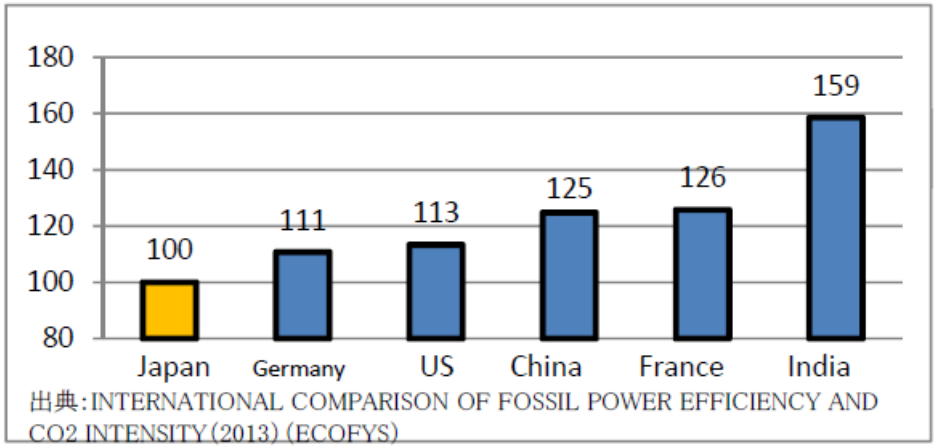
Primary energy supply per GDP unit of each country(2009)



Calculated according to IEA statistics

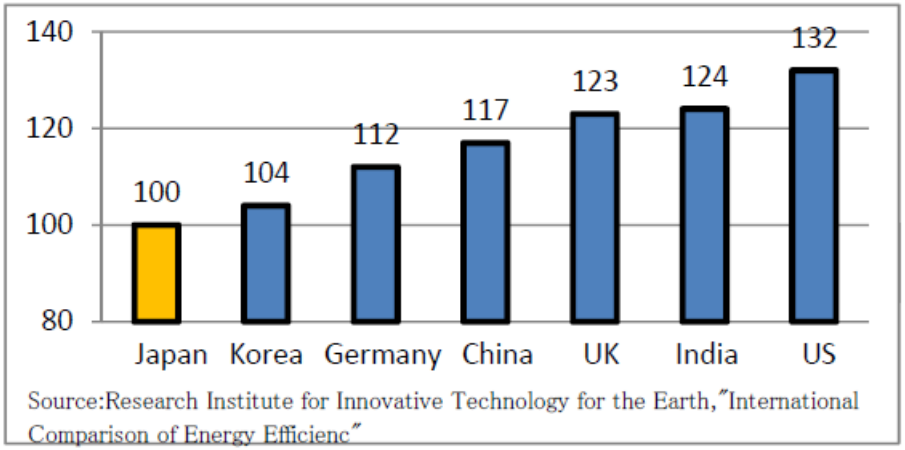
International Comparisons of Energy Efficiency

Energy required to produce 1kWh of electricity through thermal power generation (2010)



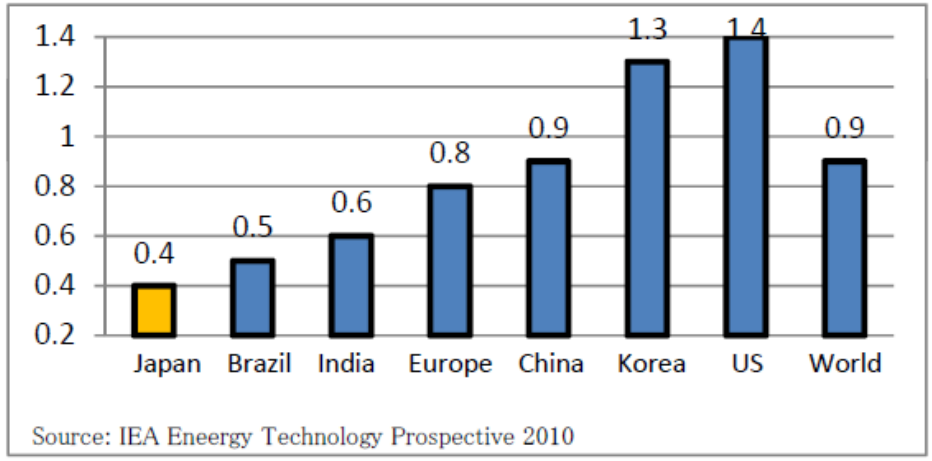
出典:INTERNATIONAL COMPARISON OF FOSSIL POWER EFFICIENCY AND CO2 INTENSITY(2013) (ECOFYS)

Energy required to produce 1 ton of iron (2010)



Source:Research Institute for Innovative Technology for the Earth,"International Comparison of Energy Efficienc"

Energy saving potential by adopting BAT (Cement) (GJ/T)



Source: IEA Eneergy Technology Prospective 2010

Ref: Contribution to domestic energy efficiency improvement (1973->2011)

- Industry in total:-41.4%
  - Steel and iron:-25.5%
  - Chemical:-54.9%
  - Ceramics:-11.7%
  - Paper and pulp:-51.4%

Japan's Policies on Energy Efficiency

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	Industrial sector	Consumer sector		Transportation sector
		Commercial sector	Household sector	
Regulatory Measures	Energy Management			
	Performance Standards(Top Runner Program, etc.)			
	Visualization (Energy-Saving Labeling System, etc.)			
Promotional measures	Standardization (ISO 50001, etc.)			
	Subsidies for facility purchasing and interest payments			
	Tax incentives for facilities, buildings, automobile			
	R&D including on high performance heat pumps, etc.			
	Activities for awareness raising including forums, seminars, etc.			

Designed to facilitate evolving efforts by private sector, through:

- Peer pressure - Obligation to make efforts for 1% reduction of energy consumption in an annual average, periodic reporting on energy consumption
- Robust internal governance - Obligation to assign energy managers
- Technological innovation - Top Runner program

National Energy Management System : EC Act

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■ -Energy Manager as "Key Person" to Promote EE&C

Top Management

Submission of
- **Periodical Report on Energy Use**
- **Medium-long Term Plan for improvement**

Government

EC Act

Advising on
- Improvement plan of Energy Efficient equipment and facilities
- Organization for Energy Efficiency and conservation

Authorization of the competency and position of the Energy Manager

Registered Energy Manager

- Making the **Periodical Report**
- Keeping the energy consuming facilities in sound condition
- Caring out **"Energy Audit"**

< candidates for energy managers >
Energy engineers, Maintenance engineers, Process engineers.
They are usually nourished through In-house training and OJT training. If necessary, enterprises may utilize the ECCJ's training course.

- **Instruction** to the employees for energy conservation activities
- Technical advice for energy efficient operation of the facilities

Engineers (middle management) ＜Energy Conservation Activities＞ **Employees**

Top Runner Program

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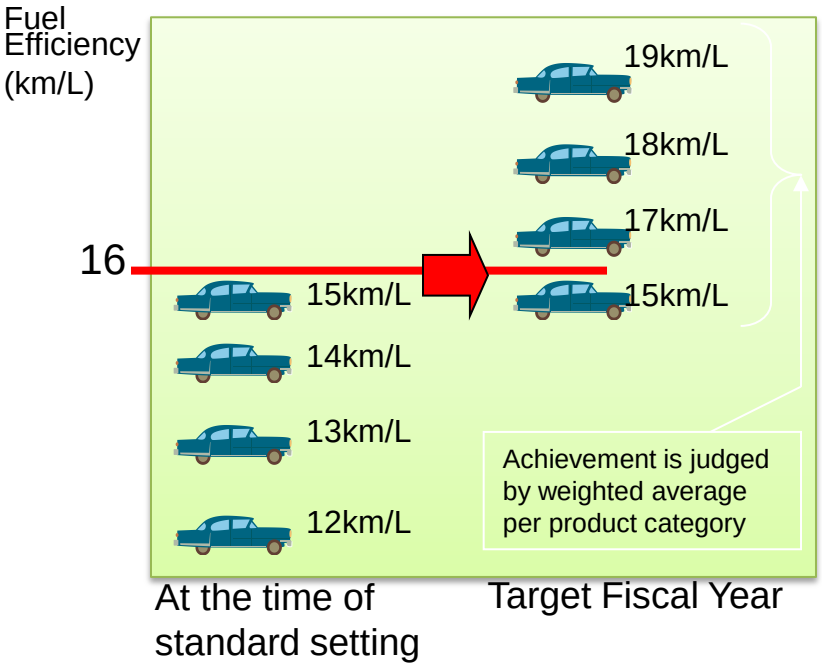
- "Top Runner Program", introduced in 1999, is a mandatory program, which encourages competition among companies by setting the efficiency targets for the next 3 to 10 years.
- With companies' efforts, the program has contributed to the significant improvement of energy efficiency of consumer electronics and automobiles.

Example of Top Runner Program



Improvement of energy efficiency

Gasoline passenger vehicles
48.8% (FY1995→FY2010)

Air-conditioners
(For ones of 4.0kW or less in cooling capacity)
32.3% (FY2005→FY2010)

Electric refrigerators
43.0% (FY2005→FY2010)

TV sets (LCD and PDP TV)
29.6% (FY2004→FY2008)

etc.

Expanding Top Runner Program

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Energy Conservation Measures in Consumer Sector

Top Runner Program for Building Materials, etc.

✓Certain items that do not consume energy themselves but contribute to higher efficiency of energy consumption in housing, buildings, or other equipment will be added to the Top Runner program.

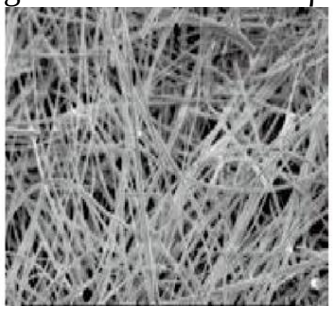
Specified equipment (28 items, as of January 2014)

1. **Passenger cars**
2. **Trucks**
3. **Air conditioners**
4. **Television receivers**
5. **Video tape recorders**
6. **Lighting apparatuses**
7. **Copying machines**
8. **Computers**
9. Magnetic disk devices
10. **Electrical refrigerators**
11. **Electrical freezers**
12. **Heaters**
13. **Gas cooking appliances**
14. **Gas water heating appliances**
15. **Oil water heaters**
16. **Electric toilet seats**
17. **Vending machines**
18. **Power transformers**
19. **Jar rice cookers**
20. **Microwave ovens**
21. **DVD recorders**
22. **Routing equipment**
23. **Switching equipment**
24. **Multifunction office machines**
25. **Printers**
26. **Heat pump water heaters**
27. **Industrial motors (three-phase induction motors)**
28. **LED lamps**

Now includes

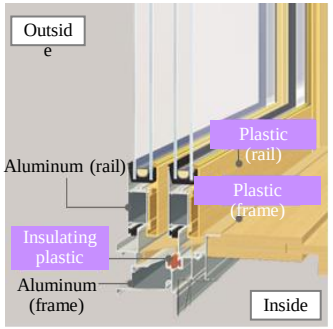
Insulation

High-performance glass wool (fine fibers)
Avg. fiber diameter: 4-5 μm



Windows

Al-plastic composite sash + low-E multilayer glazing



Energy-Saving Labeling System

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- Labeling for manufactures and retailers started in 2006.
- Out of 28 products under the Top Runner program, 25 are covered by labeling for manufacturers and 5 for retailers.

Examples of Energy-Saving Labels

Energy conservation standard achievement percentage	Annual Energy Consumption
166%	42kWh/year

Target year FY20XX

Green :satisfies efficiency

Energy conservation standard achievement percentage	Annual Energy Consumption
42%	166kWh/year

Target year FY20YY

Orange :insufficient efficiency

Currently, this labeling covers 21 products out of 28 products under Top Runner Program.

Example of a label for retailers

【Multi-stage rating system】
- Energy-saving performance is indicated from 1 to 5 stars in the market.
- Stars indication will be reviewed yearly.

【Estimated annual electricity cost】

Examples of Automobile Labels

Fuel Efficiency Standard +20% achieved

+10% achieved

Fuel Efficiency Standard achieved

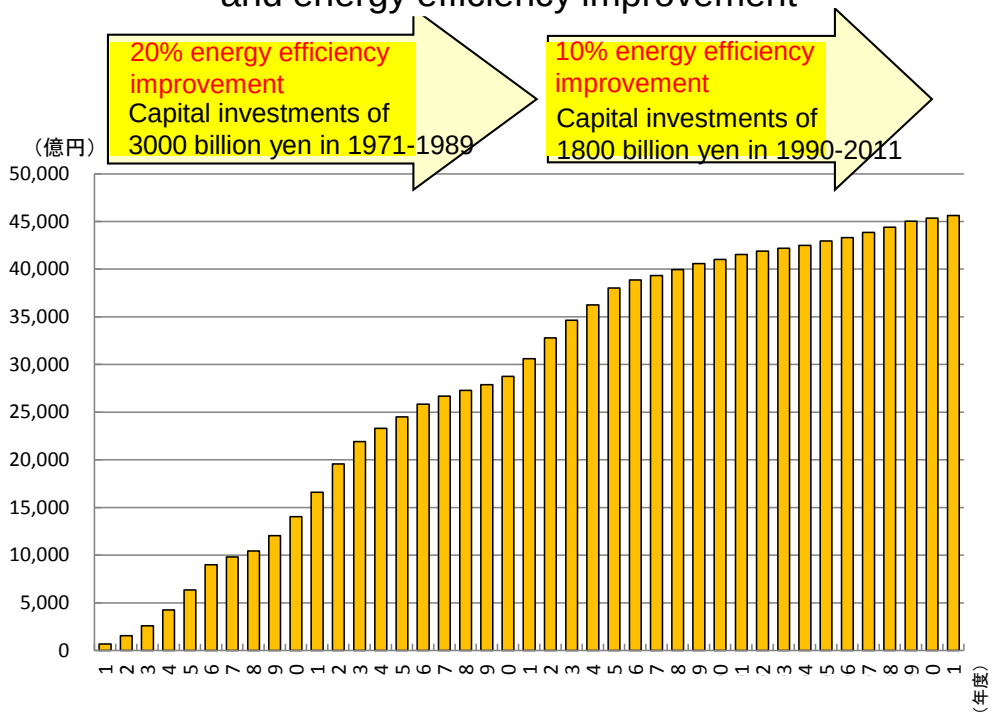
Automobile labels linked to tax incentives; if the fuel efficiency standard +20% achieved, tax exempted.

R&D for Energy Efficiency

- The Government of Japan implemented a large scale 15-year investment plan in 1970's (130 billion yen).
- In FY 2013, the Government budget of 53 billion yen was allocated to support, among others, facility purchasing at factories, building renovation, energy auditing and R&D.
- Private sector voluntarily invested in efforts to improve energy efficiency.
  (Steel sector had made capital investments of appro. 5000 billion yen since 1971.)

"Moonlight" program	
Period	1978-1992 (thereafter integrated into "New Sunshine" program)
Total budget	130 billion yen
Themes	・Waste heat recovery ・Magnetoplasmadynamic ・High efficiency gas turbines ・New type power storage system ・Fuel cell power generation technology ・General-use stirling engine ・High performance heat pump ・Technology using superconductivity ・Ceramics gas turbine ・Distributed power storage system

Investments by steel sector in environmental protection and energy efficiency improvement



Global Contribution of Japan's Environmental and Energy Technologies

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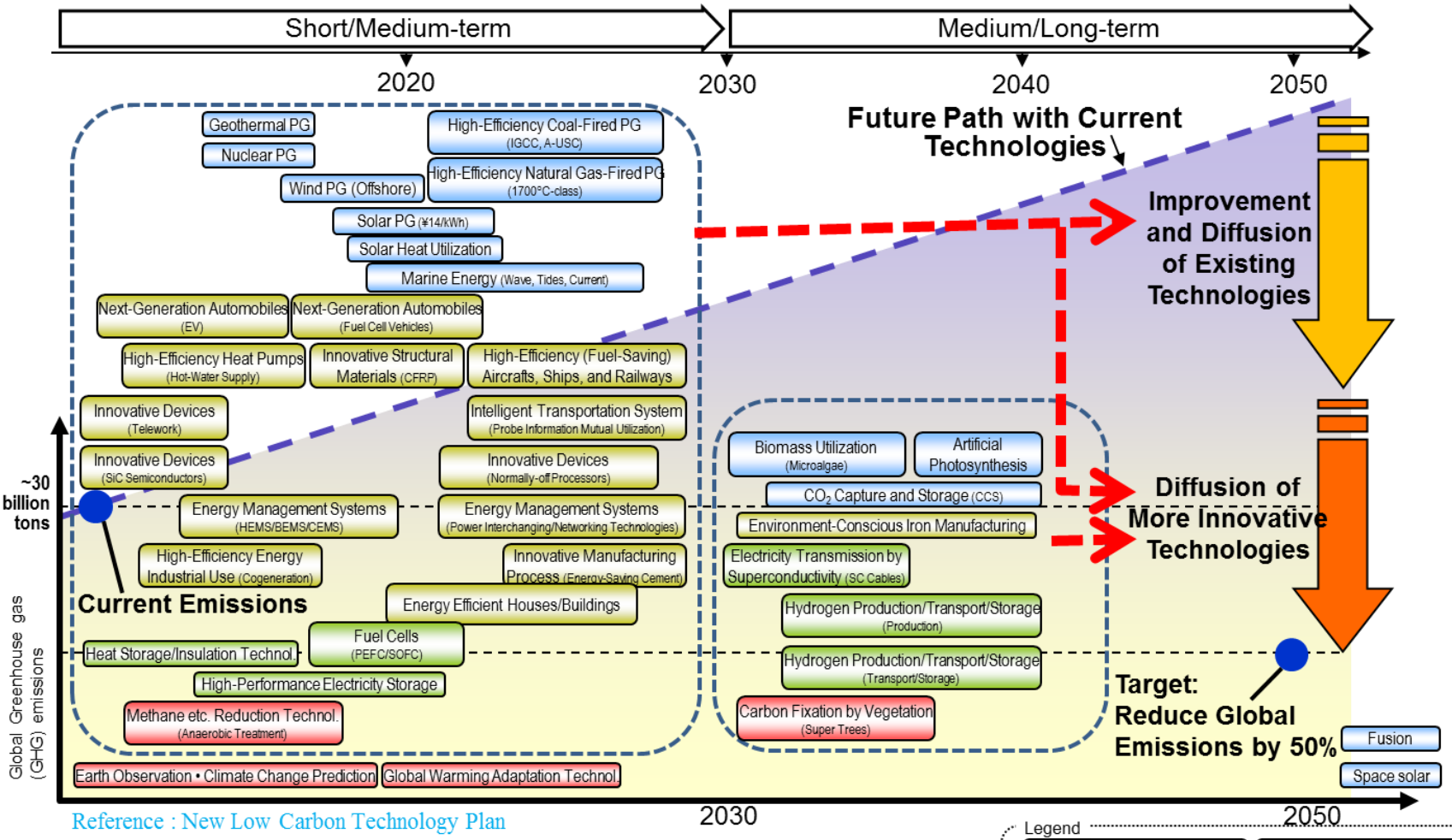
- Japan will continue to develop advanced environmental and energy technologies in the short/medium-term to medium/long-term, and will contribute to halving global greenhouse gas emissions by 2050 through global diffusion of such technologies.
- Steadily implement the revised Low Carbon Technology Plan as well as globally cooperate to develop and diffuse the technologies to cover approximately 80% of the reduction needed to halve global GHG emissions by 2050.
- Aim to **invest USD110 billion of both public and private finance over five years** on the premise of achieving national and regional primary balance surplus by Fiscal Year (FY) 2020.



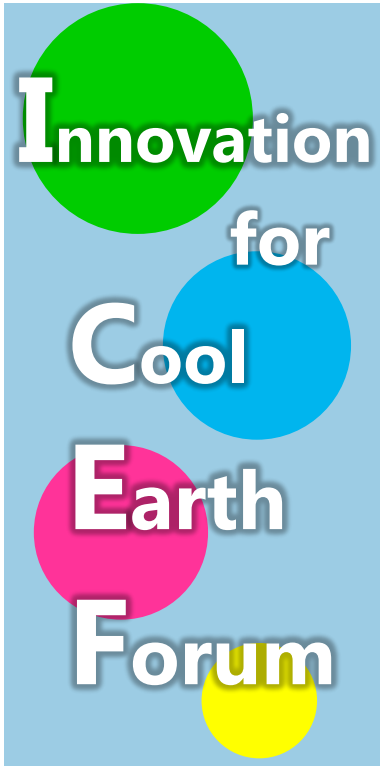
Reference : New Low Carbon Technology Plan

*1 The horizontal position of environmental and energy technologies indicates approximate time of practical diffusion based on the roadmap of each technology.
*2 "Future path with current technologies" indicates approximate transition of global GHG emissions assuming no change in efficiencies for existing technologies (e.g., generating efficiency of coal-fired generation)
*3 The downward arrows for "Improvement and diffusion of existing technologies" and "Diffusion of innovative technologies" indicate both contributions are required to reduce global GHG emissions; they do not specify the amount of reduction by each contribution.

Legend
Production • Supply
Consumption • Demand
Distribution • S/D Integration
Other Technologies
*1 Center of bars indicates approximate time of practical diffusion.
*2 Parentheses show technology examples. Refer to the full text for details.

Innovation for Cool Earth Forum (ICEF)

- On October 2013, Prime Minister Shinzo Abe announced that the Government of Japan will host an annual global conference, the **Innovation for Cool Earth Forum (ICEF)**.



1. Objectives

World-leading researchers, business persons, and policy makers meet and discuss every year,

- How to promote Innovation in the area of Energy and Environment Technologies
- How to disseminate these technologies to address Climate Change
- How to enhance the cooperation among Academia, Business, and Government

2. Organization

Host: NEDO, New Energy and Industrial Technology Development Organization
(Japanese public research and development management organization)
The Government of Japan

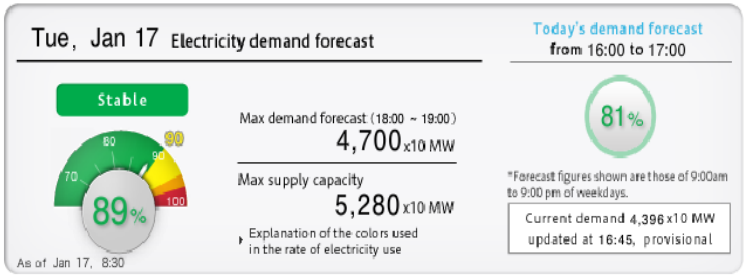
3. Date/Venue for 2014

Date : **October 7th**, 2014 : Opening Reception
October 8th, 2014 : Plenary Session, Concurrent Session
Venue : Hotel Chinzanso Tokyo, Japan

Awareness raising for energy conservation

- Memory of Crisis
  - Oil crises (1970s)
    - Limits on consumable quantity of oil
    - Restricted use of oil (partial suspension of neon signs, etc.)
  - Great East Japan Earthquake (2011)
    - Rolling blackout
    - Peak cut

Electricity demand forecast



- Ongoing efforts
  - A number of activities have been undertaken to raise people's awareness for energy efficiency improvement.

Exhibition

Fryers

Localized events

International Cooperation on Energy Efficiency

- Japan has been contributing to international cooperation for energy efficiency improvement at a global scale.
  - ➢ Bilateral cooperation
    - Support for establishing energy efficiency policies through capacity building, joint policy researches, etc.
    - Dissemination of technologies and know-how through joint demonstration projects
    - Support for standardization to promote BAT
    - JCM
  - ➢ Multilateral cooperation through IEA, IPEEC, GSEP（Sectoral）, APEC, etc.

Capacity building for the Philippines

IPEEC

Development of international standards through enhanced cooperation

- Promote international standardization, through proposing new international standards for evaluating the level of energy efficiency on advanced technologies (e.g., LED lighting apparatuses)
- Support developing countries to establish national standards and to establish regulations consistent with appropriate international standards to evaluate the level of energy efficiency. (e.g., Project for supporting ASEAN Member States to adopt appropriate standards/regulations for the inverter air conditioners)

Example-1: CO2 emission from steel manufacturing

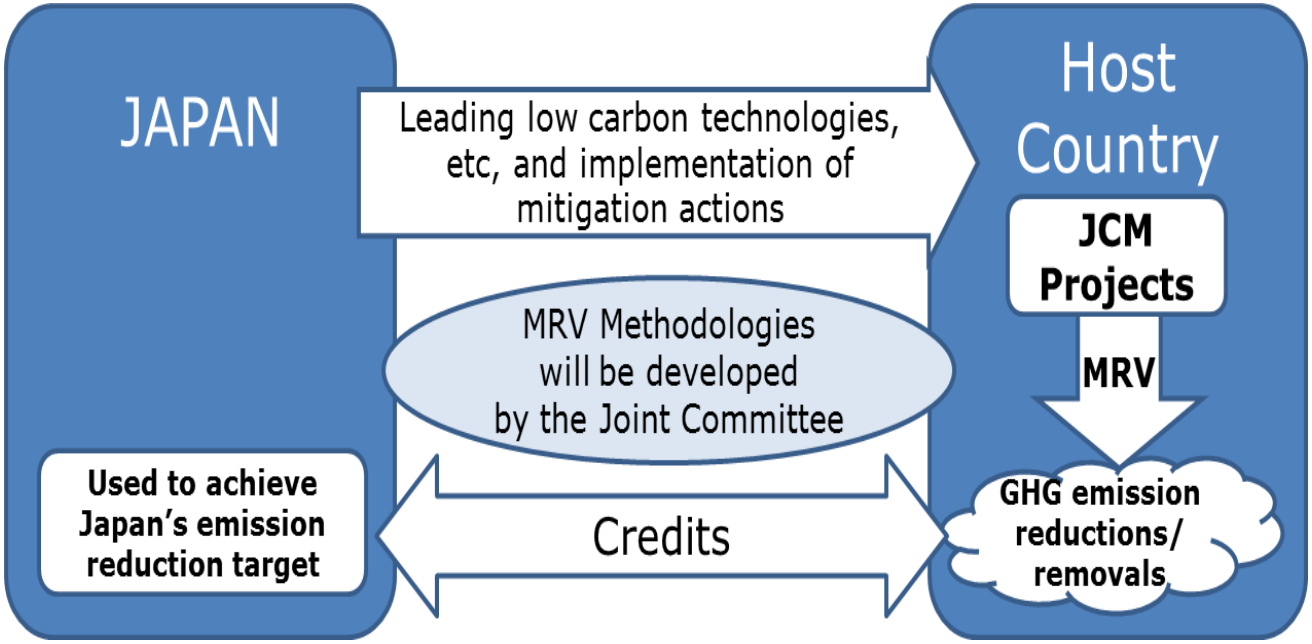
- ISO 14404 is the standard for calculating the amount of energy consumption and CO2 emissions from the steel manufacturing processes (Proposed by Japan)
- Any world steel manufacturers can use this standard. This standard would contribute to the reduction of CO2 emissions.

Example-2: Energy saving from home electric appliances

- Collaborate with Asian countries in developing testing methods to evaluate the ability of energy efficiency (e.g., air conditioners, refrigerators) which adjust to the climate and the life style of Asia.

Basic Concept of the JCM

- Facilitating diffusion of leading low carbon technologies, products, systems, services, and infrastructure as well as implementation of mitigation actions, and contributing to sustainable development of developing countries.
- Appropriately evaluating contributions to GHG emission reductions or removals from Japan in a quantitative manner, by applying measurement, reporting and verification (MRV) methodologies, and use them to achieve Japan's emission reduction target.
- Contributing to the ultimate objective of the UNFCCC by facilitating global actions for GHG emission reductions or removals, complementing the CDM.
- Japan has signed the bilateral document for the JCM with 10 countries (Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Viet Nam, Lao PDR, Indonesia, Costa Rica and Palau.)



[The Second East Asia Low Carbon Growth Partnership Dialogue] May 18, 2013 (Tokyo)
Mr. Kishida, Minister for Foreign Affairs, introduces the JCM to the ministers of the East Asia Summit countries

[Signing with Maldives] June 29, 2013 (Okinawa)
Mr. Ishihara, Minister of the Environment and Dr. Shakeela, Minister of Environment and Energy

[Signing with Viet Nam] July 2, 2013 (Hanoi)
Mr. Motegi , Minister of Economy, Trade and Industry and Mr. Quang, Minister of Natural Resources and Environment