

Prospects of Cooperation in the Energy Sector between Japan and Russia

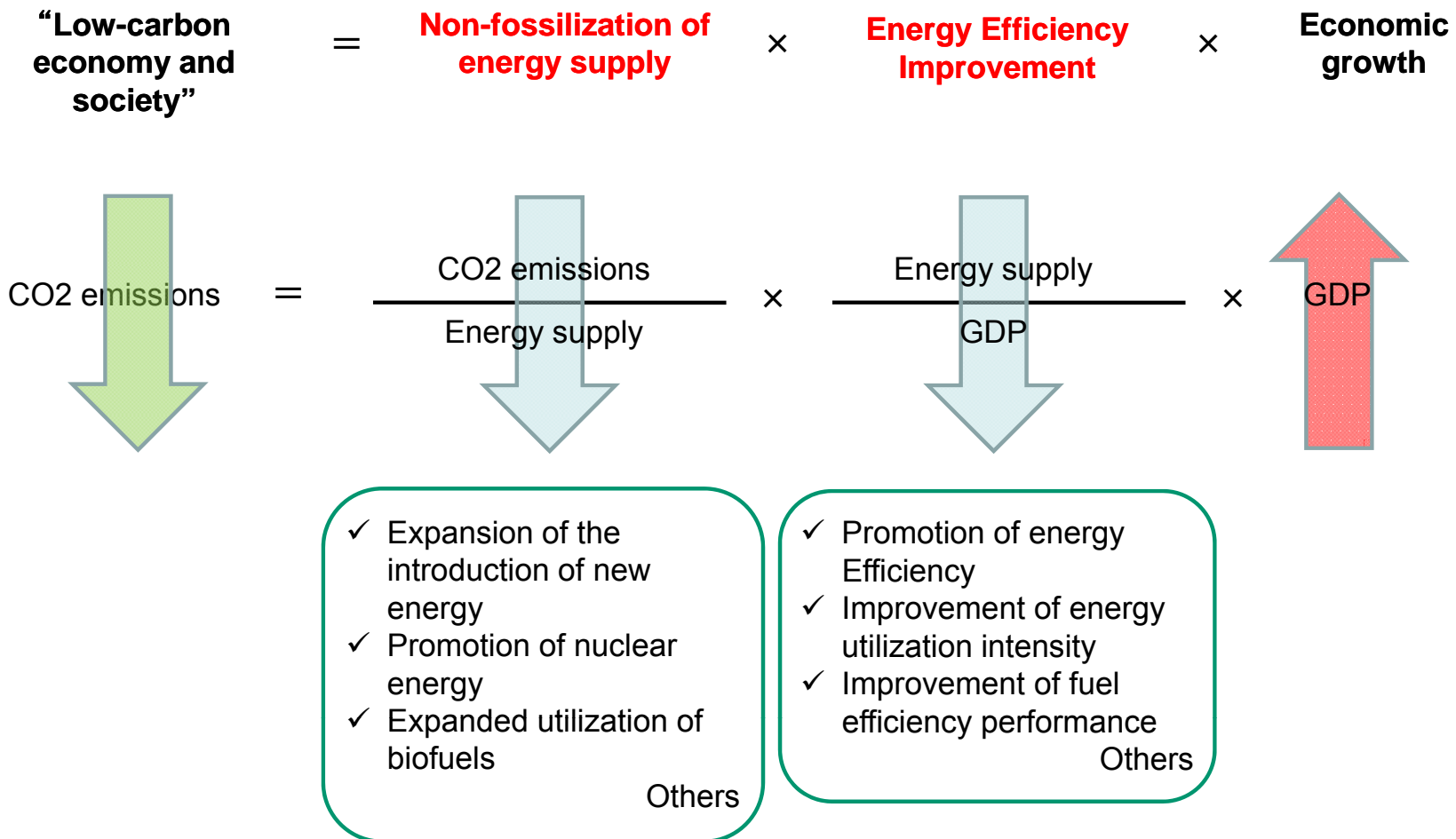
*May 13, 2010
Khabarovsk, Russia*

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Japanese policies in the area of Energy Conservation and Renewable Energy

“Low-carbon Economy and Society” Energy Conservation and New Energy



Energy Efficiency Policy

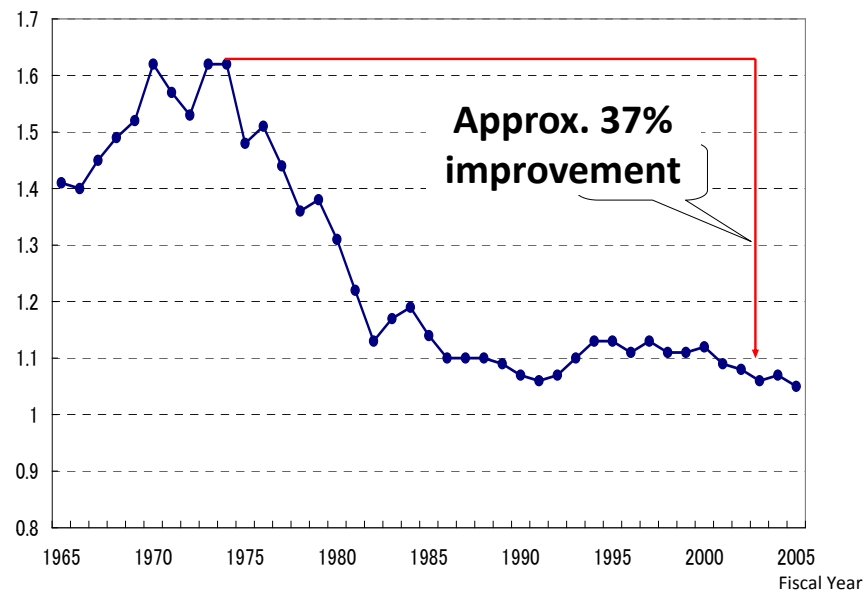


Energy Conservation Efforts of Japan after Oil Crises

- Japan improved the energy efficiency by 37% in last 30 years after the oil crises in the 1970s as a result of active activities made by both public and private sectors.
- Japanese primary energy consumption per GDP is the lowest in the world owing to various energy conservation measures taken for the respective sectors.

Energy use per real GDP of Japan

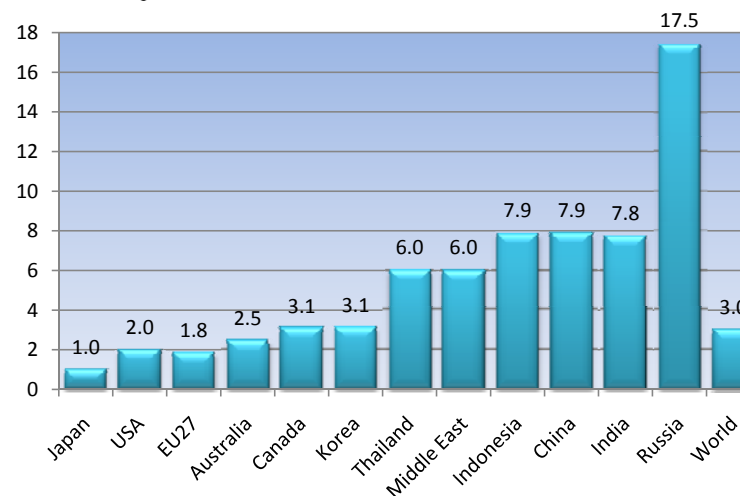
(Oil converted kilo ton/1 billion yen)



(Source) "Total Energy Statistics" by ANRE

Primary energy supply per GDP unit of each country (2007)

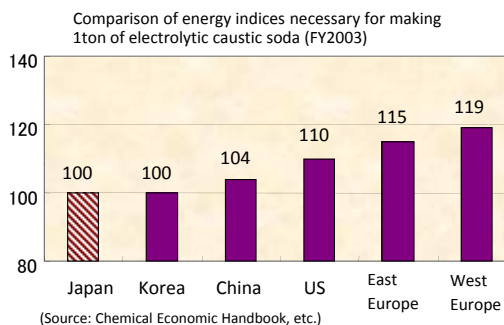
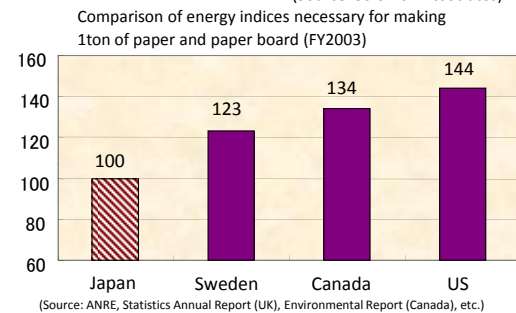
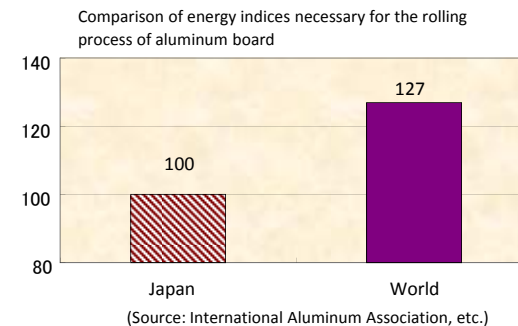
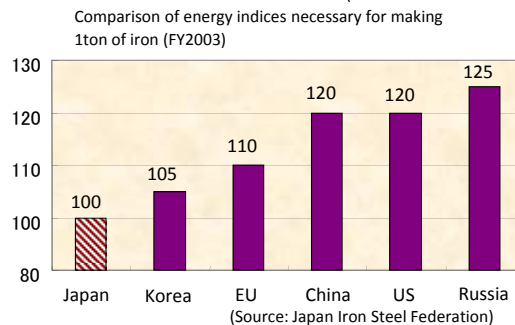
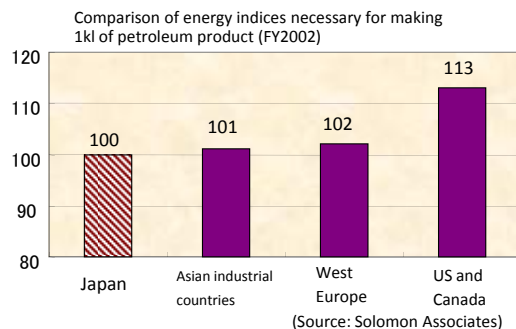
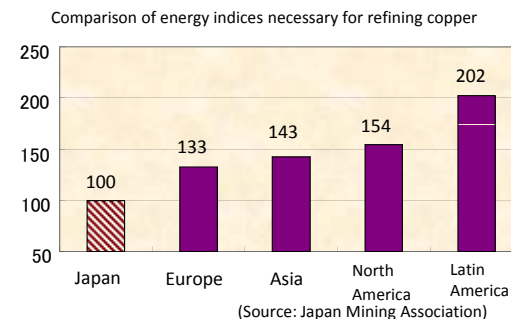
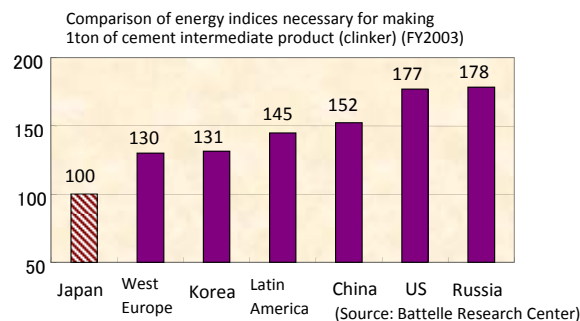
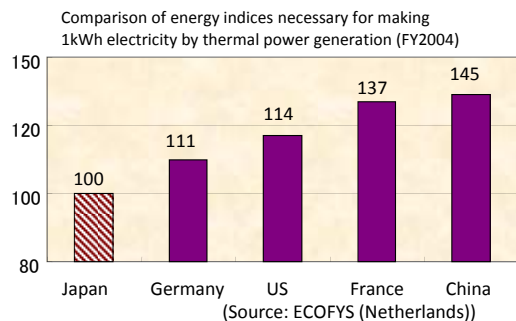
(Index Japan=1.0)



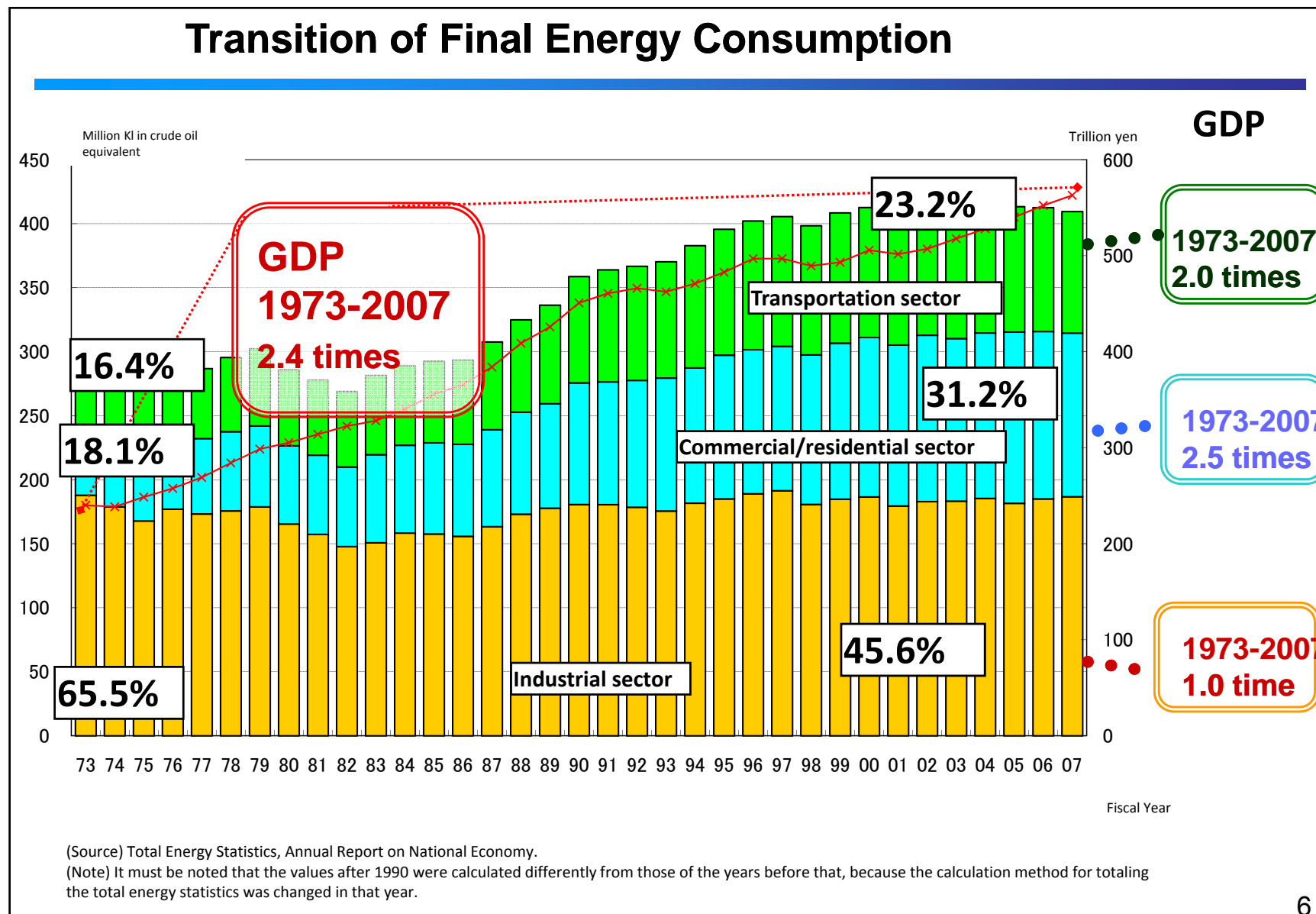
* Calculated according to IEA Energy Balances of OECD/Non-OECD Countries(2008edition)
Index of each country making Japan 1, based on the value dividing primary energy consumption by GDP.

Energy Consumption Efficiency of Each Sector

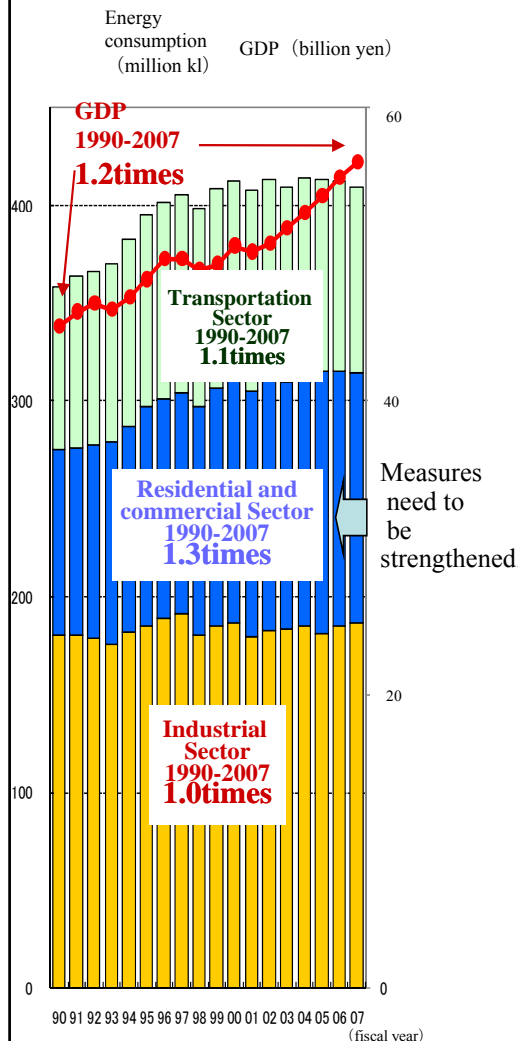
○ The energy consumption efficiency of Japanese manufacturers is the highest in the world and it was achieved by the activities to improve energy efficiency.



Source: Nippon-Keidanren International Cooperation Center
Excerpt from Outline of Follow-up Result, 2007
(dated November 14, 2007)
(<http://www.meti.go.jp/committee/materials/downloadfiles/g70216a04j.pdf>)



Overview of Japan's energy efficiency policy



Regulation

- Energy management obligation by Energy Conservation Law (Factories, Carrier, Consignor)
 - Factories : Introduce energy management by an unit of a company (in 2008)
- Enhancement of energy efficiency of buildings by Energy Conservation Law
 - Strengthen regulation (in 2008)
- Top Runner Program

Voluntary action

- Promotion of Nippon Keidanren's Voluntary Action Plan

Incentive

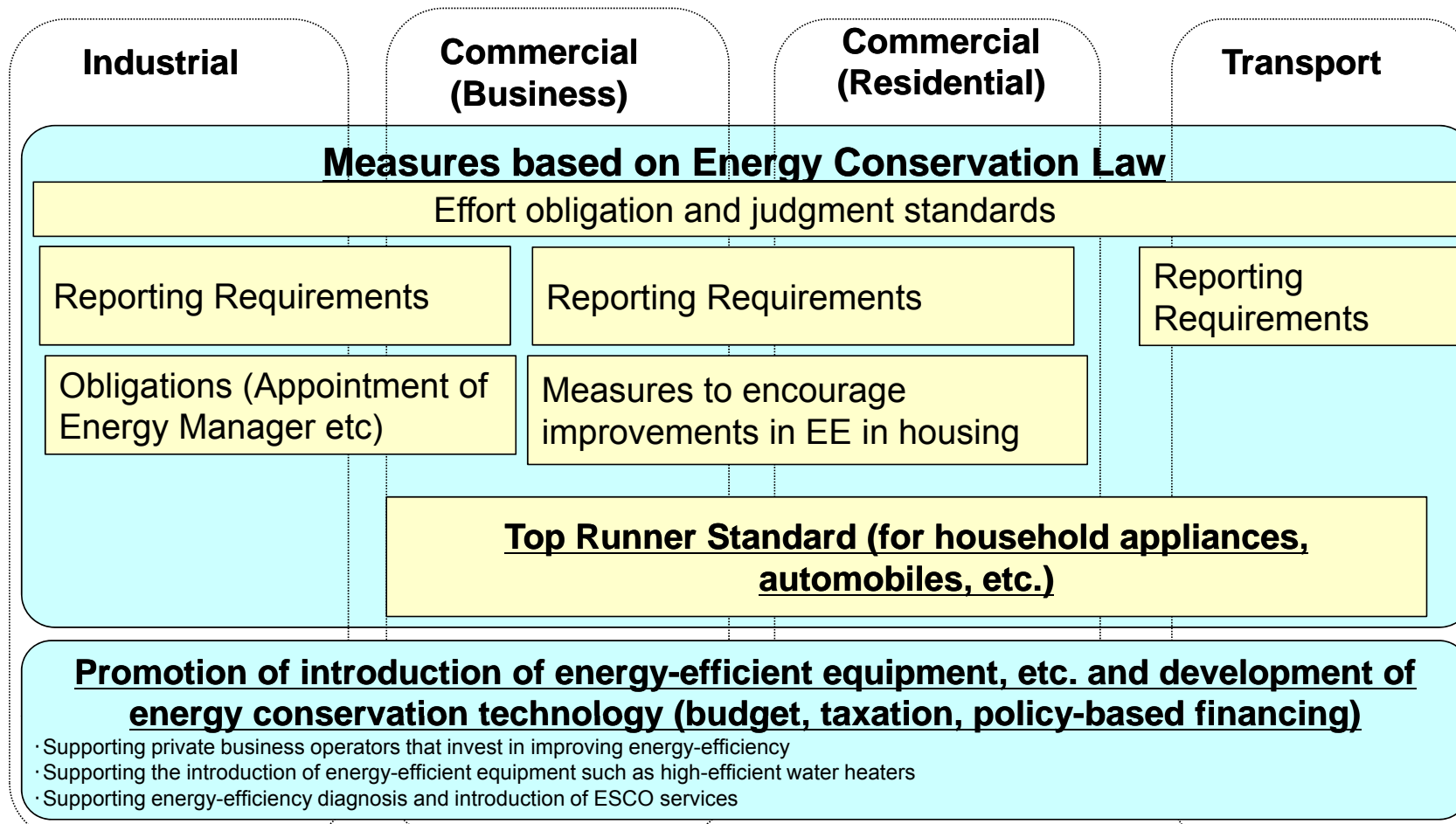
- Promotion of high fuel economy vehicles (clean energy vehicles)
- Subsidies for promoting energy efficient facilities (high-efficient building , high-performance industrial furnace etc.)
- Energy-saving labeling, Forum for Promoting energy efficient home electric appliances, etc.
- Tax incentive for energy efficient reform of residence , Low-interest loan

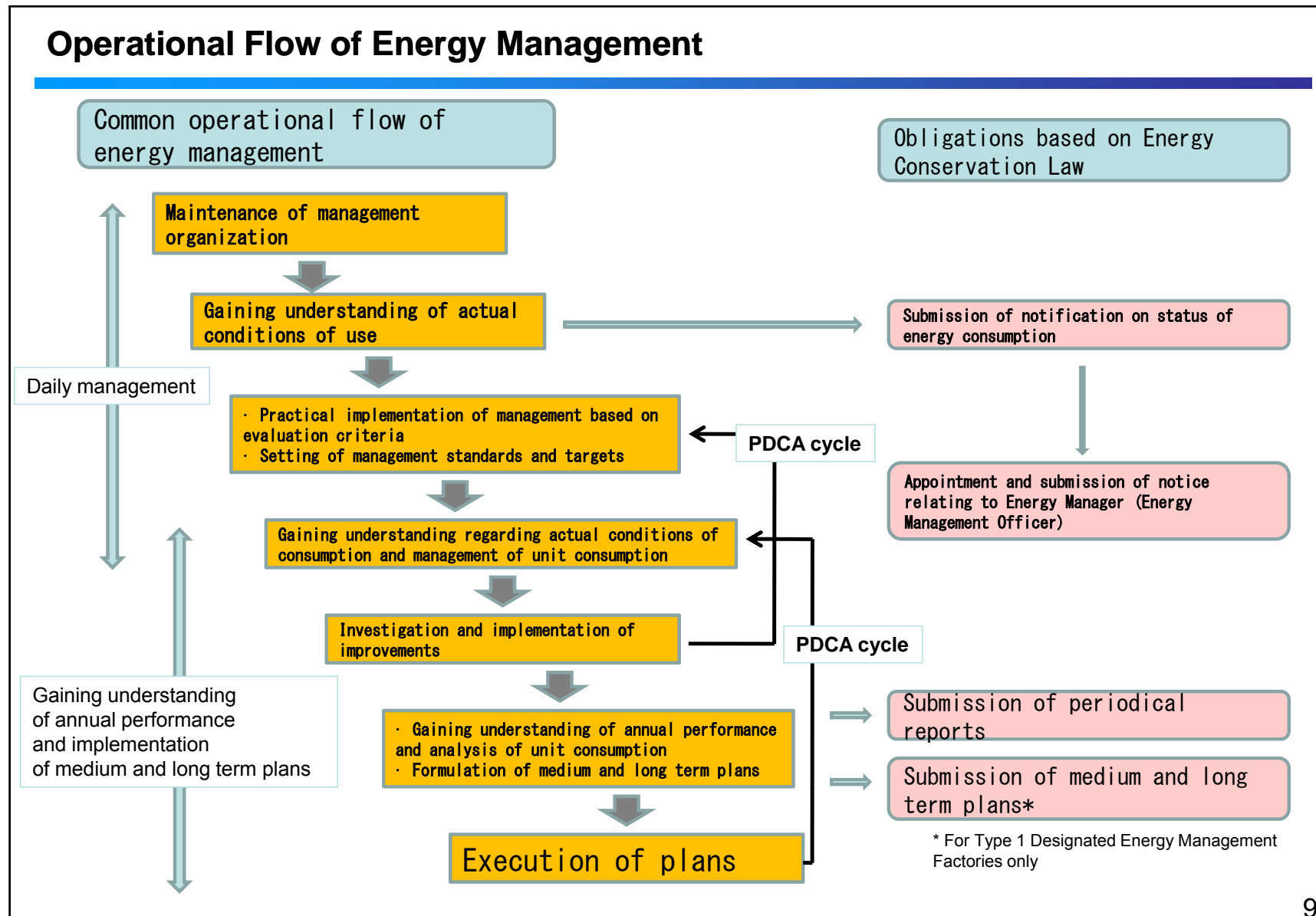
Cross Sectoral approach

- Providing information and promotion of national movement
- Promotion of energy efficiency technological development
- Promoting international cooperation

Overall Picture of Energy Efficiency Initiatives

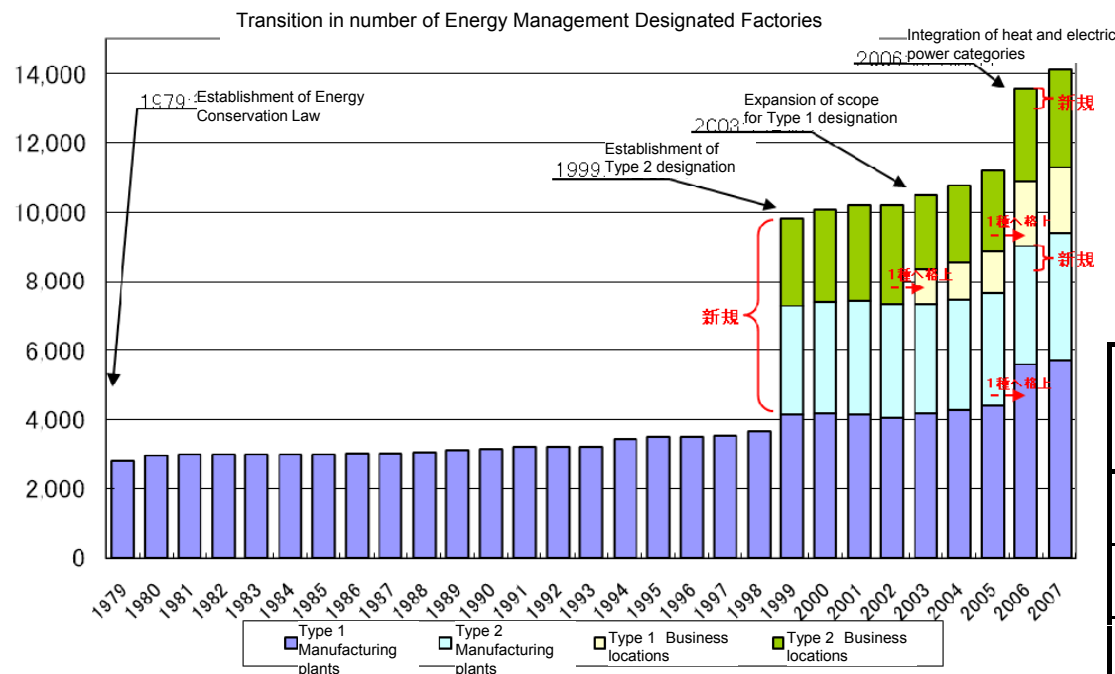
Energy Efficiency is promoted through both regulatory and supportive measures.





Status of Designation for Energy Management Designated Factories

- Numerous amendments have been established since initial establishment in 1979 with 14,116 business locations (total amount of consumption for heat and electric power at or over 1,500 kiloliters [crude oil conversion] per year) designated as of March 2008. Manufacturing plants comprise 9,375 of these business locations (66 %).



Number of designated factories
(as of end March 2008)

	Manufacturing plants	Business locations	Total
Type 1	5,719	1,921	7,640
Type 2	3,656	2,820	6,476
Total	9,375	4,741	14,116

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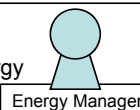
* Factory: A business location that belongs to five manufacturing business categories (manufacturing, mining, electric power supply, gas supply and heat supply).

Appointment of Energy Manager (Energy Management Officer)

In order to realize energy conservation, appointments are made for persons who are to play a **central role in promoting energy conservation in the field**, by submitting proposals to business operators and providing instructions to employees, based on specialized knowledge relating to energy management, such as maintenance and management of production facilities.

Requirements for Energy Managers

- Person must have a license for the Qualified Person for Energy Management of Type 1 Designated Factory



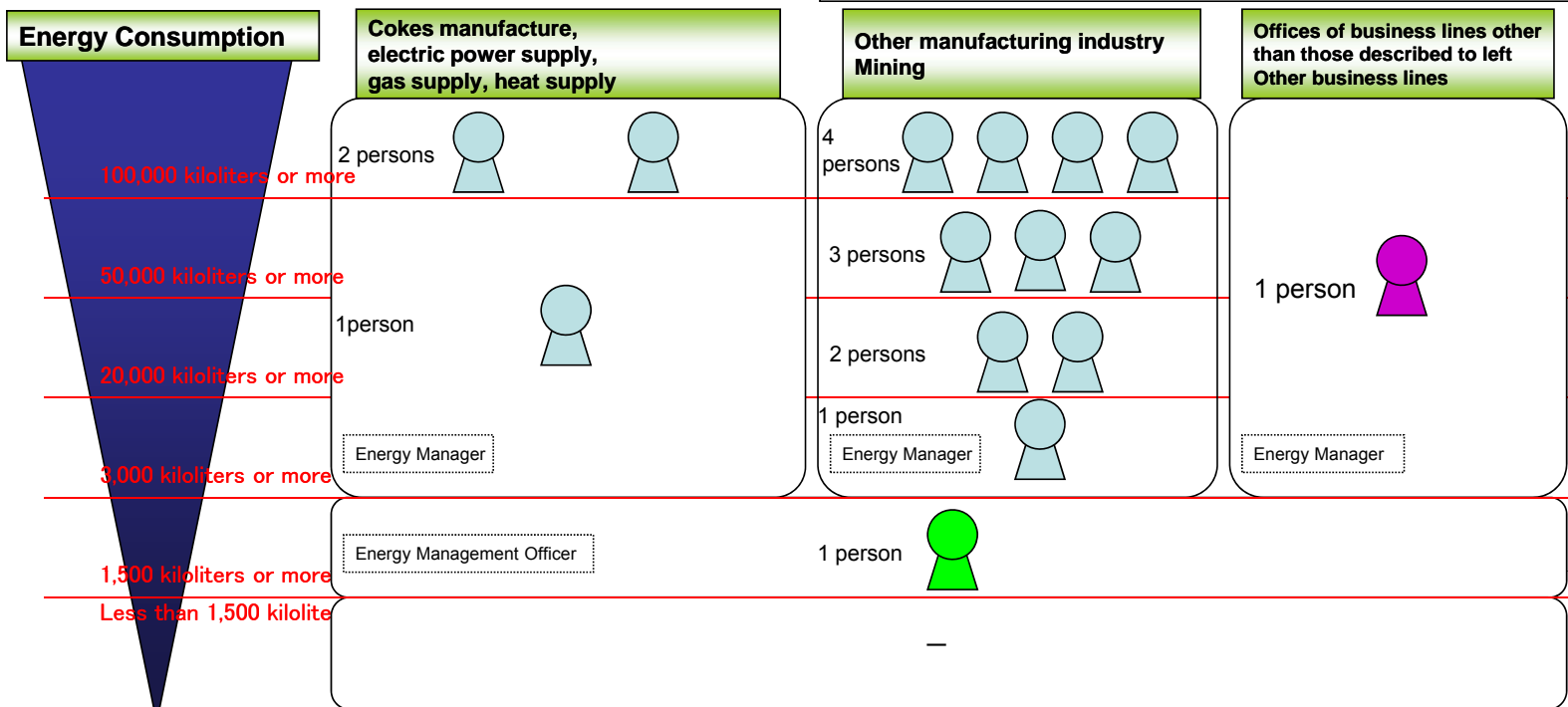
Energy Manager

Requirements for appointment of Energy Management Officers

- Person must have a license for the Qualified Person for Energy Management of Type 1 Designated Factory
- Person must have completed Energy Management Officer Course



Energy Management Officer



Registered Energy Manager

- Registered energy manager: National qualification established in 1948 on the basis of Energy Conservation Act
- Registered energy managers are required at plants with energy consumption of 3,000kl/year or more (approx. 8,000 locations in Japan)
- Qualified persons for energy management are required at smaller facilities

Registered energy manager

Examination passed (1 year of practical experience)

On site training completed (3 years of practical experience)

Total number of people with registered energy manager qualifications: 36,435

Qualified person for energy management

Seminars completed

Total number of those who completed the seminars: 21,088

Examination



On site training

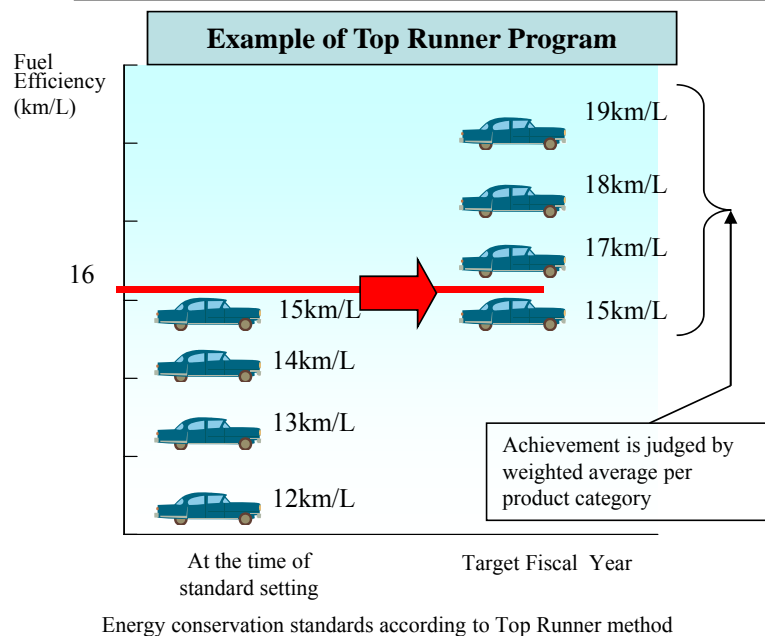


Seminars



Top Runner Program

- Energy conservation law stipulates energy conservation standards for domestic appliances and vehicles according to the Top Runner method. Manufacturers and the like are under the obligation to comply with the standards. For incompliance, manufacturers and the like may be imposed recommendation, publication, order, penalty (under one million yen penalty).
- 23 product types were made the target of the program.



Target products (23 products)

- | | |
|-----------------------------|----------------------------|
| 1. Passenger vehicles | 9. Magnetic disc units |
| 2. Freight vehicles | 10. Electric refrigerators |
| 3. Air-conditioners | 11. Electric freezers |
| 4. TV sets | 12. Space heaters |
| 5. Video-cassette recorders | 13. Gas cooking appliances |
| 6. Fluorescent lights | 14. Gas water heaters |
| 7. Copiers | 15. Oil water heaters |
| 8. Computers | 16. Electric toilet seats |

etc.

* Top Runner Program:

The concept of the program is that fuel economy standards for vehicles and energy conservation standards for electric appliances, etc. shall be set exactly the same as or higher than the best standard value of each product item currently available in the market.

Past Energy Conservation Effect due to Top Runner System

Device	Improvement of energy consumption efficiency (recorded)	Improvement of energy consumption efficiency (estimated)
Television receiver (cathode-ray tube television)	25.7% (FY1997 → 2003)	16.4%
Video tape recorder	73.6% (FY1997 → 2003)	58.7%
Air conditioner (room air conditioner) *	67.8% (FY1997 → 2004)	66.1%
Refrigerator	55.2% (FY1998 → 2004)	30.5%
Freezer	29.6% (FY1998 → 2004)	22.9%
Gasoline passenger vehicle *	22.8% (FY1995 → 2005)	22.8% (FY1995 → 2010)
Diesel truck *	21.7% (FY1995 → 2005)	6.5%
Vending machine	37.3% (FY2000 → 2005)	33.9%
Fluorescent lighting equipment *	35.6% (FY1997 → 2005)	16.6%
Computer	99.1% (FY1997 → 2005)	83.0%
Magnetic disk unit	98.2% (FY1997 → 2005)	78.0%
Copying machine	72.5% (FY1997 → 2006)	30.97%
Electric toilet seat	14.6% (FY2000 → 2006)	9.7%
Gas water heater (instantaneous gas water heater, gas-heated bath)	1.6% (FY2000 → 2006)	4.1%
Gas cooking machinery (cooker)	15.7% (FY2000 → 2006)	13.9%
Gas heater	1.9% (FY2000 → 2006)	1.4%
Oil heater	5.4% (FY2000 → 2006)	3.8%

Uniform Energy Saving Label

- The Revised Law Concerning the Rational Use of Energy enforced in April 2006 stipulates that retailers shall make efforts to provide information. In light of this, a guideline was formulated, including providing information by using uniform energy-saving labels.
- The system started in October 2006. As of August, 2008, televisions and air conditioners the targets of this system.

Uniform Energy Saving Label



【Multi-stage rating system】

- Energy-saving performance is indicated in 5 stages, from 1 to 5 stars, from low to high performance of products offered in the market.
- In order to clarify the compliance level with the Top Runner standard, arrows are placed under the stars, showing achievement and non-achievement.

【Energy-saving labeling system】

- Products which achieved the Top Runner standard carry a green “e” mark, while others carry an orange “e” mark.
- Achievement level and annual electricity consumption are also indicated.

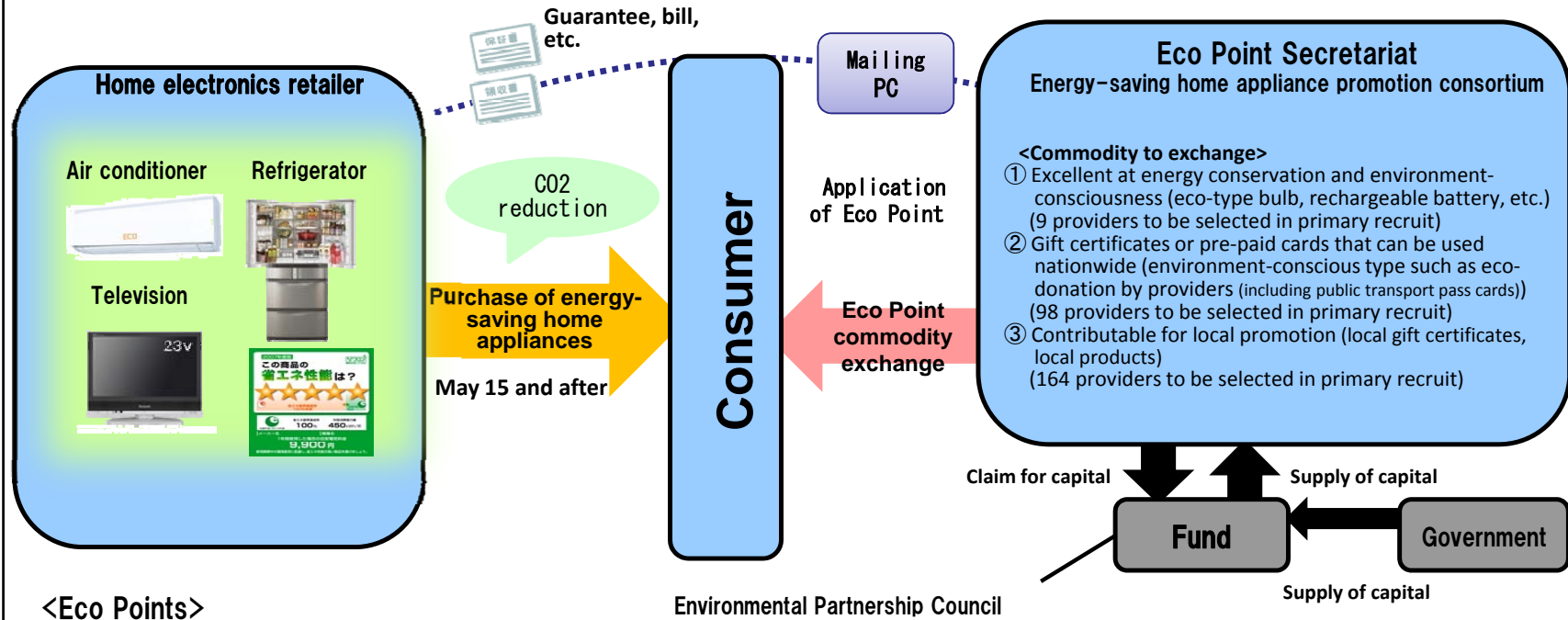
【Expected annual electricity bill】

- The expected annual electricity bill is indicated to show the energy consumption efficiency (annual electricity consumption) clearly.

Spread of energy-saving home appliances by using Eco Point

[Purpose] ① CO2 reduction, ② Economic activation, ③ Spread of ground-wave digital television

[When to start] Acceptance of Eco Point application starts in July and commodity exchange starts in August.



<Eco Points>

	Air conditioner	Refrigerator	Television
Purchase of product with uniform energy-saving label equivalent to 4 stars	6,000 to 9,000 (3 steps according to cooling capacity)	3,000 to 10,000 (4 steps according to capacity)	7,000 to 36,000 (5 steps according to screen size)
Further recycling	3,000	5,000	3,000

Promotion of High-Efficiency Boilers

- Energy demand for hot-water supply dominates approximately 30% of total energy consumption in a household.
- A subsidy system has been introduced to promote the proliferation of energy efficient hot-water systems.

CO2 Refrigerant Heat-Pump Boiler (ECO CUTE)

Utilizing the principle of a heat-pump used in an air-conditioner, it can be heated with energy of approximately 3 times more than input energy. Energy saving of **approximately 30%** compared to a traditional combustion-type boiler is achieved.



Latent-heat Recovery Boiler (ECO JOZU)

Recovers the latent heat of exhausted gas, which is usually wasted. Energy saving of **approximately 15%** compared to a conventional combustion-type boiler is realized.



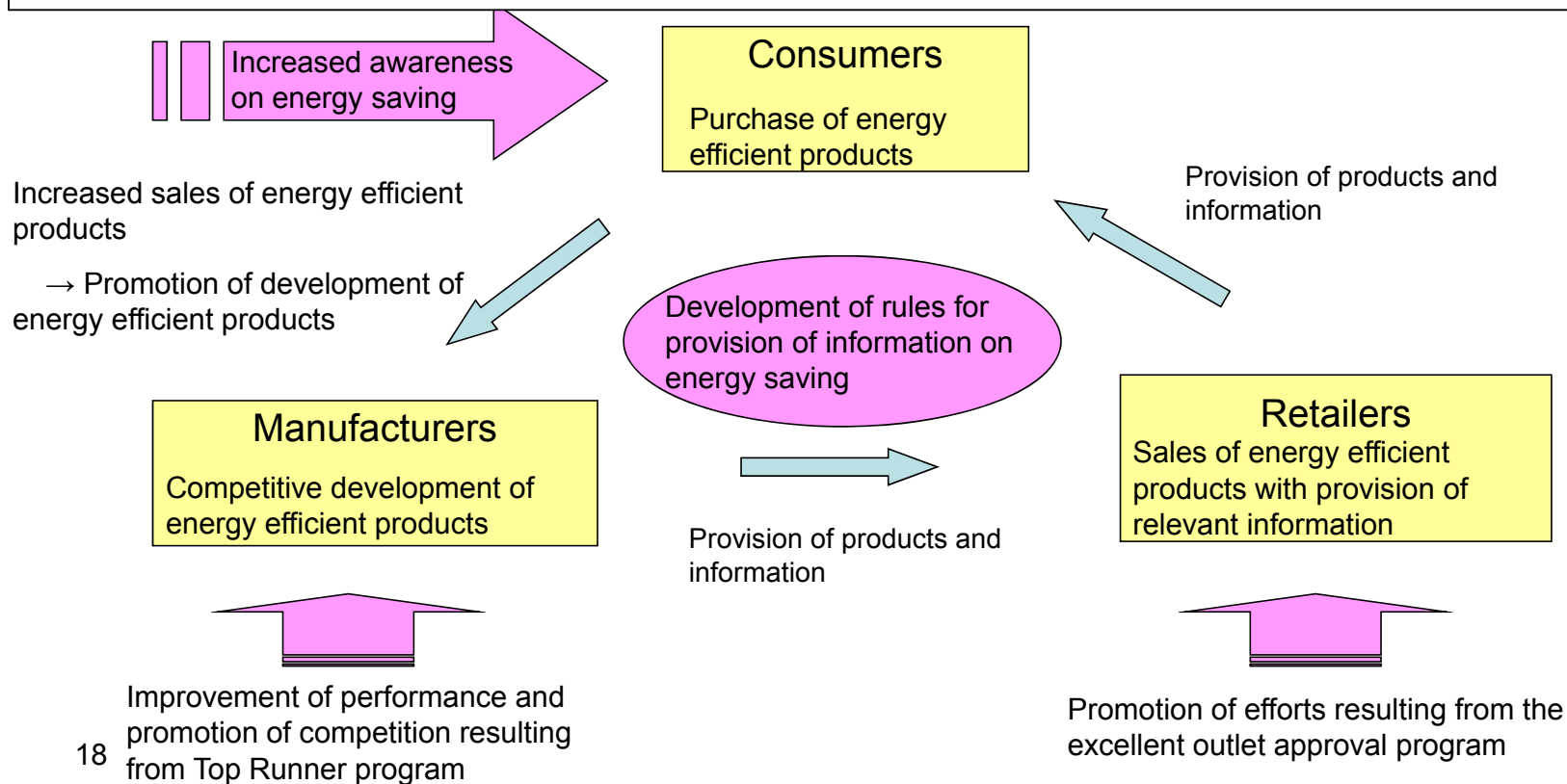
Gas Engine Boiler (ECO WILL)

Uses the gas-powered engine's exhaust heat and power to provide heat (main) and electricity (sub) for **approximately 10%** of overall energy saving for a building.



Positive Growth Cycle in Popularization of Energy Efficient Products

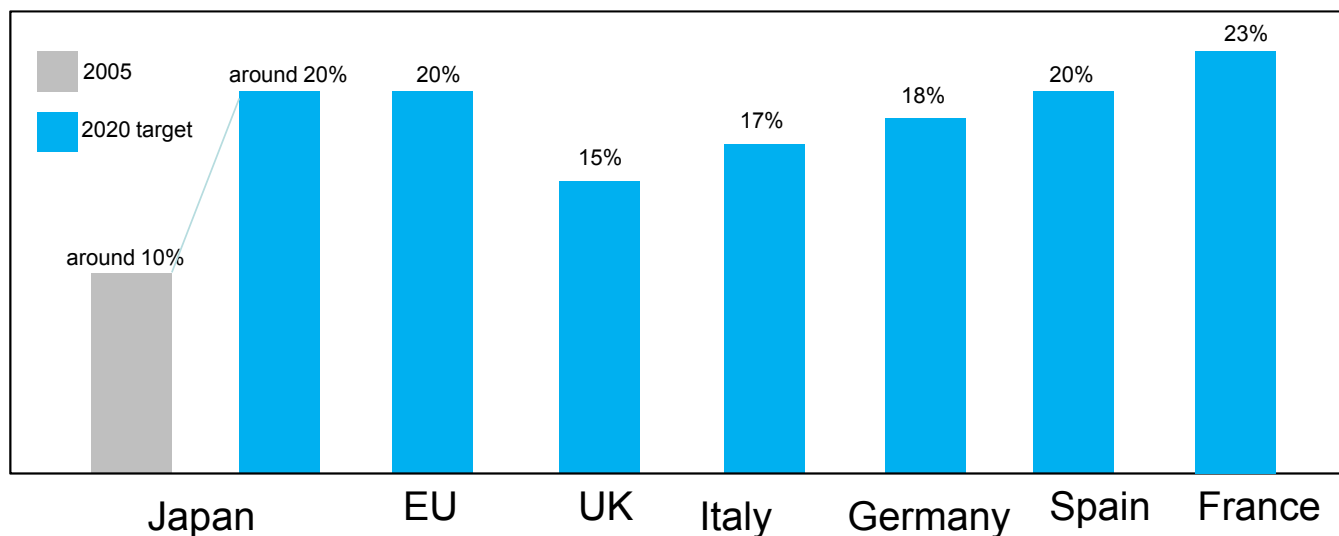
- By providing necessary information, encourage consumers to select energy efficient products.
- Popularization of energy efficient products will act as incentives for development of further energy efficient products.



Renewable Energy Policy



Renewable Energy Deployment Target compared to Final Energy Consumption



*) Including heat supply from heat pumps as prescribed at EU Directive

New Utilization Targets under the RPS Law

RPS Law (Special Measures Law on Use of New Energy by Electric Utilities or Renewables Portfolio Standards Law)

<Utilization Target for fiscal 2014>

- 16 billion kWh as realistic and ambitious” goal.

<Improvement of the RPS Law System>

- Photovoltaic power is recognized as twice its value (2011 – 2014).
- Small- and medium-scale hydraulic and geothermal power generation was included
- Biomass power generation: recognition of material recycle of wood chips.

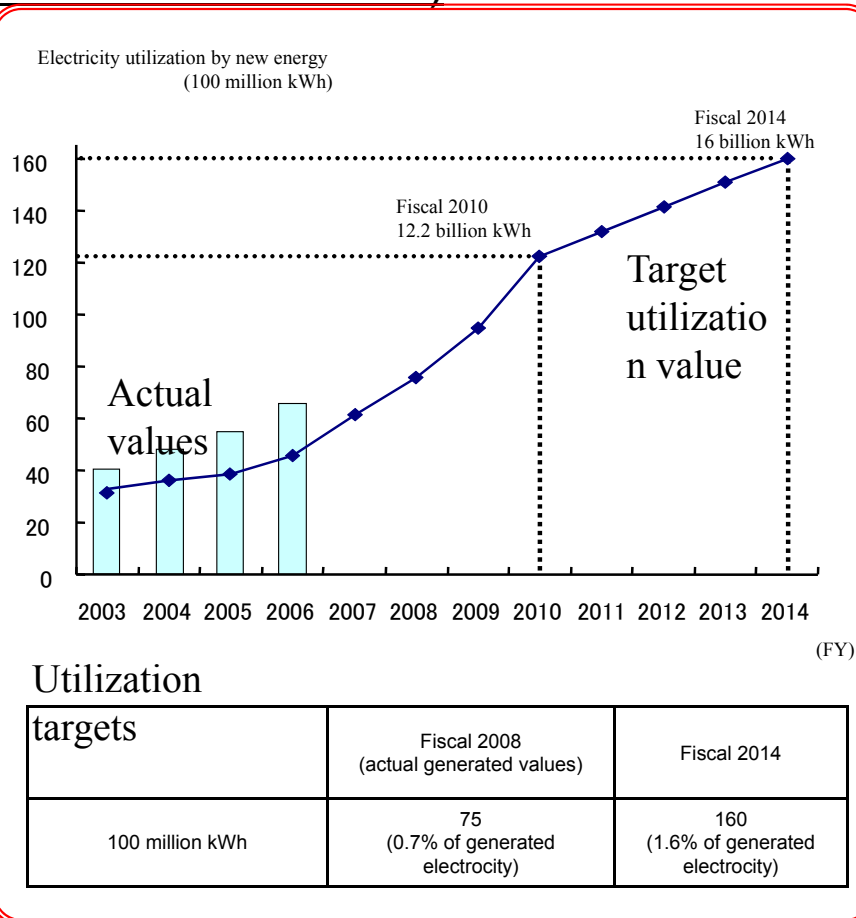
<Governmental Measures>

- The government in future will expand the potential for the introduction of new energy by reviewing various restrictions in addition to financial assistance for new energy.

- *Utilization of Green Certificate

- *Policies on system interconnection, etc.

- *Promotion of technological development to reduce cost of PV generation



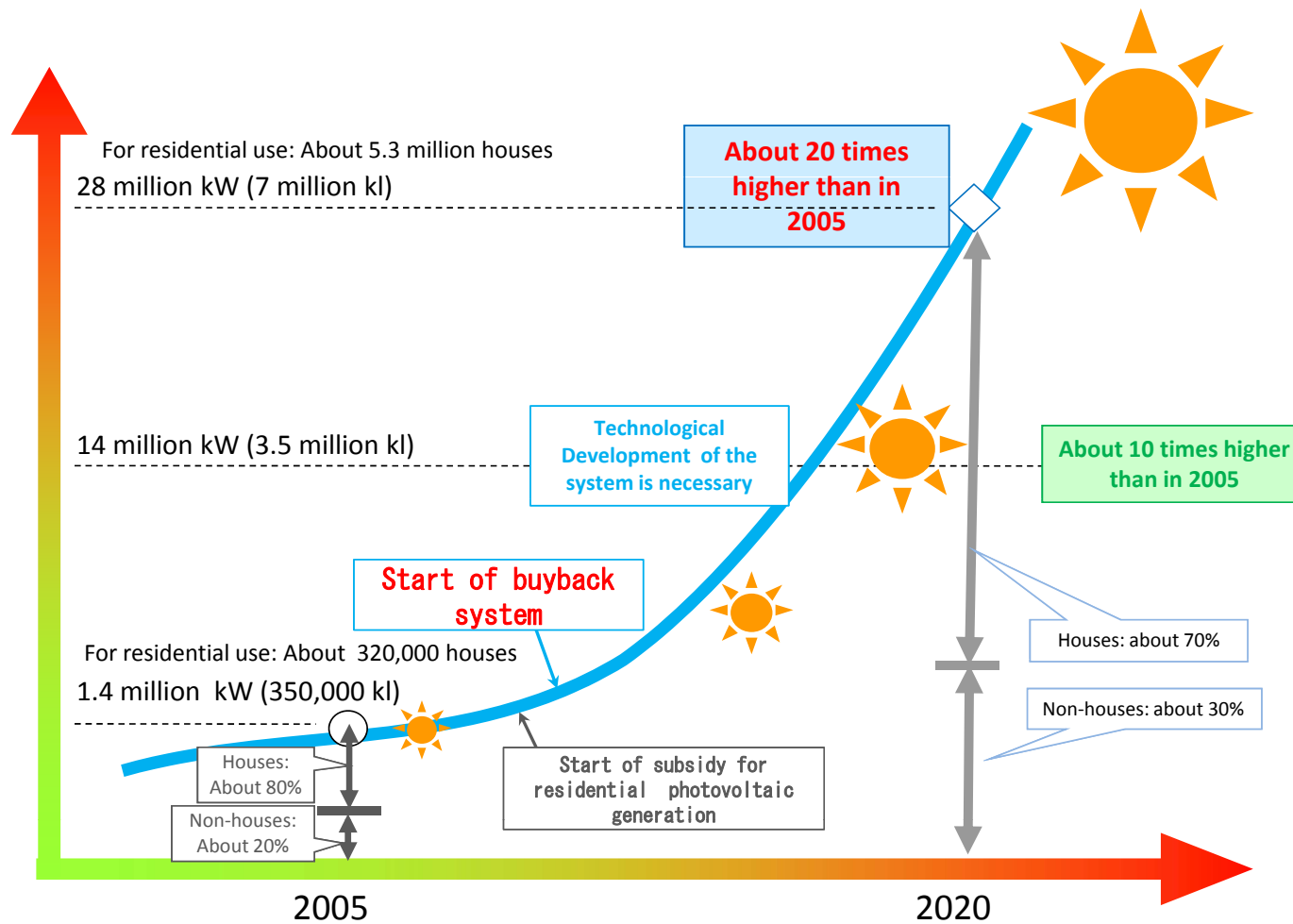
Utilization

targets	Fiscal 2008 (actual generated values)	Fiscal 2014
100 million kWh	75 (0.7% of generated electricity)	160 (1.6% of generated electricity)

Incentives & Regulation to Install PV Systems

	Subsidies	Tax Incentives	Regulation
Residence	<p>70,000 yen per kW start from Jan.2009</p> <p>(approx.10% of cost of system)</p>	<p>included in Home Loan Taxation amount to 1% of the loan balance is deducted from the income tax for 10 years</p> <p>also included in Renovation Promotion Taxation amount to 10% of the renovation cost (up to 5 million yen) is deducted from the income tax, in case of the renovation for energy conservation</p>	RPS Act
Industrial Sector (Factory, Buildings, etc.)	<p>Upper Limit : 1/3 of Total Cost</p> <p>in case of large scale plants cooperate with local governments, upper limit : 1/2 of total cost</p>	<p>Investment Promotion Taxation for Improvement of Energy Supply & Demand Structure</p> <p>amount to 7% of the total cost is deducted from the corporation tax or 30% special depreciation (for small and medium-sized enterprises)</p>	
Public Sector (Local Government, School, Hospital, etc.)	<p>Upper Limit : 1/2 of Total Cost</p>	— —	

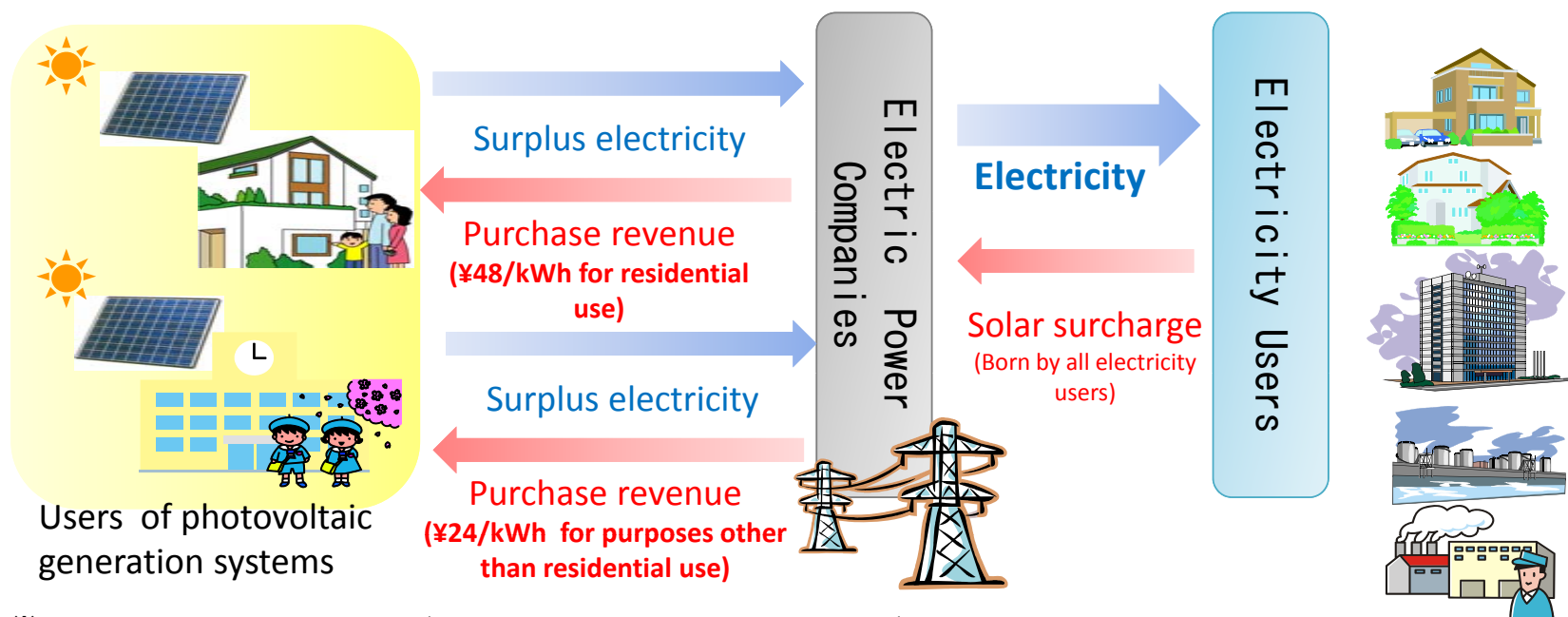
Scenario for Introduction of Photovoltaic Generation (Estimate)



Outline of the New Buyback Program for Photovoltaic Generation

Major points of the buyback system

- Of the electricity generated by photovoltaic generation systems, surplus electricity will be purchased.
- The buyback period is within the 10 years from the start of the program. The buyback price is fixed.
(※The buyback price may differ depending on the fiscal year in which a panel is installed. In the initial stages, it is ¥48/kWh for residential use [less than 10kW].)
- Expenses will be born by all electricity users.



※In the initial stages after installation, ¥48/kWh for residential use (less than 10kW) and ¥24/kWh for other uses. In the case where a private electric generator is also installed, ¥39/kWh and ¥20/kWh, respectively.

Action Plan for Promoting the Introduction of Solar Power Generation

- To encourage players to promote solar power generation through concrete measures
 - increasing the amount of installations of solar power generation systems tenfold by 2020 and 40-fold by 2030
“Action Plan for Achieving a Low-carbon Society” (approved by the Cabinet in July 2008)
 - Promotion of the installation of solar power generation systems in homes, businesses and public facilities
“Comprehensive Immediate Policy Package” (formulated by the government and the ruling parties in August 2008)

【Content】

(1) Measures on the supply and demand sides

(a) Supply-side measures

- Technology transfer
- Foster cooperation between solar cell manufacturers and housing companies
(formulate standard execution guidelines,) etc.

(b) Demand-side measures

- Build and enhance Next-Generation Energy Parks

< Residential sector >

- Dramatically increase the installation of solar power generation systems through subsidies for residential solar power systems or other means.

< Business sector >

- Promote installation by SMEs.
- Promote “mega solar” (large-scale solar power generation plants) construction projects

< Public facility sector >

- Provide detailed information on installation examples for the owners of public facilities (roads, railroads, ports, airports, etc.)
 - Encourage information sharing between companies engaged in the solar power generation business and those operating public facilities
- Promote installation in a greater number of public facilities (by enhancing

public

assistance available to such facilities).

< Educational institutions >

- Increase the installation of solar power generation systems in elementary, junior high, and high schools as well as universities and other schools.
- Encourage schools to use solar power generation as a topic in their

environmental

education and certify those that have done so as model schools.

(2) Building institutional infrastructure

- improve institutional infrastructure, including regulatory instruments

(3) Consolidating infrastructure for the solar energy-related industries.

【Reference:Existing examples】

Roads:Slope in Highway



(Osaka prefecture:200KW)

Railroad:Post-house



(Kanagawa prefecture:140KW)

Airport: cargo terminal
(planning)



(Haneda airport: 2000KW)

※ image

Educational Institution:
window roofs of a school



(Tokyo prefecture:21KW)

Waterfront: Industrial complex
(planning)



(Osaka prefecture:18,000KW)

※ image

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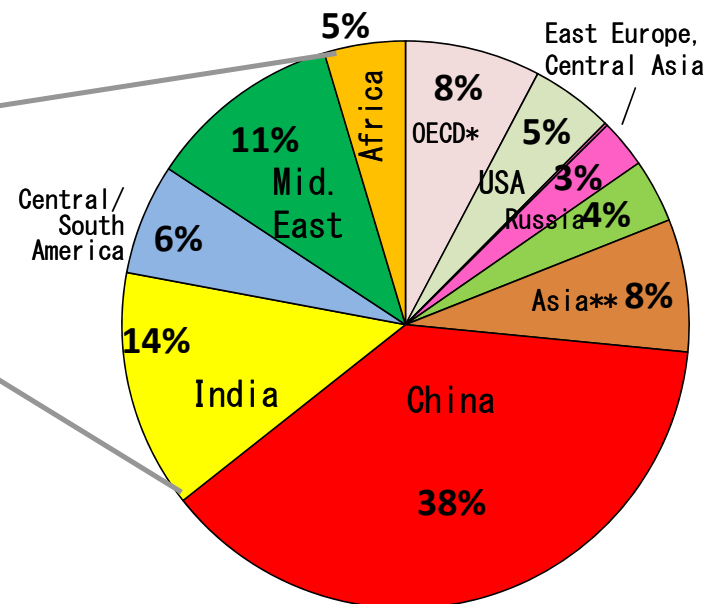
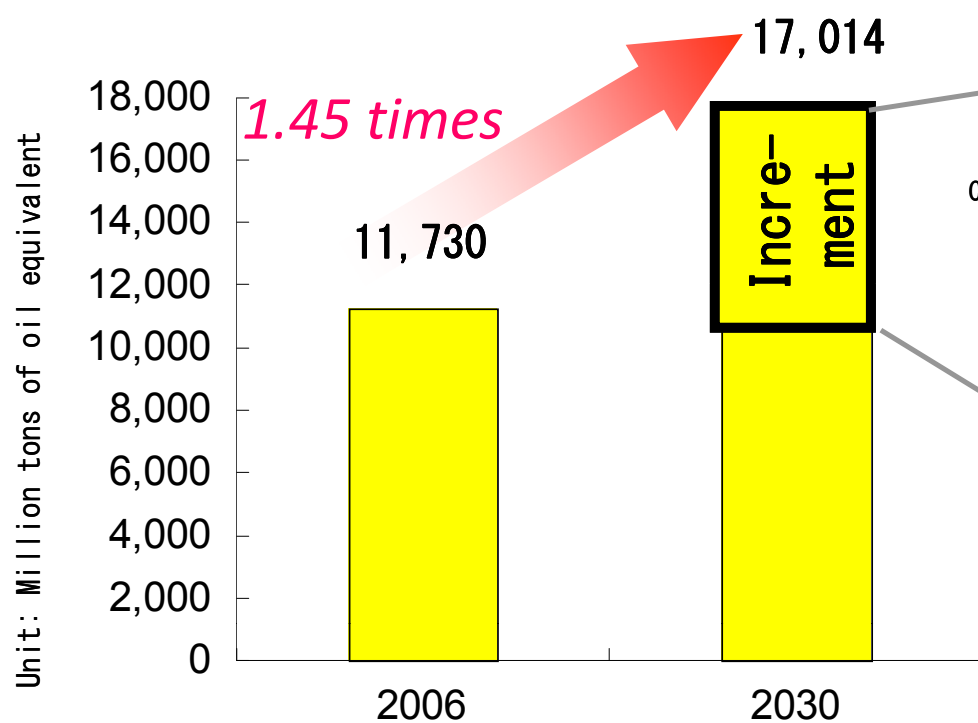
International Cooperation



Prospects of World Energy Demand

- By 2030, world energy demand will increase by 1.45 times of demand in 2006.
- China and India will account for over 50% of the increase (China: 38%, India: 14%).
- Additionally, the Middle East accounts for about 11%, which will be one of the greatest demand areas.

[Prospects of world energy demands]



*Excluding Japan and USA

**Excluding Japan, China, India and Korea

[Details of increment of energy demands]

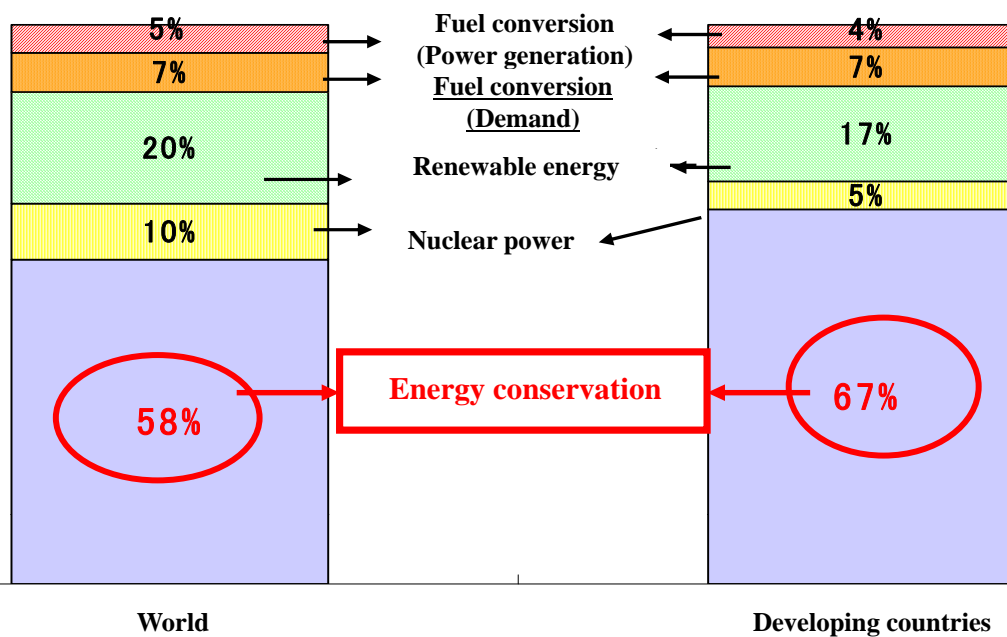
Source: IEA World Energy Outlook 2008

CO₂ Reduction Potential

Energy Efficiency accounts for over 50% of CO₂ reduction potential.

Contribution of each measures to the CO₂ reduction potential in 2030
(Analysis by IEA)

* Proportion making the entire reduction potential 100



International Cooperation in Energy Conservation and Renewable Energy

Support to Develop Institutional Framework

- Acceptance of trainees
 - Creation of laws and systems (tax systems, subsidy programs and others) to promote energy conservation
 - Introduction of energy-saving and other associated technologies, and methods for management of energy conservation
 - Japan’s energy cooperation initiative (East Asia Summit).
(Energy Conservation) Accept 1,000 trainees from East Asian countries in five years and send 500 experts in five years
(Renewable Energy) Accept 500 trainees from East Asian countries in five years
- Dispatch of experts
 - Long-term dispatch of experts to prepare energy conservation plans (formulation of energy-conservation targets, action plans and others) and develop energy conservation institutions such as law system.
 - Short-term dispatch of experts for energy conservation diagnoses of factories

Energy conservation and Renewable energy model projects

- Demonstrate the effectiveness of Japan’s practical energy efficient technologies with actual models and others in the countries where such technologies have not come into wide use yet
- Disseminate proven energy-saving and alternative-energy technologies on a business basis
- The greatest challenge facing us is to promote wide use after completion of projects.



Coke dry quenching equipment (CDQ)

Support of business based technology deployment

- Support “Japanese Business Alliance for Smart Energy Worldwide” to realize energy-saving businesses and others with the government and private sectors in one
- Public-private forums to support business to business transactions

Multilateral Frameworks

- IEA, APEC, APP, EAS, IPEEC, IRENA etc.

JASE-World was established in October, 2008

Japanese Business
Alliance for
Smart
Energy
- Worldwide



Mr. F. Mitarai,
Chairman of JASE-W



Purpose

Contribution on Greenhouse Effect through Promotion of Energy Conservation Technology over the World

Activities

- Publication of **Smart Energy Products & Technologies** and its distribution to the World.
- Globalizing **Japan's eco-friendly businesses** through the government – private joint activities.
- **Deep discussion on specific business fields**
 - ① Heat Pump / Inverter Working Group
 - ② Energy Saving Solution Working Group
 - ③ Solar Power Working Group

Establishment : October 30th, 2008

Chairman : Mr. F Mitarai, Chairman of Japanese Business Federation

Main Members : 57 Companies, 19 Observers, 11 Governmental Organizations



Japanese Business Alliance for Smart Energy Worldwide

Thank you

