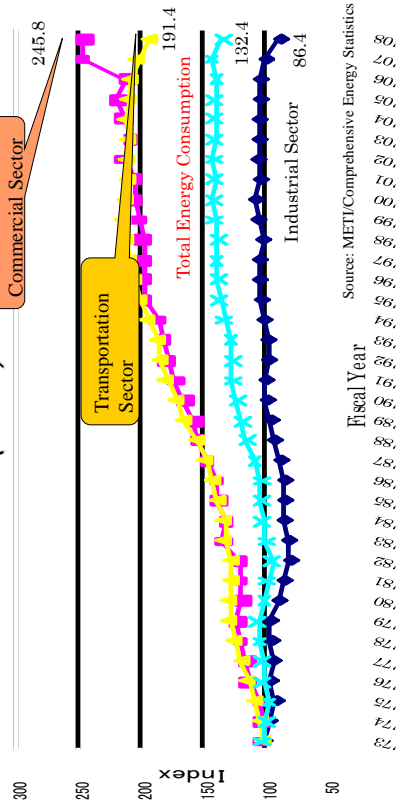


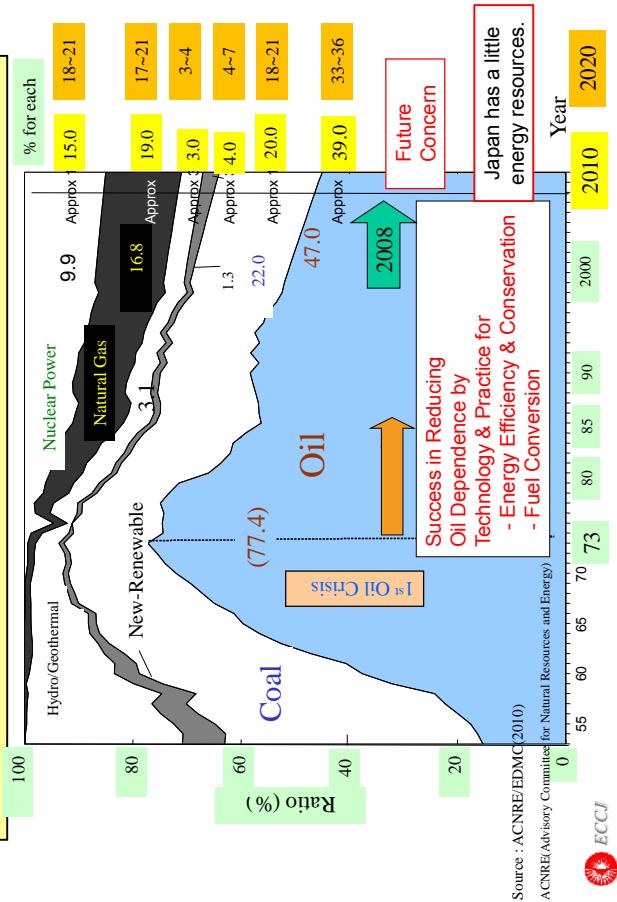
1. Trend in Final Energy Consumption by Sectors (2008)

< shown by index based on '73 >

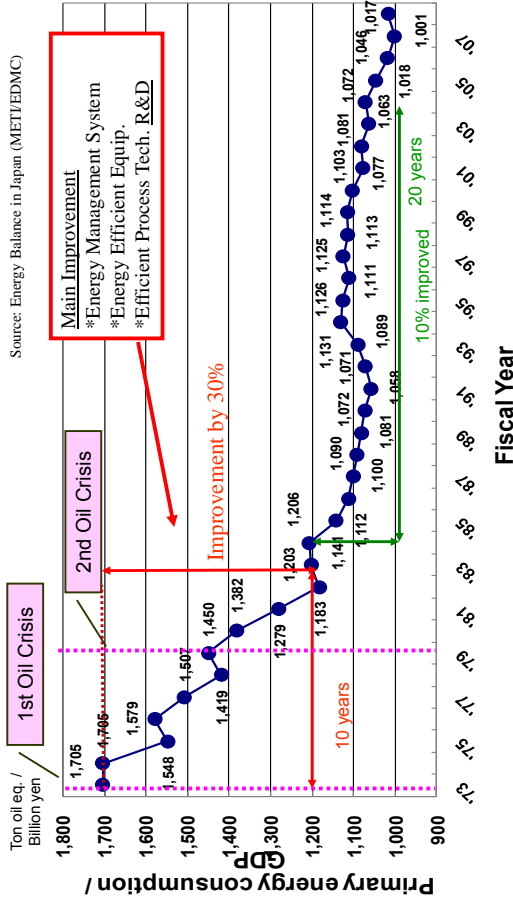


Amend the Energy Conservation Act (enforced in April, 2003), and enforce the regulation of large-scale buildings in conform with Type 1 designated factories. Enforce the energy conservation promoting activities of the residential and commercial sector.

3. Composition of Primary Energy Supply in Japan

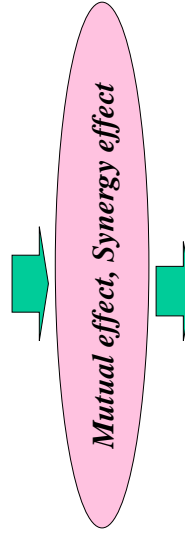


2. Changes of Primary Energy Intensity in Japan



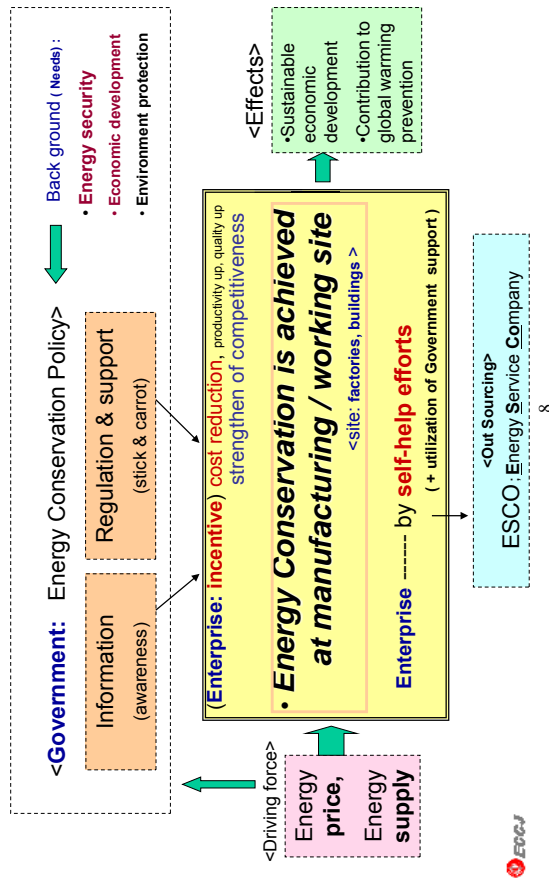
4. Why did the manufacturing industry of Japan succeed in the energy conservation after the Oil Crisis?

1. Regulation measures by Government (Energy Conservation Act)
2. Support and subsidy system by Government (finance, tax & subsidy aid)
3. Cost reduction (enforcement of international competitiveness) and Self-help efforts by companies --- investment, ZQC activity, Kaizen by Sho-shudan, TQM, etc.
4. Energy saving effort in individual Sectors (Equipment and Transportation) --- Top-runner Program



Japan became the first class in energy conservation technology with the rapid progress of energy conservation.

5. Mechanism of Energy Conservation



6-2. New National Energy Strategy

New National Energy Strategy was formulated in 2006, under Ministry of Economic, Trade and Industry (METI).

The New National Energy Strategy containing an especially important program of measures, looking toward 2030, placing central importance on Energy security aims at the establishment of energy security of Japan, an integral solution of energy and environmental problems as well as contributions to the efforts to overcome energy problems of Asia and the world, setting up numerical targets.

Targets aimed at realization: In the New National Energy Strategy, the following three are targets to achieve.

1. Establishment of energy security measurements that our people can trust and rely on
2. Establishment of the foundation for sustainable development through a comprehensive approach for energy issues and environmental issues all together
3. Commitment to assist Asian and other nations around the world in addressing energy problem

Numerical Targets

1. Target of energy conservation; By at least 30% to be achieved by 2030
2. Target of nuclear power generation; To the level over 30-40% by 2030
3. Target of reducing oil dependence in the transport sector; To about 80% by 2030
4. Target of overseas natural resource development; To about 40% by 2030
5. Target of reducing oil dependence; Below 40% by 2030

6-1. Energy Policy

The Basic Energy Plan has formulated in 2003 under Ministry of Economic, Trade and Industry (METI) on the basis of **Basic Act on Energy Policy enacted in 2002**.

The Basic Energy Plan is required to be reviewed at least every three years, and to be revised if needed. (Formulation: 2003, Revision: 2007, 2010)

In June 2010, the 2nd revised Basic Energy Plan was made for the 2003 October's "Basic Energy Plan", taking into account the recent fluctuation of energy related status. The amendments are as follows:

1. Formulating the revised Energy Basic Plan is consistent with the "New Growth Strategy"
2. Directing bold and quantitative policy targets and specific policy measures



Japan will fundamentally change its **Energy Supply and Demand System by 2030**.

6-3. Development of Energy Conservation Technologies (1)

Energy Conservation Technology Strategy (Five Priority Fields)

1. Super combustion system technology
Technology to save energy in manufacturing processes by omitting combustion or improving the efficiency of combustion
Example: Glass manufacturing technology using plasma technology, etc.

2. Future energy conserving device technology
Technology to save energy by upgrading the performance of devices such as semiconductor used in various fields
Example: Energy conservation technology for transformers and motors using silicon carbide (SiC), etc.

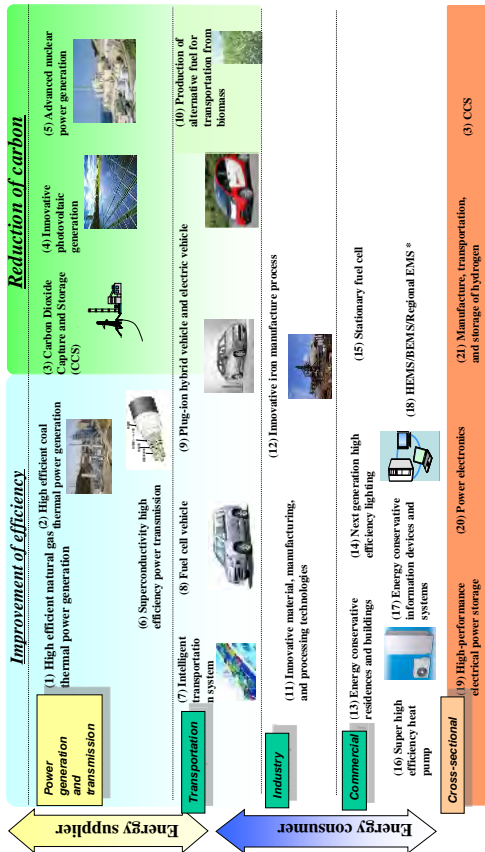
3. Technology of energy utilization beyond space-time restrictions
Technology to save energy by using excess energy beyond space-time restrictions
Example: Technology of transporting factory waste heat in demand to remote areas for effective use, etc.

4. Energy conserving information living space creation technology
Technology to save energy by integrating high-efficiency equipment and IT technology based on lifestyle changes
Example: Technology for integrated control of air conditioning, lighting, etc. using human-detection sensors

5. Technology to establish an advanced transport society
Technology to improve the efficiency of transport machines and by more sophisticated use of machines including modal shift
Example: Technology to improve fuel economy of vehicles, control of traffic signals using IT (see figure below), new traffic system technology, etc. (Traffic signal control technology adjusting to the movement of running vehicles)

6-4. Development of Energy Conservation Technologies (2)

Surveying the flows from suppliers to consumers for each energy source, "21" technologies that enable drastic reduction of CO₂ were chosen from both perspectives of efficiency improvement and reduction of carbon



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Specific Measures for Energy Conservation

Regulatory Control (The Energy Conservation Act)

- 《Industrial Sector》
 - Target: 1%/year improvement of energy intensity
 - Obligation for factories with high energy consumption
 - **Energy Management System**
 - To appoint Energy Managers
 - To submit periodic reports on energy utilization
 - To submit mid-long term plan for energy conservation
- 《Residential/ Commercial Sectors》
 - Obligation to prevent heat-loss through windows and walls to utilize **high efficient facilities for buildings**
 - Obligation to improve energy efficiency of appliances utilized in households and offices based on the **Top-Runner Program**
 - 《Transportation Sector》
 - the **Top-Runner Program** for passenger/freight vehicles
 - Obligation for cargo owners and carrier companies (to submit periodic report and mid-to-long term plan)

Supporting Promotion (preferential tax, loan and investment)

- 《Promoting the introduction of high-efficiency equipment for enterprises and local public bodies》
 - **Tax incentives** for introduction of equipment (exemption or depreciation)
 - **Low-interest loan** for the introduction of equipment
 - Budgetary support for introduction of high-efficiency equipment --- **subsidies**
 - Promoting the Home/Building Energy Management System (HEMS & BEMS)
 - Supporting ESCOs business
 - Promoting the introduction of **High-efficiency hot water supply apparatuses**, Co-generation system etc.
- 《Technological development》--- by NEDO
 - Technological development by governmental bodies
 - Supporting technological development by enterprises
 - **reduction of standby power consumption, etc.**

Energy Conservation Progress

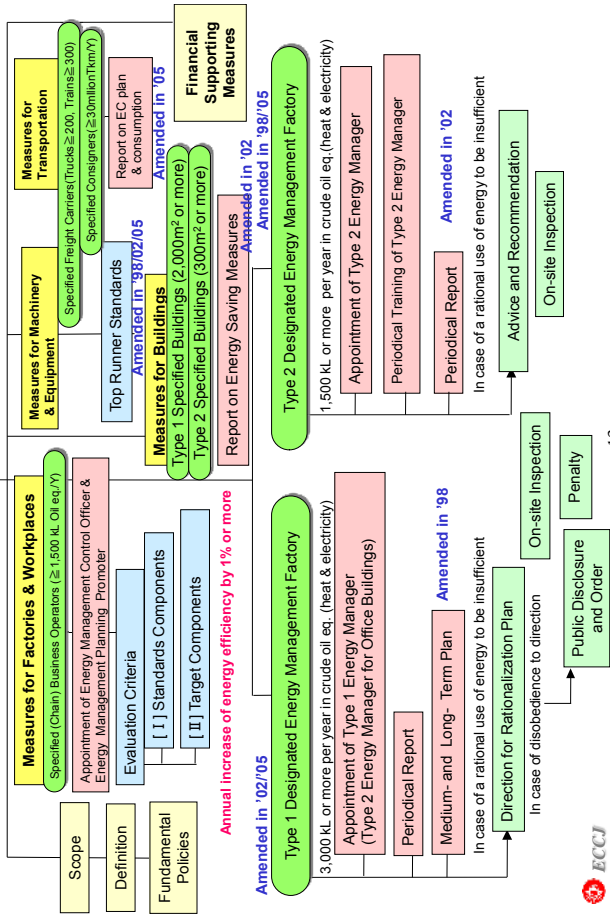
Public Information (publication, labeling and education)

- 《Publication, Advisory》
 - Dispatch of advisory experts for glass roots activities
 - Public distribution of the catalogues of high-efficiency products
- 《Labeling System》
 - Labeling system to provide consumers with information on high energy efficient home appliances and passenger cars
- 《Education》
 - Promoting energy conservation in elementary and junior high schools

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7. Energy Conservation Act [enacted in 1979, amended in 1983/1993/1998/2002/2005/2008]



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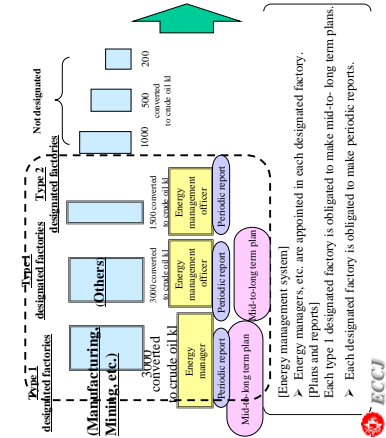
The comparison of regulatory target before and after revision in 2008

The Energy Conservation Act was revised in May 2008.

- Companies who have and run factories or workplaces of which total energy consumption amounts to 1,500kl or more per year in crude oil equivalent are designated as "Specified Business Operators"
- Chain business operators such as convenience stores or restaurants who have and run factories, workplaces or member stores of which total energy consumption amounts to 1,500kl or more per year in crude oil equivalent are designated as "Specified Chain Business Operators"
- They shall prepare and submit a Medium- and Long-term Plan, and Periodical Report on the status of their energy utilization.

[Before Revision]

<Energy Management per Factory or Workplace>



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The condition and role of each key person for energy management after revision in 2008

Energy Management Control Officer

Condition: According to the law, the position shall be filled with a person who supervises and manages the implementation of the business (executive-level employee). It means the person shall implement energy management for a company as a whole with a bird's eye view.

- Role:
1. Promotion of efforts with management perspective
 2. Coordination of Medium- and Long-term Plan
 3. Planning for on-site management, implementation of practical business affairs

Energy Management Planning Promoter

Condition: A person who has completed training courses concerning energy management or who has a qualified energy manager's license.

- Role:
1. Practical assistance for an energy management control officer

Type 1 Energy Manager and Type 2 Energy Manager

Condition: Same as before the revision

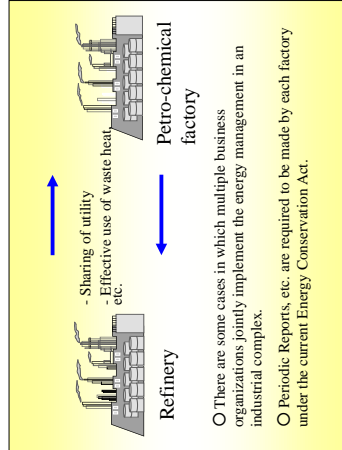
Role: Same as in the law before the revision, they shall implement management in the workplaces such as designated energy management factory. Also, they shall collaborate with an energy management control officer and energy management planning promoter to implement systematic efforts based on management judgment and to take effective measures for energy conservation for a company as a whole.

Joint Energy Management by Multiple Companies

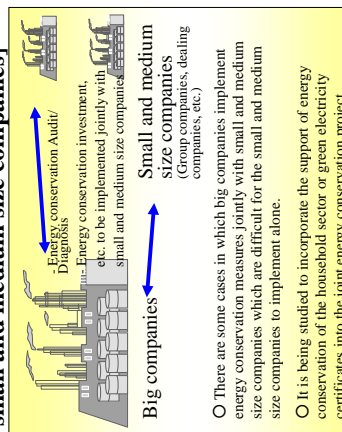
Introduces a system that systematically evaluates Business Operators which jointly implement the energy management crossing the unit of Business Operator (Energy, CO₂ Joint Reduction Project).

Examples of joint energy management

[Co-work at industrial complex]



[Co-work by big companies and small and medium size companies]



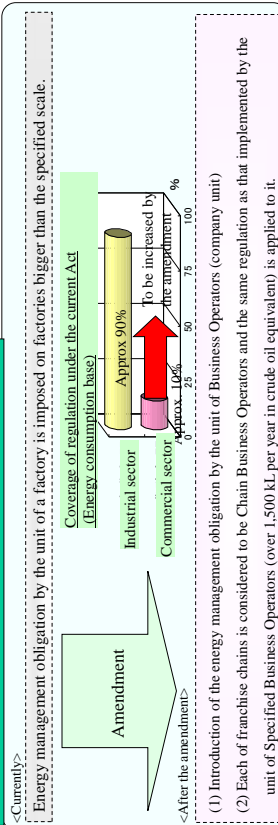
The energy management implemented jointly by those multiple companies is systematically evaluated.

Outline of Amendments Part of the Energy Conservation Act

- In order to further promote the measures for containing the global warming, it is important to strengthen the energy conservation measures in the Commercial and Residence sectors where the energy consumption is greatly increasing.
- To do this, the energy conservation measures for offices, residences and buildings must be strengthened by amending the Energy Conservation Act.

Strengthening of energy conservation measures for the commercial sector

Introduction of regulation by the unit of a business organization



Other measures

- <After the amendment>
- Energy conservation activities of each company are totally evaluated considering the following factors.
- State of energy conservation of each business type (benchmark for each sector is made)
- Energy conservation activities to be implemented jointly by multiple business organizations (joint energy conservation project)

Benchmark index and Medium- and Long- Term Target Level

| Classification | Business Field | Benchmark Index | Target Level |
|----------------|--|---|--------------------|
| 1A | Iron manufacturing using Blast Furnace | The value obtained by A/B A: Energy consumption in BF B: Amount of raw steel | 0.531 kJ/t or less |
| 1B | Common steel manufacturing using Electrical Furnace | Sum of (1) and (2) (1) A: Energy consumption in EF B: Amount of raw steel (2) A: Energy consumption in Rolling B: Amount of rolled steel | 0.143kJ/t or less |
| 1C | Special steel manufacturing using Electrical Furnace | Sum of (1) and (2) (1) A: Energy consumption in EF B: Amount of raw steel (2) A: Energy consumption in Rolling B: Amount of shipped steel | 0.36kJ/t or less |
| 2 | Electrical supplier | The value obtained by A/B (thermal efficiency standard index) | 100.3% or more |
| 3 | Cement manufacturing (Portland cement, BF cement, silica cement, fly-ash cement) | Total of (1) to (4) (1) Raw material process (2) Pyro-process (3) Finishing process (4) Shipping | 3,891MJ/t or less |

- The way to set the sectors and the Benchmark is decided based on the specific study at the council.

8. Structure of the Energy Conservation Act (Act on the Rational Use of Energy)

(1979 enforced, 1983, 1993, 1999, 2003, 2006, 2008 amended and enforced)

<Contents>

Chapter I General Provisions

- Article 1 Objective
- Article 2 Definition

Chapter II Basic policy, etc.

- Article 3 (Basic policy)
- Article 4 (Role of Energy Users)

Chapter III Measures, etc. Pertaining to Factories, etc.

Section 1 Measures Pertaining to Factories, etc.

- Article 5 (Evaluation Criteria for Business Operators)
 - (i) Improvement of methods for use of energy, choice of machinery and equipment having high performance in light of energy consumption and other matters concerning the rational use of energy in factories, etc. used exclusively for an office or any other usage similar thereto; or
 - (ii) Matters concerning the rational use of energy in factories, etc. (excluding those which fall under the preceding item), which fall under any of following sub-items:
 1. Rationalization of combustion of fuel.
 2. Rationalization of heating, cooling and heat transfer.
 3. Recovery and utilization of heat waste.
 4. Rationalization of conversion of heat into power, etc.
 5. Prevention of heat loss by radiation, conduction, etc and electrical loss by resistance.
 6. Rationalization of conversion of electricity into power, heat, etc.

Chapter IV Measures Pertaining to Transportation

Chapter V Measures, etc. Pertaining to Buildings

Chapter VI Measures Pertaining to Machinery and Equipment

Chapter VII Miscellaneous Provisions

Chapter VIII Penal Provisions

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Energy Conservation Act and its back ground

1973, 1978 Oil crisis <Energy security>

- *guidelines for EC to factories & business premises, buildings and equipment
- *Designated energy management factories (DEMF) must appoint energy managers 14,116 factories
- 1983 amendment: Streamlines the process of license approval & issuance

1979 the Act Concerning on the Rational Use of Energy (Energy Conservation Act) enacted

1993 the EC Act amended

- *submission of periodical report concerning energy consumption and energy management
- *Top Runner Program
- *submission of Medium- & Long-Term Plan
- *new category as to the type 2 DEMF

1998 amended

- *submission of periodical report from the type 2 DEMF
- *E-C measures for the designated buildings

2002 amended

- *heat and electricity are integrated into a single amount of energy consumption
- *submission of periodical report and mid-to long-term plan from cargo owners and carrier companies
- *E-C measures for residential buildings
- *energy saving information by energy suppliers and equipment retailers

2005 amended

- *E-C measures for chain-stores and franchised business
- *integrated management of factories' EC by the head office

2008 amended

- *integrated management of factories' EC by the head office

1997 COP3 (Kyoto Protocol)

1998 Law Concerning the Promotion of the Measures to Cope with Global Warming

2005 Kyoto Protocol Target Achievement Plan

International collaboration structure after 2013?

Global Warming Issue

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Outline of the Top Runner program

- 1) Background:**
The government launched the Top Runner Program based on the 1999 amended Act which the standards are set based on the most energy efficient product commercially available in given category. For each manufacturer and importer, the weighted average efficiency of all units shipped within the same category must meet the standards for that by the target year decided for each category.
- 2) Designated products:**
Target products are ones designated as machinery and equipment which are commercially used in large quantities in Japan, consume significant amount of energy on use and intensively required with "energy consumption efficiency".
- 3) Target standard values:**
As for the designated products, manufacturers and importers etc. are obliged to meet the target standard values concerning "energy consumption efficiency". Target standard values are set based on the most energy efficient product commercially available in the market in given category.
- 4) Classification of target standard values**
Target standard values are set in classifications considering a variety of models with different sizes and functions etc. for each product.
- 5) Target fiscal years:**
Target fiscal years by which the target standard value must be achieved are set up through taking into consideration of future technological development forecasts and the development period of products and so on, usually in the range of 4 to 8 years from the base fiscal year.
- 6) Judgment methods of achievement:**
In the target fiscal year, achievement of the target is judged based on such indicators as a weighted average of shipment by product for each product category per manufacturer and importer etc.
- 7) Measurement methods:**
The measurement method primarily uses JIS (Japanese Industrial Standards)
- 8) Indications:**
Responsibility is assigned to indicate the "energy consumption efficiency" of the device in catalogs, on the device itself, etc.

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9. Energy Conservation Measures for Machinery & Equipment

"Top Runner Program"

*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.

Concept for setting target standard

Energy efficiency standard (A is the top runner.)

Target value is set based on the products with the highest energy efficiency in the market.

TRP regulates the weighted average of shipment volume of products in the same category per manufacturers, importers etc., in terms of energy efficiency.

Currently designated products

Total 23 products designated

- 11 products designated in 1999
 1. Air conditioners
 2. Fluorescent lights
 3. Television sets
 4. Copying machines
 5. Computers
 6. Magnetic disk units
 7. Video cassette recorders
 8. Passenger vehicles
 9. Freight vehicles
 10. Electric refrigerators
 11. Electric freezers
- 7 more products designated in 2002
 12. Space heaters
 13. Gas cooking appliances
 14. Gas water heaters
 15. Oil water heaters
 16. Electric toilet seats
 17. Vending machines
 18. Transformers (molded)
- 3 more products designated in 2006
 19. Microwave Oven
 20. Electric Rice Cooker
 21. DVD Recorder
- 2 more products designated in 2008
 22. Routers
 23. Switches units

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What is Top Runner Program? (Example: TV Sets)

- (1) **Target standard value (standard energy consumption efficiency):**
It is product's annual energy consumption, expressed as energy consumption efficiency. Taking the best annual energy consumption (kWh/year) as a base, target standard values are decided with an allowance for technological improvement.
- (2) **Category:**
For TV sets, products are classified by number of pixels, TV receiver size, moving picture display speed, and number of additional functions.
- (3) **Target year:**
For LCD and plasma TV sets, the target fiscal year is FY 2012 and every fiscal year after that (the standard was developed in FY 2007).
- (4) **Method for evaluation of achievement:**
Achievement is judged based on a weighted average for each category per manufacturers (vendors).
- (5) **Measurement method:**
Measurement method which takes into account hours of use based on the actual status is adopted.
- (6) **Display:**
Product's annual energy consumption is required to be displayed in catalogs, on product bodies, etc.

Energy Conservation Effect under Top Runner Program

| Product Category | Target Fiscal Year | Base Fiscal Year | Efficiency Improvement (Initial Expectation) | Efficiency Improvement (Result) |
|---|-----------------------------------|------------------------------------|--|---------------------------------|
| TV sets (using CRT) | 2003 | 1997 | 16.4% | 25.7% |
| Video Tape Recorders | 2003 | 1997 | 58.7% | 73.6% |
| Air Conditioners (Room Air Conditioner) | 2004* Oct.1,2003 → Sep.30,2004 | 1997** Oct.1,1996 → Sep.30,1997 | 66.1% | 67.8% |
| Electric Refrigerators | 2004 | 1998 | 30.5% | 55.2% |
| Electric Freezers | 2004 | 1998 | 22.9% | 29.6% |
| Passenger Vehicles* (Gasoline) | 2010 | 1995 | 22.8% | 22.8%(FY2005) |
| Freight Vehicles* (Diesel) | 2005 | 1995 | 6.5% | 21.7% |
| Vending Machines | 2005 | 2010 | 33.9% | 37.3% |
| Fluorescent Light Equipment | 2005 | 1997 | 16.6% | 35.6% |
| Copying Machines | 2006 | 1997 | 30.8% | 72.5% |
| Computers | 2007 | 2001 | 69.2% | 80.8% |
| Magnetic Disc Units | 2007 | 2001 | 71.4% | 85.7% |
| Electric Toilet seats | 2006 | 2000 | 10.0% | 14.6% |

Reference: "Top Runner Program (March 2010) by METI

Legislation pertaining to the Top Runner Program

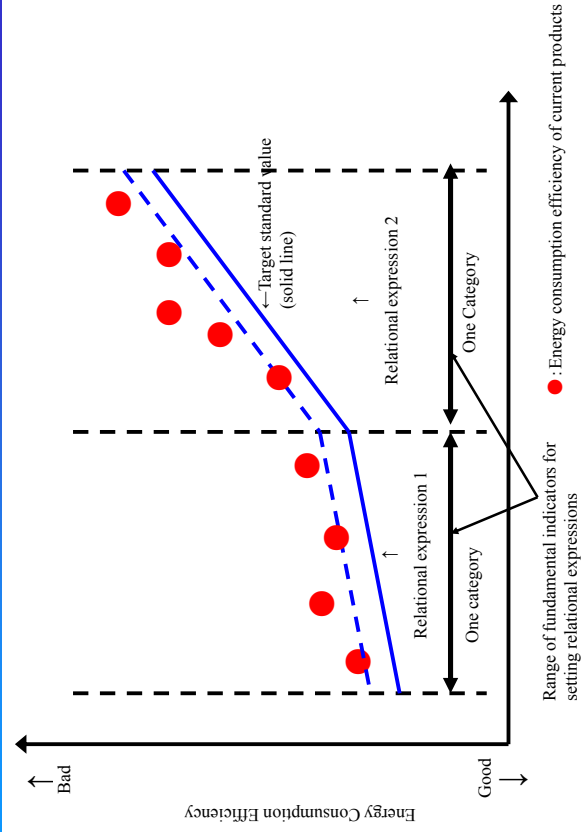
Act on the Rational Use of Energy (Act No.49 of June 22, 1979) the latest amendment in 2008

- [Acts]
- Chapter VI Measures Pertaining to Machinery and Equipment
 - Article 77 Role of Manufacturers, etc.
 - Article 78 Standards of Judgment for Manufacturer/ Importers (the basic concepts used in the Top Runner Program)
 - Article 79 Recommendations and Orders concerning Improvement of Performance (Standards Monitoring Procedures)
 - Article 80 Labeling
 - Article 81 Recommendations and Orders concerning Labeling
 - Chapter VII Miscellaneous Provisions
 - Article 87-13 Reports and On-site Inspections
 - Chapter VIII Penal Provisions
 - Article 95-2 Penal Regulations

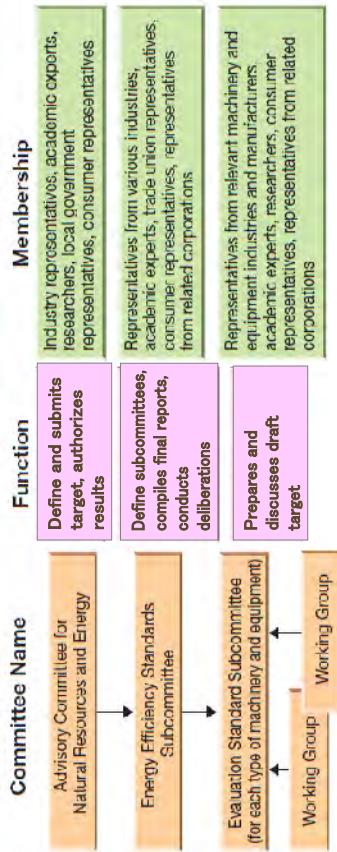
- [Government Ordinances]
- Article 21 Designated Devices (explicit notification of designated devices)
 - Article 22 Production and importation volumes for manufacturers of designated devices (margin standards)
 - Article 23 Council to hear opinions on orders issued to manufacturers of designated devices
 - Article 32 Reports and On-site Inspections (items reported, etc.)

- [Ministerial Ordinances]
- Article 48 Exclusions for designated devices
 - Article 49 (appendix 5) Energy consumption efficiency (standard evaluation index)
- * For passenger and freight vehicles, this is the "Ministerial Ordinance Concerning the Calculation of Vehicle Energy Consumption Efficiency".

Concept of Setting Top Runner Standards



Advisory Committee for the Government



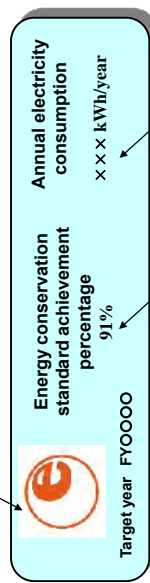
Three principles to designate the machinery & equipments

- 1) The machinery and equipment are used in large volumes in Japan.
- 2) The machinery and equipment use substantial amounts of energy while in use.
- 3) Improvement on the energy consumption efficiency of the machinery and equipment can be expected.

Energy Labeling Program (I) -- Method of Indication

★ Case 1: Target still not achieved

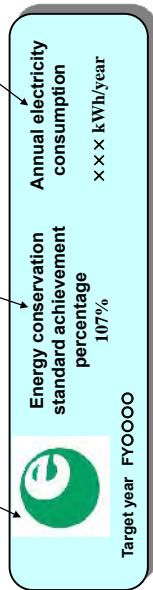
Symbol is colored in orange



This system introduced in August 2000

★ Case 2 : Target achieved

Symbol is colored in green



* The label size differs depending on the space available for indication etc.

Future Direction of Top Runner Program

- Enlargement of Targeted Products
- Targeted products will be those for commercial use.

Uniform Energy-Saving Labeling System for Retailers (II)

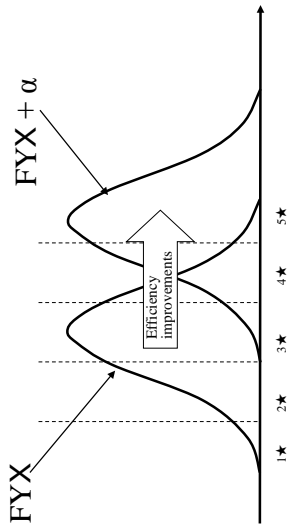
- The Revised Law Concerning the Rational Use of Energy enforced in April 2006 stipulates that retailers shall make efforts to provide information. In light of this, a guideline was formulated, including providing information by using uniform energy-saving labels.
- The system started in October 2006. (For Air Conditioners, Refrigerators and Television Sets)
- From April 2010, Fluorescent Lights(household) started, now 5 products including Electric Toilet Seats are designated.

Uniform Energy-saving Label



Changing the Multi-level Evaluation Standards

- If the same multi-level evaluation standard is too rigidly applied long time, efficiency improvements due to model changes would tend to bias the overall distribution towards higher rankings, so the standards are reviewed on a regular basis.
- A survey is conducted once a year, and if the number of the devices that have attained the Top Runner standard increases 30% or more, the multi-level evaluation standard is revised.
- The multi-level evaluation standard is changed annually on April 1.



Top Runner Program and Labeling System List of Appliances / Equipment

| Appliances / Equipment | Top Runner Program | Energy Saving Labeling Program | Uniform Energy Saving Label | Indication of "Expected Electricity Bill" |
|----------------------------|--------------------|--------------------------------|-----------------------------|---|
| 1 Passenger Vehicles | ○ | | | |
| 2 Freight Vehicles | ○ | | | |
| 3 Air Conditioners | ○ | ○ | ○ | ○ |
| 4 TV Sets | ○ | ○ | ○ | ○ |
| 5 Video Cassette Recorders | ○ | ○ | ○ | ○ |
| 6 Lighting Equipment | ○ | ○ | ○ | ○ |
| 7 Copying Machines | ○ | ○ | ○ (Fluorescent house lamp) | ○ |
| 8 Computers | ○ | ○ | ○ | ○ |
| 9 Magnetic Disc Units | ○ | ○ | ○ | ○ |
| 10 Electric Refrigerators | ○ | ○ | ○ | ○ |
| 11 Electric Freezers | ○ | ○ | ○ | ○ |
| 12 Space Heaters | ○ | ○ | ○ | ○ |
| 13 Gas Cooking Appliances | ○ | ○ | ○ | ○ (Fuel) |
| 14 Gas Water Heaters | ○ | ○ | ○ | ○ (Fuel) |
| 15 Oil Water Heaters | ○ | ○ | ○ | ○ (Fuel) |
| 16 Electric Toilet Seats | ○ | ○ | ○ | ○ |
| 17 Vending Machines | ○ | ○ | ○ | ○ |
| 18 Transformers | ○ | ○ | ○ | ○ |
| 19 Microwave Ovens | ○ | ○ | ○ | ○ |
| 20 Electric Rice Cookers | ○ | ○ | ○ | ○ |
| 21 DVD Recorders | ○ | ○ | ○ | ○ |
| 22 Routers | ○ | ○ | ○ | ○ |
| 23 Switching Units | ○ | ○ | ○ | ○ |

Retailer Assessment Program for Top Energy Efficient Product Retailing Promotion Store

- In order to promote energy efficient products, it is essential to introduce measures for retailers, who are the contact point between manufacturers and consumers.
- Recognition should be extended to retailers who actively promote energy-efficient products or provide appropriate energy conservation information.
- The **Energy Efficient Product Retailer Assessment Program** was introduced in FY2003.

Targeted retailers:

All home appliance retailers including small-scale stores whose sales coming from home appliances account for 50% or more of total sales

Modified in FY2005
 - Large home appliance retailers having a total floor space of at least 800 m², whose sales from home appliances account for 50% or more of total sales

- "Top Energy Efficient Product Retailing Promotion Store" are selected each year and publicized along with their rankings. Effective FY2004, Minister of Economy, Trade and Industry Award and Minister of Environment Award were established.
- Selected retailers are authorized to carry a special logo.
- In FY2009, 485 large-scale stores and 210 medium- & small-scale stores were certified as excellent stores.

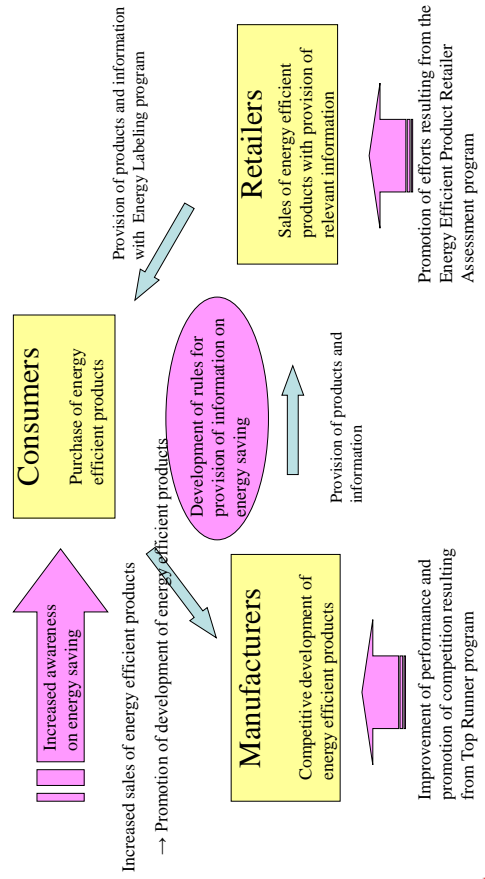
Logo

2005年度



Positive Growth Cycle in Popularization of Energy Efficient Products

- Providing necessary information, it will be expected to encourage consumers to select energy efficient products.
- Popularization of energy efficient products will act as incentives for development of further energy efficient products.

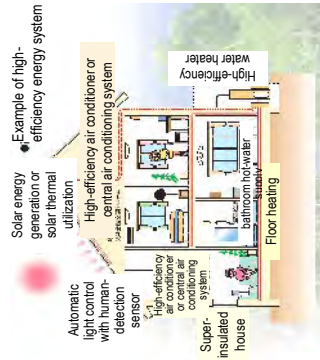


Support for High-Efficiency Residences and Buildings

- Budgetary measures are utilized effectively to promote the introduction of higher-efficiency buildings and facilities and broader recognition of energy conservation residences and buildings. (Improvement of projects to promote the introduction of high-efficiency energy systems for houses and buildings.)

Projects to promote the introduction of high-efficiency energy systems for houses and buildings

- Energy conservation for houses and buildings is achieved effectively through **comprehensive introduction and utilization of proper insulation, installation of high-efficiency facilities/equipment, and energy management systems.**
- For this purpose, **supports are provided for active efforts to introduce integrated "high-efficiency energy systems,"** and to disseminate these systems widely.
- Regarding **houses**, in particular, it is **important to raise awareness** of the functions and advantages of highly energy-efficient houses **among a wide range of consumers.** For this purpose, considerations are made to **adequately evaluate better performance, strengthen linkage with systems to visualize the evaluation,** and utilize budgetary measures effectively.



10-1. Financial Supporting Measures (FY 2010)

Tax incentives program (FY2010): Subject equipment 74units

This program is based on "Tax System Promoting Investment in the Reform of the Energy Supply and Demand Structure".

- Tax incentives: To be able to choose one of the following options;
- Tax exemption is equivalent to 7% of the equipment acquisition cost (which should not be more than 20% of the income tax or corporate tax payable,) and applying only small and medium sized companies.
 - Special depreciation of 30% of the equipment acquisition cost in the year of acquisition, in addition to ordinary depreciation and applying all companies.

Loan program with special interest rate (FY2010):

This program is based on "Act for Energy Conservation and Recycling Support" and applied only small and medium-sized enterprises from 2008.

- Newly acquired equipment should improve energy efficiency by more than 25% compared to existing average equipment.
- In the case of replacement of equipment, newly acquired equipment should improve energy efficiency by more than 40% compared to the replaced equipment.
- Subject equipment: 52units such as heat pump, waste heat boiler and cogeneration system. 11units such as excavating machines, compacting machines, tractors and foundation work machines.
- For installing the specific high-performance furnace and boiler

Subsidy program (FY2010):

This program is prepared by the government for those who will introduce energy conservation facilities, projects and technologies.

Through: NEDO and other organizations

Of course there are **no governmental intervention and no subsidies for energy prices.**

System for Indicating Thermal Insulation Performance of Residential Windows

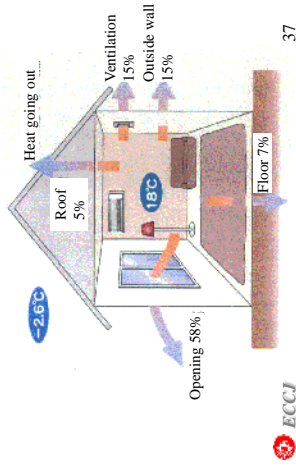
- To promote the energy conservation in the household sector, the openings of residences are big factors in making the energy conservation performance of residences. It is important to encourage consumers to select windows, etc. with higher thermal insulation performance.
- The "Guideline concerning provision of information on thermal insulation of windows, etc." is compiled to provide consumers with information on thermal insulation performance of windows, etc. and to spread the windows with high thermal insulation performance.
- The indication system started on and from April 1, 2008.

Importance of measures for residential windows

The proportion of the heat lost when it goes out or comes in from house windows when heating or cooling.

Proportion of heat going out of windows when heating in the winter: 58%
Proportion of heat coming in from windows when cooling in the summer: 73%

[Heating in the winter]



Insulation performance indication label

Indicated by four stars added as the insulation performance goes up (Window)



* The indication is made basically for the entire windows, but depending on the business type, it is also possible to make the indication for each glass or sash.



10-2. Finance conditions*1

Financing limit

Direct loan*2 720 million yen

Alternate loan*2 120 million yen

Financing percentage

Refer to the rate specified by the concerned financing

Predefined rate is applied based on the credit risk and financing period.

Financing period

Less than 15 years (of which 2 years are designated as a grace period)

*1. These finance conditions are those defined by Japan Finance Corporation (JFC), Operations aimed at Small and Medium Enterprise. Operations aimed at Micro Business and Individuals accommodate only the direct loans and the special financing limit is 72 million yen.

*2. Direct loans are loans which should be applied directly at the window of financing institutions. Alternate loans are those which are applied through the applicant's financial agency.

Financing target enterprises

Financing target enterprises of Japan Finance Corporation, Operations Aimed at Small and Medium Enterprises are stipulated in accordance with the Article 2, Item 3 of the Japan Finance Corporation Law, based on the industry and the size of business (in terms of capital and number of employees) as described below. If the target enterprise matches the size of business either in terms of capital or number of employees, it becomes a justifiable target. For the target enterprises of JFC, Operations Aimed at Micro Business and Individuals, please contact the appropriate client service.

| Target industry | Target size of business |
|--|--|
| Manufacturing*1, Construction, Transportation, etc. | Capital: less than 300 million yen or less than 300 employees |
| Wholesale | Capital: less than 100 million yen or less than 100 employees |
| Retail | Capital: less than 50 million yen or less than 50 employees |
| Service*2 (there are some exceptions from the target) | Capital: less than 50 million yen or less than 100 employees |

*1 Among manufacturing industries, the target size of rubber products manufacturing companies (excluding auto and airplane tire and tube manufacturing companies and industrial belt manufacturing companies) is capital of less than 300 million yen or less than 900 employees.
 *2 Among service industries, the target size of hotel businesses is capital of less than 50 million yen or less than 200 employees, while that of software and information processing service companies is capital of less than 300 million yen or less than 300 employees. The companies which fall into the following industries are excluded from target industries eligible for JFC's financing programs for small and medium-sized enterprises: (For details, please contact the appropriate client service) Agriculture, forestry, fishery, Financial/Insurance (excluding insurance agency and insurance services), housing lease and housing land lease among the property industry, medical and social work services (excluding health services), non-profit organizations, certain entertainment and amusement business, speculative businesses, and enterprises which are offensive to public order and morals

Assistance to ESCO Projects/Business Promotion

ESCO Promotion Council (JAESCO)

Potentiality of ESCO (Energy Service Company) business in Japan is estimated as 2,470 billion yen, by the ESCO Business Introduction Promotion Study Group of ECCJ. (energy saving amount: 4 million kl / year)

In the U.S., the scale of market is approx. \$ 2 billion. (2000).

ESCO business started in 1998 in Japan.

ESCO Promotion Council (JAESCO) established in 2000. (124 members as 2010)

In FY 2007, the total amount of repair work for energy conservation increased by 30% compared to the previous fiscal year.

The order volume of ESCO business substantially increased from 27.8 billion yen in FY 2006 to 40.7 billion yen and ESCO business still accounts for more than half (64%).

<Future challenge>

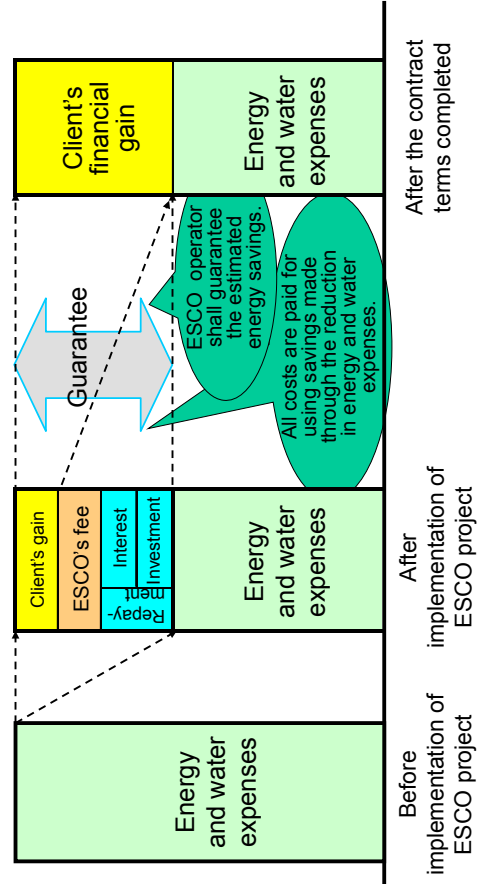
- To promote the ESCO business in the public sector
- To facilitate fund procurement
- To improve the recognition of the business

Support for the Introduction of ESCO Business ~ Expanding ESCO Market ~

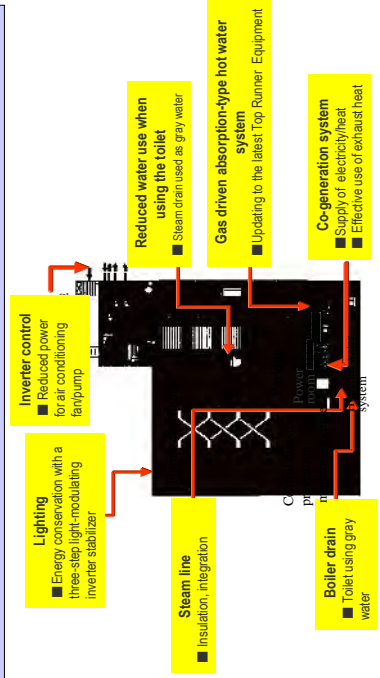
○ Support, in the forms of partial subsidy for initial investments, low-interest loans, etc., is extended to private enterprises and local governments implementing ESCO business.

○ ESCO projects have tended to increase their shares among "the government subsidy to disseminate and promote the projects that introduce highly-efficient energy system for residences and buildings" and "the government subsidy to assist businesses who execute the rational use of energy".

Cost and Profit of ESCO Project



Example of ESCO business introduction (at a hospital)



Energy conservation effect due to the introduction of ESCO: (utility bill reduction) : Approximately 25%

ESCO Project in the Ministry of Economy, Trade and Industry Buildings

- The ESCO project was introduced to the Ministry of Economy, Trade and Industry (METI) buildings, which is the first ESCO project for a government facility, to promote energy conservation at the Ministry's buildings, as well as to promote the ESCO project in the private sector.
- Measures will be considered to introduce the ESCO project broadly to other government buildings, schools, hospitals, etc.

METI building ESCO demonstration project

- Facilities: METI main building and annex (approximately 110,000 m²)
- Project term: March 2005-end of March 2009
- Contract partner: Takasago, Kinden, Mitsubishi Jisho Sekkei Joint Consortium for METI ESCO Demonstration Project

(Participants: Takasago Thermal Engineering Co., Ltd., Kinden Corporation, Mitsubishi Jisho Sekkei Inc.)

| | |
|--|---|
| Contract expense | 19.95 million yen (including tax) |
| Guaranteed saving on utility bills | Approximately 5.5 million yen/year |
| Reduction of CO ₂ emissions | Approximately 160 t-CO ₂ /year |

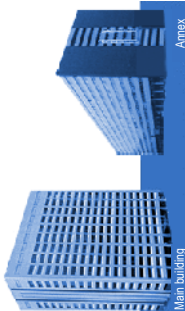
[Specific activities]

- On-and-off operations considering the temperature of the machine room, etc.
- Modification of the setting values of the annex's freezer coolant temperature (to reduce the freezer's running time)
- Modification of the cool water exit temperature of the annex's freezer (to reduce operational load)
- Stop/OA when the annex's air conditioners start operation (to reduce load caused by the outside air)
- Control of outdoor air quantity based on CO₂ density
- Installation of automatic flushing valves and sound effect equipment at restrooms in the annex
- Replacement of emergency exit sign lighting on and above the ground floor of the main building with energy-saving high-intensity lights

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Utilized as a ESCO project model

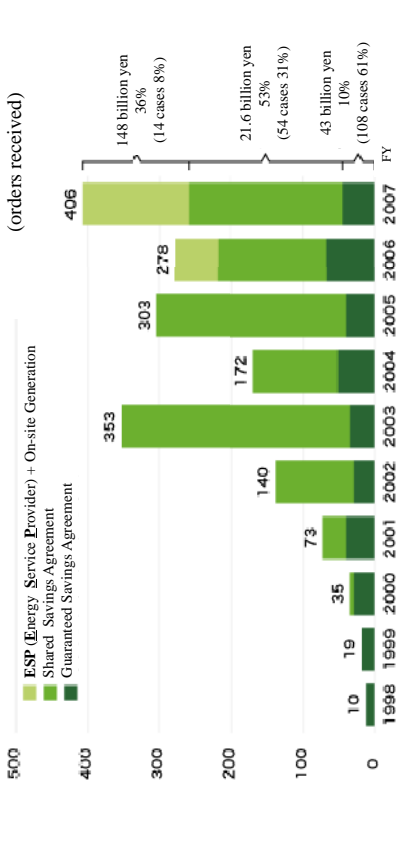


- Promote ESCO projects for other government, municipality, and commercial buildings, using this project as a model case
- Publicize this project by including it in "The compilation of ESCO implementation project cases" (produced by ECCJ)

Dissemination and Promotion of the ESCO Project ~ Expanding ESCO Market ~

- There are two methods of ESCO business.
- The ESCO business has two forms: "Guaranteed Savings Agreement", where customers cover business costs, and "Shared Savings Agreement", where the ESCO business operator covers business costs. These options enable to select service provision according to the customer needs.
- After in FY2006, ESP with On-site Generation has researched and accounted the item separately.

Trend on Types of ESCO Contracts (orders received)



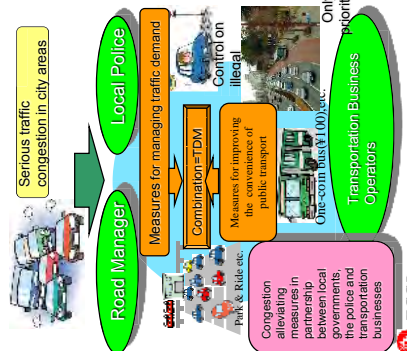
Source: from the Homepage (<http://www.jaeseco.or.jp/>) of JAESCO (Japan Association of Energy Service Companies)



Traffic Management Measures

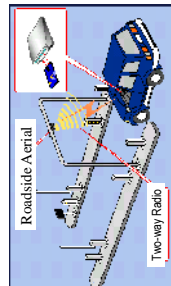
- Adjusting automotive traffic demands through the promotion of TDM (Transportation Demand Management) measures.
- Promoting ITS (Intelligent Transport System) by promoting ETC (Electronic Toll Collection) and VICS (Vehicle Information and Communication System)
- Promoting the development of traffic safety infrastructures such as upgrading traffic signals.

Promotion of TDM (Transportation Demand Management)



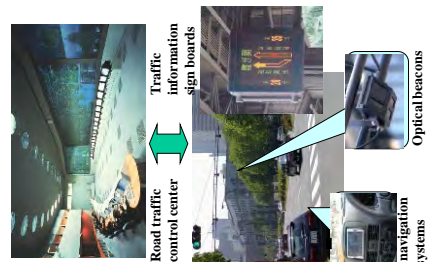
ETC Promotion Measures

Raise ETC usage rate to around 70% by the end of FY2007 to alleviate congestion at toll gates.



Source: Organization for Road System Enhancement (What is ETC?)

Development of Traffic Safety Infrastructures



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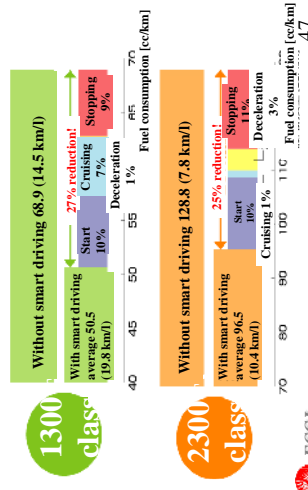
Necessity of Dissemination and Promotion of Energy-Saving Driving

- Fuel economy of new vehicles improved substantially through the introduction of the Top Runner fuel economy standard. However, fuel economy can further improve by energy-saving driving.
- Approximately 25% fuel economy effect can be achieved by energy-saving driving.
- Fuel economy effects differ depending on individual driving situations. However, energy-saving effects can be expected particularly in urban areas where drivers start and stop frequently.
- It is possible to know the transition of fuel economy and the improvement of fuel economy by energy-saving driving by utilizing the energy-saving driving support system.

Utilization of the energy-saving driving support system <http://www.recoo.jp/>

Fuel economy effect in energy-saving driving

* Based on results of the Smart Driving Contest in FY 2004





The key words are:

5 seconds, 5 km/hr and 5 seconds
Eco Drive 5-5-5

- 5 seconds of energy saving awareness when starting your car
<Reaching 20 km/hr speed in 5 seconds ensures full result>
- 5 km/hr austerity from target speed
<Driving 5 km/hr below the speed you want to drive at will relieve your stress>
- 5 seconds of waiting is worth no idling
<Keeping your engine stopped even for a short while helps you enjoy fuel efficiency >

And if you add the early release of the accelerator pedal,
you will be a master of Eco Drive!

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.



Sensible-heat Recovery Boiler (ECO JOZU)

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

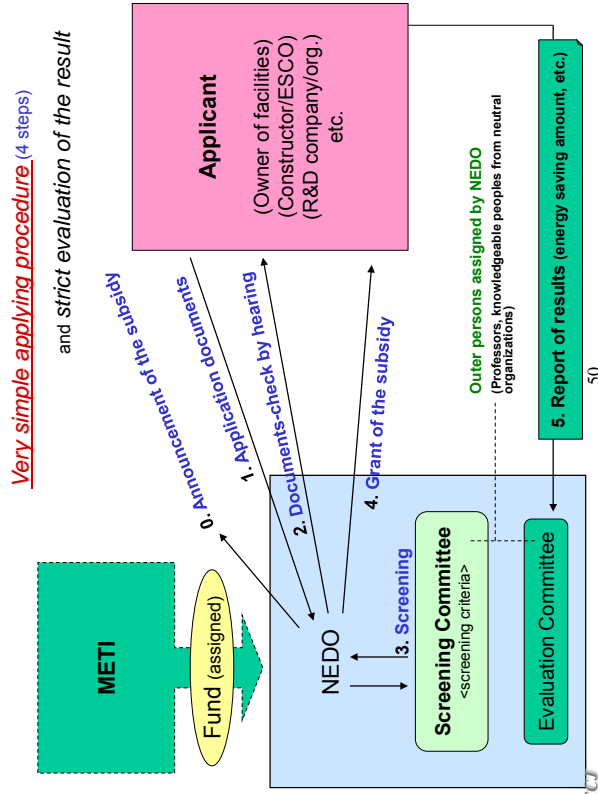


Gas Engine Boiler (ECO WILL)

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.



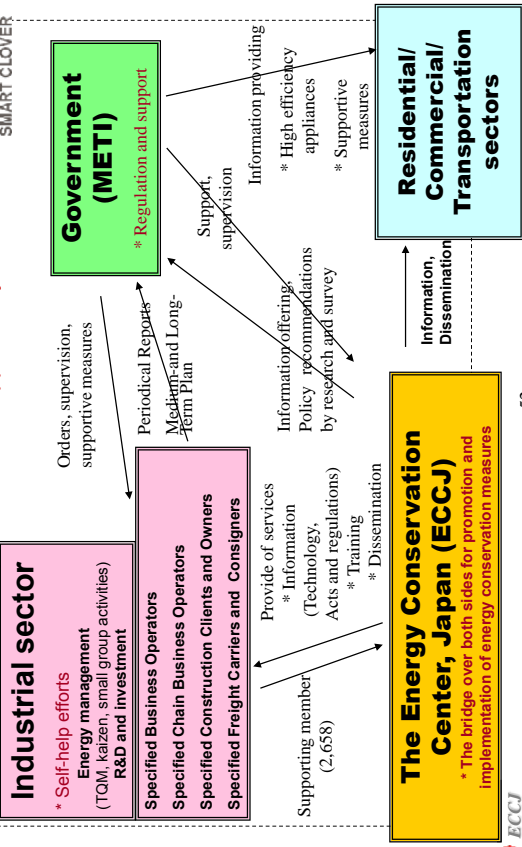
<Example > Applying procedure for the subsidies by METI/NEDO



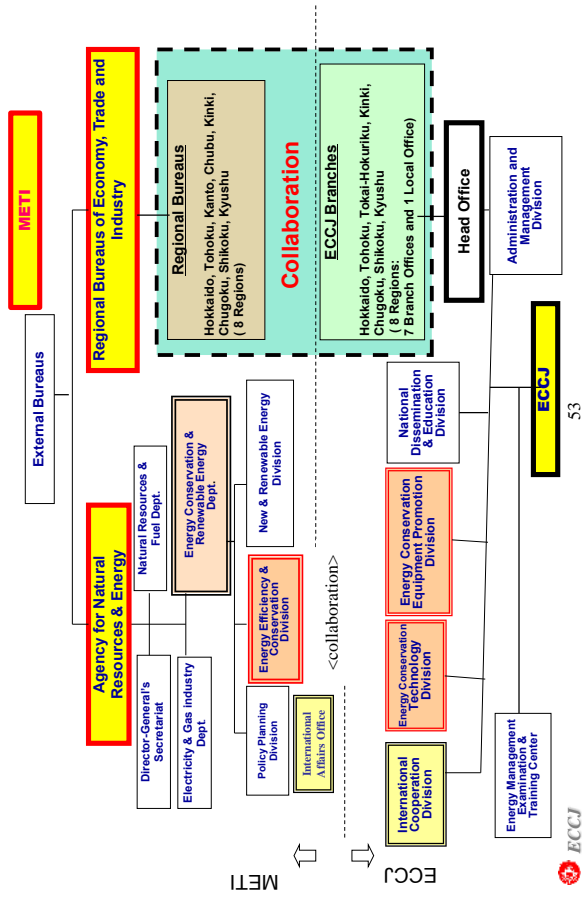
II. Activities of ECCJ

1. Role of ECCJ

Execution of the "Energy Conservation Act" with promotion of a supportive system



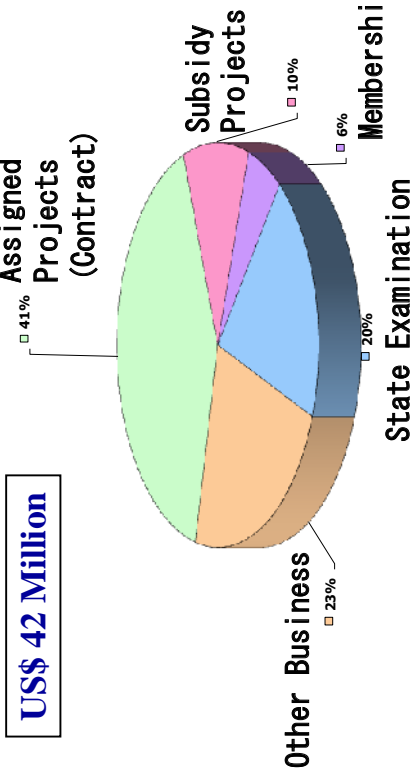
2. METI-ECCJ Collaboration Framework to enforce Energy Conservation Policy and the Act in Japan



3. Profile of ECCJ

Legal status : * NPO under the supervision of METI
Establishment : * 16th October, 1978 (just before the 2nd oil crisis)
 <Roots: Heat-management Association established in 1947>
Purpose of establishment : * Core organization responsible for promotion of energy conservation
Office location : * Tokyo Head office & 7 branches and one branch office
Supporting member : * 2,658 companies (as of April 2010)
Staff (full time): * 143 persons (as of August 2010)
Budget : * 3,611 million yen in FY2009 (42 million US\$:86 ¥ / US\$)
Fields of activity : * Industrial, Residential/Commercial and Transportation sectors

Budget in FY2009



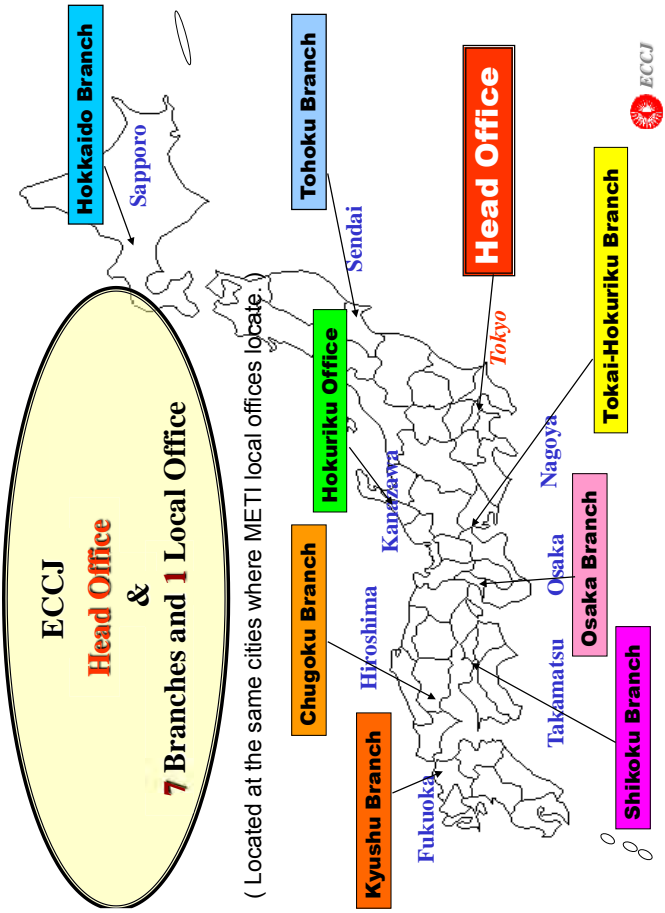
4. History of ECCJ under Change of Energy-related Situation

| Year | Change of Energy-related Situation |
|------|-------------------------------------|
| 1947 | Heat-management Regulation enacted |
| 1948 | Heat-management Regulation enforced |
| 1951 | Heat-management Regulation enforced |
| 1972 | 1st Oil Crisis |
| 1973 | 2nd Oil Crisis |
| 1978 | Energy Conservation Act enforced |
| 1979 | 1st Oil Crisis |
| 1981 | Energy Conservation Act Rev. (1) |
| 1983 | Energy Conservation Act Rev. (2) |
| 1984 | Energy Conservation Act Rev. (2) |
| 1993 | Energy Conservation Act Rev. (3) |
| 1997 | Energy Conservation Act Rev. (4) |
| 1999 | Energy Conservation Act Rev. (5) |
| 2003 | Energy Conservation Act Rev. (5) |
| 2006 | Energy Conservation Act Rev. (5) |
| 2007 | Energy Conservation Act Rev. (6) |
| 2008 | Energy Conservation Act Rev. (6) |
| 2009 | Energy Conservation Act Rev. (6) |

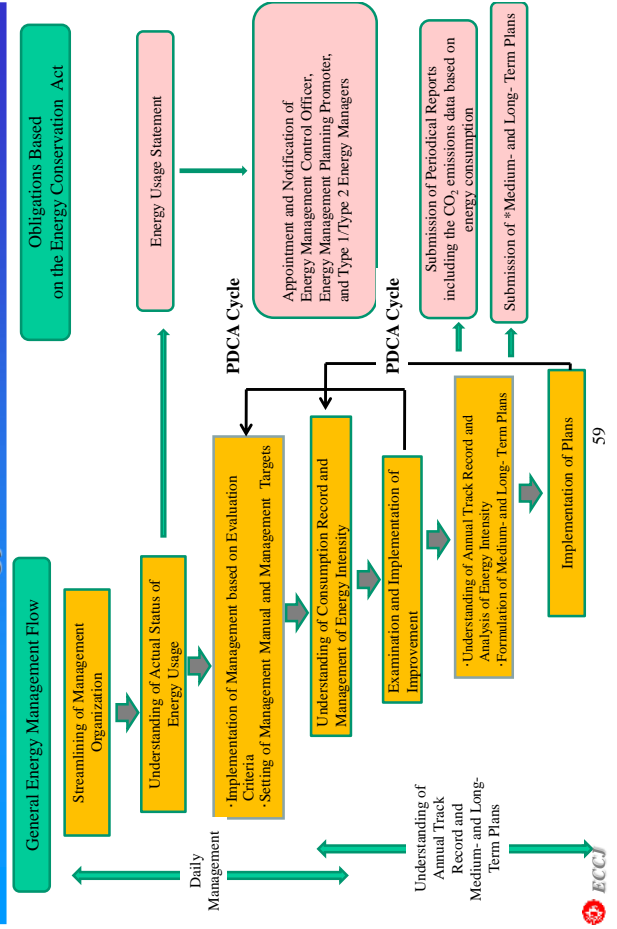


5. Main Activities of ECCJ by Sectors

- ① Energy conservation audit/diagnosis services for factories
 - ② Education & training on energy conservation
 - ③ State examination for energy managers (assigned by the Gov.)
 - ④ Dissemination (conference for successful cases of EC activities, excellent energy conserving equipment, etc.)
 - ⑤ Technological development and spillover
- Industrial sector**
- ① Energy conservation audit/diagnosis services for buildings
 - ② Ranking catalogue for energy efficient appliances (Dissemination of Top Runner Program)
 - ③ Promotion of Energy Labeling System
 - ④ International Energy Star Program implementation
 - ⑤ Energy Efficiency Product Retailer Assessment System
 - ⑥ Dissemination of Energy conservation indicator "E-Co Navigator"
 - ④ Energy Education at primary and middle schools
- Residential, Commercial & Transportation sectors**
- ① Energy conservation campaign & exhibition (ENEX)
 - ② Commendation (grand energy conservation prize)
 - ③ Information & data base, Publicity and publishing "Handbook etc."
 - ④ Survey and monitoring
 - ⑤ International cooperation & Communications
- Cross sector**



Energy Management Flow and Obligations based on the Energy Conservation Act

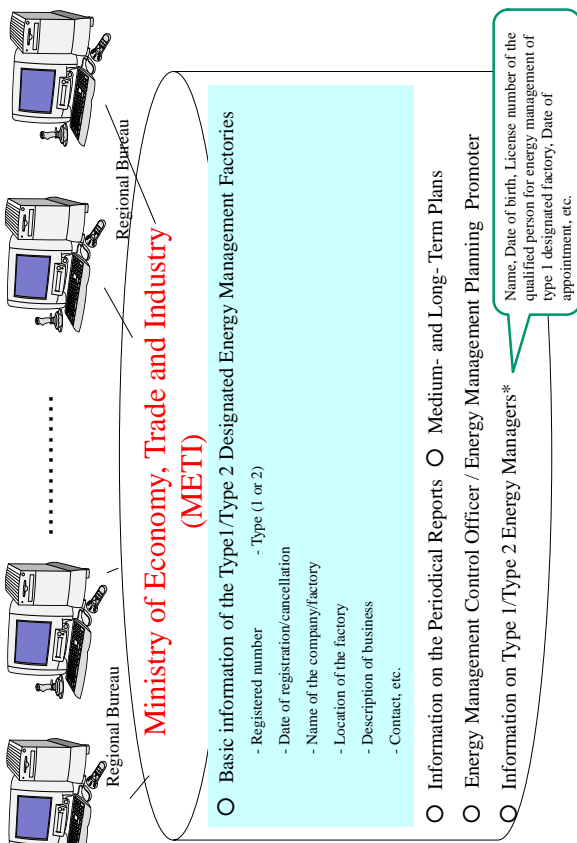


Roles of the Ministry of Economy, Trade and Industry (METI) and the Energy Conservation Center, Japan (ECCJ)

| Major Energy Conservation Measure | Ministry of Economy, Trade and Industry | Regional Bureaux (9 Bureaux) | ECCJ |
|--|--|---|---|
| Complete standards such as acts and regulations | ○ | △ (Cooperation provided as required) | △ (Technical cooperation) |
| Acceptance of and guidance on notifications and reports such as periodic reports | — | ○ (Acceptance of and guidance on notifications, etc.) | — |
| Enforcement of legal actions such as on-site inspections | ○ (Determination of policies) | ○ (Implementation of inspection) | — |
| Operation of training system for qualified person for energy management of type 1 designated energy management factory | ○ (Designation of organ and delivery of certificate) | — | ○ (Implementation of test and training) |
| On-site investigation and On-site inspection of factory | ○ (Determination of policies and consignment) | ○ (Guidance, etc. after investigation) | ○ (Implementation of investigation) |
| Support for company such as energy conservation diagnosis, etc. 60 | ○ (Determination of policies and assistance) | △ (Publicity of system) | ○ (Implementation of support) |

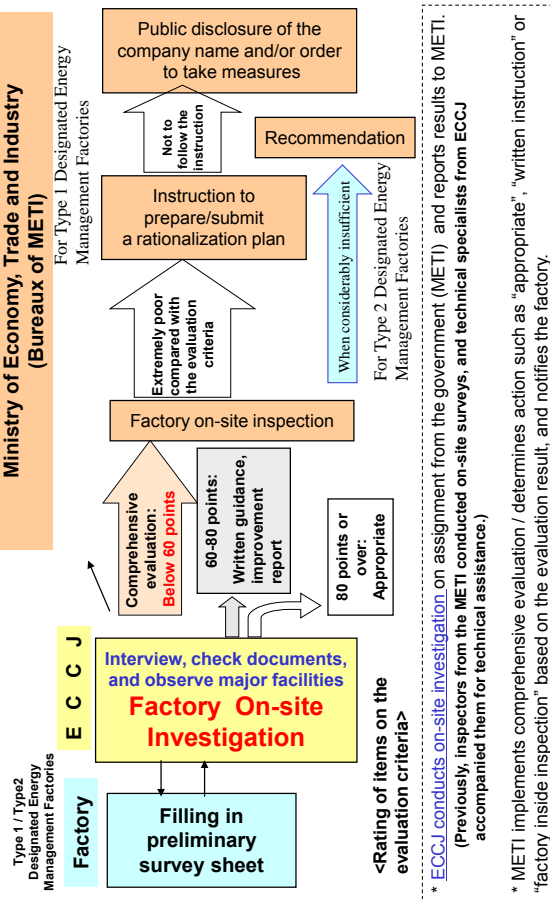
Management of Information related to Type 1/Type 2 Designated Energy Management Factory

Input the Information to an Energy Conservation System Connecting the Ministry of Economy, Trade and Industry and Each Regional Bureau



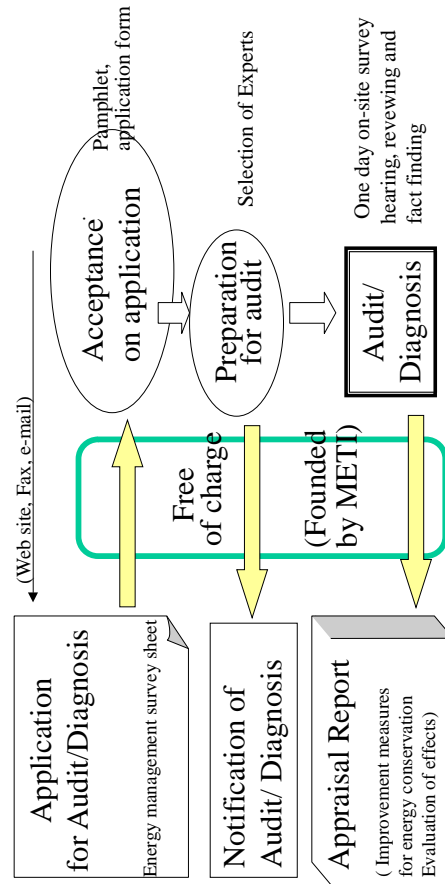
Flow of Factory On-site Investigation

Type 1 DEMIFs / Since FY 2001 Type 2 DEMIFs / Start FY 2008



Scheme of Audit/Diagnosis

for medium sized factories & buildings



One-day Energy Diagnosis is very effective for fact finding.



- Survey items**
- Energy Management Standards
 - Energy loss / Efficiency of Utilities

Preliminary survey (document review) and 1-day on-site survey by 1 thermal expert and 1 electric expert

Fact finding: * Items to be improved

General management items (along the guide-line of the A.C.T), EE&C propelling organization

- Pump, fan, compressor, co-generation and others
- Air conditioning and refrigeration facilities
- Boiler, industrial furnace, steam system, heat exchanger, waste heat, wastewater
- Receiving and transforming facilities, motor, lighting, and electric heating facilities

Recommendations:

- *Counter measures
- *Effect estimated (energy saving / cost saving)

<After follow> questionnaire survey for top management

---- implementation of the recommendation, energy/cost saving %,.

We have made public the proposed measures & expected effects for other factories' reference.



Promotion toward "Smart Life" -- Change of lifestyle in Residential & Commercial Sectors

First oil crisis (1973)
Second oil crisis (1979)

Imminently promoted energy conservation measures

Perpetual energy conservation measures

Promotion and enlightenment of energy conservation

Sustained awareness of energy conservation

Action

- Summer and Winter campaigns (PR activities through mass-media, Commendation ceremonies)
- ENEX exhibitions
- Education (posters contests, textbooks, seminars)
- Grass roots activities (EC Republic)
- Disclosure of information on internet

Equipment

- Ranking catalogs for high energy efficiency (TV, Refrigerator, Air-conditioner, etc.), Labeling system
- Energy conservation Indicator (Ene-Con "Navi")
- Grand prize for energy conservation (activities, equipments)
- International Energy Star logo displayed on energy-saving OA equipments

Change of Lifestyle

Checklist of lifestyle

Energy efficient equipment

"Energy Conservation Navi"

House reforming High-energy quality

"Car Idling-Stop" activity



Energy conservation-monitoring system for residential Sector

"Energy Conservation Navigator" displaying energy saving amount and saved charges (electricity, fuel gas, water)

The voltage and current are measured to calculate power consumption, and the results thereof are transferred to the monitor.

NEDO/ECCJ Cooperative Publication (since FY 2000)

| | |
|---------------------------------|----|
| Number of Registered Companies: | 13 |
| Number of Types of E-Co-Navi: | 38 |

Wireless transmission

E-Co-Navi

Display

The system displays the following items

- Consumed amount (kWh, m³) from the beginning of the month
- Target energy charges
- Previous energy charges

Meter

Distribution panel

CT (current transformer), Gas flow meter, Water flow meter



<Example> Practical training courses for energy conservation (5 courses)

Objective: to bring up engineers who can implement practically, "Energy Conservation" through their own workshop

General course, Electric course, Thermal course, Building management course, Improvable-subject finding course

| Thermal course contains 4 stages (total 9days course) | | | |
|---|---|--|--|
| <p>1st stage (2 days)</p> <p><Lecture></p> <ul style="list-style-type: none"> * Basic technology of heat saving * Thermal energy * Oil and gas fuel *Combustion calculation and CO₂ emission *Success cases etc. <p><Practical training with facilities></p> <ul style="list-style-type: none"> * Combustion adjustment practice *Air ratio *Shape and color of flame * Gas explosion experiment and safety limit etc. | <p>2nd stage (2 days)</p> <p><Lecture></p> <ul style="list-style-type: none"> *Energy saving on steam *Management of steam system *Effective use of steam *Steam trap and drain recovery *Engineering software for steam etc. <p><Practical training with facilities></p> <ul style="list-style-type: none"> *Steam trap practice *Function *How to judge function *Air trap practice *Engineering software practice *Design *Merit etc. | <p>3rd stage (3 days)</p> <p><Lecture></p> <ul style="list-style-type: none"> *Measuring instrument and how to measure *Heat balance calculation and analysis *Improvement measures etc. <p><Practical training with facilities></p> <ul style="list-style-type: none"> *Practice of heat balance with model furnace *Operation of furnace *Data acquisition *Data analysis etc. | <p>4th stage (2 days)</p> <p><Lecture></p> <ul style="list-style-type: none"> *Successful cases and thermal energy management *Various cases *Check list for energy saving activity *Boiler management *Energy Conservation Law etc. <p><Practical training with facilities></p> <ul style="list-style-type: none"> *Observation of actual facilities (improved facilities) *O₂ control *Air pre-heater *Co-generation *Regenerative burner etc. |
| Objective person: Energy manager and engineer, Maintenance engineer, Manufacturing engineer, Plant and facility operator | | | |
| <p><fee: 800US\$></p> <p><fee: 1,000US\$></p> <p><fee: 800US\$></p> <p><fee: 800US\$></p> | | | |
| <p>Conferment of the Certification</p> | | | |



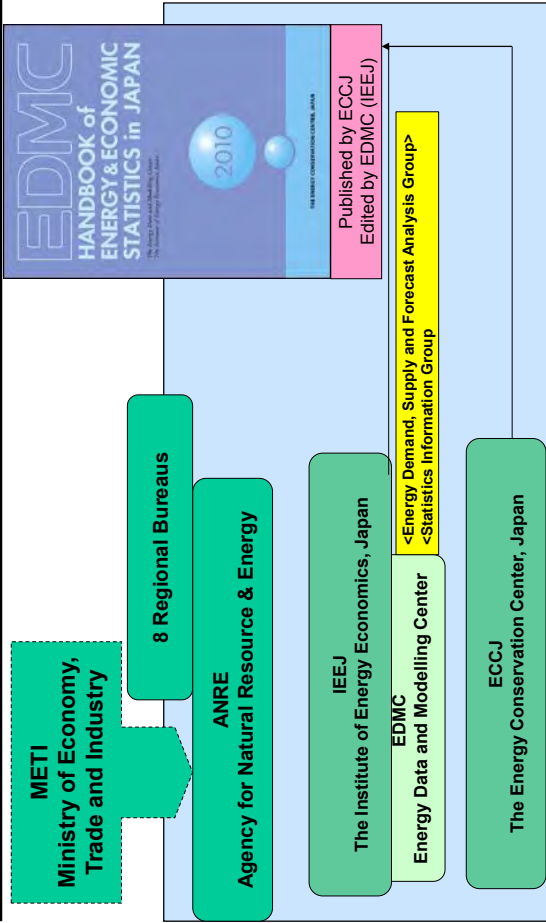
Publication

Various kinds of publications and videos are produced as a part of ECCJ's activities

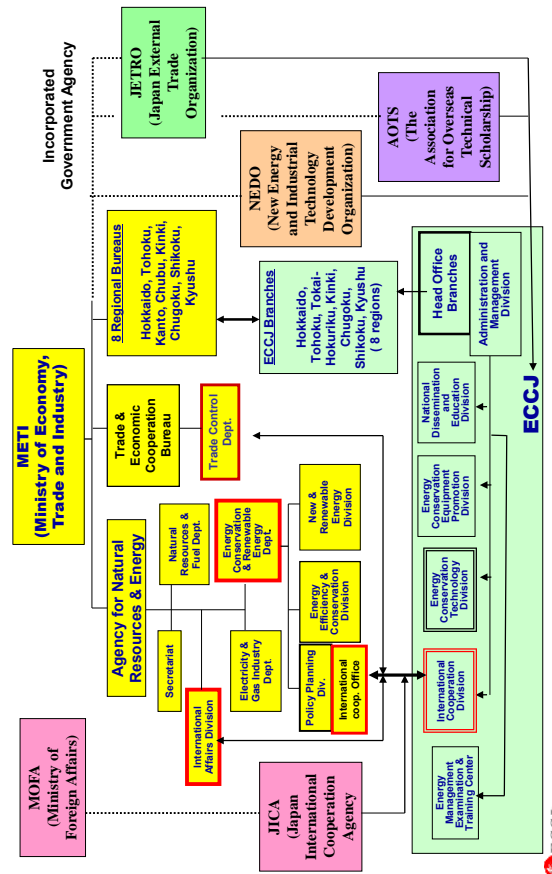


System of Gathering of Data on Energy in Japan <Example >

by METI / ANRE / IEEJ / ECCJ



6. METI and the Related Organizations in Japan for International Cooperation on the Energy Conservation



Fundamental Framework of ECCJ's Activities for International Cooperation

<Policy Proposal>

- * Investigation of policy regarding energy and energy conservation.
- * Potential survey and feasibility study on energy conservation and reduction of GHG emission.

<Capacity-Building>

- * Training course in Japan and abroad.
- * Dispatching experts to overseas for seminars, workshops, etc.

<Technical Cooperation>

- * Factory audit/diagnosis and improving advise through field activities including plant survey, energy conservation audit, etc.
- * Cooperation and support for establishment and operation of Energy Efficiency & Conservation (EE&C) Centers or such organizations.

Asia Energy Efficiency & Conservation Collaboration Center

Establishment : In April, 2007

Location : In The Energy Conservation Center, Japan

Purpose : Information service on energy efficiency and conservation to Asian countries

Activities : One stop service

- Send of the information about legislation, policy, management method, technology, best practices, etc. on EE&C
- Response to inquiry on EE&C
- Introduction of contact points in government/non-government organizations related to energy



Contact Us : <http://www.asiaeec-col.eccj.or.jp/>



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A4-302

Dissemination/Promotion of Technology (Example)

CONCEPTUAL IMAGE & CLASSIFICATION of Japanese State-of-the-art Smart Energy Products & Technologies



URL: <http://www.jase-w.eccj.or.jp/technologies/overview.html>

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JASE-World was established in October, 2008

Japanese Business Alliance for Smart Energy - Worldwide



Mr. H. Yonekura,
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 , Former Chairman of Japanese Business Federation
Main Members : 57 Companies, 19 Observers, 11 Governmental Organizations



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Japanese Business Alliance for Smart Energy Worldwide

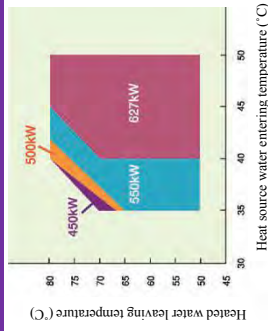
Dissemination/Promotion of Technology (Example)

Device & Equipment: F-22 Water – Water Centrifugal Heat Pump

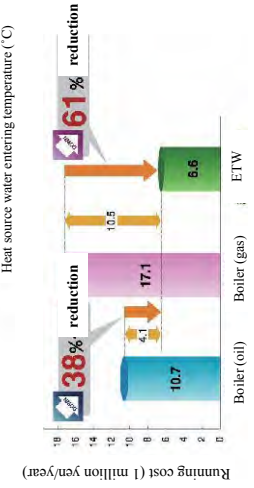
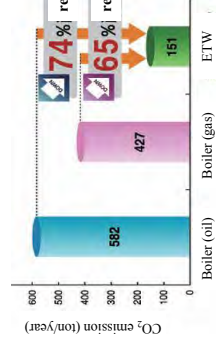


Rated COP*1)4.5 (when heat source water entering temperature is 45°C and hot water leaving temperature is 80°C)

*1): COP = Abbreviation of Coefficient of Performance.
The bigger the value of COP, the higher the energy-saving characteristics.
COP = Cooling rated ability (kW) / Power consumption (kW)



ETW water heat pump



URL: <http://www.jase-w.eccj.or.jp/technologies/pdf/factory/F-22.pdf>

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Dissemination/Promotion of Technology (Example)

Energy Supply: F-10 Heat Pump Chillers for Factories & Buildings

Air blower
DC inverter fan (above)
DC inverter motor (below)

Super-high efficiency type
Cooling COP 4.5*

Air-side heat exchanger
Effective use of major exposed area. Surface area expands by becoming hexagonal.

Compactor
DC inverter scroll compactor

Air-cooled heat pump chillers, suitable for large-scale air conditioning tasks, such as office buildings, factories and hospitals

Energy-saving effects: High-efficiency types reach COP4.5 for cooling. That is a 59% improvement over chillers of 15 years ago (20HP, our product)

| Model | Equivalent HP | Cooling capacity kW | Cooling COP |
|-----------------------------|---------------|---------------------|-------------|
| Super-high-efficiency types | 20 | 42 | 4.5 |
| High-efficiency types | 30 | 85 | 3.6 |
| High-capacity type | 40 | 100 | 3.2 |

Ease of maintenance: When multiple modules operate together, one module can stop and the others that are in normal condition will continue to operate automatically. Individual modules can then be serviced without shutting down the entire system.

*Unique integrated control system "ZLNOS" can optimize control of up to 20 units to suit air conditioning load.

Large-capacity units can be linked together up to a maximum of 800HP, with the units controlled to operate in rotation for longer life spans.



URL: <http://www.jase-w.eccj.or.jp/technologies/pdf/factory/f1-10.pdf>

Dissemination/Promotion of Technology (Example)

Device & Equipment:

F-7 High-performance Industrial Furnace Equipped with Regenerative Burner



Exhaust gas passes through the burner via a tube.

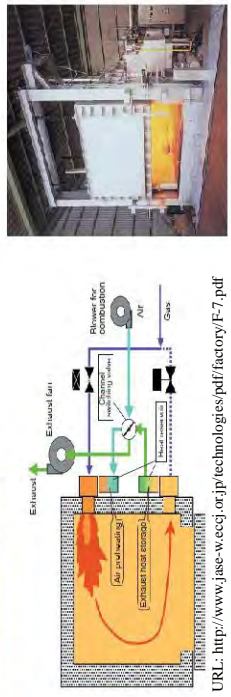


Air and exhaust gas undergo direct heat exchange inside the burner.

Features

- Two burners are operated alternately. While one burner is in operation, the exhaust heat is stored in the heat reservoir of the other burner for effective utilization of the exhaust heat.

Basic Concept or Summary



URL: <http://www.jase-w.eccj.or.jp/technologies/pdf/factory/F-7.pdf>



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Dissemination/Promotion of Technology (Example)

URL: <http://www.jase-w.eccj.or.jp/technologies/electricity.html>



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Dissemination/Promotion of Technology (Amorphous Transformer (1/2))

URL: <http://www.jase-w.eccj.or.jp/technologies/pdf/electricity/E-2>

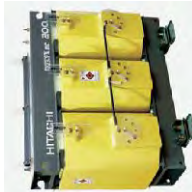
Features

- Amorphous alloy is used in the iron core of the transformer.
- No-load loss (standby power) is reduced to about 1/3*1.
- Energy saved is a maximum 44% more than the value of the leading runner*1.
- CO2 emission is suppressed, contributing to the prevention of global warming.

*1: Comparison between the 3-phase, 1,000kVA50Hz X-SP Series and the top runner standard value



Oil-immersed transformer

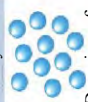


Molded transformer

<Crystal Structure>



<Non-crystal Structure Amorphous>



Amorphous core

Concept Drawing of an Amorphous Alloy

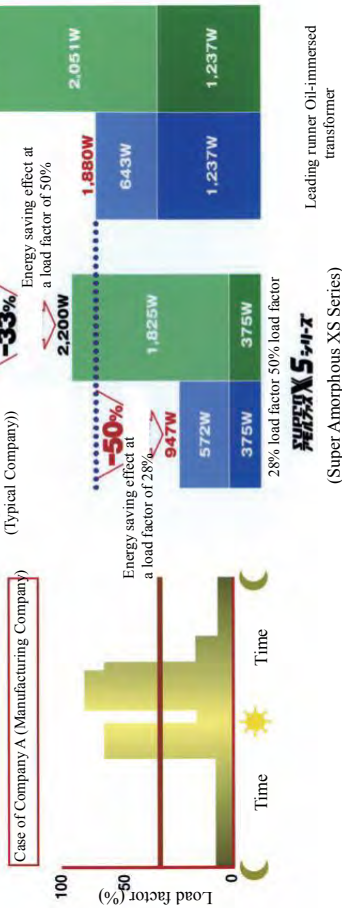


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Dissemination/Promotion of Technology (Amorphous Transformer (2/2))

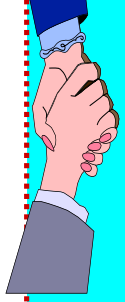
URL: <http://www.jase-w.eccj.or.jp/technologies/pdf/electricity/E-2>

Transformer Characteristics
Comparison Table
(3-phase 1,000kVA 50Hz
(Typical Company))



Super Amorphous XS Series
(Super Amorphous XS Series)

Leading runner Oil-immersed transformer



Thank you very much

省エネのシンボルです
SMART CLOVER

**More information could be seen in
ECCJ's Internet Home Page at :**

<http://www.eccj.or.jp/> <from 1996>

<http://www.asiaeee-col.eccj.or.jp/>

<http://www.jase-w.eccj.or.jp/>

The Symbol of Energy
Conservation

Since 2005
ECCJ has been spread
the symbol mark with
the visual image of a
four-leaf clover which
is thought to bring
happiness named as
"SMART CLOVER",
representing everyone's
energy conservation
activities.

The Energy Conservation Center, Japan

Since 1978



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