

Text No.2

**POLICY & PROMOTION OF  
ENERGY CONSERVATION IN JAPAN  
<Outline>**

**省エネルギー 推進活動**

May 19, 2003

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Managing Director

The Energy Conservation Center, Japan

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常務理事

< JICA training course : Energy Efficiency and Conservation >

**Policy & Promotion of  
Energy Conservation in Japan  
< outline >**

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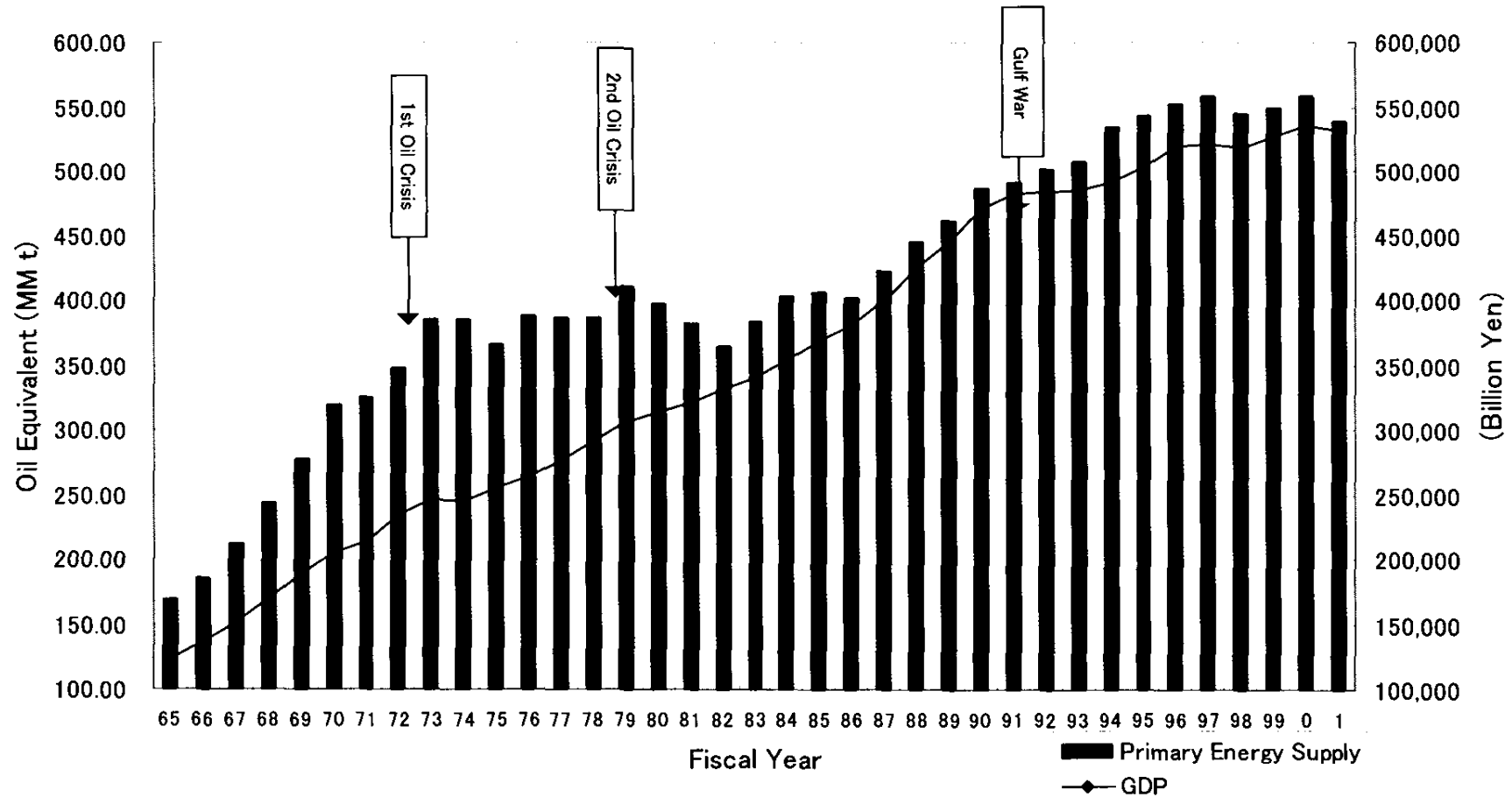
**The Energy Conservation Center, Japan**

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# ***1. Trends of Energy & Principle of Energy Policy***

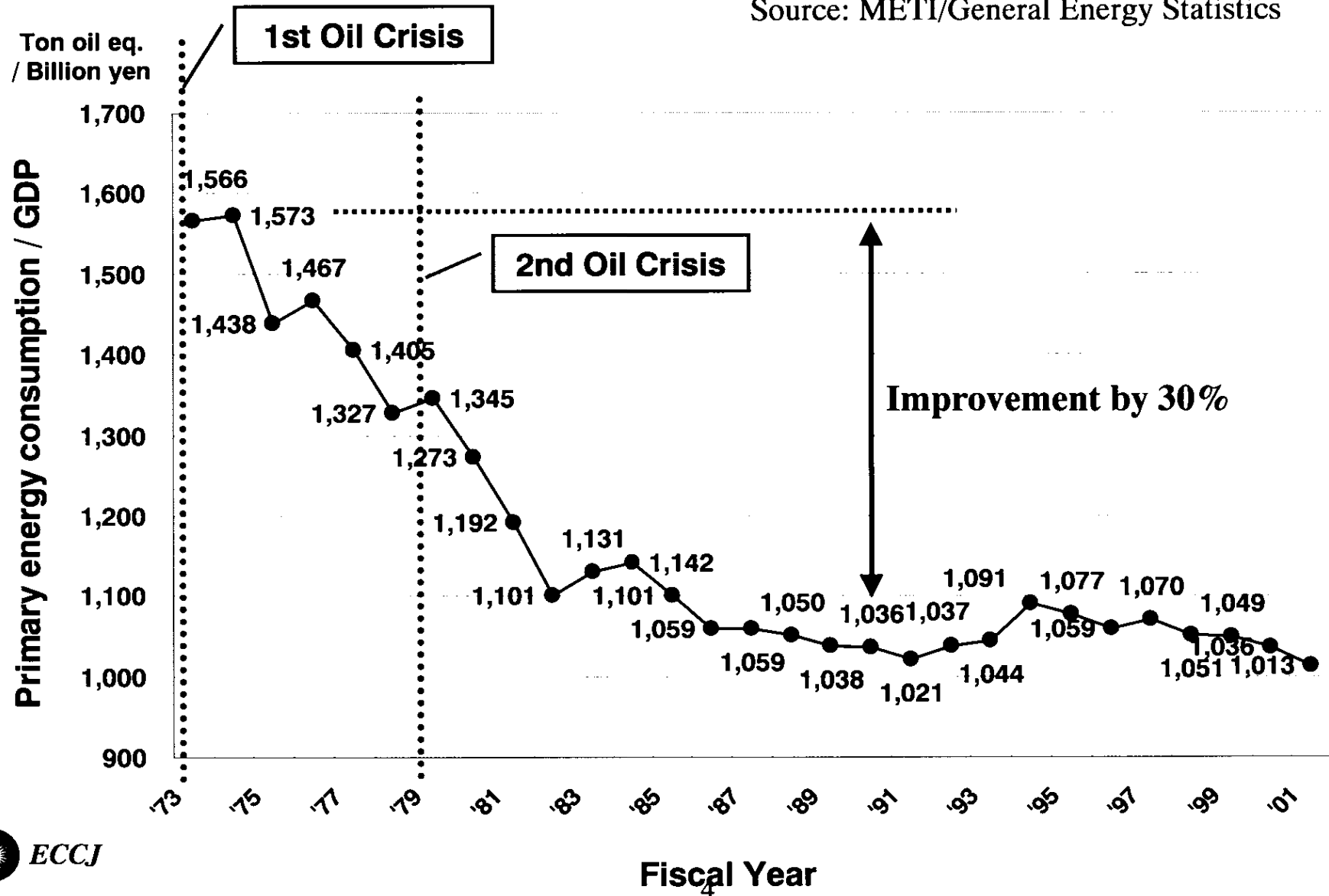
# Trend of Primary Energy Consumption and GDP



(Source: EDMC Handbook of Energy & Economic Statistics in Japan 2002)

# Trend of Primary Energy Intensity per GDP in Japan

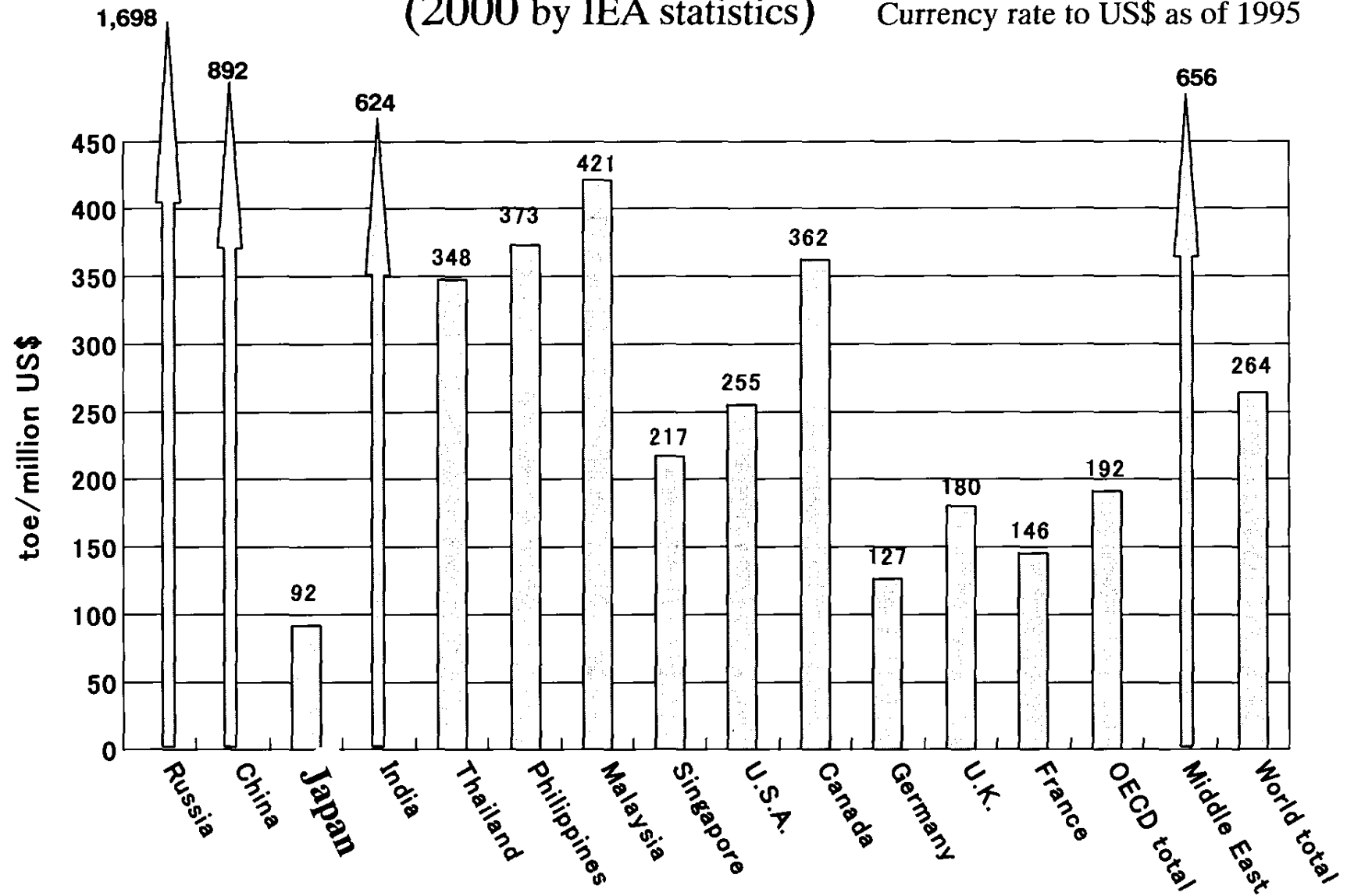
Source: METI/General Energy Statistics



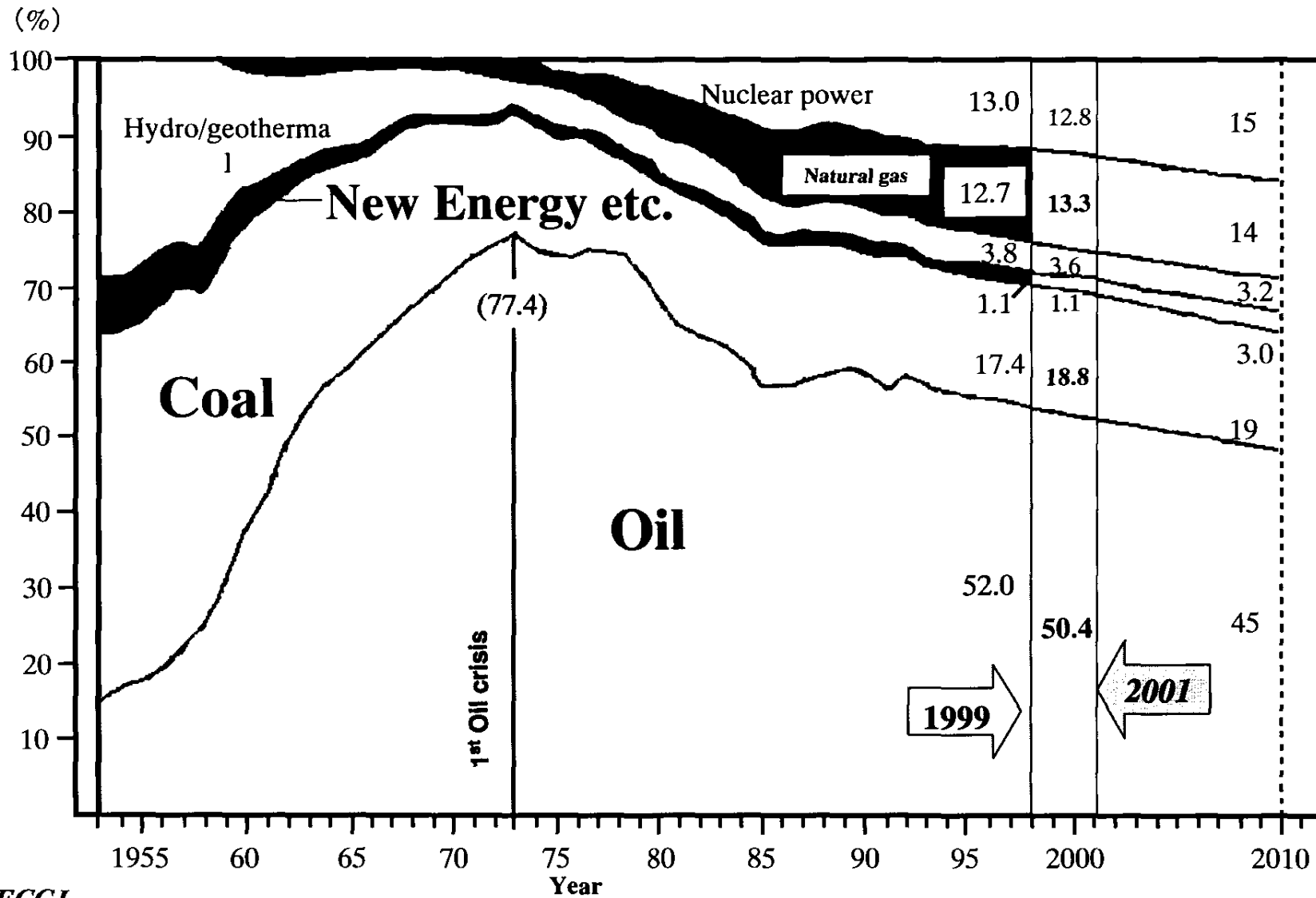
# Primary Energy Intensity per GDP

(2000 by IEA statistics)

Currency rate to US\$ as of 1995

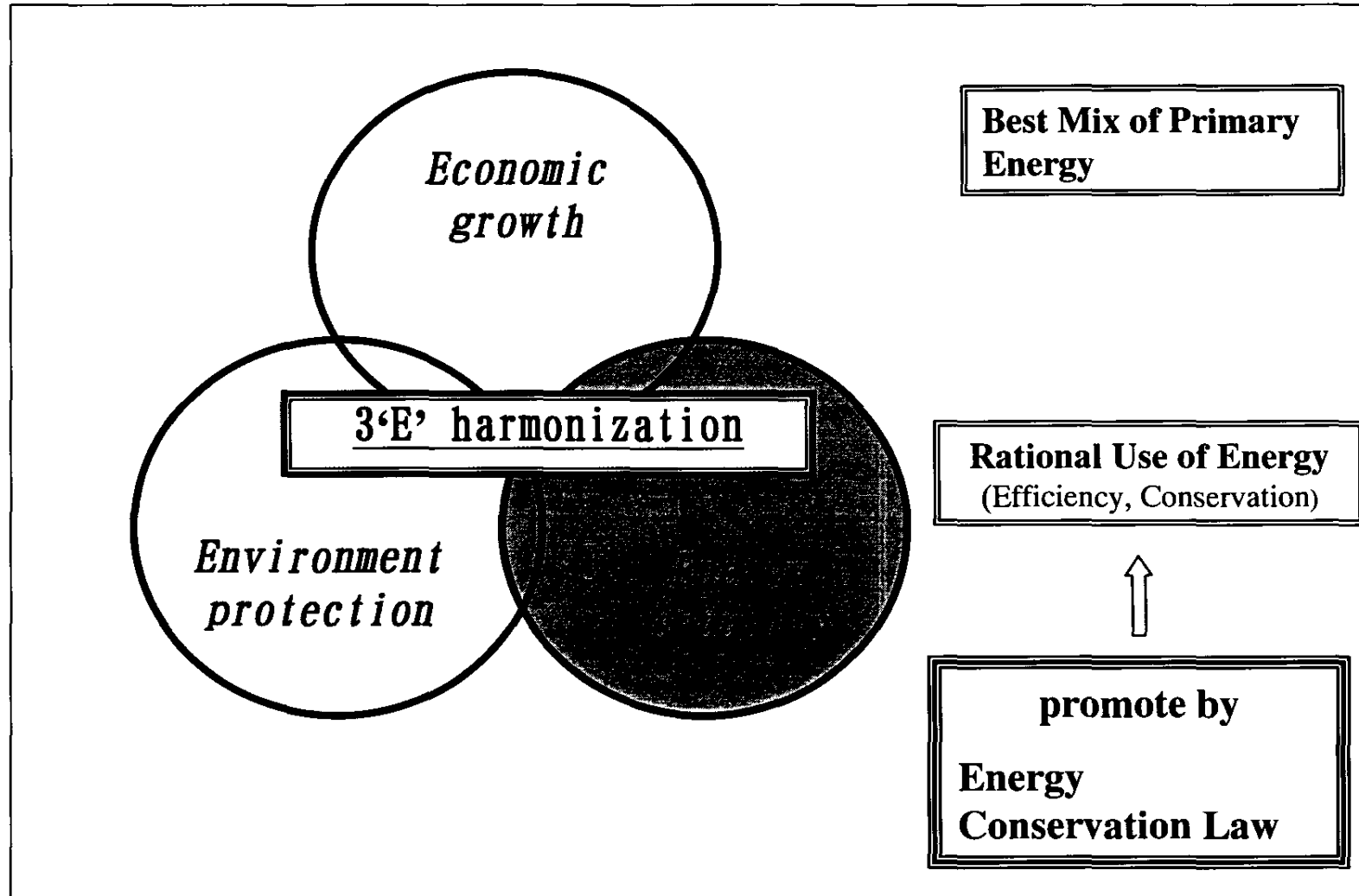


# Composition of Primary Energy Supply in Japan



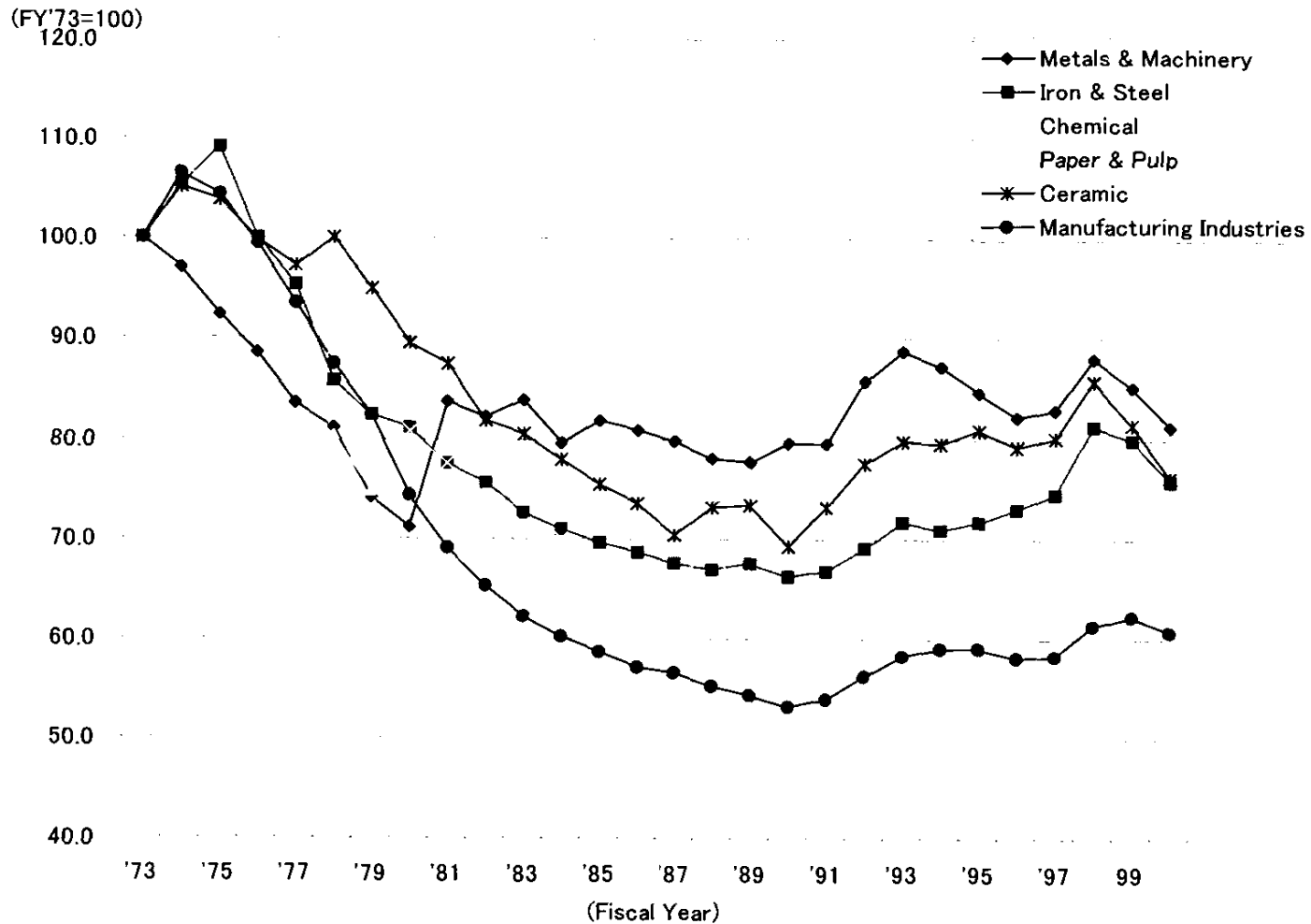


# Principle of Energy Policy --- 3'E's harmonization



## ***2. Energy Conservation Policy in Japan***

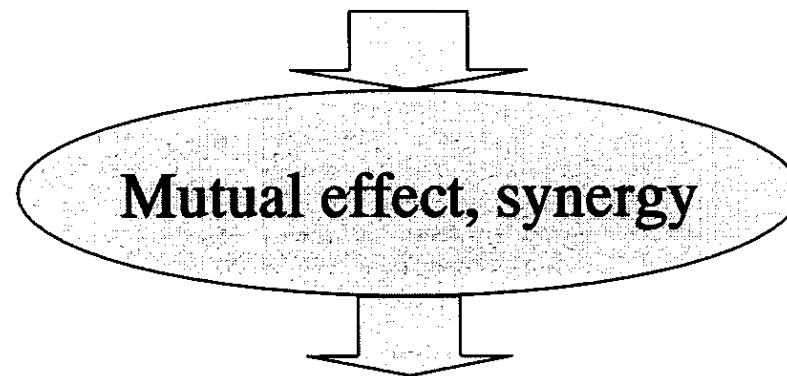
# <Manufacturing> Trend of Energy Consumption Intensity by Sector



(Source: EDCM Handbook of Energy & Economic Statistics in Japan 2002)

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

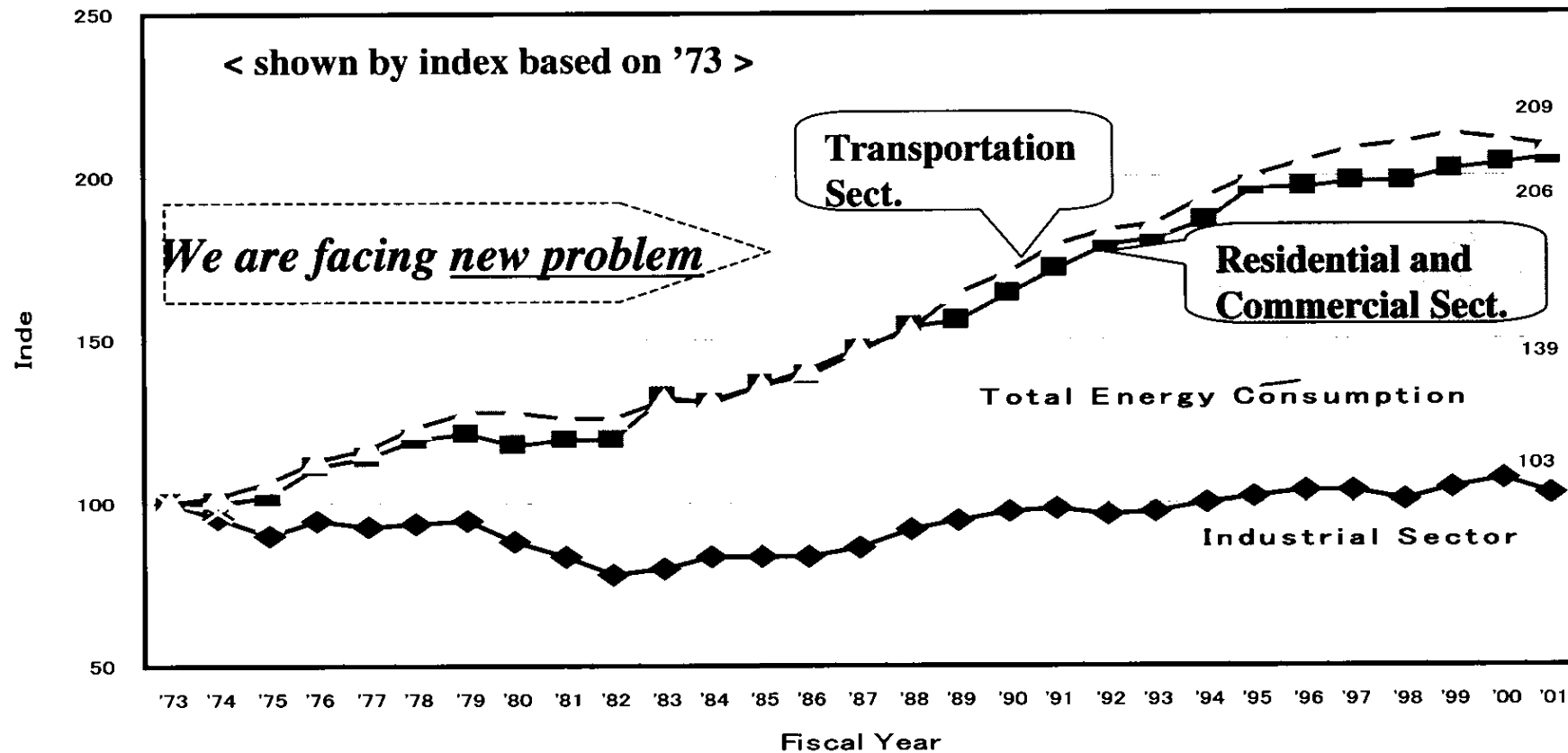
- Cost reduction (enforcement of international competitiveness) and self-help efforts by companies
- Regulation measures by Government (Energy Conservation Law)
- Support and subsidy system by Government (finance, tax, subsidiary aid)



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

# Trend in Final Energy Consumption by Sector

(2001)

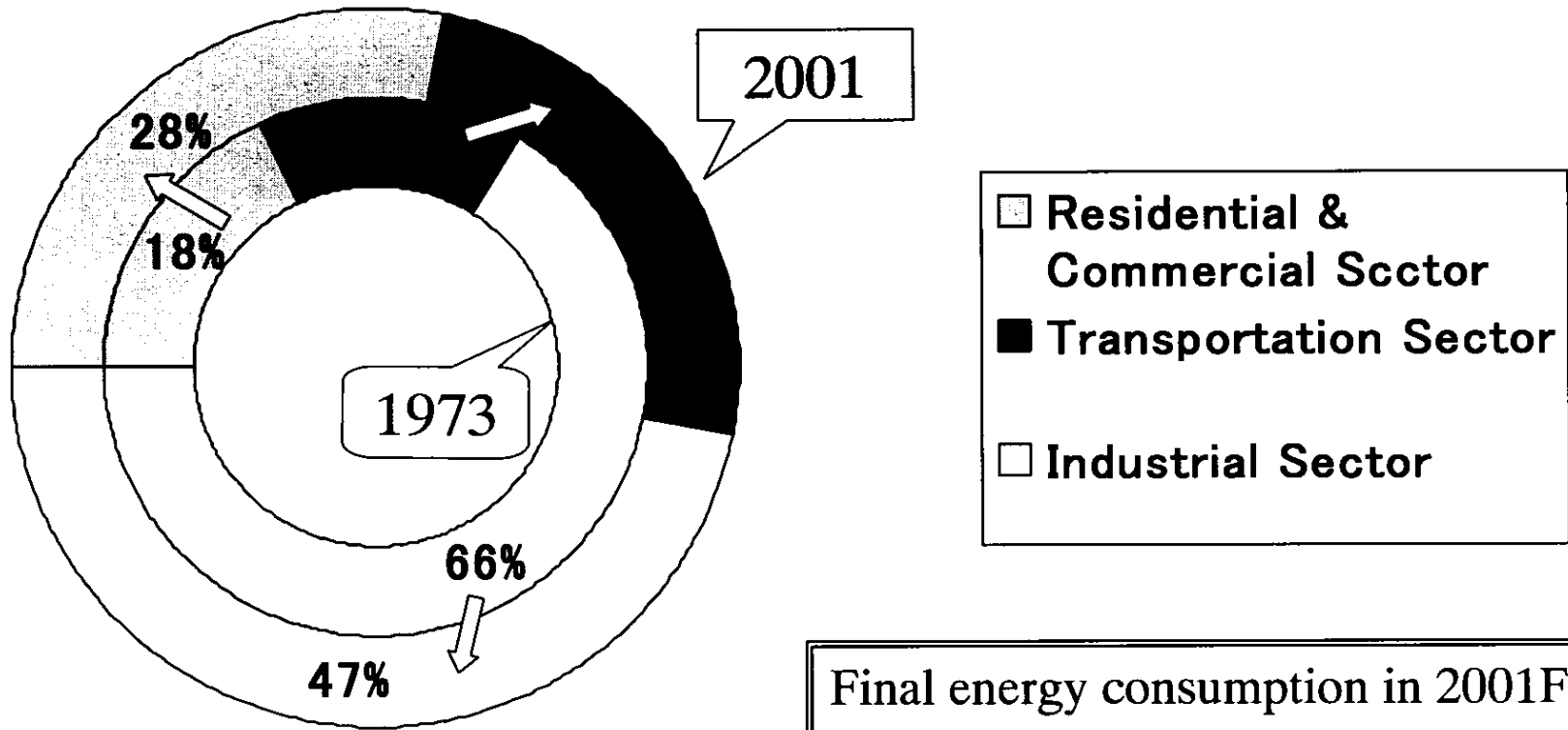


Amend the Energy Conservation Law (enforced in April, 2003) , and enforce the regulation of large-scale buildings in conform with Class 1 designated factories.

Enforce the energy conservation promoting activities of the residential and commercial sector.



# Consumption Share of Each Sector



Final energy consumption in 2001Fy  
**403 million kl oil equivalent**

# CO<sub>2</sub> Reduction Targets in Major Countries during 2008 and 2012 (Compared with the base year 1990)

<COP3 Kyoto Commitment in 1997>



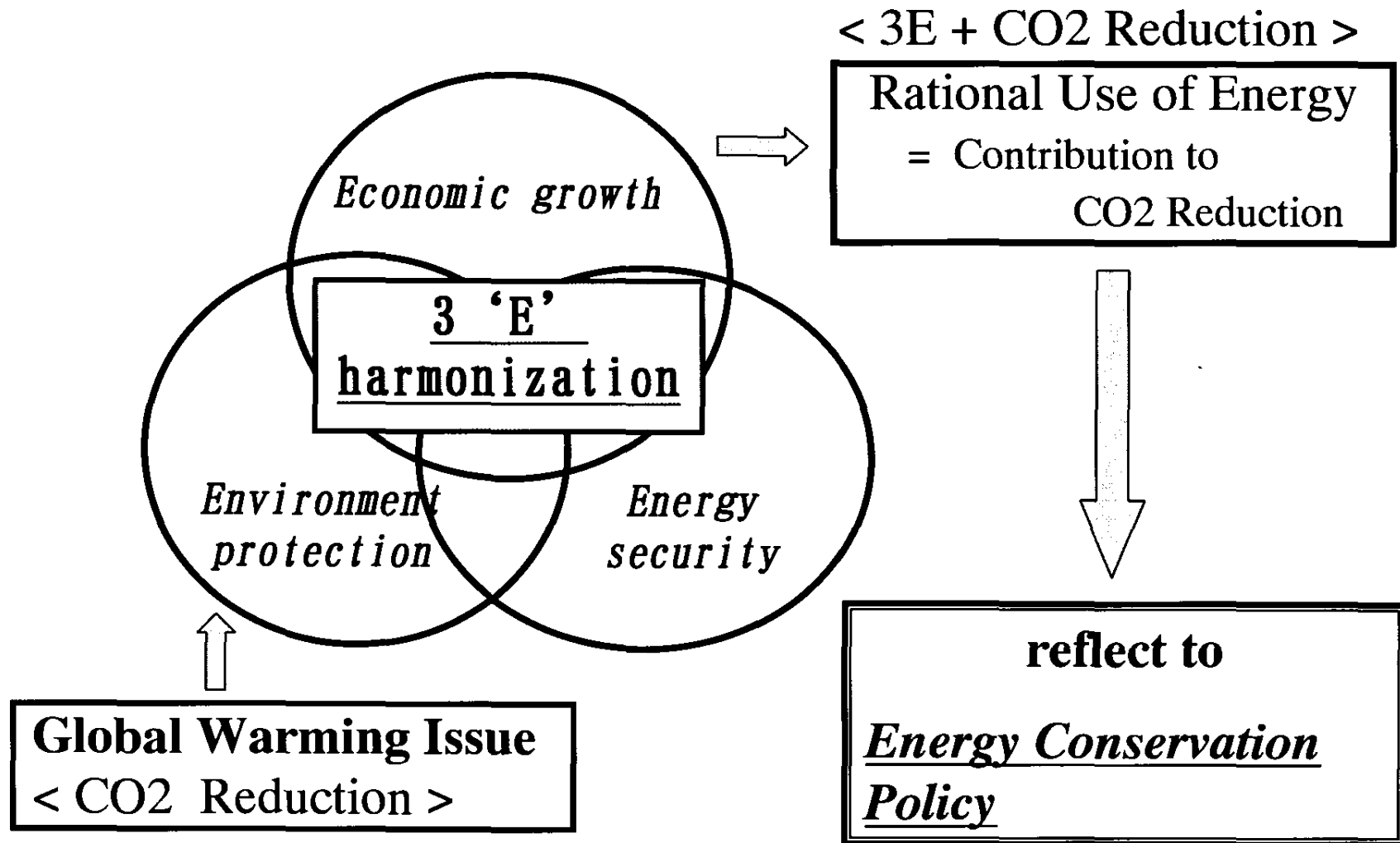
## *Kyoto Commitment*

- **GHG emissions - 6% below 1990 level**
- **Stabilization of CO<sub>2</sub> emissions at 1990 level**

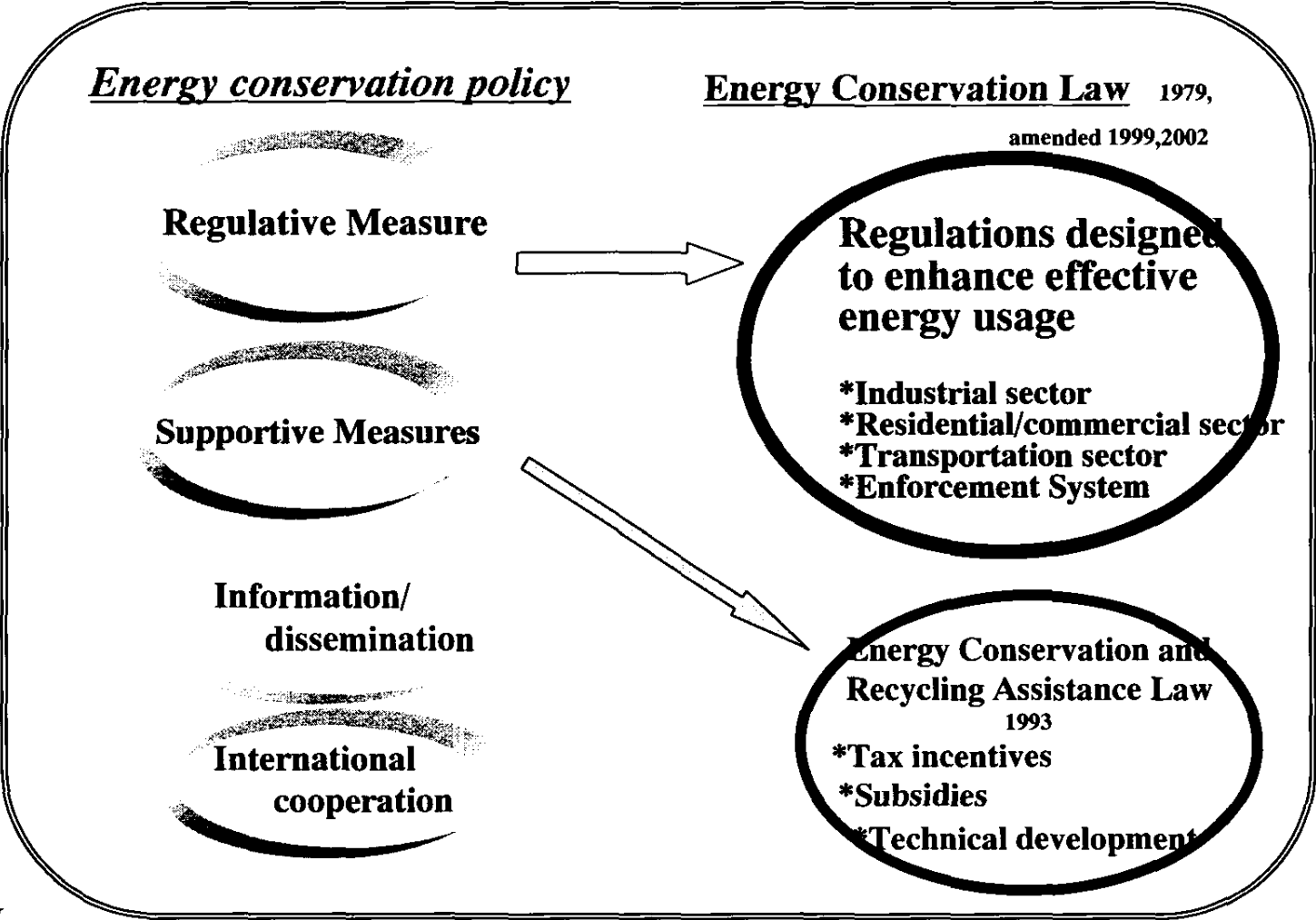
<b>- 2.5%</b>	Emission Reduction of CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O 0% : CO <sub>2</sub> from Energy Origin - 0.5% : Emission Reduction of CH <sub>4</sub> , N <sub>2</sub> O etc - 2.0% : Renewable Energy, Innovative Technologies
<b>- 3.7%</b>	Sinks(Land Use Change and Forestry)
<b>+ 2.0%</b>	HFC, PFC, SF <sub>6</sub>
<b>- 1.8%</b>	Kyoto Mechanism ( Emission Trading, JI, CDM )
<b>- 6.0%</b>	Total



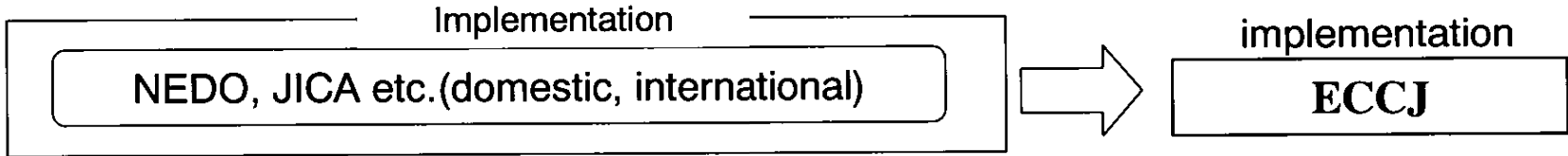
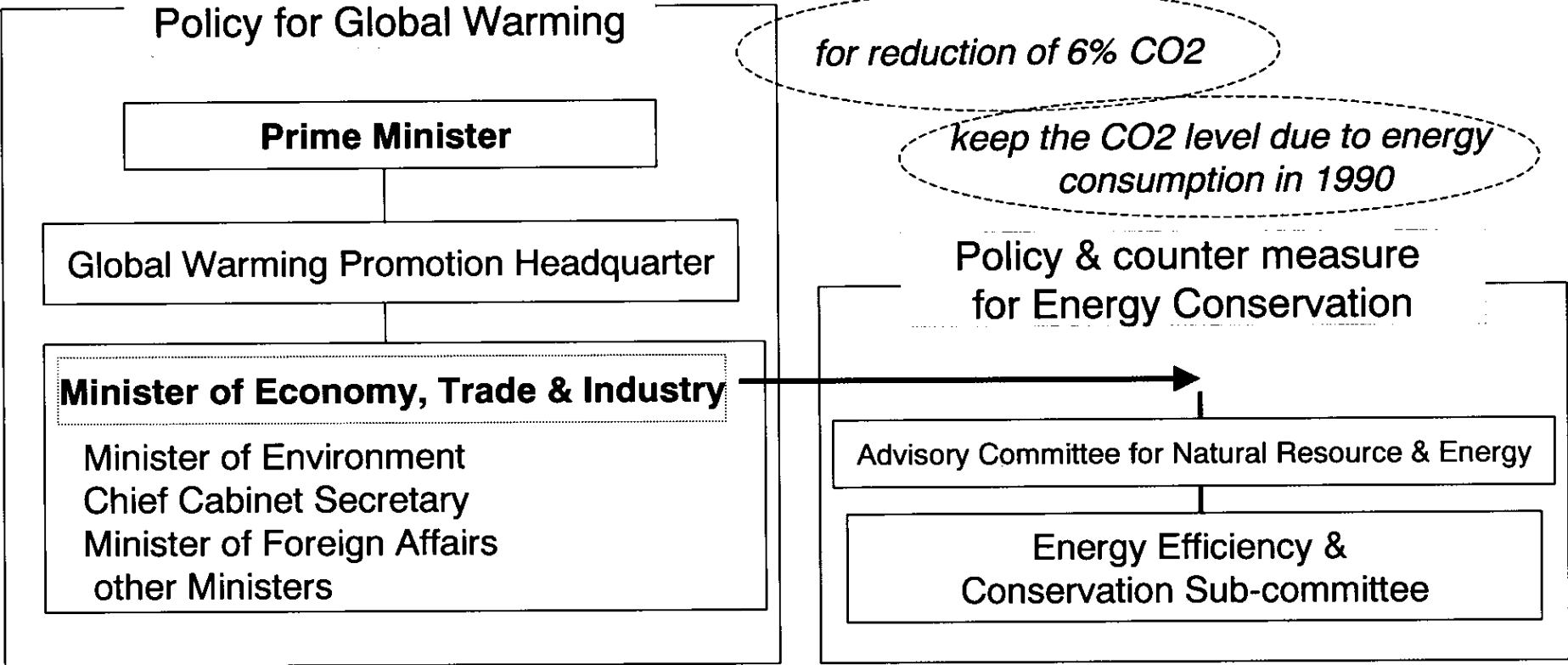
# Reflection of Global Warming Issue to Energy Conservation Policy



# Energy Conservation Policy and Energy Conservation Law



# Structure of Energy Conservation Promotion in Japan



## Dealing with Global Warming by the Government

### Government Policy and Procedure :

- Follow the decision settled at COP3
- Put emphasis on energy conservation as for energy-oriented CO<sub>2</sub> reduction

Revision of Global Warming Prevention Principles <Feb. 2002>

Ratification of Kyoto Protocol <Jun. 2002>

### Consolidation of Laws, etc. :

Revision of Global Warming Prevention Law <2002.4>

Revision of Energy Conservation Law <2002.6>

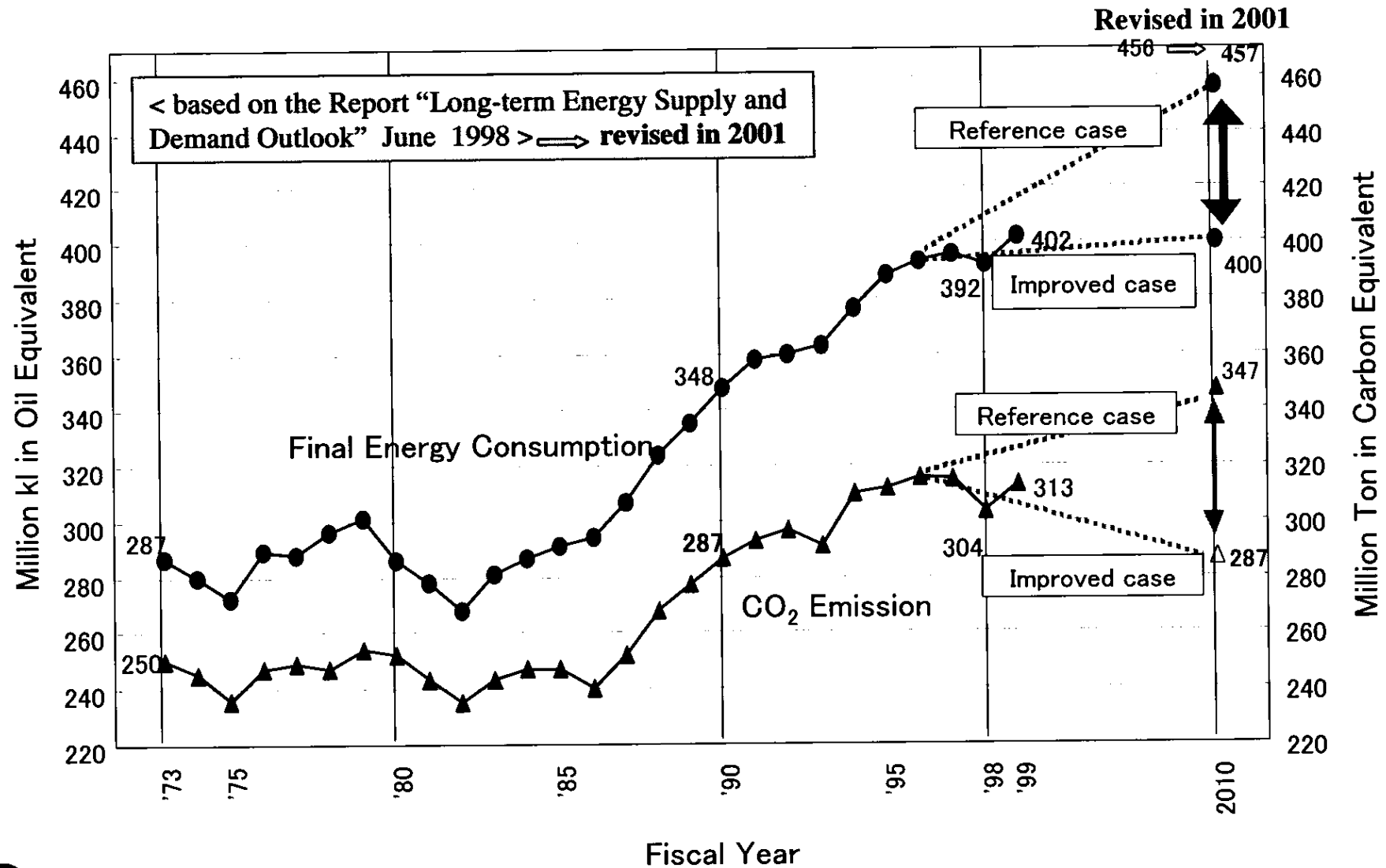
Revision of Law of Promotion of Renewable Energy Usage <2002.6>

Enactment of Fundamental Law for Energy Policies <2002.6>

Revision of Energy Conservation & Recycling Assistance Law <2003.3>

# Final Energy Consumption and CO<sub>2</sub> Emission due to Energy Use

<target amount of energy consumption to be reduced is 57 million kl oil eq.>



Features and Key points of energy conservation  
counter-measure ... 2001 METI Revision

*Towards the reduction of 57million kl oil eq.*

**3 Features**

- Put high regard on the measures taken up to now
- Adopt long-term and sustainable measures
- Promote energy conservation measures to guide each citizen

**Key points of concrete measures :**

**<Industry sector> promote the existing measures by enforcing self-action plan  
(containing “the voluntary action plan by Keidanren”, and following it up)**

**<Residential sector> introduction of effective equipment, thorough demand  
management, promotion of energy conservation action**

**<Transport sector> Diffusion of energy conservation automobile,  
rationalization of transport & distribution system**

**<Trans-sector measures> settlement of energy conservation technology  
strategy, promotion of energy conservation education**

# Framework of Energy Conservation Measures

## REGULATORY CONTROL

(The Energy Conservation Law)

43.7M kl (of which additional measures: 4.2M kl)

### 《For factories》 20.1M kl

- Obligation for 1<sup>st</sup> category designated factories.
  - To submit periodic reports on energy utilization
  - To submit long-term energy conservation plan
  - To appoint energy managers and submit notification of such
- Conduction of on-site investigations at the 1<sup>st</sup> category designated factories to evaluate whether they keep the standard required by the Law. (2001Fy~)
- Obligation reinforced for 2<sup>nd</sup> category designated factories. (2003 Apr.~)
  - To submit periodic reports on energy utilization
  - To submit long-term energy conservation plan

### 《For appliances》 12.5M kl

(additional measures: 1.7M kl)

- Energy efficiency improvement of appliances utilized in households and offices
- Obligation to improve fuel efficiency based on the Top-Runner Program criteria
- Expanding the range of appliances subject to the Top-Runner Program

### 《For buildings》 11.1Mkl (additional measures: 2.5Mkl)

- Strengthening of conservation standards
- High energy consumption buildings are designated for 1<sup>st</sup> category. (2003 Apr.~)

## SUPPORTING PROMOTION

(budget, fiscal investment and loan, preferential tax)

13.3M kl (of which additional measures: 2.8M kl)

### 《Promoting the introduction of high-efficiency equipment for enterprises and local public bodies》

12.3M kl (additional measures: 1.8M kl)

- Budgetary support for introduction of high-efficiency equipment and demonstration testing (38 billion yen)
  - Promoting the diffusion of Home/Building Energy Management System (HEMS & BEMS)
  - Supporting ESCOs business
  - Promoting the introduction of high-efficiency hot water supply apparatuses
  - Promoting the reduction of standby power consumption
  - Spreading hybrid cars, idling-stop systemized cars, so on
- Tax incentives for introduction of equipment (exemption & depreciation)
- Low-interest loan for the introduction of equipment
- Energy demand management (with ESCOs)

### 《Technological development (79 billion yen)》

(additional measures: 1M kl)

- Technological development by governmental bodies
- Supporting technological development by enterprises
- High performance boilers, lasers, lights and so on



### ***3. Outline of Energy Conservation Law***



# Structure of the Energy Conservation Law

(1979 enforced, 1999, 2002 amended and reinforced)

## <basic objective>

Enhancing energy efficiency in order to achieve 3E's harmonization.

- Regulations regarding factories
- Regulations regarding buildings
- Energy efficiency standard for appliances and automobiles (Top runner program)

# Regulation and Target for Industrial Sector



**target**

Reduce 1% of energy intensity  
on average per year in a medium and long-term vision

4,100 + 1,000

**Major Energy Consumers  
(designated 1st category  
factory)**

Reinforced in 2003  
to contain buildings

≥ 3,000 kl/y or  
≥ 12 million kWh/y



Apr. 1999 6,400 - 1000

**Small Energy  
Consumers  
(designated 2nd  
category factory)**

≥ 1,5000 kl/y or  
≥ 6 million kWh/y

\* Selection of energy management officer  
\* Records of energy consumption

**Obligation**

\* Selection energy managers  
\* Submission of future plans  
\* Periodical reports, etc.

In case of marked insufficiency

Direction of the submission of  
rationalization plans

Public announcement & order

Reinforced  
in 2003

\* Periodical reports

**Guidance  
of energy management**

(Judgement Standards)

\*Rationalization of combustion  
\*Recovery of waste heat  
\*Prevention of the electricity  
loss, etc.

**Operation Standard of  
Equipment's**

\* Target Points  
\* Measures to attain targets

# Designated Energy Management Factories

Reinforced in 2003

	Class 1 (one) Designated Factories [4,146 factories as of April 2000]	Class 2 (two) Designated Factories [6,391 factories as of April 2000]
Designation Standards	Manufacturing, Mining, Energy supply, (The restriction of targeted industry is abolished from April, 2003 ) Heat : 3,000 KL- coe or more/year Electricity: 12 mil.KWH or more/year	No limitation on industrial category  Heat : 1,500 KL- coe or more/year Electricity: 6 mil.KWH or more/year
Judgement Standards	Obligation to make efforts to comply with the Standards (making efforts to improve energy intensity by more than 1% per year on average)	Same as left
Energy Management	Obligation to appoint and register energy managers	Obligation to appoint and register energy management officers who have to take energy conservation lectures periodically
Energy Conservation Plans	Obligation to formulate and submit medium-to-long term plans for energy conservation every year to MITI	For class 1 Buildings, they can submit the plans supervised by outside energy manager in case of vacancy of own energy manager.
Status of Energy Use	Obligation to report the status of energy use every year to MITI	Same as left <reinforced in 2003>

Energy managers should be selected from licensed persons. The License to be acquired through the state examination.



# Regulations regarding buildings

## 1. Obligations to building owner

- \* Prevention of heat loss through external walls and windows.
- \* Efficient utilization of energy for air conditioners, ventilation systems, lighting, water heaters, elevators.

## 2. Guidance and standards for the building owners on building design and construction.

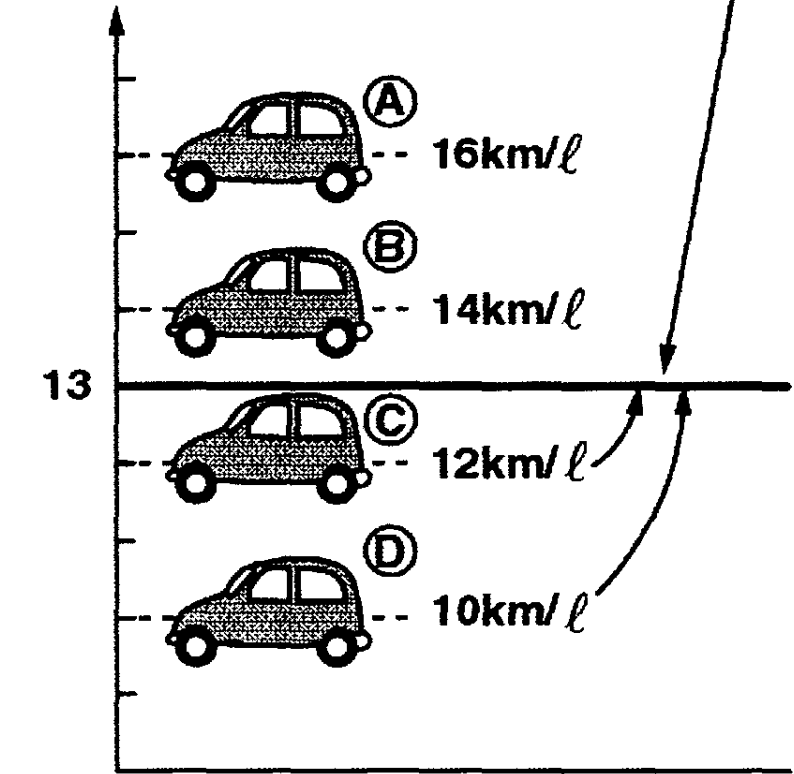
**the amended Law to be enforced in April 2003**

**for big size/class 1 designated commercial buildings**

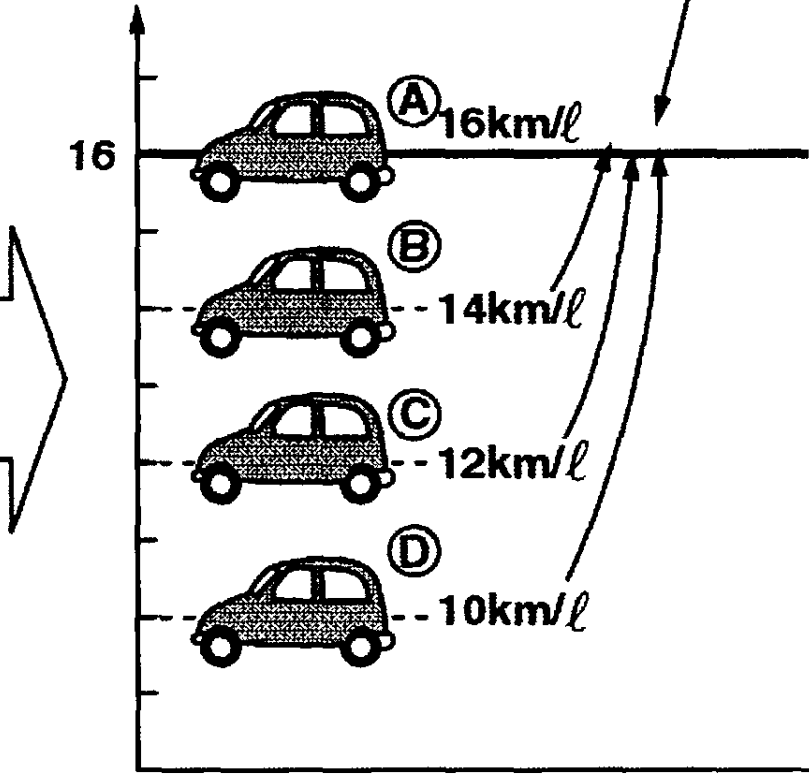
- **Obligation to report the status of energy consumption every year**
- **Obligation to submit medium-to-long term improving plan under the supervision of energy manager**

# Energy Efficiency Standard for Appliances and Automobiles Top Runner Program -Concept-

Old energy efficiency standard (more than average)



New energy efficiency standard ((A) is the top runner.)



# Top Runner Program – 12 Target Items

< under Energy Conservation Law >

*8 items to be added in 2002 autumn*

<b>Items (Product categories)</b>	<b>Target year</b>	<b>Improvement of efficiency *</b>
<b>Air conditioners (for use in both cooling and heating)</b>	<b>2004</b> (partially 2007)	<b>63%</b>
<b>Television receivers</b>	<b>2003</b>	<b>16%</b>
<b>Video cassette recorders</b>	<b>2003</b>	<b>59%</b>
<b>Fluorescent lamp luminaries</b>	<b>2005</b>	<b>17%</b>
<b>Copiers</b>	<b>2006</b>	<b>30%</b>
<b>Computers</b>	<b>2005</b>	<b>83%</b>
<b>Magnetic disk drives(hard disks)</b>	<b>2005</b>	<b>78%</b>
<b>Gasoline-fueled passenger cars</b>	<b>2010</b>	<b>23%</b>
<b>Gasoline-fueled trucks</b>	<b>2010</b>	<b>13%</b>
<b>Diesel-powered passenger cars</b>	<b>2005</b>	<b>15%</b>
<b>Diesel-powered trucks</b>	<b>2005</b>	<b>7%</b>
<b>Electric refrigerators and freezers</b>	<b>2004</b>	<b>30%</b>



**Energy Labeling Items**

\* Base year:1997 (automobiles:1995)

## Expansion of the scope of Top Runner (8 items added in December 2002)

Gas Stove (Heater)

Oil Stove (Heater)

Gas Home Cooker (Cooking Range)

Gas Hot Water System

Oil Hot Water System

Toilet Seat with heater & hot water

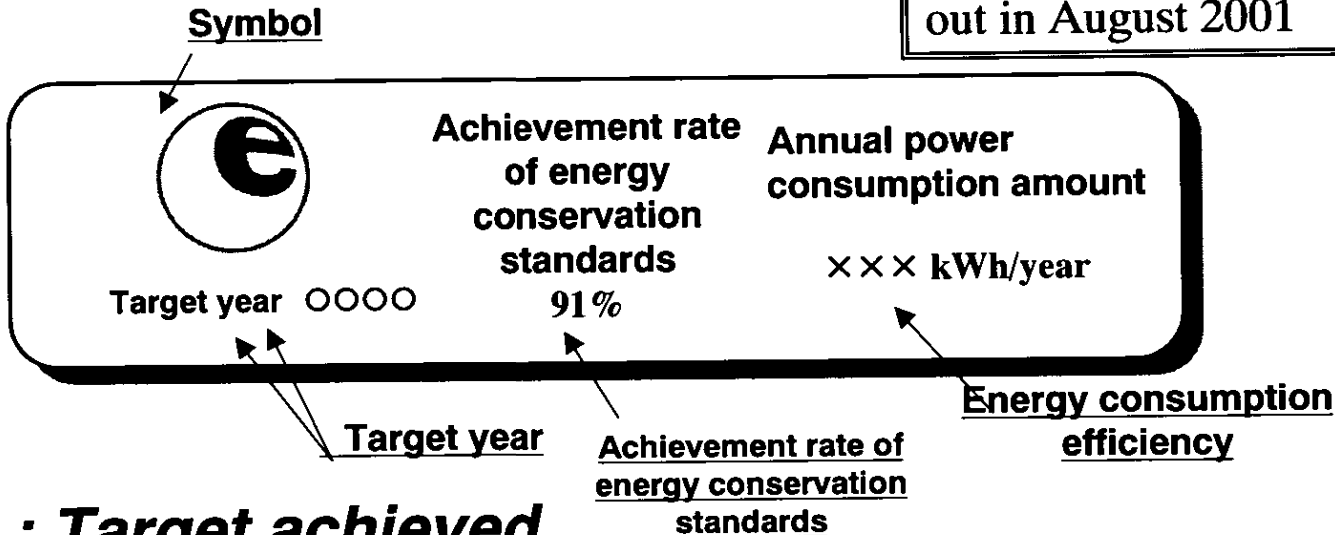
Automatic Vending Machine

Electric Transformer

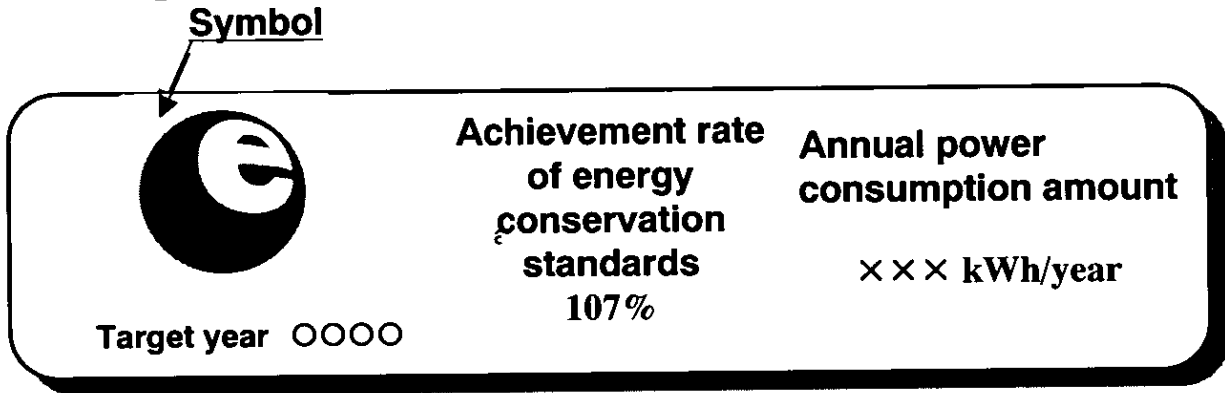
# Energy Labeling -- Method of Indication --

## ★ Case 1: Target still not achieved

This system launched out in August 2001



## ★ Case 2 : Target achieved



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



## ***4. Energy Manager System***

## **Energy Manager System (supplement)**

Energy managers system have contributed greatly to carry out the energy conservation in industrial sector.

### **<Historical back ground --- authorized by the Law>**

1948 :Regulations concerning heat management and  
license of heat manager

1951 :Law concerning heat management

1979 :Energy Conservation Law --- reinforcement of the managers' power

### **<Role of Energy managers under the Law>**

\* To maintain energy-using facilities in sound conditions following the Guidance (**Judgement Standards**) by the Law.

\* To recommend energy efficiency improvement of the facilities.

(the management must give consideration to the recommendations in high regard)

### **Number of Energy Managers Required by the Law**

#### **The 1st-class designated mining, electricity/gas/heat supply factories**

<u>Fuel consumption, annually</u>	<u>Number Required</u>
3,000 or less than 100,000 kl-oe	1
100,000 kl-oe or more	2

#### **The 1st-class heat-designated manufacturing factories**

<u>Fuel consumption, annually</u>	<u>Number Required</u>
3,000 or less than 20,000 kl-oe	1
20,000 or less than 50,000 kl-oe	2
50,000 or less than 100,000 kl-oe	3
100,000 kl-oe or more	4

#### **The 1st-class electricity-designated manufacturing factories**

<u>Electricity consumption, annually</u>	<u>Number Required</u>
12,000 or less than 200,000 MWh	1
200,000 or less than 500,000 MWh	2
500,000 MWh or more	3

Energy managers should be selected from licensed persons. The License to be acquired through the state examination.

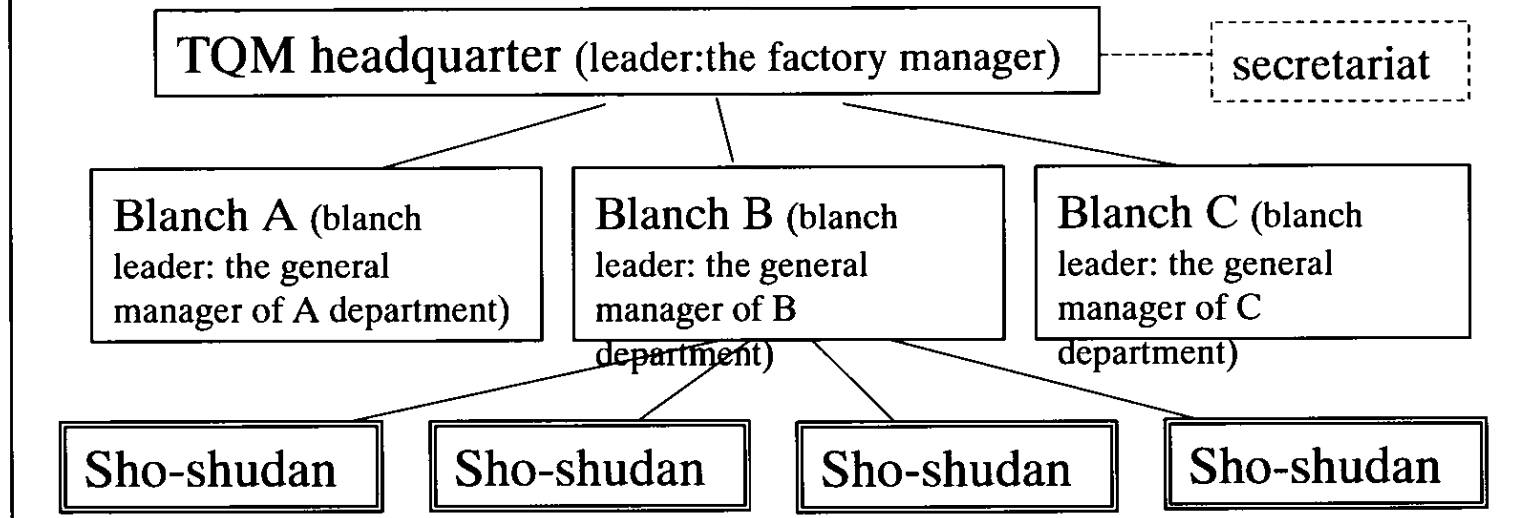
In case of commercial buildings, they are permitted to submit medium-to- long term improving plan under the supervision of outer person who licensed energy manager instead of selecting and registering the in-house energy manager. ----- by the Law revised and enforced in April 2003

*5. Self-help Efforts of Energy Conservation by Enterprises*

## TQM and Sho-shudan activity

- TQM and Kaizen by Sho-shudan activity are very popular in Japanese enterprises/factories. Sho-shudan activity is generally included in TQM.
- All subjects concerning cost down and quality up including energy conservation can be objectives for Kaizen. However generally speaking, the theme being adopted are led to be suitable for the TQM policy (the company's management strategy).
- In some case, Kaizen will be expanding to the technological improving project of the factory/company.

The position of Sho-shudan in TQM organization:



In many cases **energy managers** play the role of secretaries, advisers, instructors.

# Self-help efforts in Enterprises

## E n e r g y M a n a g e m e n t

Observation (fact finding) → Control → improvement

^ T Q M ^

Introduction of newest technology & facilities

### Task force

*a large amount of investment*

### Project

Technological improvement,  
Adoption of high efficiency equipment

*a small amount of investment*

### Kaizen by Sho-shudan

keeping the operation standard, small maintenance,  
tuning up the operational conditions,

< Minimum requirement: observation system or measuring tools of energy consumption >

Every departments / Every persons should be participating to the activities.

< T Q M >

Large effect

High level  
(Investment level)  
<Top management>

Middle level  
(Technological level)  
<Engineers>

Low (easy) level  
(operational & facility management level)  
<Workers>

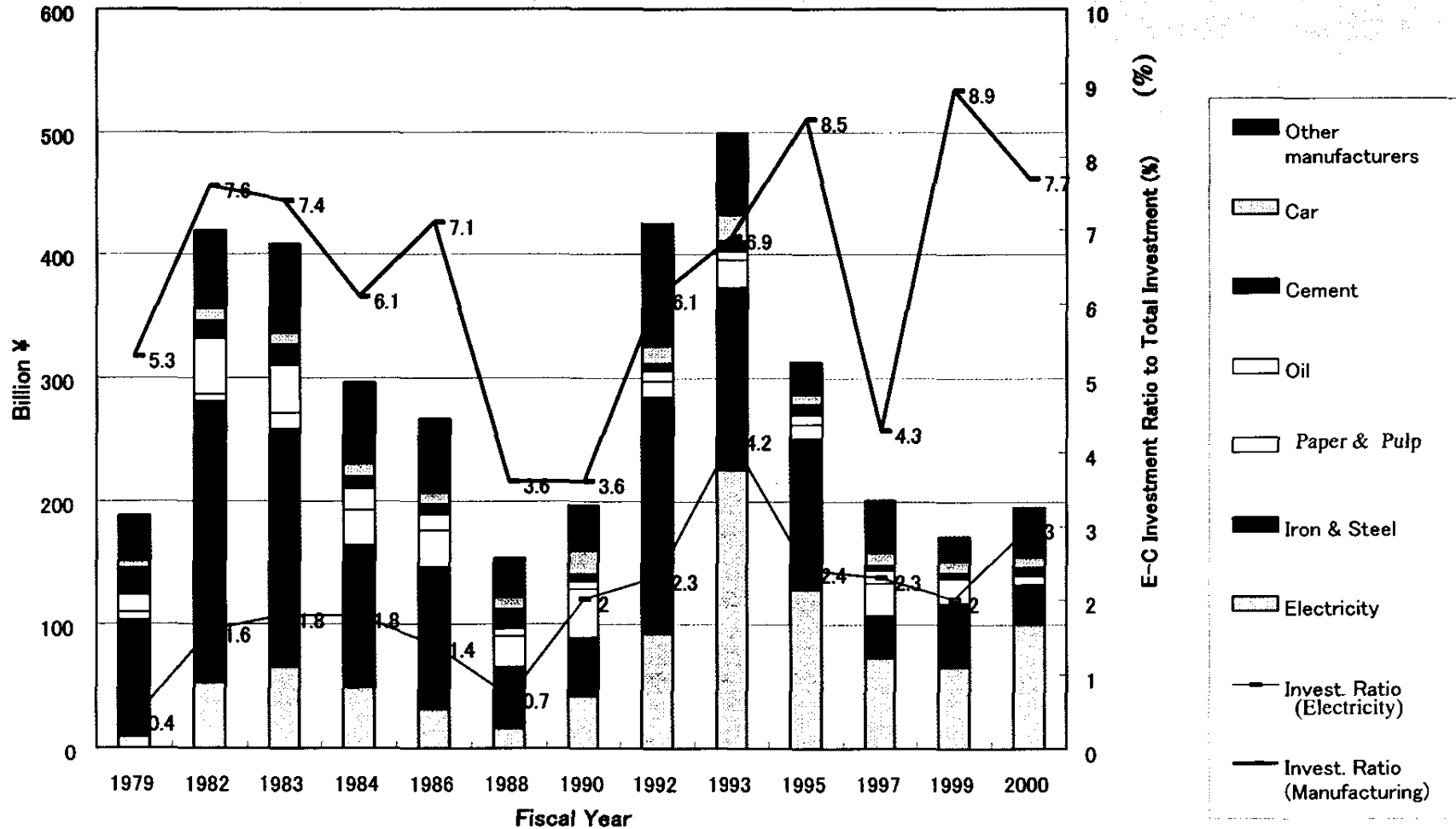
Small effect



# Trend of the Investment for Energy Conservation Facilities

Major Manufacturing Companies & Electricity

( based on the research report by METI in 2001Fy for 444 companies )



# **Voluntary Action Plan by KEIDANREN**

**(Keidanren: the Federation of Economic Organizations)**

**•Participants : 36 Industries** (Coverage Ratio : 77% of CO<sub>2</sub> emissions in the industrial and energy-conversion sectors)

## **Expected Energy Conservation Technology and Process to be Introduced**

- \* Iron & Steel : Continuous Annealing Line, D-C Electric Arc Furnace, etc.**
- \* Chemical : Gas Phase Polypropylene Manufacturing Process, etc.**
- \* Cement : Vertical Roller Mill Crusher, High Efficient Clinker Cooler, etc.**

### ***Target in Year 2010***

**To reduce CO<sub>2</sub> emission from Industrial and Energy- converting Sector below the amount in 1990**

**< To make the predicted increase of energy consumption**

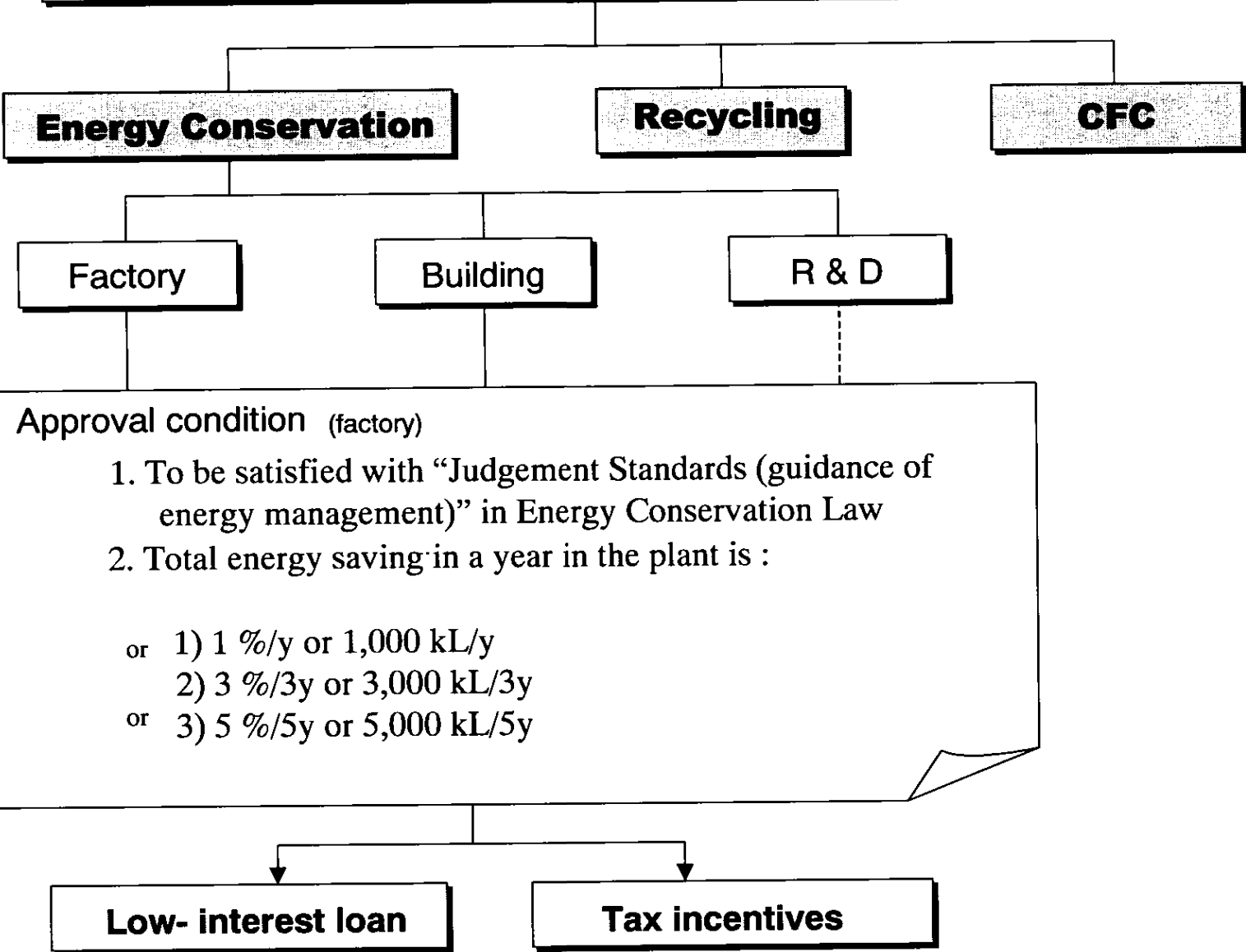
**( 21 Mil kL/year) zero >**



- ***Supportive System by Government  
(Investment and Technology Development)***

# Supportive Measures (1)

## Energy Conservation & Recycling Assistance Law



# Tax Incentives

----- From 1984 -----

Intended for	Tax incentives
<ul style="list-style-type: none"> <li>· 91 facilities</li> <li>· 52 facilities for small and medium companies</li> <li>· Others</li> </ul>	<ol style="list-style-type: none"> <li>1. Tax exemption equivalent to 7% of the equipment acquisition cost from the income tax or corporate tax payable (applicable only to small and medium companies from fiscal year 1999)</li> </ol> <p style="text-align: center;">or</p> <ol style="list-style-type: none"> <li>2. Special depreciation of up to 30% of the equipment acquisition cost</li> </ol>
<p>Systems approved on the basis of the "Assistance Law" (Energy savings of 5% or 5,000 kL)</p>	

\* Basic acquisition cost = [Acquisition cost] x [Multiplier rate (25 to 100%)]

\* Special depreciation: The depreciation is classified as "loss" as defined in the Tax Law, and is included in the calculation of profit in the settlement of accounts.

## [Status regarding the use of tax incentives]

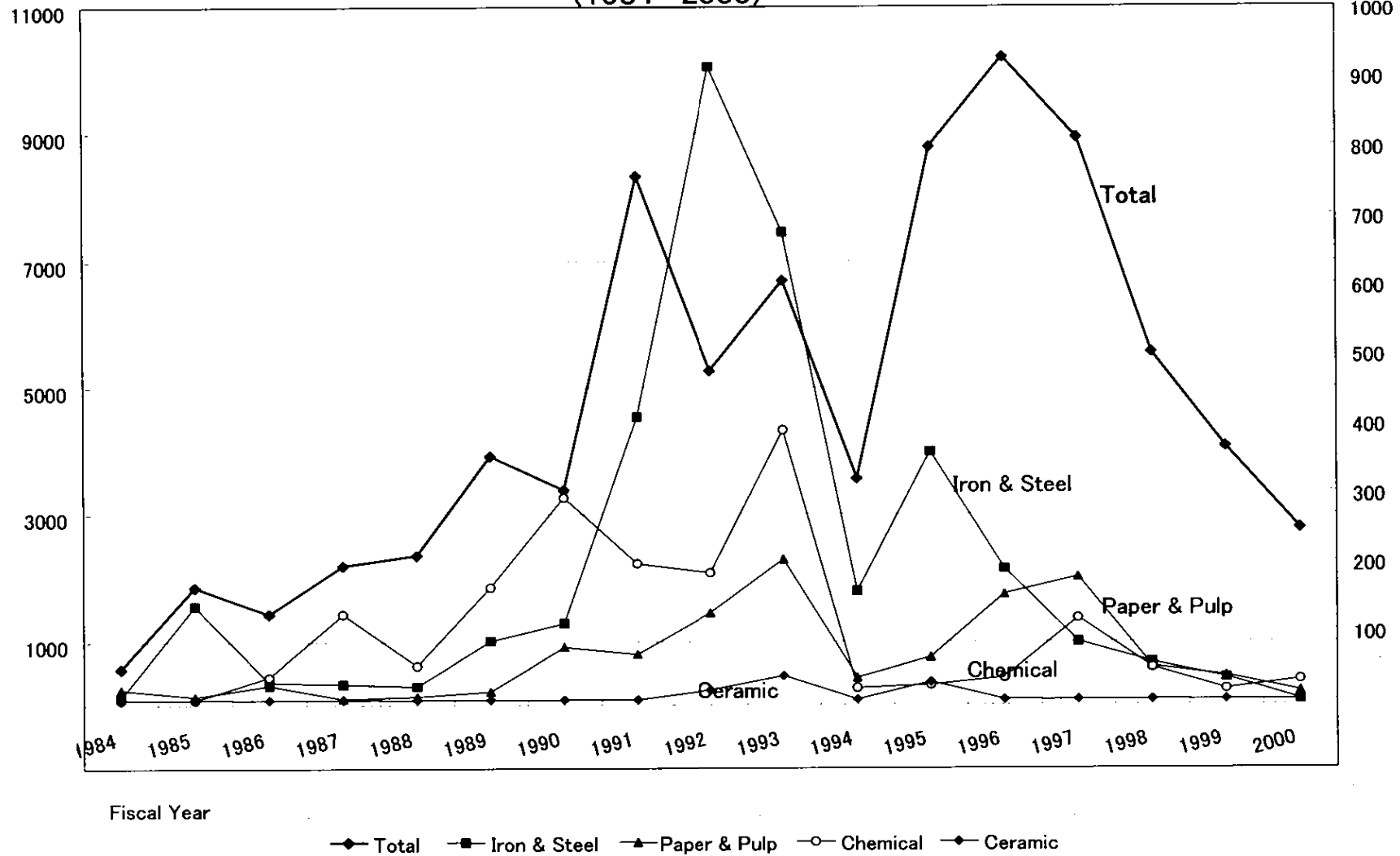
(Unit: cases)

	FY 1984	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000
No. of cases	10,544	26,607	21,271	24,609	19,981	15,417

Investment : 100 MM yen

**Investment by Tax System for Promotion of Investment in  
Reformation of Energy Supply and Demand Structure  
(1984~2000)**

Iron & Steel  
Chemical Industry  
Paper & Pulp  
Ceramic



## Supportive Measures (2)

### Subsidy

Many subsidy schemes are handled by **NEDO** and other organizations

- **Projects for installation of advanced energy efficiency facilities / systems**  
<i.e. High-temperature air combustion / Regenerative burner >
- 2) Projects for introduction of co-generation systems**
- 3) Building / extending high heat insulation houses and buildings**
- 3) Supporting ESCO enterprises**
- 4) Purchasing low CO2 emission auto mobiles**
- 5) R&D Projects for high energy efficient technologies and systems**

**<others>**

# **Development of Energy Conservation Technology**

---- promoted by **NEDO**

(**New Energy and Industrial Technology Development Organization** )

- R&D on High-Efficiency Thermoelectric Conversion System
- R&D on Advanced High-Temperature Air Combustion Control Technology
- R&D of the Advanced Clean Energy Vehicle
- R&D on Low Power Consuming LSIs
- R&D on Practical Industrial Co-generation Technology
- R&D of a Utilization System of Marine Resources for the Effective Use of Energy
- R&D of High-efficiency Triple-Effect Absorption Chiller Project
- R&D for Reduction of Standby Power Consumption
- R&D for Optimal Control of Reduction of Electric Power Consumption by Utilizing Information Technology
- etc.

*7. Implementation of Energy Conservation Policy*  
----- *Activity of **ECCJ***

## 7-1. Profile and main activities of ECCJ



## **Profile of ECCJ**

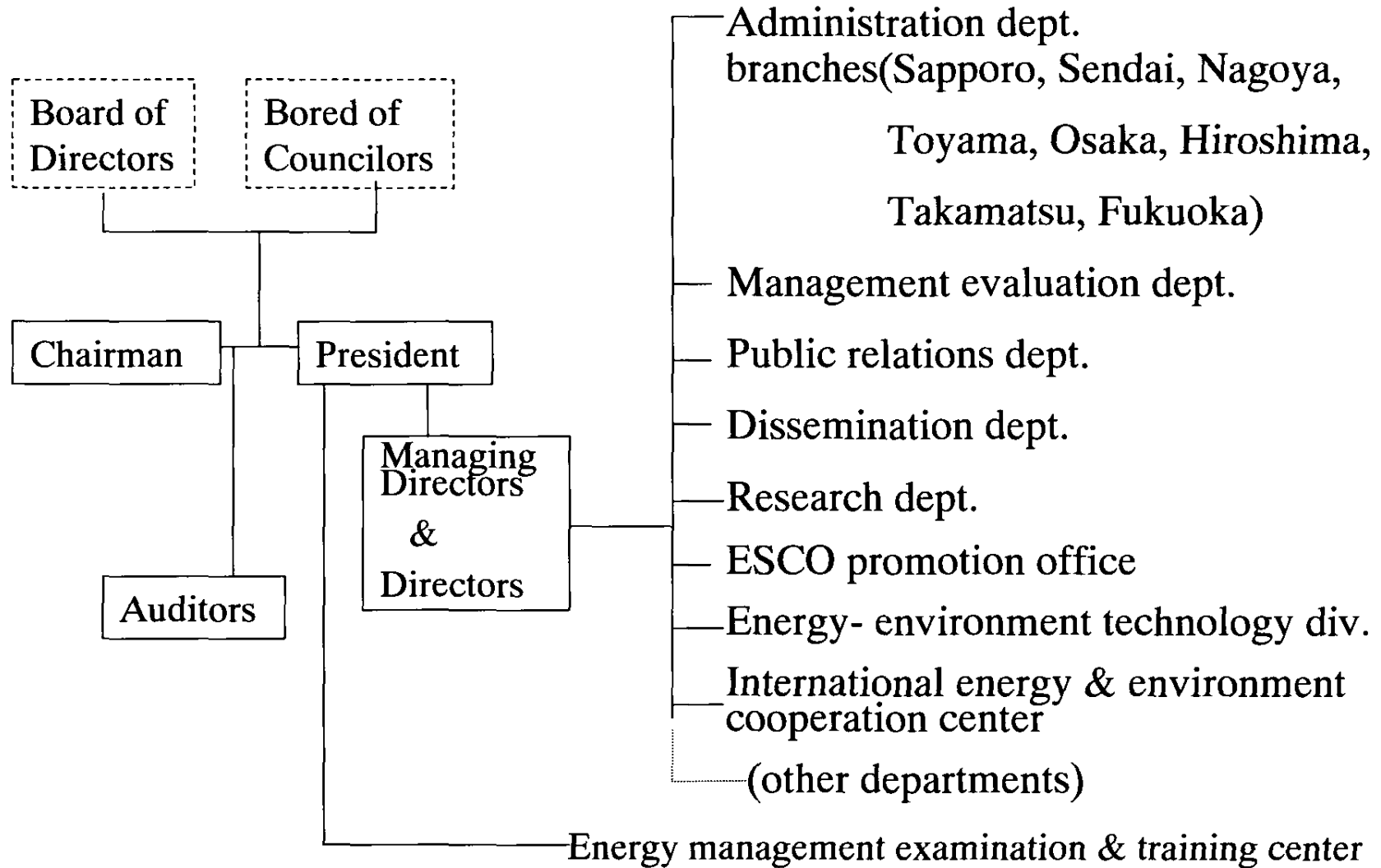
- Legal status :** \* NPO under the supervision of METI
- Establishment :** \* 1978 (just after the 2nd oil crisis)
- Purpose of establishment :** \* Core organization responsible for  
promotion of energy conservation
- Office location :** \* Tokyo Head office & 8 branches
- Supporting member :** \* 2,956 companies (as of June 2002)
- Staff :** \* 219 persons (as of March 2002)
- Budget :** \* 8,265 million yen in 2002FY  
(64 million U\$)
- Fields of activity :** \* Industrial, Residential/Commercial  
and Transportation sectors

## History of ECCJ under Change of Energy-related Situation

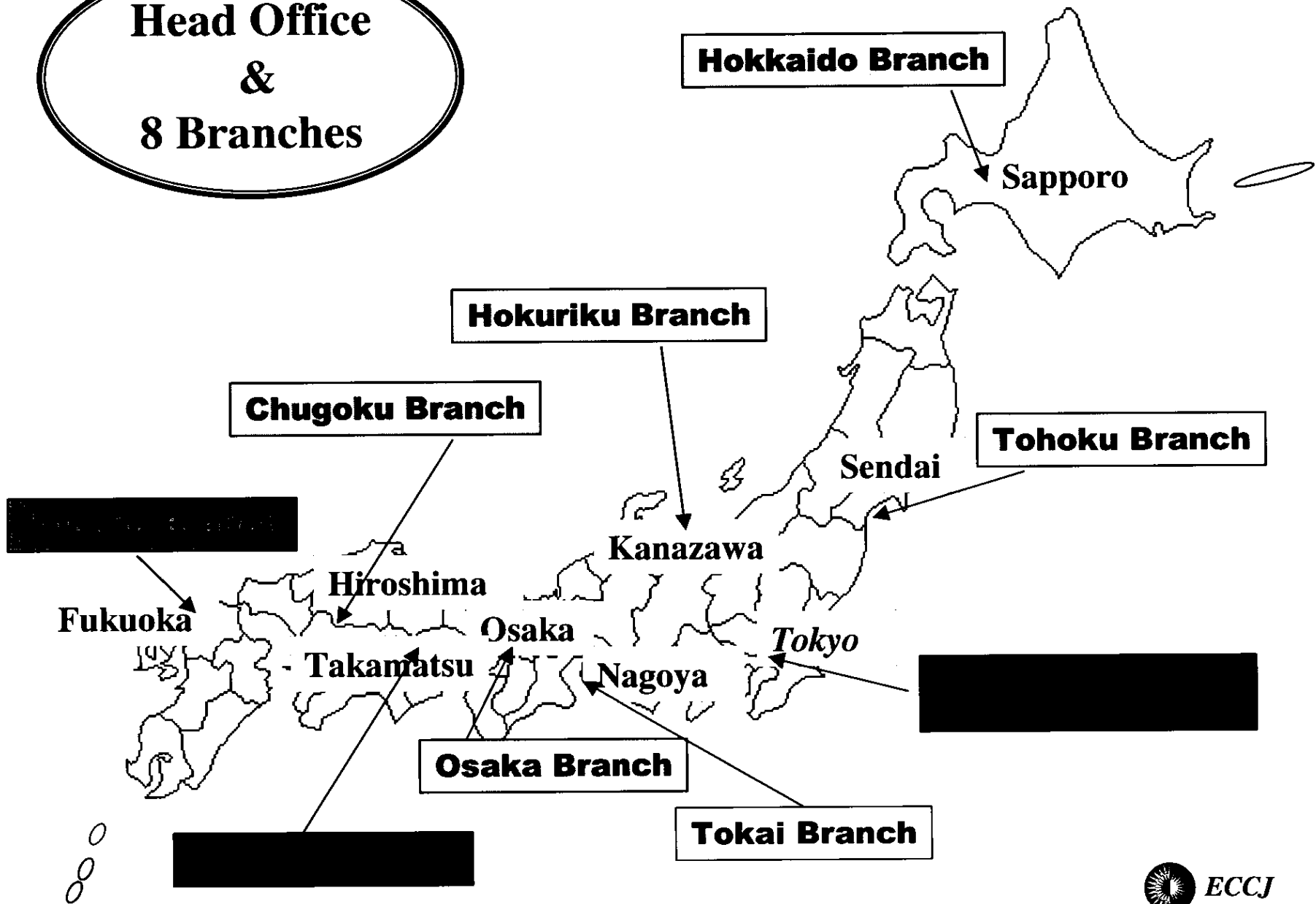
<u>History of ECCJ</u>	<u>Year</u>	<u>Change of Energy-related Situation</u>
Heat-management Association established in Kinki district	1947	Heat-management Regulation enacted
Heat-management Association established in the other districts	1948	
Central Heat-management Conference started	1951	Heat-management Regulation enforced
Japan Heat Energy Technology Association established	1972	
	1973	1st Oil Crisis
ECCJ established	1978	2nd Oil Crisis
	1979	Energy Conservation Law enforced
International Dept. started	1981	
Examination Dept. started	1984	
ESCO Project Promotion Office started	1997	COP3 (Kyoto Protocol)
Training Course Dept. started	1999	Revised Energy Conservation Law enforced

# ECCJ Organization Chart (out line)

established Oct. 16, 1978

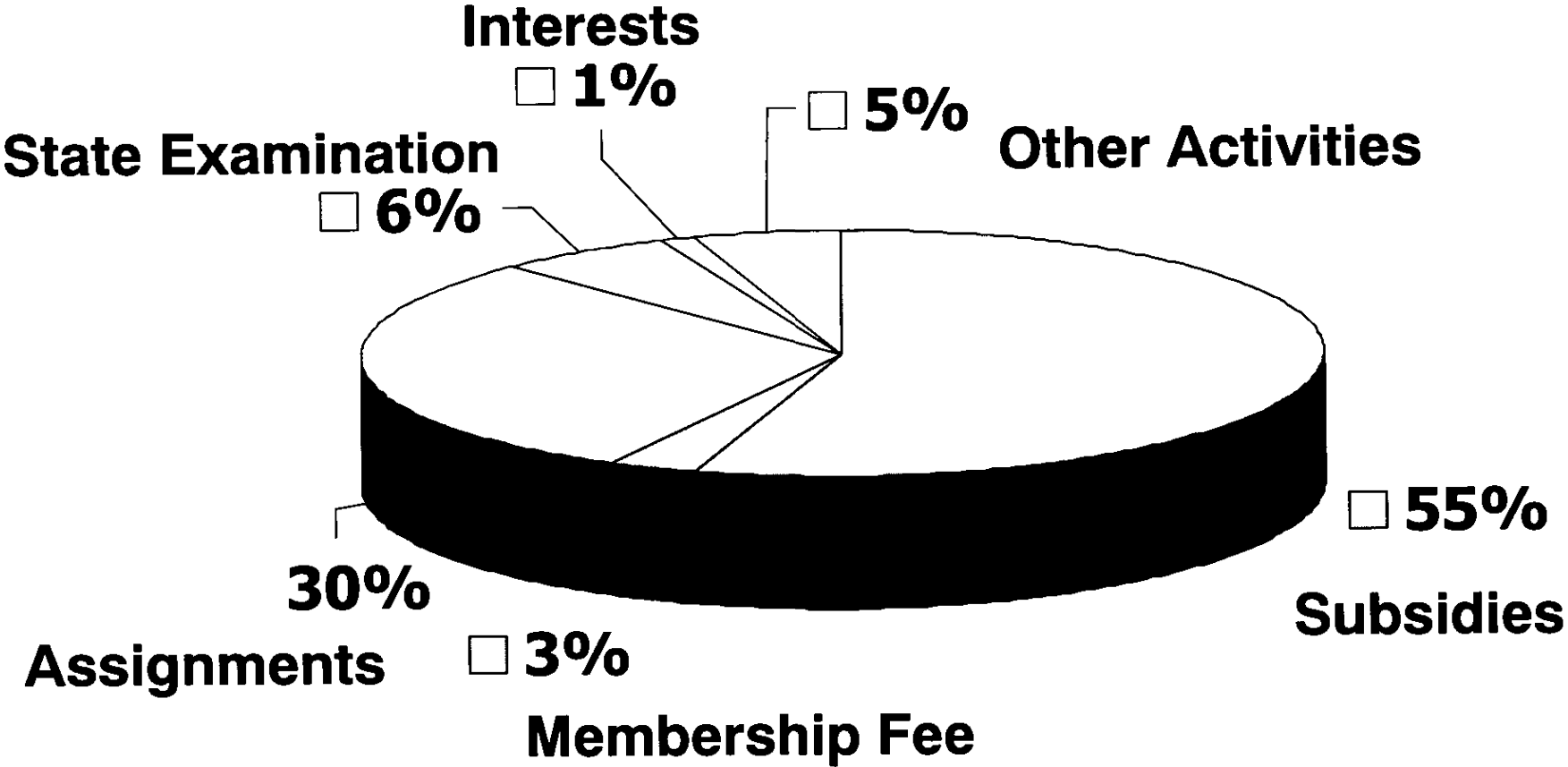


**Head Office  
&  
8 Branches**



# Budget in 2002<sup>Fy</sup>

US\$ 64Million



# Main Activities of ECCJ

## Industry

- ① Energy conservation audits services for factories
- ② Education & training on energy conservation
- ③ State examination for energy managers (assigned by the Gov.)
- ④ Technological development
- ⑤ Disseminating (conference for successful cases of E-C activities, excellent energy conserving equipment, etc.)
- ⑥ ISO14001 seminar for environmental inspectors

## Residential & Commercial

- ① Energy conservation audits services for buildings
- ② Ranking catalogue for energy efficient appliances
- ③ Promotion of Energy labeling system
- ④ International energy star program implementation
- ⑤ Smart driving for energy conservation – Stop idling –
- ⑥ Energy conservation “navi”
- ⑦ Establishment of “energy conservation republic”
- ⑧ ESCO research and development

## Overall

- ① Energy conservation campaign & exhibition (ENEX)
- ② Commendation (grand energy conservation prize)
- ③ Information & data base
- ④ Publicity and publishing
- ⑤ Consulting service through e-mail
- ⑥ International cooperation

## 7-2. For industrial sector

# Public Programs on Energy Conservation Auditing Performed by ECCJ

Program	Applicable factory	Overview	Funded by
<p style="text-align: center;"><b>Energy Conservation Auditing for Factories</b></p> <p style="text-align: center;">(Free-of-charge)</p>	<p>Medium sized factories</p>	<div style="border: 1px dashed black; padding: 5px; display: inline-block;"> <p>On-site discussions Document review On-site inspections</p> </div> <div style="border: 1px dashed black; padding: 5px; display: inline-block; margin-left: 10px;"> <p>1 day</p> </div> <div style="border: 1px dashed black; padding: 5px; display: inline-block; margin-left: 10px;"> <p>Report of findings → Proposals on improvement</p> </div> <p style="text-align: center;">200 factories/year</p>	<p>METI</p>
<p style="text-align: center;"><b>Energy Conservation Auditing for Buildings</b></p> <p style="text-align: center;">(Free-of-charge)</p>	<p>Buildings</p>	<div style="border: 1px dashed black; padding: 5px; display: inline-block;"> <p>On-site discussions Document review On-site inspections</p> </div> <div style="border: 1px dashed black; padding: 5px; display: inline-block; margin-left: 10px;"> <p>1 day</p> </div> <div style="border: 1px dashed black; padding: 5px; display: inline-block; margin-left: 10px;"> <p>Report of findings → Proposals on improvement</p> </div> <p style="text-align: center;">150 buildings/year</p>	<p>METI</p>
<p style="text-align: center;"><b>Energy Conservation Auditing for Factories</b></p> <p style="text-align: center;">(Free-of-charge)</p>	<p>Large sized factories</p>	<div style="border: 1px dashed black; padding: 5px; display: inline-block;"> <p>Document review On-site inspections with measuring devices</p> </div> <div style="border: 1px dashed black; padding: 5px; display: inline-block; margin-left: 10px;"> <p>3 days</p> </div> <div style="border: 1px dashed black; padding: 5px; display: inline-block; margin-left: 10px;"> <p>Report of findings → Proposals on improvement &amp; introduction of new technologies</p> </div> <p style="text-align: center;">70 factories/year</p>	<p>METI / NEDO</p>



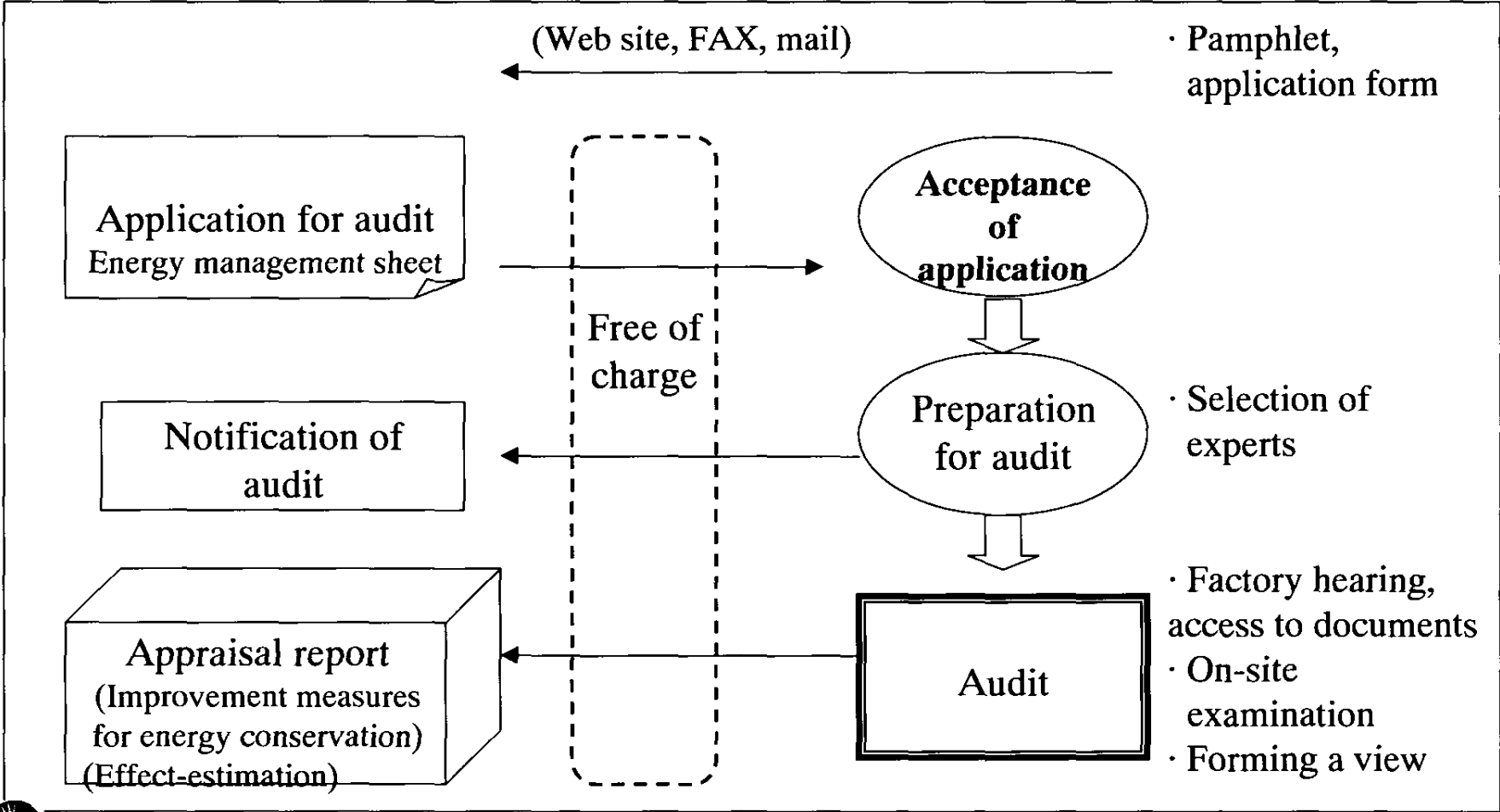
**We have made public the proposed measures & expected effects for other factories' reference.**



# 1 day-Energy Audit for Factories and Buildings

- one-day on-site examination by thermal and electric experts
- free of charge ----- subsidized by Japanese Government

<Flow chart of procedures>



# Results of 1 day-audit for factories

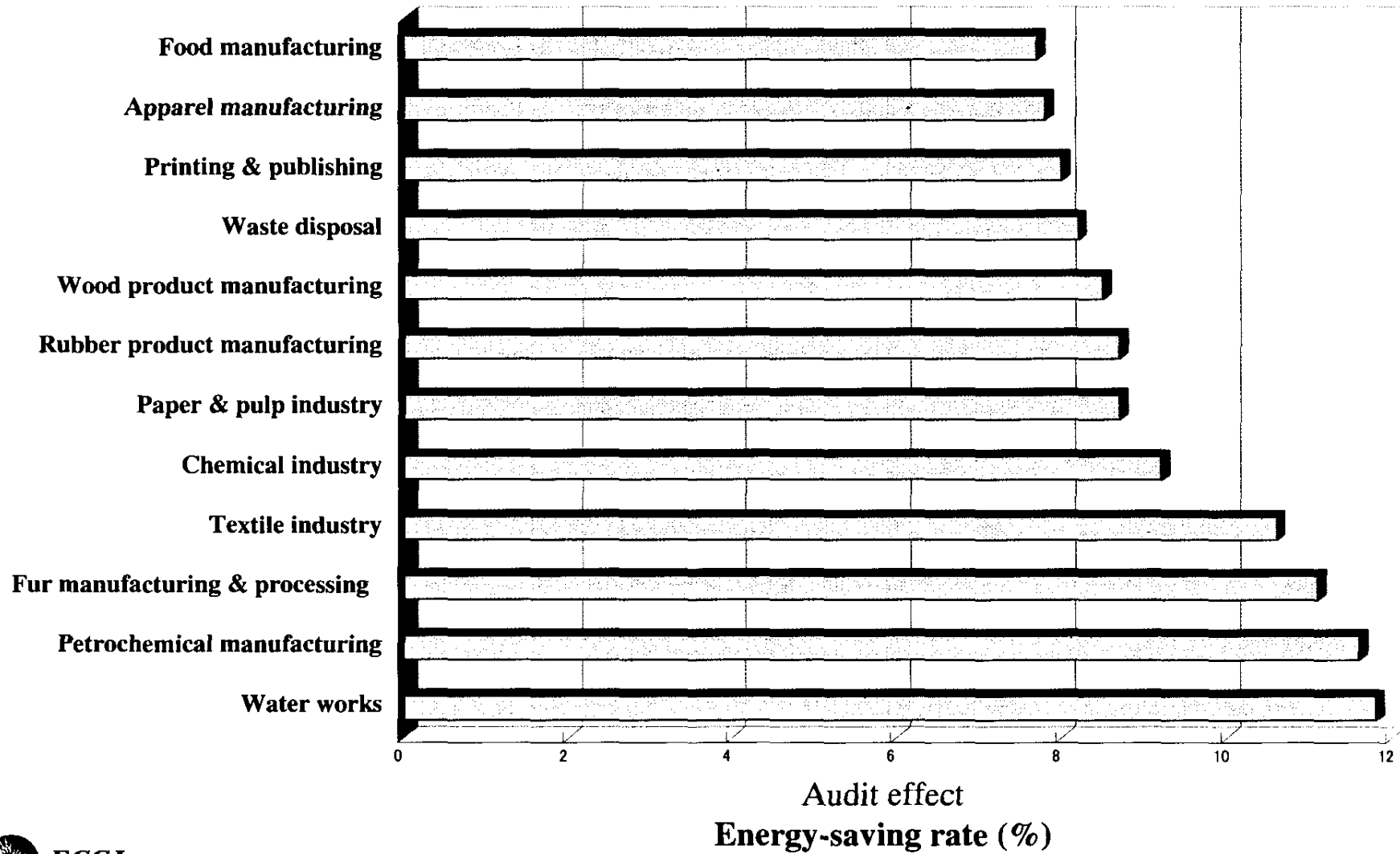
Number of factories audited: **1,340** (Fiscal years 1997 – 2001)

## **(Details)**

Electromechanical apparatus manufacturing	267 (19.9%)
Chemical industry	127 (11.1%)
Food manufacturing	121
Transport equipment manufacturing	112
Plastic products manufacturing	106
Metal product manufacturing	94
General machinery and apparatus manufacturing	67
Ceramic/Cement product manufacturing	59
Precision machinery and apparatus manufacturing	54
Nonferrous metal manufacturing	45
Textile industry	38
Pulp, paper manufacturing	20
(Others)	

# Energy-saving effect by 1 day-audit

(Average energy-saving rate by industry)



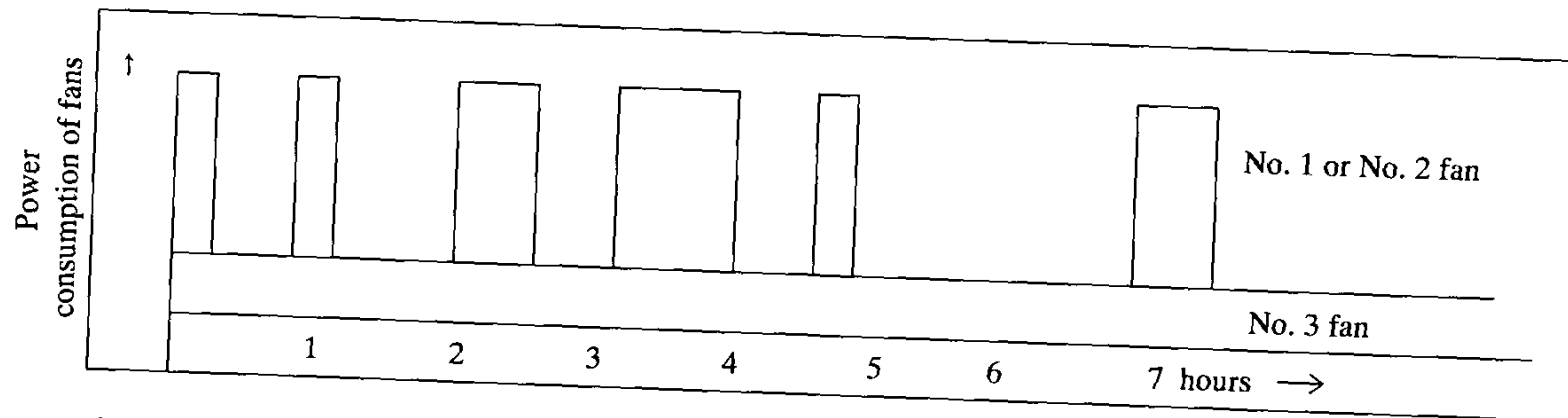
## Case example of audit (1): Water supplying works

Problems: 1. Aeration fan is uncontrollable.

2. Fluidized bed incinerator is inefficient.

Improvement measures:

1. Aeration fan — It is inappropriate to use an inverter. (Investment in the inverter to control three units of aeration fans simultaneously so as to avoid wind pressure change is too costly.) The problem was solved by the combination of interval operations and the control of the number of units.



2. Increase the efficiency of fluidized bed incinerator by using regenerative burner — A pair of burners, which are unified with a heat regenerator for preheating, burn alternately in a short cycle.

Effect: Power — 1,200MWh/year, Oil — 293kL/year, Total — 12.4% reduction

## **Case example of audit (2): Food manufacturing industry**

- Problems:
1. Operation standard for air conditioner is not clear.
  2. Operation standard for compressor is not clear.
  3. There is room for improved use of steam.

### Improvement measures:

1. Increase the standard preset temperature by 1°C.
2. Narrow the nighttime air conditioning area and extend the time.
3. Extend the ventilation (allowing fresh air enter, driving out foul air) interval.
4. Lower the discharge pressure of compressor by 0.098Mpa.
5. Stop the operation of two large compressors and install one small compressor for nighttime operation.
6. Decrease the revolution of the digester material feeder to stop the leakage of steam.
7. Decrease the number of boilers in operation (from 9 unit for night and day to 6 units during daytime and 2 units at night).
8. Decrease the blow volume of the boiler (in accordance with water quality).

Effect: Electric power — 681MWh/year, LPG — 96.7t/year

Total — 16.6% reduction

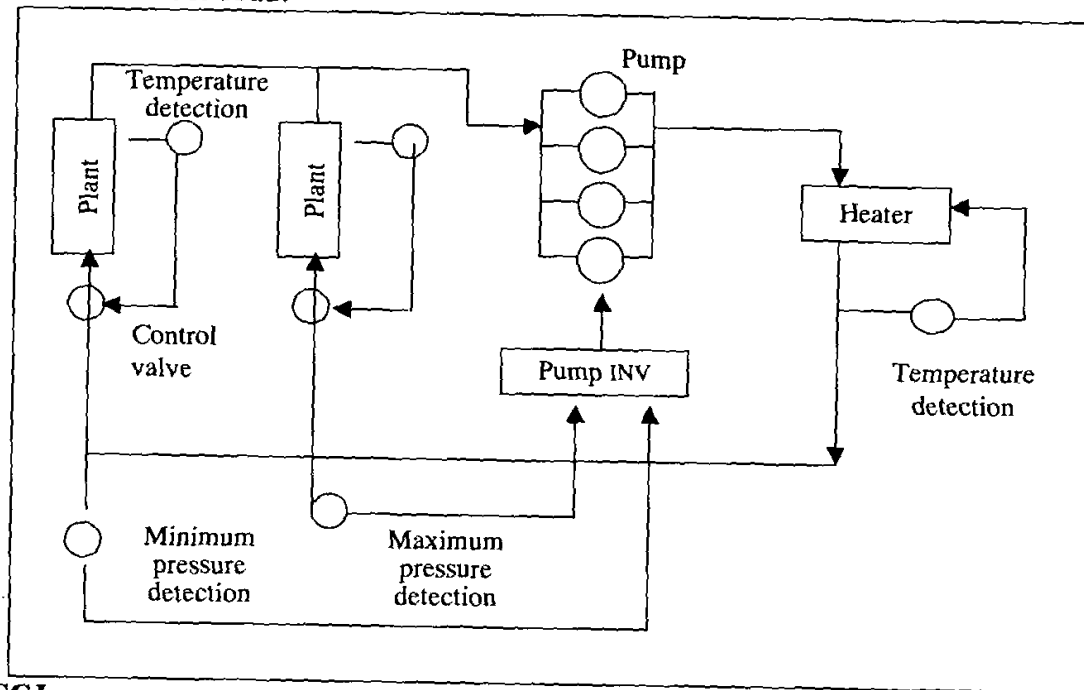
## Case example of audit (3): Petrochemical product manufacturing

Problems:

1. Refrigerator load is too large.
2. Heat is discharged from the water cooler in the rectifying system.
3. Four units of circulating pumps of thermal oil are in the condition of light load operation.

Improvement measures:

1. Increase the heat exchangers of refrigerator precooler to reduce the power consumption of the compressor.
2. Install more heat exchangers in the rectifying system to reduce the fuel gas consumption of the thermal oil heater.
3. Operate the thermal oil pump and heater, controlling the number of units and the temperature to match the load.



- Temperature detection
- Pressure detection
- Inverter control

(Effect)  
Energy-saving rate:  
13.8%

## **Case example of audit (4): Plastic product manufacturing**

### Problems:

1. Six units of compressors are installed independently, and the number of units in operation is left to personal judgment.
2. While high temperature water discharged from dies and molding equipment is cooled in the cooling tower for reuse, supply water is heated in the boiler.

### Measures:

1. Combine six compressors to automatically control the number of units in operation.
2. Control the circulating water volume of the cooling tower.
3. Recover the steam flowing out of the dies, and return it to the boilers through condenser, vacuum pump, and strainer.

### Effect:

Reduction of power consumption — 24,525kWh/year

Reduction of heavy oil — 648kL/year

Total energy-saving rate — 17.2%



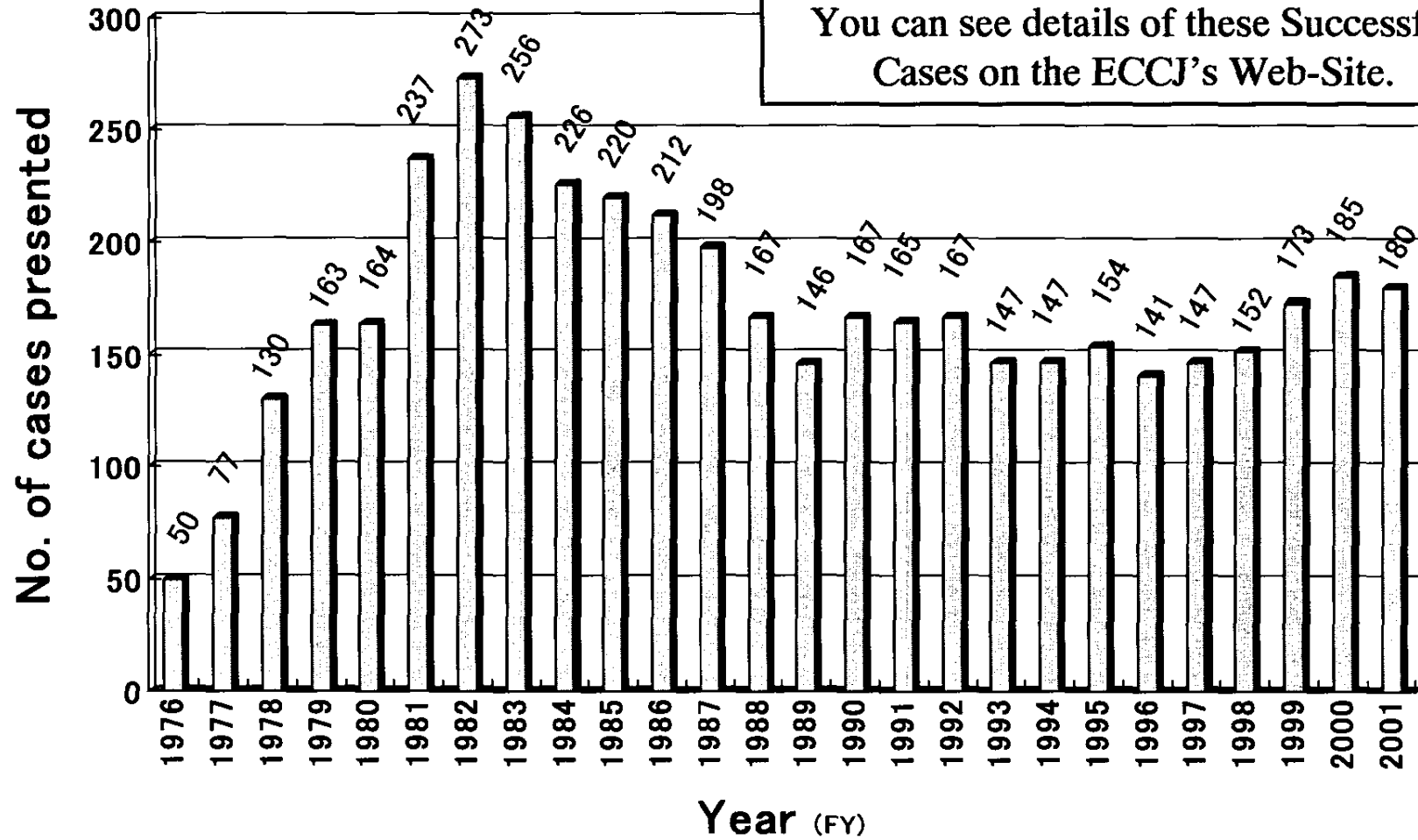
***ECCJ organizes and implements***

**the National Convention of Excellent Successful Cases**  
*from 1976*





**Number of successful cases presented at  
the National Convention of Excellent Successful Cases in Energy Conservation Activities**



**Grand prize at the National Convention  
of Excellent Successful Cases  
In Energy Conservation Activities  
<2001 FY, Central & 9 Regional Conventions>**

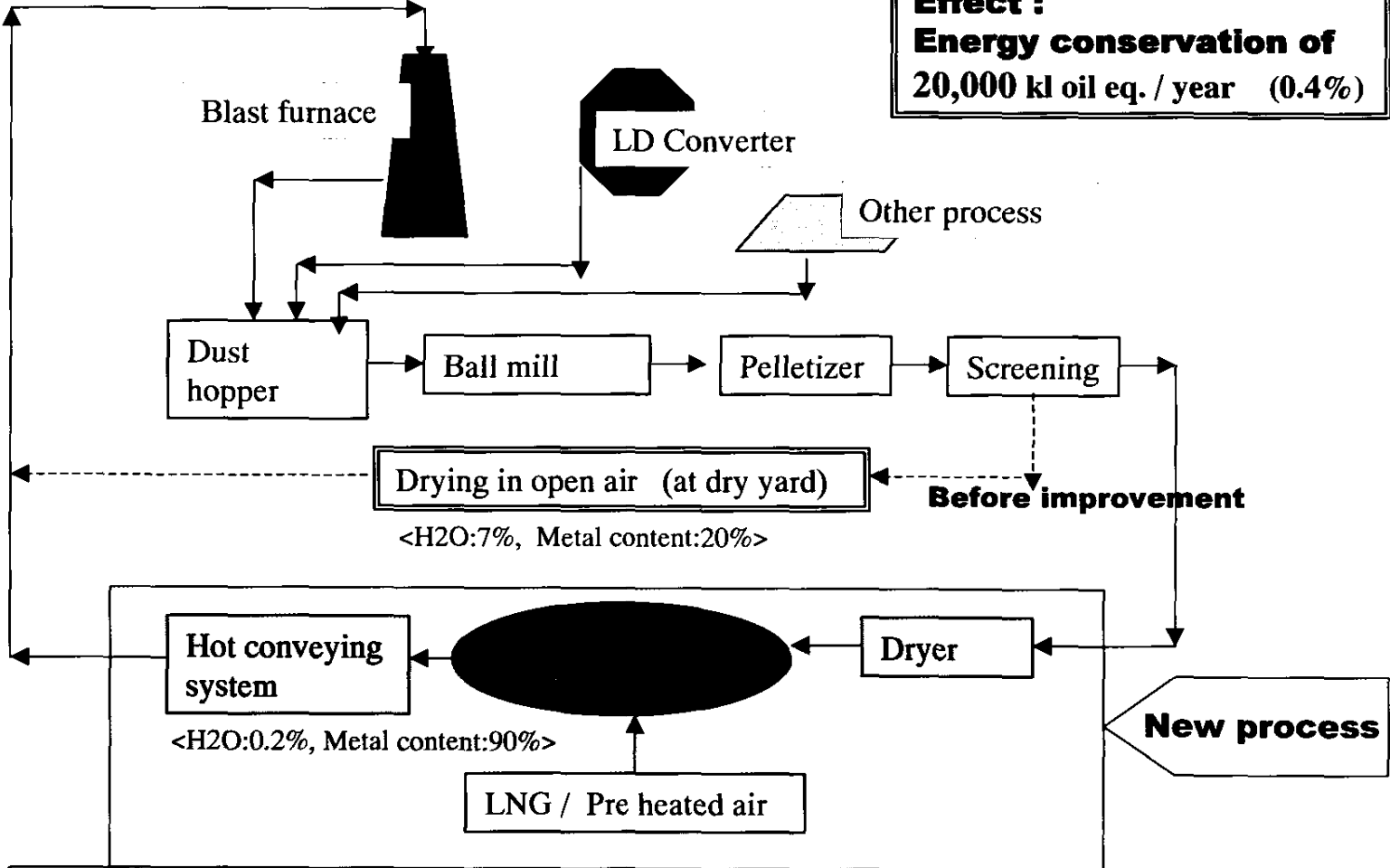
- **Grand prize of the Minister of Economy, Trade and Industry (3)**
  - \* **Toyota Motor Hokkaido Corp., Production Div., Energy group**  
“Energy conservation activity carried out by all members of the Energy group”
  - \* **Nippon Steel Corp., Kimitsu Works, R&D group of dust recycling**  
“R&D on re-using technology of surplus dust to raw material for the burst furnace”
  - \* **AEON Co., Ltd. Managing Division**  
“Systematic implementation of energy conservation counter measures in the supermarket by practical application of ESCO”
- 2. Prize of the Director of Agency for Natural Resources and Energy (5)**
- 3. Prize of Regional Bureaus of METI (17)**
- 4. Prize of the Chairman of ECCJ (22)**
- 5. Prize of excellency (15)**
- 6. Prize of encouragement (5)**

You can see details of these Successful  
Cases on the ECCJ's Web-Site.

**High efficient recycling technology  
of dust to raw material for the blast furnace**

NIPPON STEEL Corp.,  
Kimitsu Works  
R&D group of dust recycle

**Effect :**  
**Energy conservation of  
20,000 kl oil eq. / year (0.4%)**



**They introduced audiences their success story : how to have carried out the development, essence of the new technology, the result and effect, etc..**



# Training Courses for energy management

## 1. Symposium , Top management seminar

- Symposium for energy managers ... Specified for 1<sup>st</sup> Class
- Symposium for energy management officer ... Specified for 2<sup>nd</sup> Class
- Mass meetings for announcement of excellent cases to disseminate and promote them
  - ... 1<sup>st</sup> Class, 2<sup>nd</sup> Class, and ESCO business (4,600 participants / 11 places)
- Energy-related lecture meetings (at each branch), etc.

Communication of the latest information on and trends of laws and management technologies

## 2. Technical training

- Practical training courses for energy conservation (5 courses)
  - ... Training of beginners in energy management to the backbone engineers (500 people/50 times/year)
- Technical training courses for energy conservation
  - ... Personnel in charge of practical energy management / lectures, practices, and field trips
- Training in energy management technologies
  - ... Energy managers / training in the latest management technologies

## 3. Correspondence training

- Correspondence course for energy managers

## 4. Preparatory training for national exam.

- Long-term preparatory training course for national exam
- Short-term preparatory training course for national exam

preparing for national exam of Energy managers / acquisition of technical knowledge



# License of Energy Manager

(Heat/Electricity)

- \* energy managers system have contributed greatly to carry out the energy conservation in industrial sector.
- \* ECCJ is assigned to carry out the state exam. & training seminar by the government.

## 1. National qualifying examination

- ❖ Once a year
- ❖ 1 day, 4 subjects

Applicant 7,405

Succeeded 1,948

(in 2001 year)

## 2. Training seminar

- ❖ Once a year
- ❖ 6 day training & 1 day examination
- ❖ Background : education + experience

the Number of Energy Managers required by the Law :  
(1st-class designated factories)

1 ~ 4 managers (according to the amount of energy consumption)

# Technology R & D

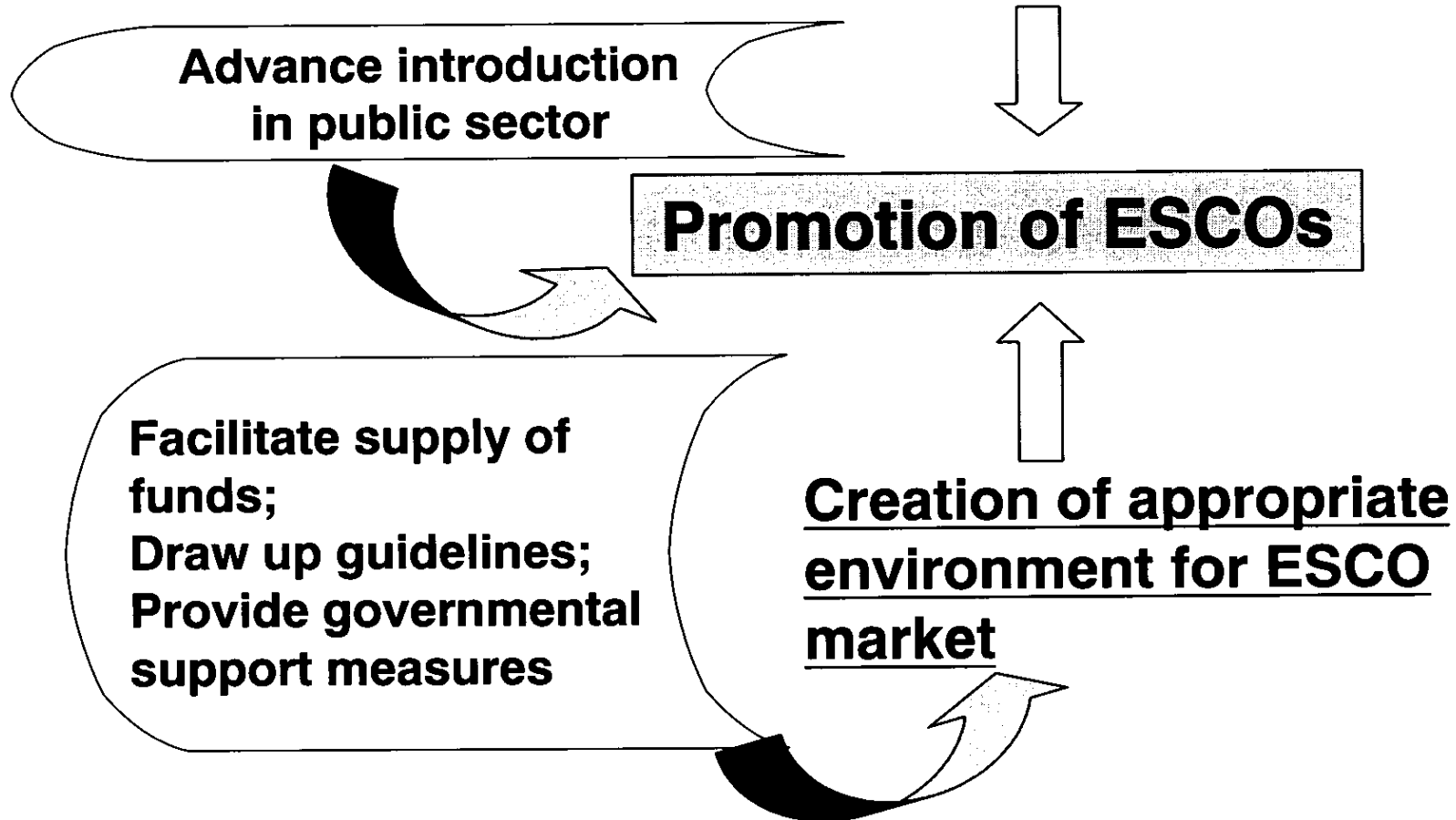
(assigned from **NEDO**:New Energy and Industrial Technology  
Development Organization )

- 1. Eco- energy city project (New Sunshine Program)** <Ended in 2000>
- 2. High temperature Air combustion technology**
- 3. High efficiency waste heat recovery system**  
(high-temperature thermoelectric system)
- 4. Supercritical fluid technology**  
(high efficient decomposition system of PCB & DXN)
- 5. Optimal Control System for Energy Conservation  
in Factories, Shops, Offices and Houses**

# Assistance to ESCO projects

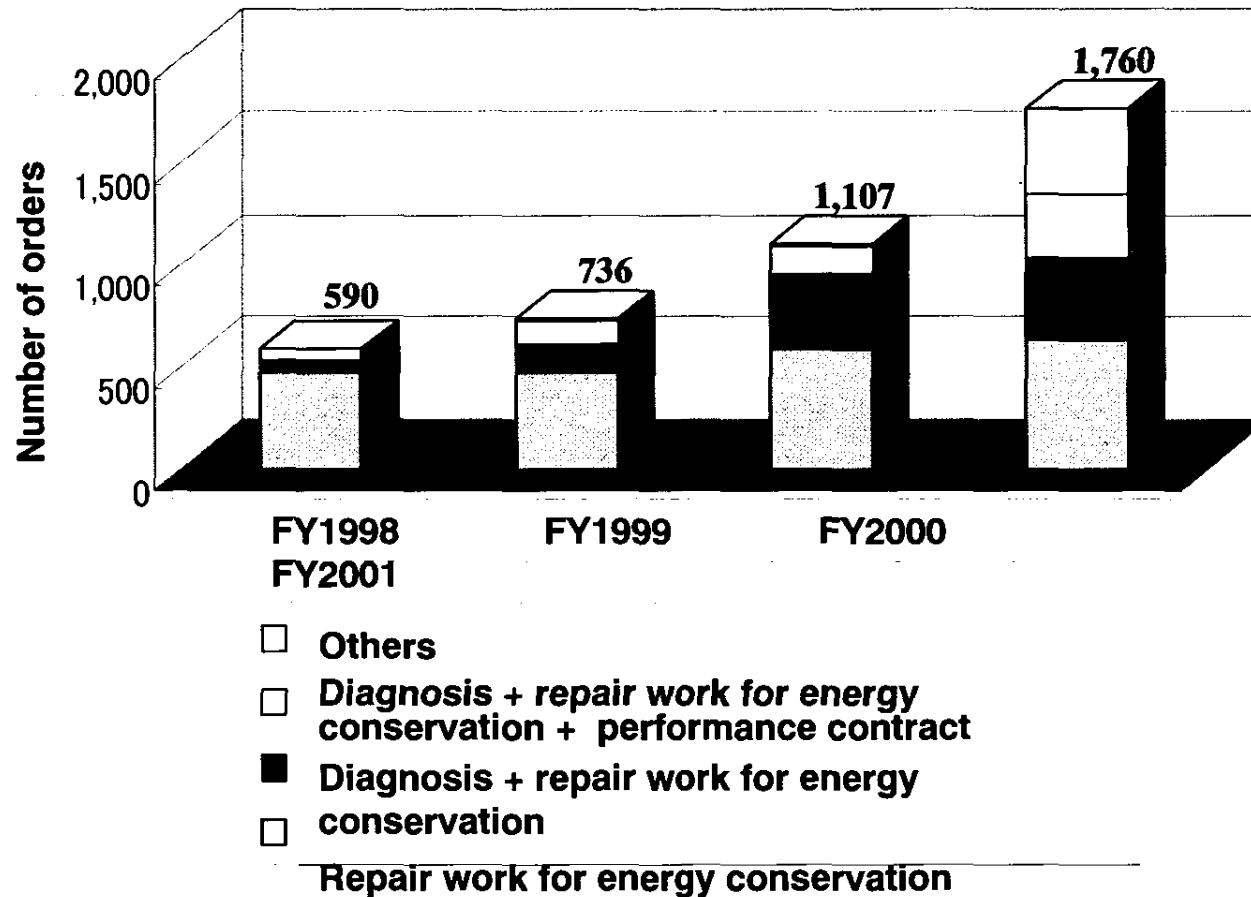
*To promote energy conservation by ESCOs*

## Establishment of recognition of ESCO business



Cooperating with **ESCO Promotion Council** (104 companies as February 2003)

# Number of Orders Received by ESCO



Reference: Findings on ESCO Promotion Council Research



## 7-3. Promotion toward “Smart Life”

for residential, commercial and transportation sectors

# Promotion toward “Smart Life” -- *Change of lifestyle* in Residential & Commercial Sector

**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 on television), ENEX exhibitions
- ¶ Education (posters contests, spread of E-Co Navi, E-C Republic, school activity)
- ¶ Grass roots activities
- ¶ Smart driving (stop idling)
- ¶ Disclosure of information on web-site, e-mail

## *Equipment*

- ¶ Energy Conservation Labeling
- ¶ Ranking catalogs for energy saving (TV, Refrigerator, Airconditioner, etc.)
- ¶ International Energy Star logo displayed on energy-saving OA equipment
- ¶ Grand prize for energy high-efficiency appliances

## *Change of lifestyle*

**Checklist of 25  
in lifestyle**

**Publicity &  
Demonstrations**

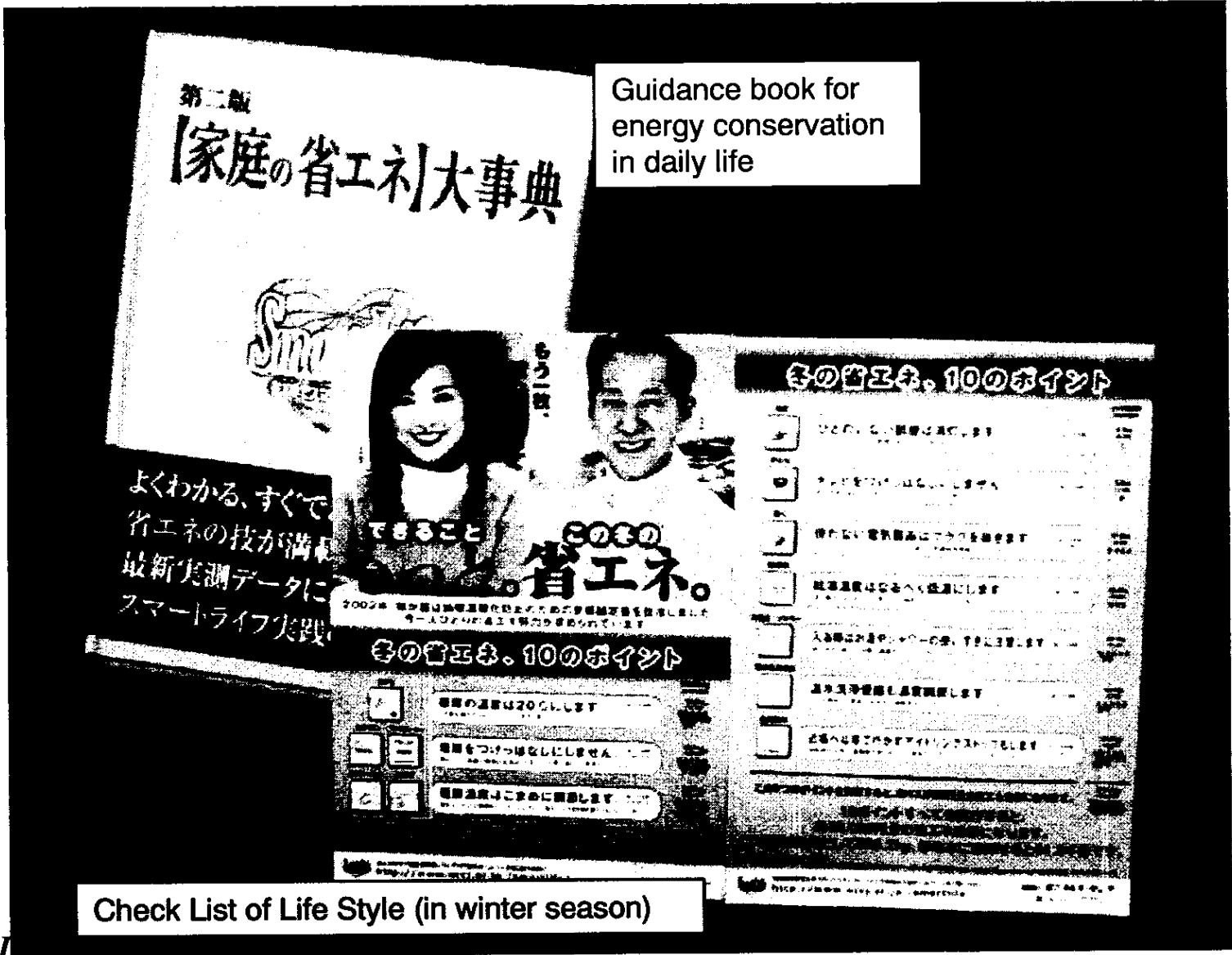
**“Energy  
Conservation Navi”**

**Energy  
conservation  
Republic**

**Education assistance  
In primary school**

# Awareness ---- Change of life style

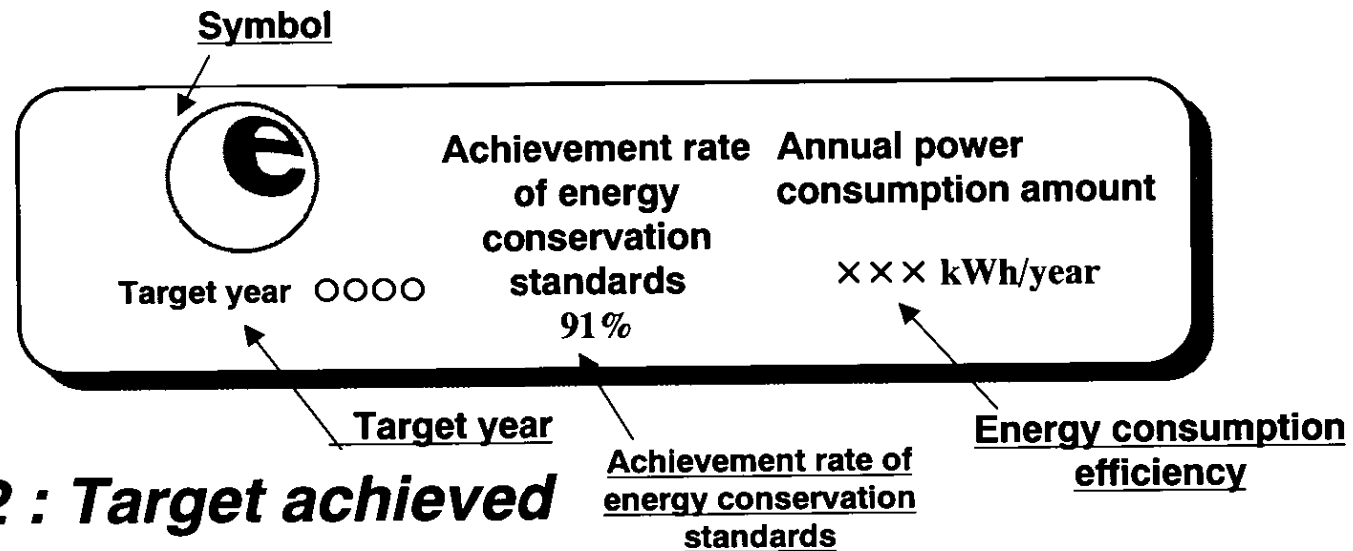
*smart life activities*



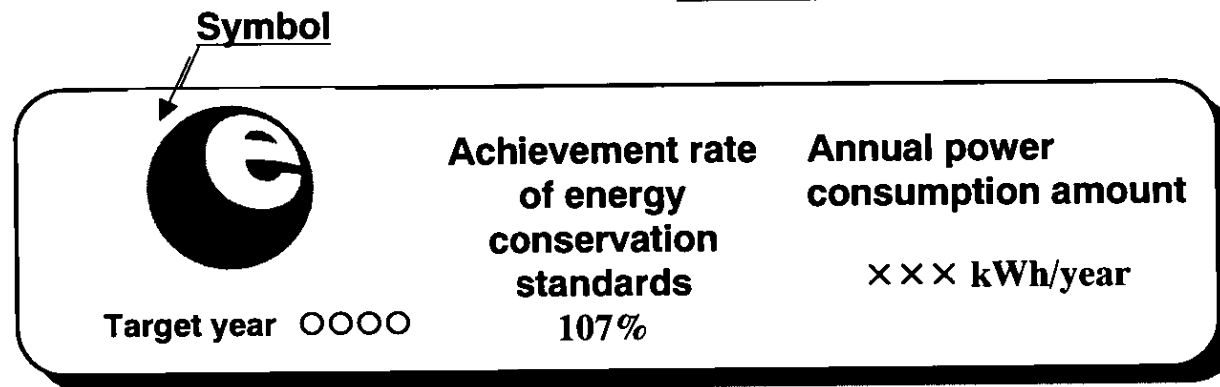
# Dissemination of Energy Labeling

-- Method of Indication --

## ☆ Case 1: Target still not achieved



## ☆ Case 2 : Target achieved



# Energy Conservation Performance Catalogue

(Comparison of energy conservation performance by ranking)

Target products: Air conditioners, TVs, VCRs, Refrigerators, Cloths washers, Lighting equipment, Copiers (7 product items)

## Ranking list (Sample)

### ●Air conditioners

<Cooling capacity: 2.5kWh(for a 7~10 mat room)>

	Manufacturers	Model (Power Supply Voltage:100V- 200V-★)	Cooling			Heating			Energy Conservation Labeling System			Seasonal Power Consump- tion (kWh)	Seasonal Electric Charge (yen)
			Power consump- tion (W)	COP	Standard heating capacity (outside temp. 7°C) (kW)	Power consump- tion (W)	COP	Energy conser- vation mark	Achievement rate of energy conservation standards	Average cooling/ heating COP			
1	日立製作所	RAS-2510MX	425	5.88	3.6	650	5.54		108%	5.71	806	18,538	
2	三洋電機	SAP-E25H	440	5.68	3.6	630	5.71		108%	5.70	827	19,021	
3	東芝	RAS-255PDR	460	5.43	3.6	625	5.76		106%	5.60	840	19,320	
4	松下電器産業	CS-E251A	455	5.49	3.6	635	5.67		105%	5.58	843	19,389	
4	松下電器産業	CS-E251A2(★)	455	5.49	3.6	635	5.67		105%	5.58	843	19,389	
6	三菱電機	MSZ-SFX25H	475	5.26	3.4	585	5.81		105%	5.54	850	19,550	
7	ダイキン工業	AN25BRS	485	5.15	3.4	600	5.67		103%	5.41	878	20,194	
6	トヨミ	TAN-25AWI	1,120	2.23	3.4	1,215	2.80			2.52	1,693	38,939	
6	日立製作所	RAS258LX	1,120	2.23	3.4	1,215	2.80		47%	2.52	1,693	38,939	
6	日立製作所	HRS-25LX	1,120	2.23	3.4	1,215	2.80		47%	2.52	1,693	38,939	
		Maximum Value	1,120	5.88	4.0	1,240	5.81	-	108%	5.71	1,817	41,791	
		Average Value	680	4.02	3.5	864	4.30	-	81%	4.16	1,184	27,223	
		Minimum Value	425	2.23	3.0	545	2.74	-	47%	2.52	806	18,538	

# Energy Star Logo Program

( joint project Japan-U.S.A. for reduction of standby electricity)



**International energy star logo is displayed on energy-saving OA equipment.**

**(on products themselves, as well as boxes, catalogs, advertisements, etc.)**

**\* Voluntary program started in October 1995**

**\* Registration service by ECCJ**

< Smart Driving >

## Promotion of Stopping Idling While Vehicles Are Stationary

- Idling while loading/unloading or waiting for the traffic light to turn green consumes gasoline as much as standby electric power consumed by home appliances.
- Stationary time of vehicles during traveling accounts for 48 percent of the entire traveling time, and time that idling can be stopped accounts for as much as 35%.
- Drivers who manually turn the engine off while waiting for the traffic light to turn green account for less than 4% of all drivers surveyed.
- If a device to automatically turn the engine off or on when waiting for the green signal is popularized, idling will be easily stopped.

< Source: Survey results of Energy Conservation Center >

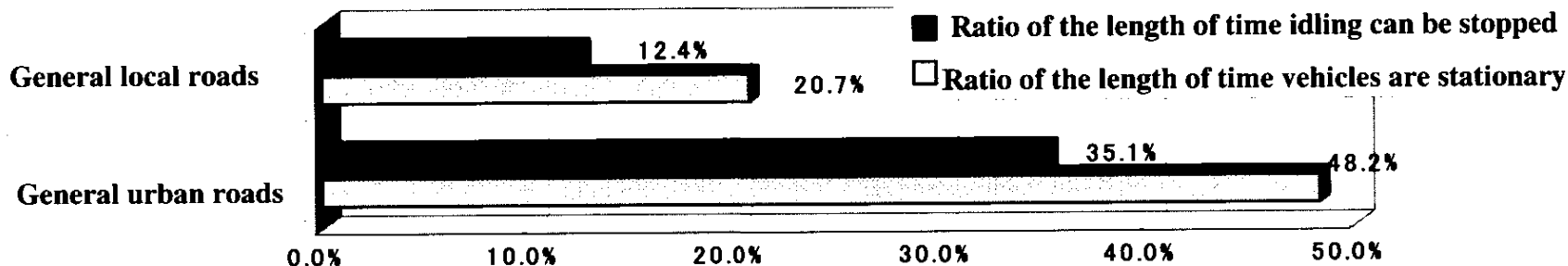


Fig. Results of running test by a monitor car (Survey by Energy Conservation Center)

< A case of saving of gasoline: A saving of 7% of gasoline consumption was achieved in the running test in the urban areas!! ... JAF's report >

### Effect that is expected of cars :

Saving of gasoline 1,530,000kl/year (in terms of oil, equivalent to 1,390,000 kl/year)

- This figure is equivalent to 8.2% of the goal (reduction of 16,900,000 kl) of the energy conservation activity in the transportation sector, and idling stop is expected to produce great results.

< Based on trial calculation by Eco-driving Society >



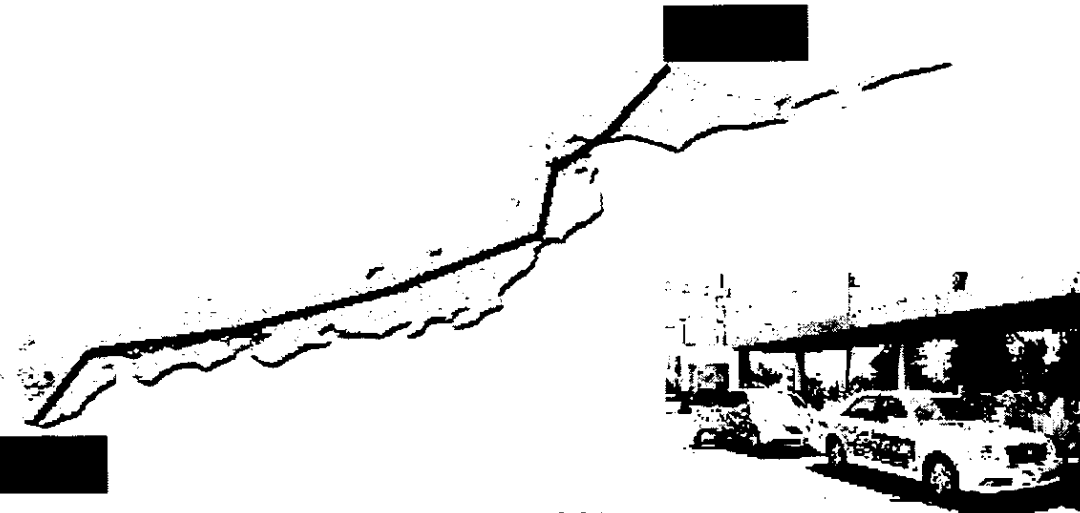
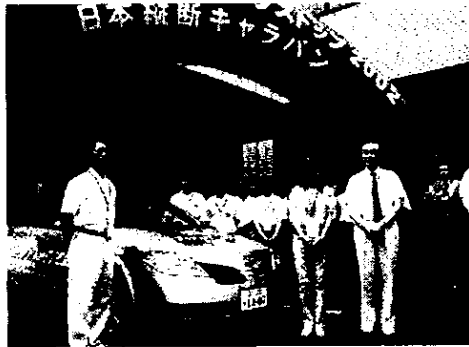
- Measures :
- Activity to educate drivers to manually stop idling while vehicles are stationary
  - Popularization of hybrid vehicles (vehicles equipped with the idling stop system)
  - Popularization of a device to automatically turn the engine off

***Demonstration caravan ... Traveling through the Japanese Islands from north to south***

**< Education of people to promote stopping idling by actual traveling, symposiums, and test driving >**

August 3, 2002 (started from Wakkanai City) to August 23 (arrived at Kagoshima City)

3 sedans -2,000 cc version (2 sedans equipped with a device to turn the engine off and 1 ordinary sedan)



Distance covered: 3,700km

**Ratio of the length of time idling is stopped to traveling hours : 6%**

**Effect of gasoline saved by idling stop : 15%**

Symposiums participated by citizens and test driving: 5 times (Sapporo, Sendai, Kanazawa, Okayama and Kumamoto)



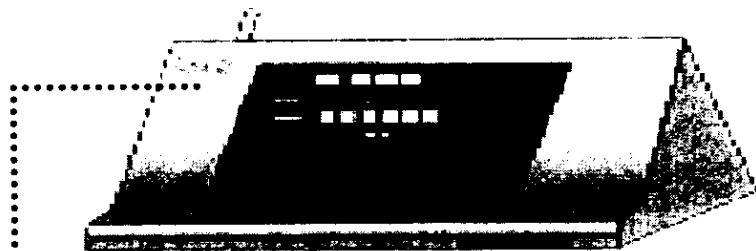


# Spread of E-Co Navi

## Outline of Energy Cost Indication System

### “Energy Conservation Navigator”

(Energy cost indicator)

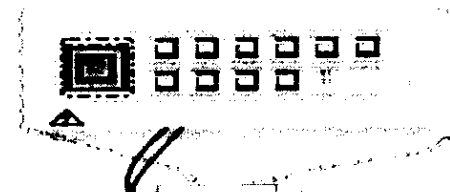


Actual energy fee

Target energy fee

Previous energy fee

Distribution box (breaker)



Wireless

Electric power meter

Wireless

0375211

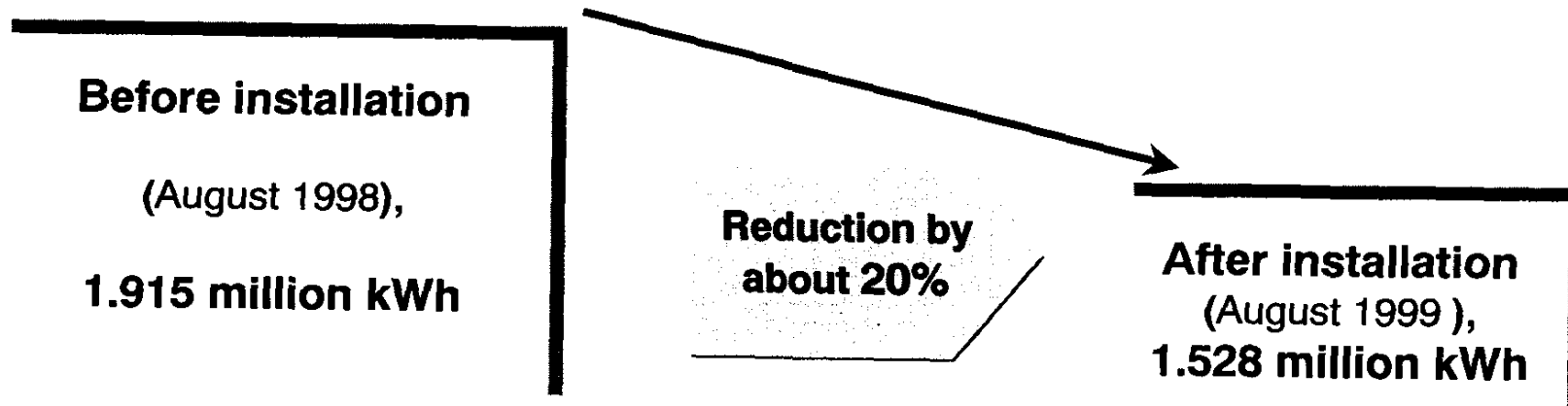
Gas flow meter

Gas and water flow meter

Water flow meter

# Effect of the E-Co Navi (Energy Cost Indicator)

◎ Electric power consumption before and after:  
(based on the data from 784 houses)

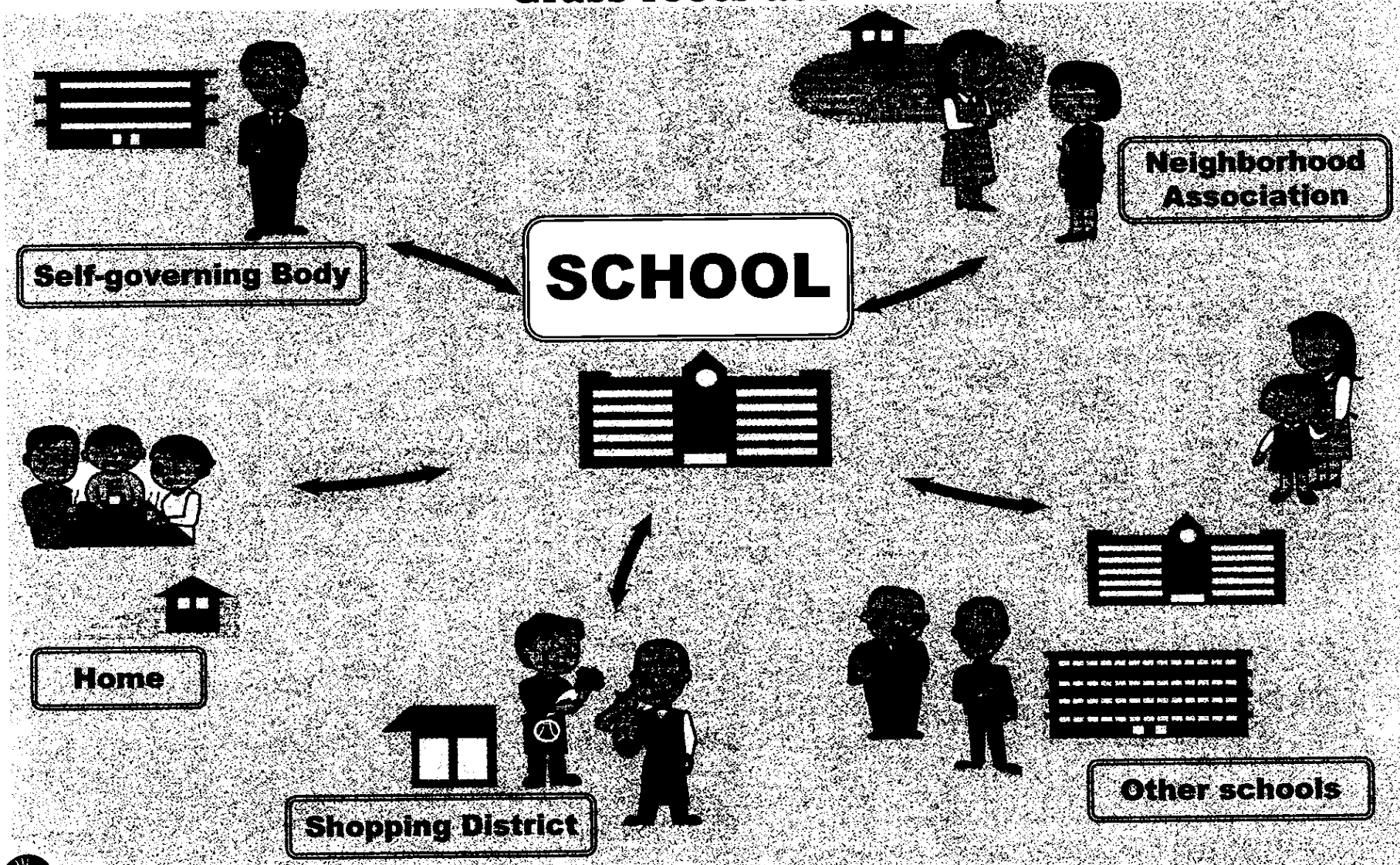


This "E-Co Navi" can express the comparison of the consumption with the target figures or the preceding year's consumption. In this way, this makes it easier for everyone to carry out energy consumption reduction and thereby contributes to total energy conservation.

Since November 1998, the "E-Co Navi" were installed at 800 houses every year across the country. In 2001<sup>Fy</sup>, 4,600 are planned to be installed.

# Education:

Model School:150  
Energy Conservation Republic:59  
Grass roots activities ,etc <in 2001<sup>Fy</sup>>



# Energy Conservation Republic

(Activity at elementary school and/or middle school)

- To choose the president and the ministers
- To set targets and programs for energy conservation

↓  
**Declaration of Establishment  
“Energy Conservation Republic”**

- ↓
- ★To act on the programs
  - ★To announce the results
  - ★To extend to other areas

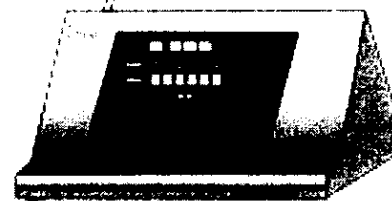
at Shincho Elementary School(Kawasaki city), they saved electricity fee

14% (¥280,000/y) in 1999

<Support>

**ECCJ**

E-Co Navi



Flag



## 7-4. Publicity

# Publicity (1)

## **1. Exhibition ( ENEX 2003 )**

Tokyo ; 48,664 visitors <exhibitors: 247>  
Osaka ; 26,722 visitors <exhibitors: 225>

## **2. Symposium**

Energy conference, Convention for successful cases, etc.

## **3. Poster & essay contest**

## **4. Promotion Poster & video**

## **5. Pamphlet & goods**

Ranking catalogue, Smart life, etc.

## **6. Newspapers and magazines**

Ene-Con Ambassador, monthly magazine, etc.

## Publicity (2)

### **7. Consulting service through e-mail**

**E-mail; soudan@eccj.Or.Jp**

**(only in japanese)**

**the number of services : 1,934 (in 2001Fy)**

### **8. Internet home page**

**< contact here please >**

**ECCJ home page ; [http://www.Or.Jp/index\\_e.html](http://www.Or.Jp/index_e.html)**

**(Language; Japanese, English, Chinese, Korean)**

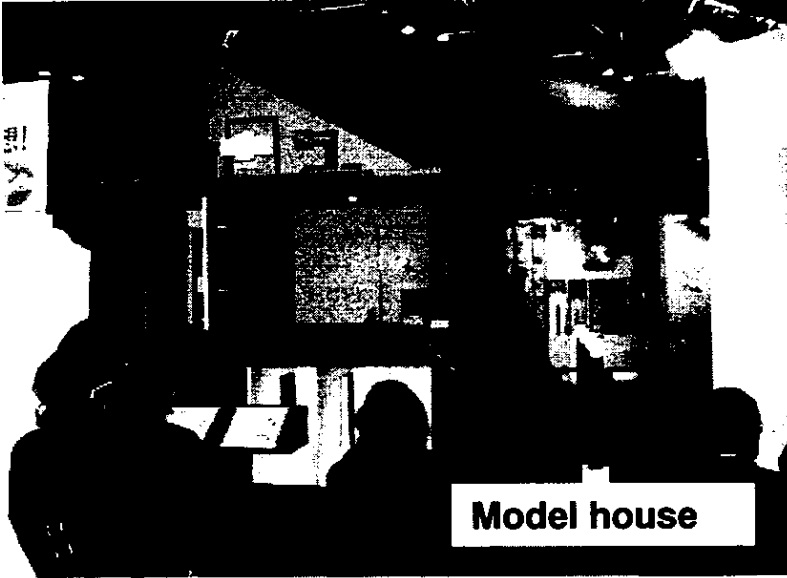
# ENEX 2003 in Tokyo

February 2003





**E N E X 2 0 0 3**



**Model house**



**Excellent home appliances**



**Excellent automobiles**



**School boys' experiments using power kits**

# Commendation (2001FY)

## **1. Grand prize for high energy efficiency appliances & cars for home use & business(commercial) use**

**\* Grand prize : 22 (93 applied)**

containing 5 grand prizes honored by METI minister

① **Hot water supply system**

(CO2 refrigerant heat pump)

② **High efficient refrigerator**

③ **Hybrid system car**

④ **Ceramic metal halide lamp**

⑤ **Switching power source devise**



(財)省エネルギーセンター主催

## **2. Factories & persons contributed to energy conservation**

❖ **121 factories/persons** were commended.



# Information & Data Base

As of February 28, 2003

## **1. Data base**

**Successful cases : 4,200**

(energy conservation activities in industrial sector)

**Papers, books : 8,800**

## **2. IEA / CADDET**

**National team : NEDO, ECCJ**

**Demonstrated advanced technologies  
3,200**

**Total : 16,000**

This Ene Con ambassador edited the tabloid paper which four times a year ECC published to home page version.

This page has introduced energy

conservation activity of local NGO groups in Japan. The energy conservation center, Japan has expected that foreigner readers understand the present situation of local energy conservation activity in Japan by this page. This page is translated in English from Japanese by machine translation software (NOVA PC-Transer/je2000 for Windows). When meaning of English writings is not understood, please read Japanese writing in the side-by-side translation sentence that is displayed when a J ? E mark is clicked. This English translation sentence is the output only machine translation software, and a translated sentence is not proofread.

# Ene Con Ambassador



No.6 Index 25 January 2000

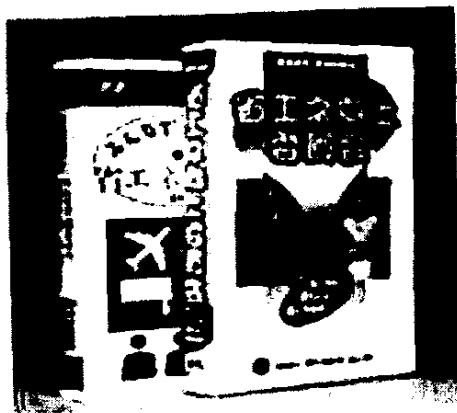
- Interview
- Display System
- Introduction of Ene Con Ambassadors
- Support Group List (1999, 1998)
- Ene Con Republic / Now Recruit
- Report

Four times a year published

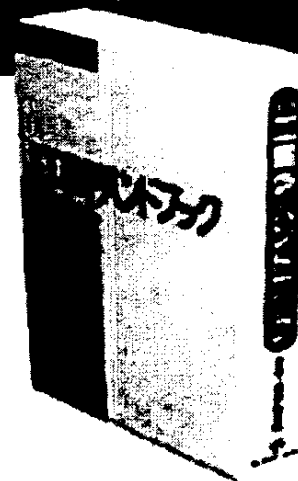
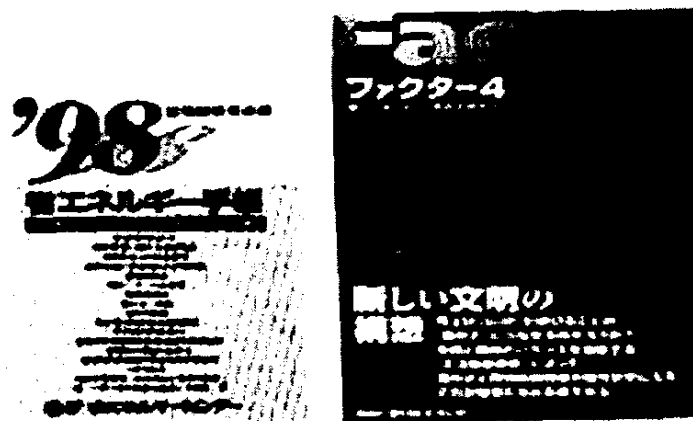
Newest: No.24 on 15 January 2003

# Publication

Monthly magazine & books



Various kinds of publications and videos are produced as a part of the Center's activities.



## 7-5. International cooperation

## **Main Fields of ECCJ's International Cooperation**

### **<Policy Proposal>**

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

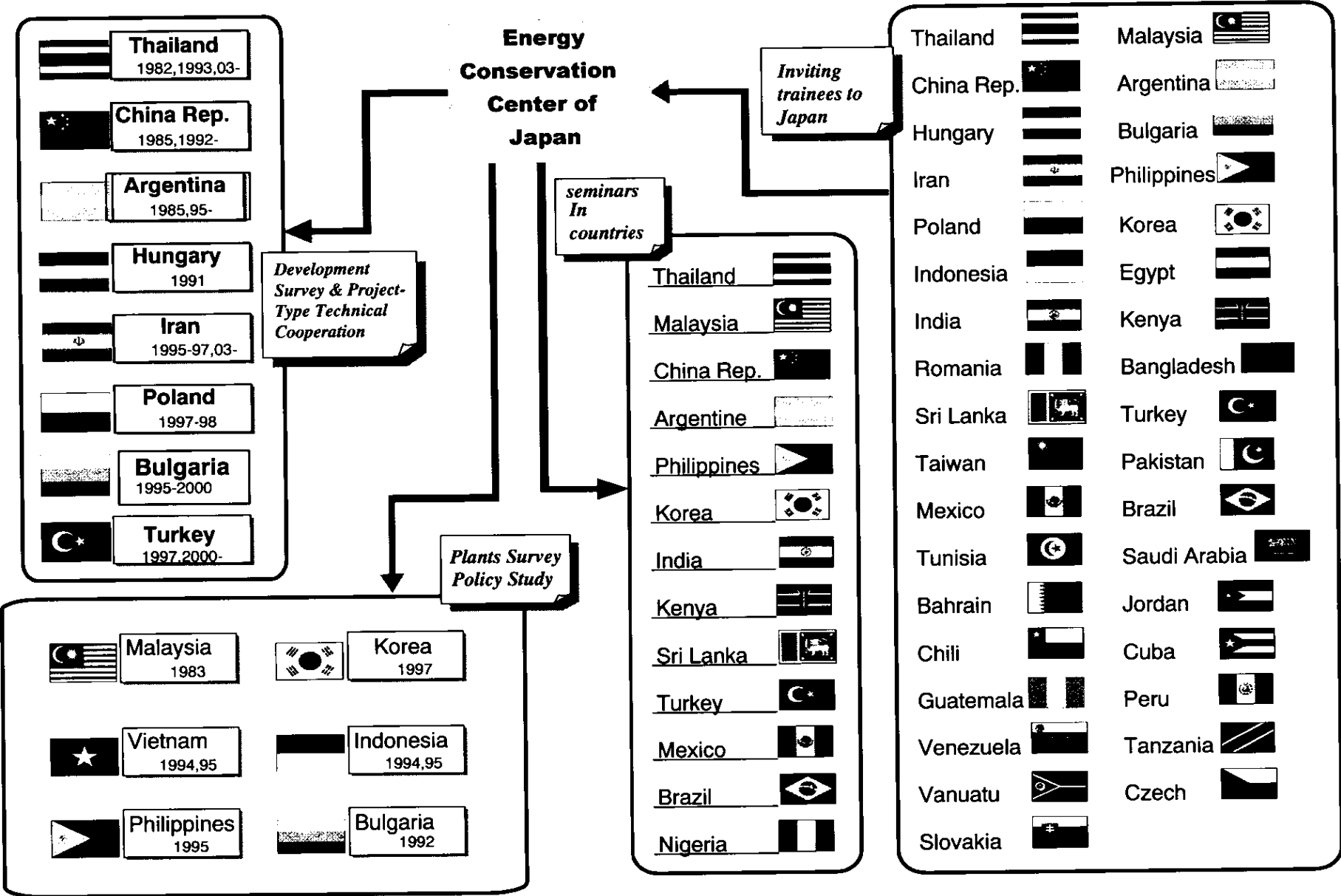
### **<Capacity-Building>**

- \*Training course at home and abroad.
- \*Dispatching experts to overseas for seminars.

### **<Technical Corporation>**

- \*Factory diagnosis and improving advise based on measurements (plant survey, energy conservation audit)
- \*Cooperation and support for establishment and operation of EE&C Centers or such organizations.

# International Cooperation of ECCJ





## <Example of Training Course in Japan>

**JICA /ECCJ Energy Efficiency and Conservation (general course)**

**<every year from 1986>**

**Duration: May 14, 2002 – July 4, 2002 (52 days)**

**Number of Participants: 12 (10 Countries)**

**Course Objectives: to understand**

- 1. The energy situation and energy policy in Japan**
- 2. The promotion policy for EE & C and its enforcement procedure**
- 3. EE & C measures in the industrial, commercial and residential, and transport sector.**
- 4. Energy management methods in buildings and factories.**

**Program: Lecture, Plant visiting to understand successful cases, Practical work (measurement of energy consumption), and Workshop (discussion and presentation).**



**<Example of abroad factory diagnosis and improving advise  
based on measurements (plant survey, energy conservation audit)>**

**NEDO/ECCJ Survey Project on the Energy Conservation in the Industrial Sector in the  
People's Republic of China** **<started in 2001>**

**Objectives: to evaluate the energy saving potential in the chemical industry sub-sector.**

**to find the energy conservation counter measures by carrying out energy audit.  
to offer the above mentioned measures and to make them to be disseminated over  
the sub-sector.**

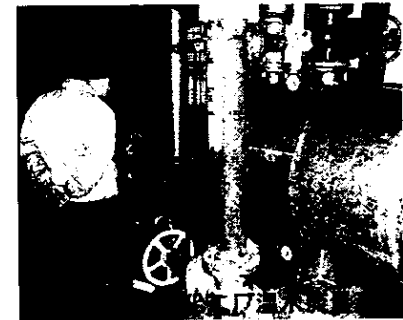
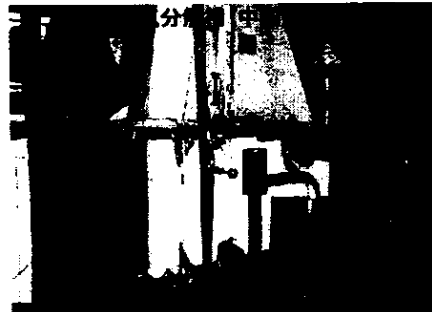
**Duration: July 22, 2002 – January 25, 2003 (1<sup>st</sup> step:10 days, 2<sup>nd</sup> step:3 weeks, 3<sup>rd</sup> step:10 days)**

**Factories for auditing survey: 天津大沽化工厂、 沈阳化工厂**

**Program: 1<sup>st</sup> step: pre survey (general information on energy consumption, preparation for the full-scale audit)**

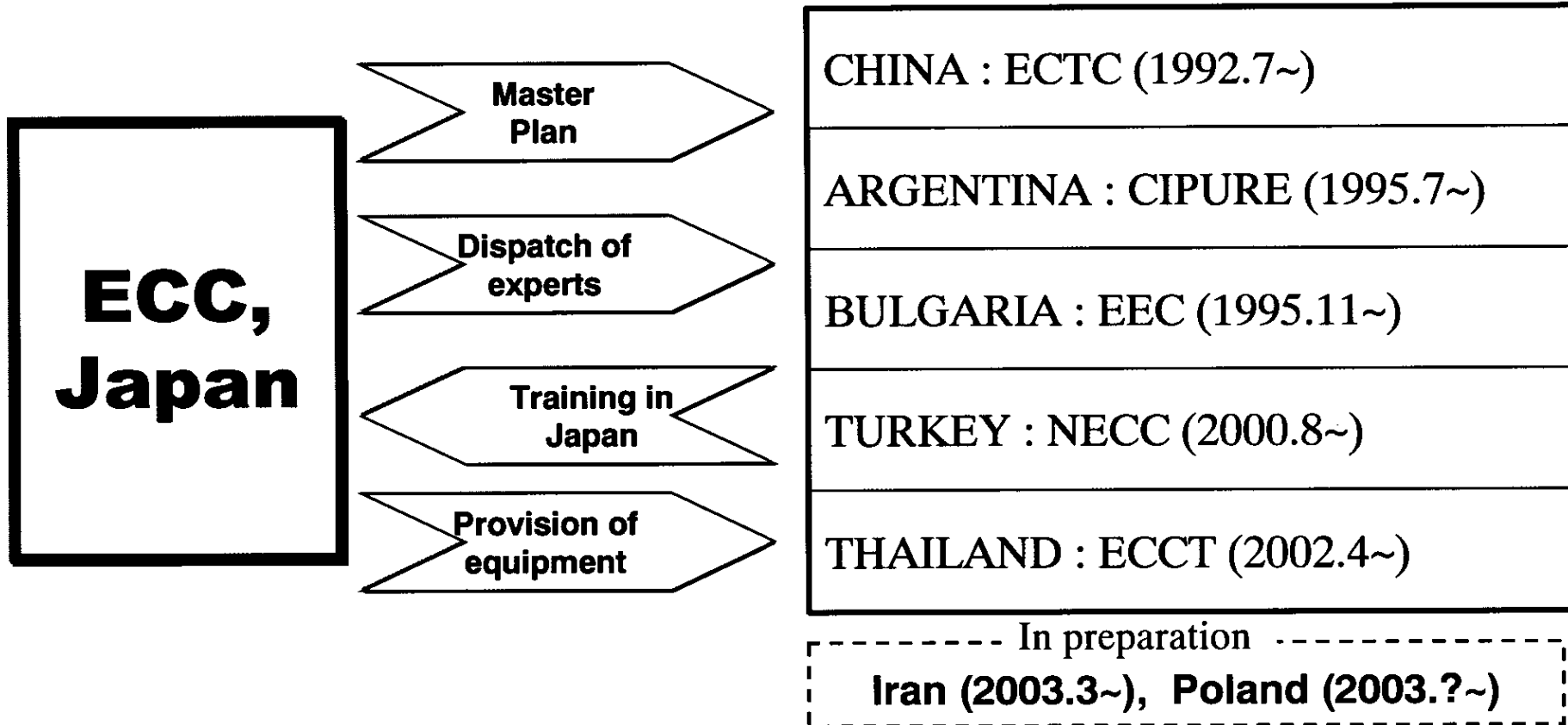
**2<sup>nd</sup> step: The auditing survey. Discussion of the audit results and tentative counter  
measures.**

**3<sup>rd</sup> step: Submission and presentation of the survey report to the Chinese Government.  
Following up the implementation of the tentative counter measures, and  
recommendation of the final counter measures at the surveyed factories.**



# International Cooperation

## Establishment of Energy Conservation Center



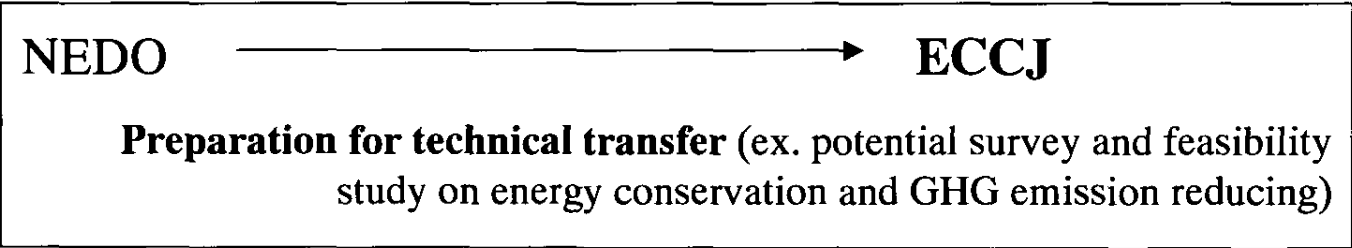
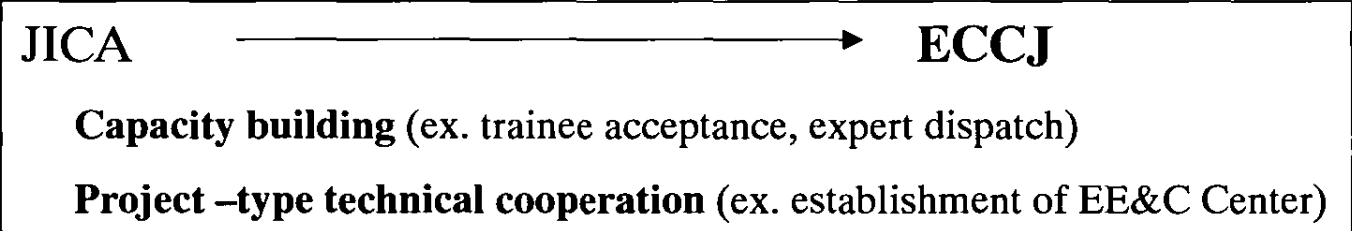
- ECTC : Dalian China energy conservation training center
- CIPURE : The rational use of energy center
- EEC : The energy efficiency center
- NECC : The national energy conservation center
- ECCT : The energy conservation center ,Thailand





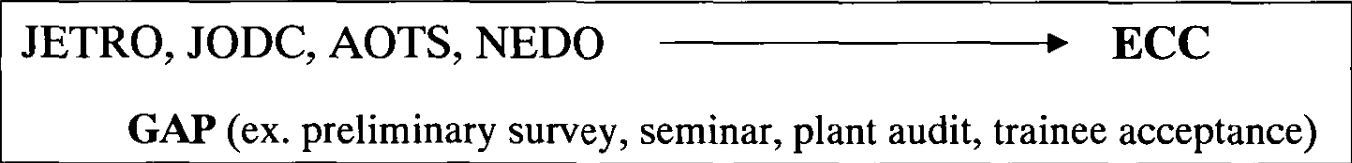
# Scheme of International Cooperation

## Your Government's Proposal to Japanese Government



## GAP Policy Dialogue between Your Government and Japanese Government

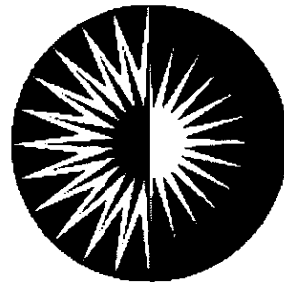
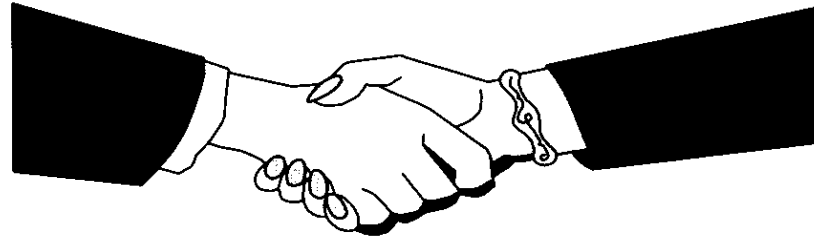
< energy conservation subjects >



## **7-6. More Information <ECCJ Web Site>**

- **You can find information regarding ECCJ's activities as well as trends of energy efficiency and conservation in Japan through accessing ECCJ's Internet Home Page:**
- **URL:  
[http://www.eccj.or.jp/index\\_e.html](http://www.eccj.or.jp/index_e.html)**

*Thank you*



*The Energy Conservation Center, Japan*