< JICA training course : Energy Efficiency and Conservation >

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

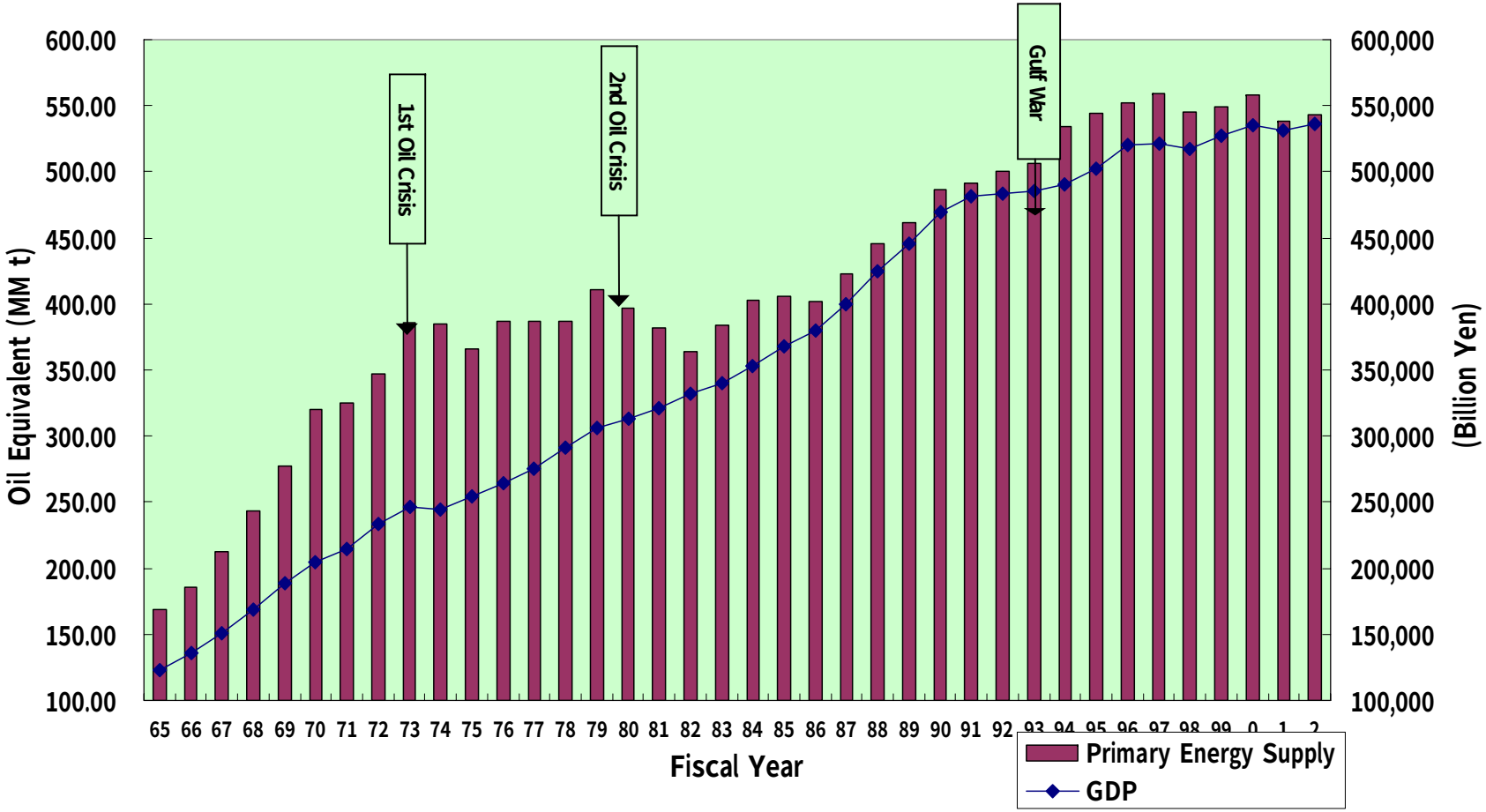
May 17, 2004

**Tsuzuru Nuibe**
Managing Director
**The Energy Conservation Center, Japan**

# Contents

# 1. Trends of Energy & Principle of Energy Policy

# Trend of Primary Energy Consumption and GDP

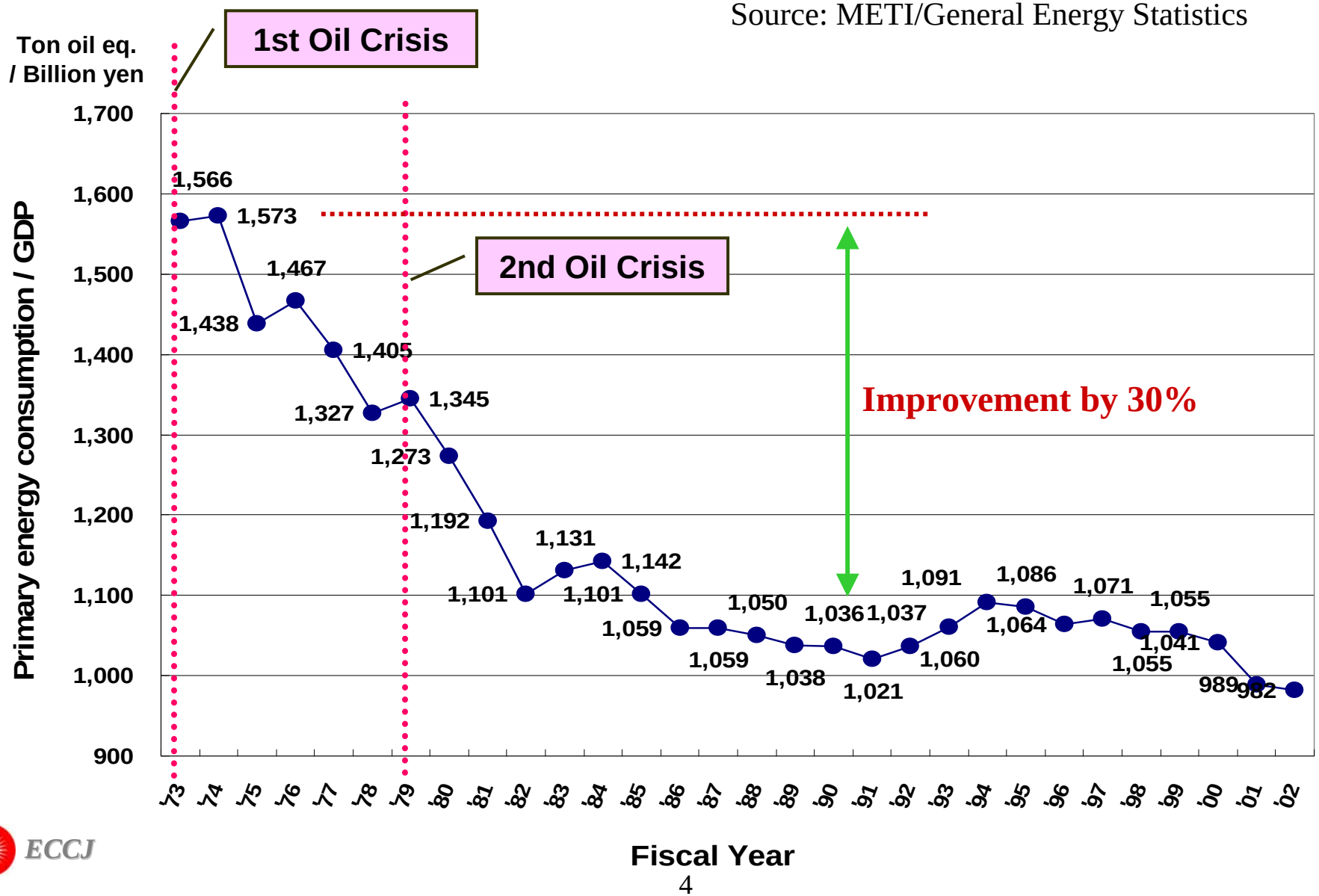



(Source: EDMC Handbook of Energy & Economic Statistics in Japan 2004)

ECCJ

# Trend of Primary Energy Intensity per GDP in Japan

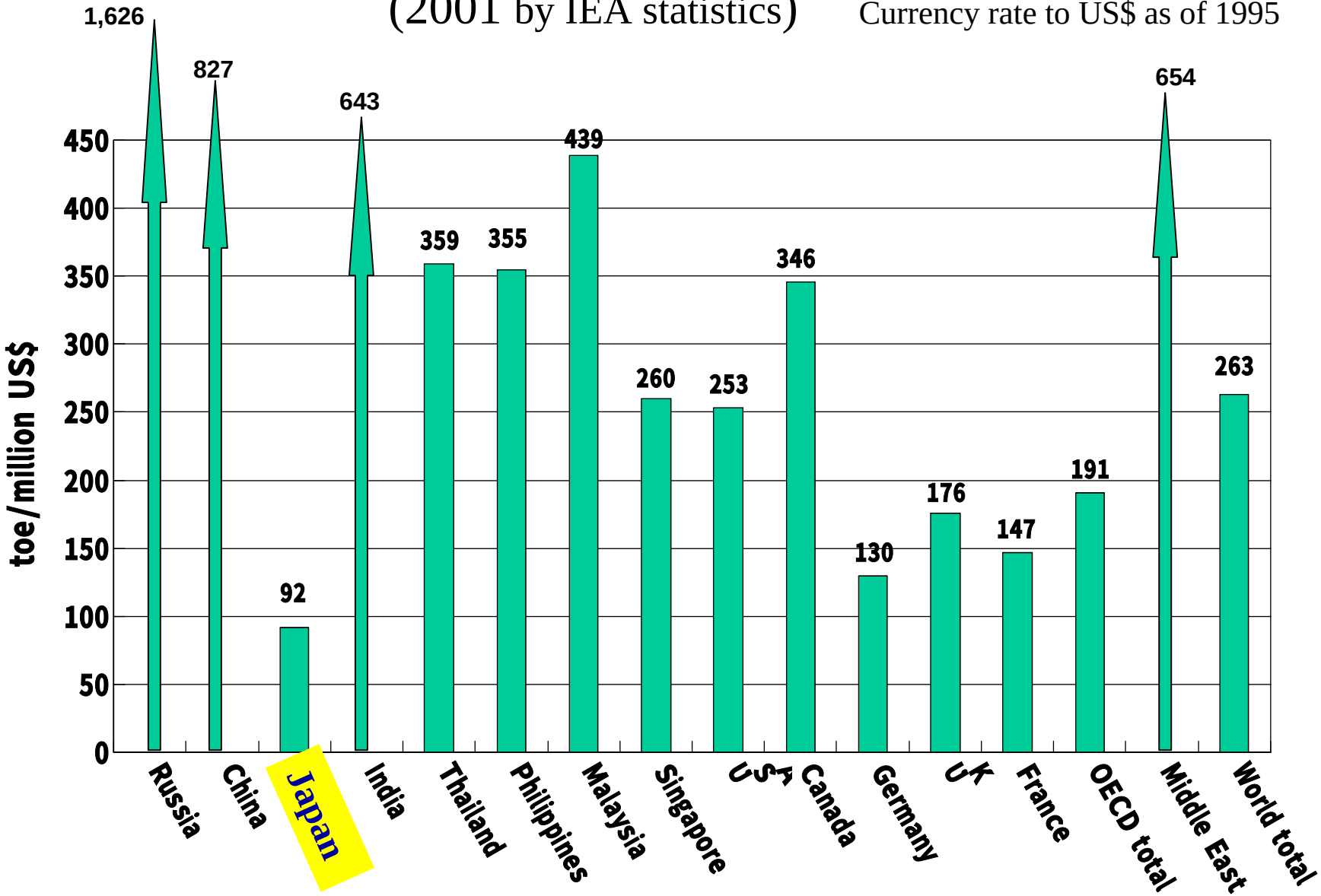
Source: METI/General Energy Statistics



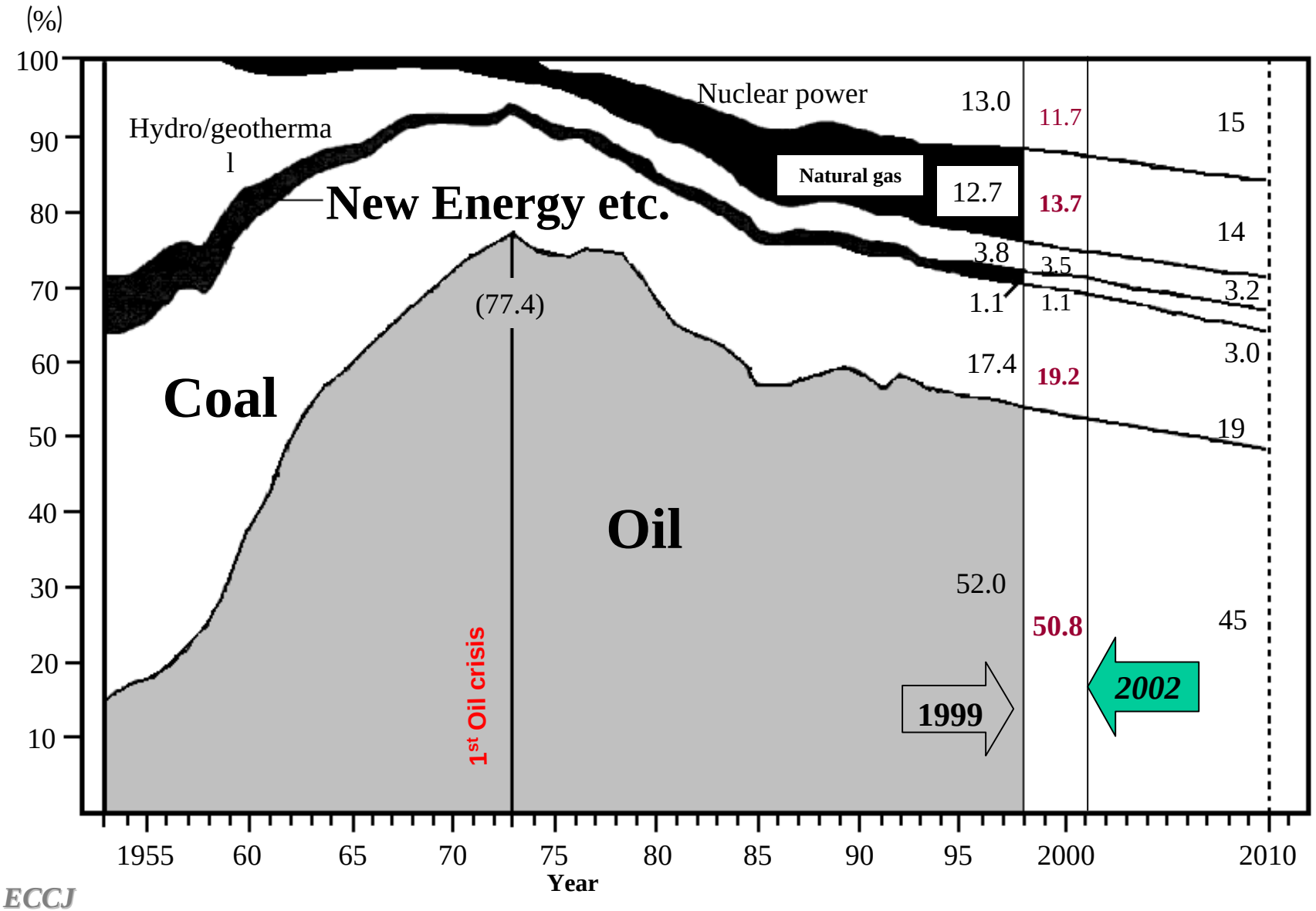

ECCJ

# Primary Energy Intensity per GDP

(2001 by IEA statistics) Currency rate to US$ as of 1995

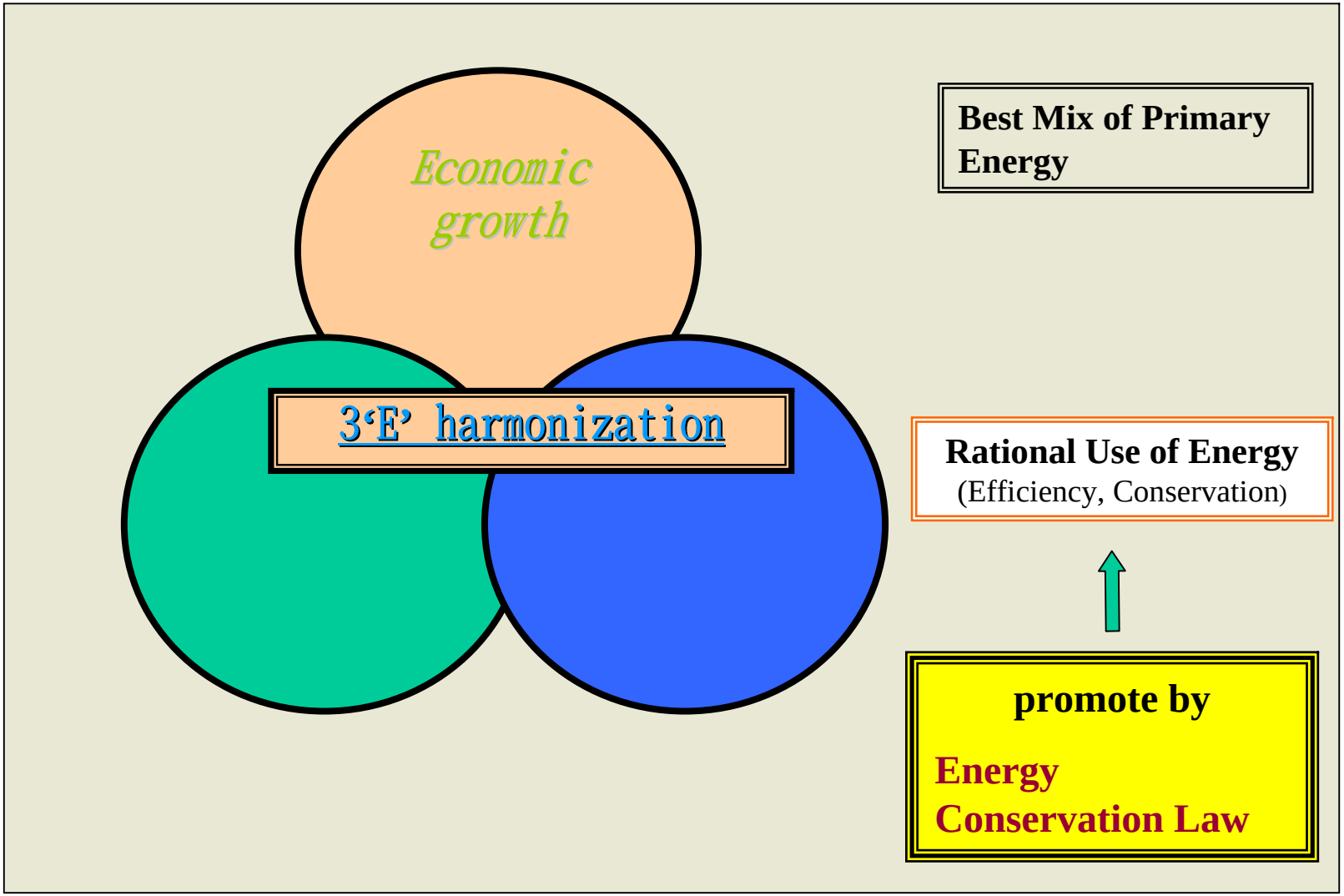


# Composition of Primary Energy Supply in Japan




ECCJ

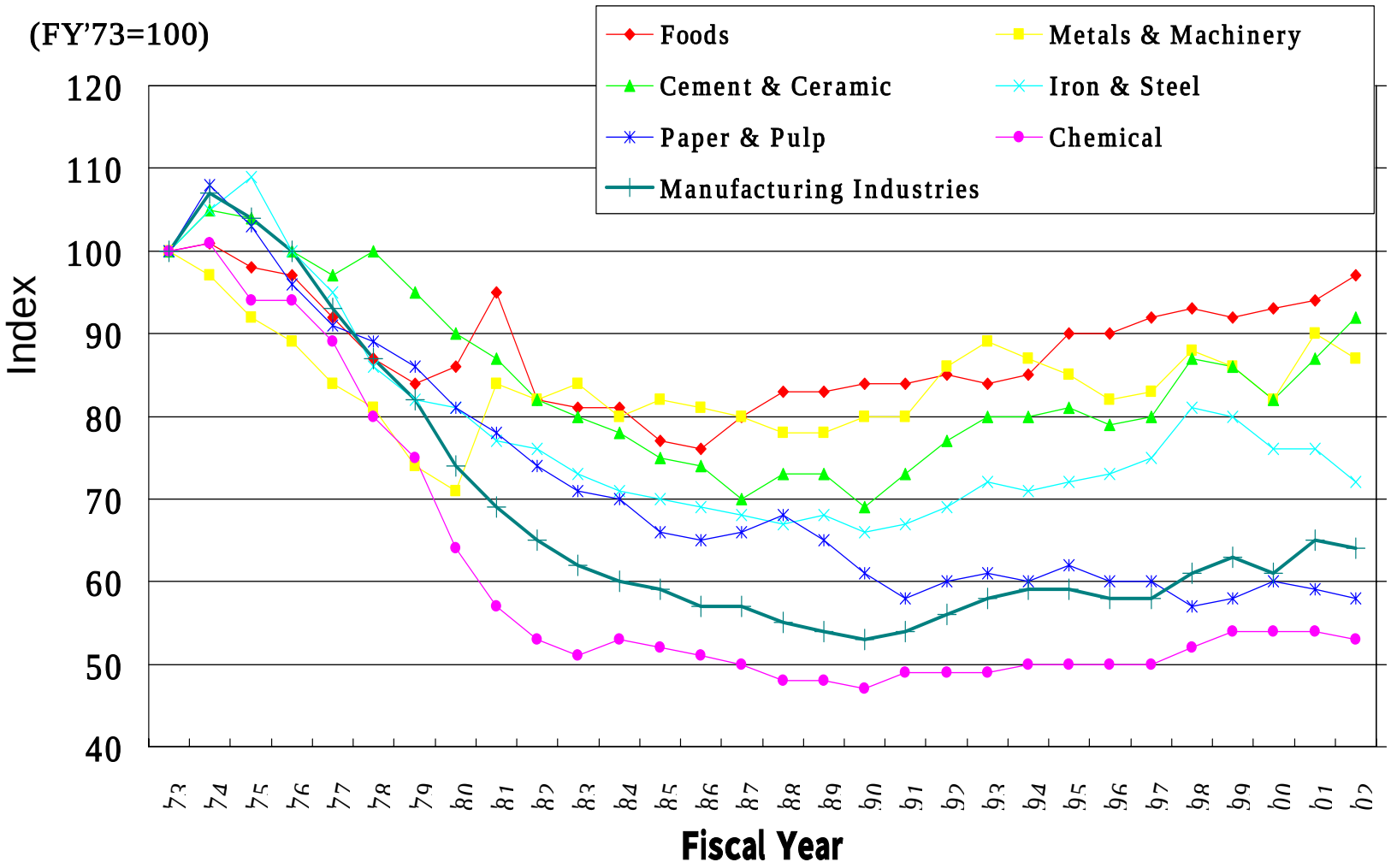
# Principle of Energy Policy --- 3‘E’s harmonization



# 2. Energy Conservation Policy in Japan

# <Manufacturing Sector>

## Trend of Energy Consumption Intensity by Sub-Sector



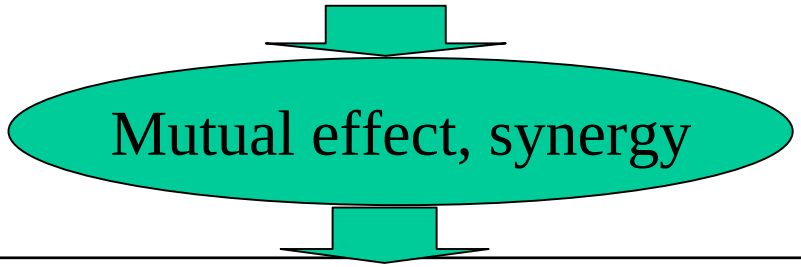

(Source: EDCM Handbook of Energy & Economic Statistics in Japan 2004)

ECCJ

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

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

4.Energy- saving efforts in the civic life

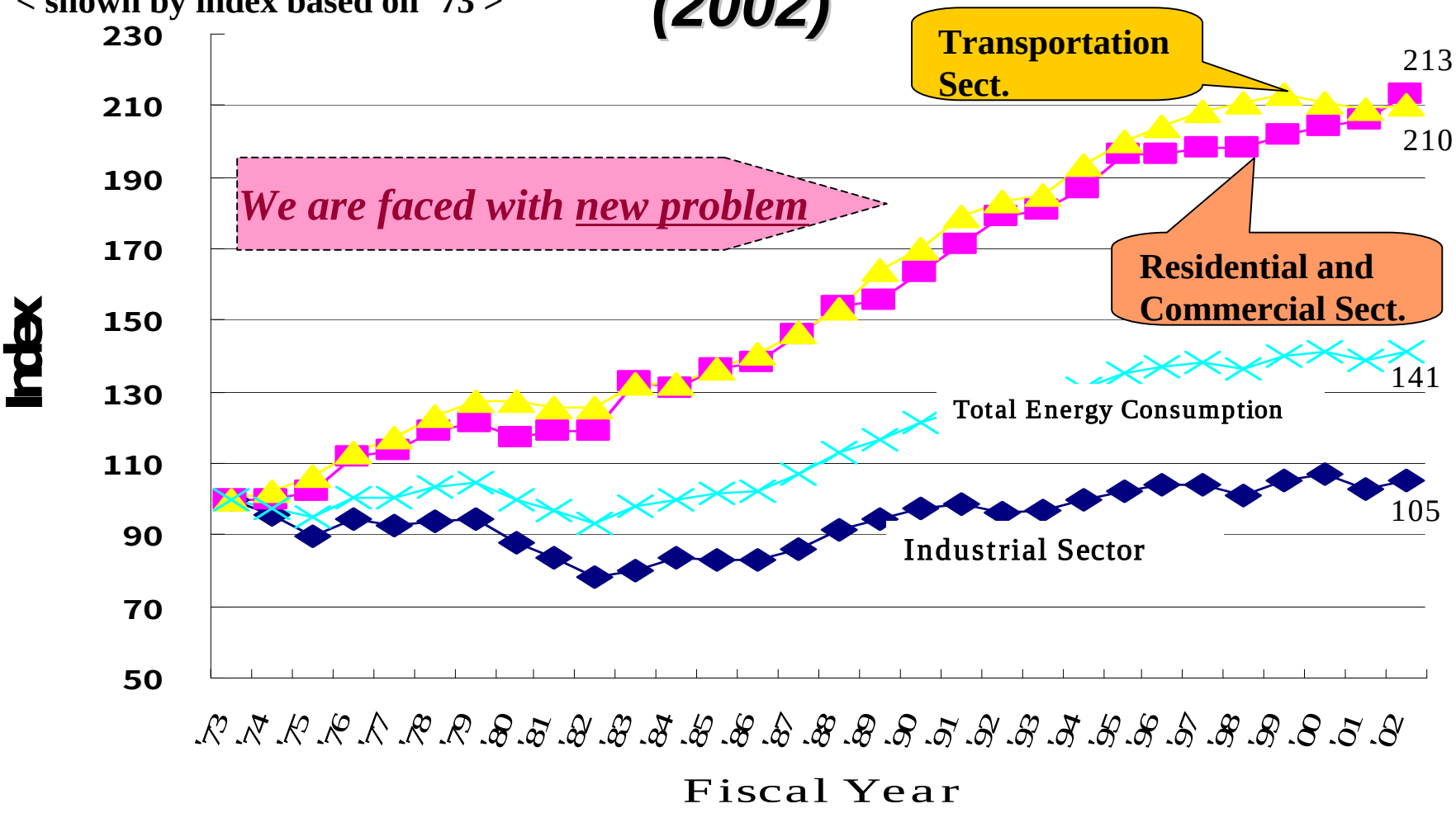



Japan became the first class in energy conservation technology by the rapid progress of energy conservation.

# Trend in Final Energy Consumption by Sector

< shown by index based on '73 >

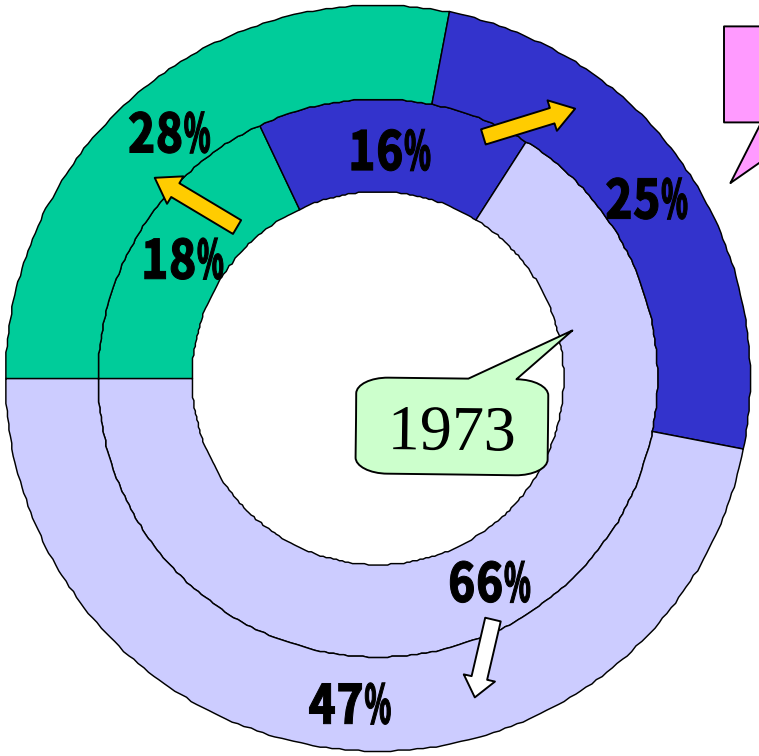
(2002)




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.

ECCJ

# Consumption Share of Each Sector




- Residential & Commercial Scctor
- Transportation Sector
- Industrial Sector

Final energy consumption in 2002Fy

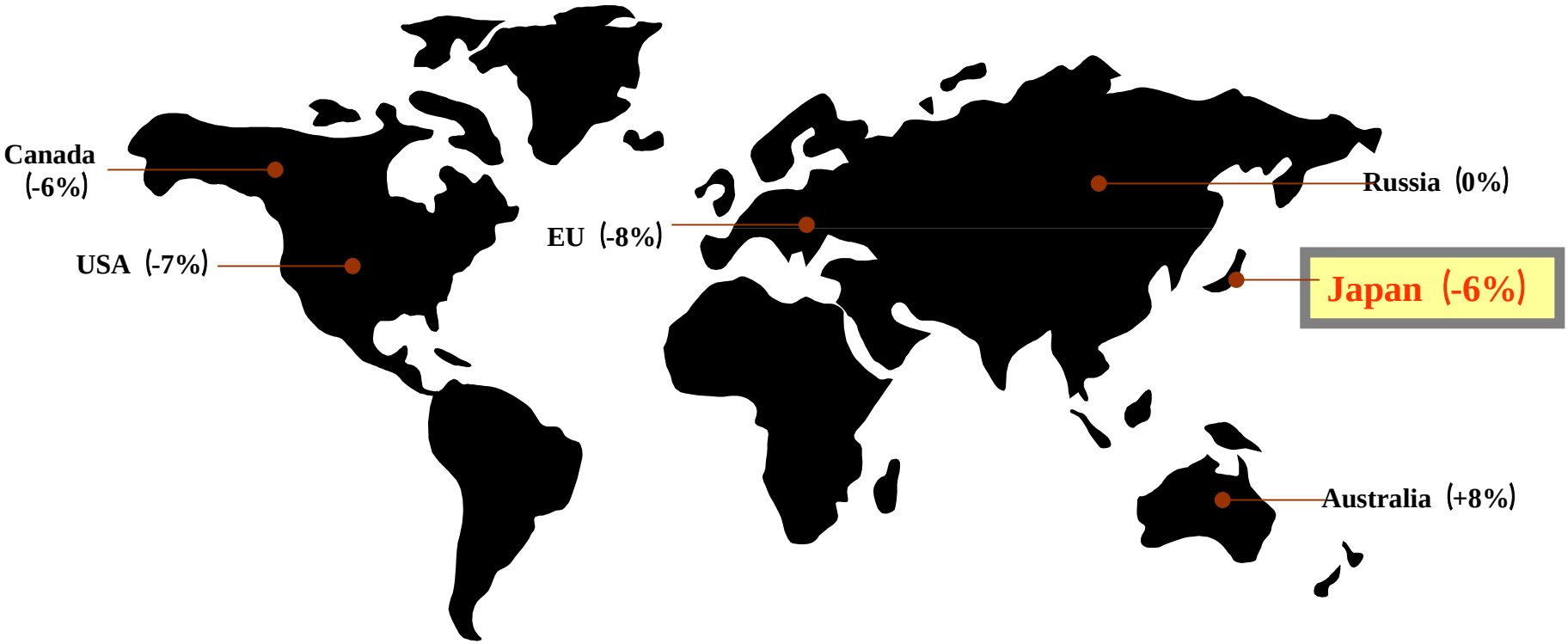
**409 million kl** oil equivalent

ECCJ

# $CO_2$ Reduction Targets in Major Countries during 2008 and 2012

**(Compared with the base year 1990)**

**＜COP3 Kyoto Commitment in 1997＞**




ECCJ

# ***Kyoto Commitment***

- **GHG emissions - 6% below 1990 level**
- **Stabilization of $CO_2$ emissions at 1990 level**

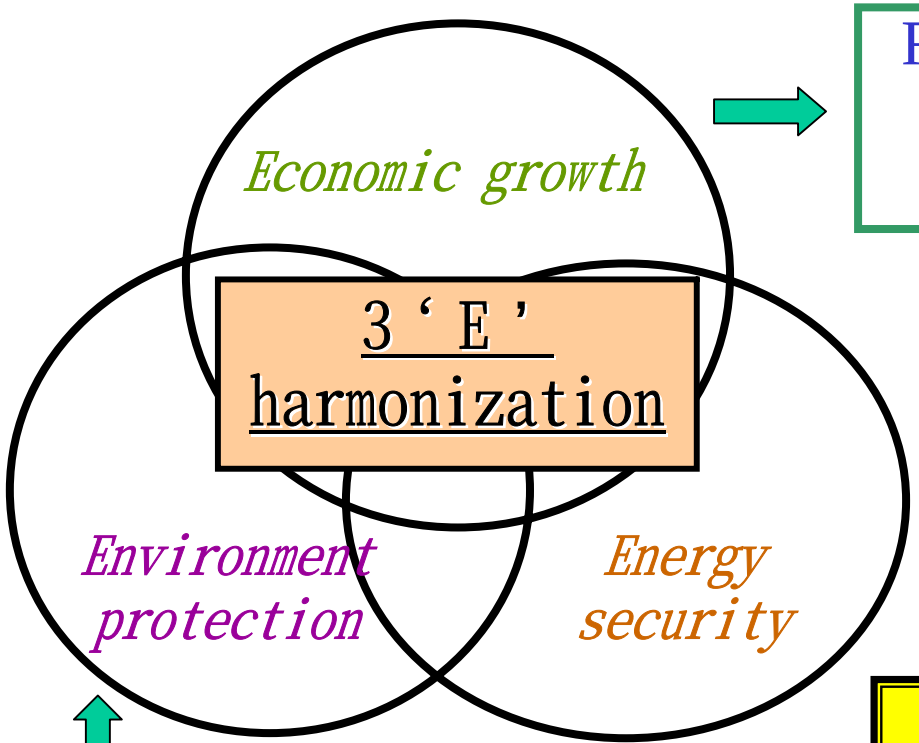
| | |
|---|---|
| **- 2.5%** | Emission Reduction of $CO_2$, $CH_4$ and $N_2O$<br>0% : $CO_2$ from Energy Origin<br>- 2.0% : Renewable Energy, Innovative Technologies<br>- 0.5% : Emission Reduction of CH4, N2O etc |
| **- 3.7%** | Sinks(Land Use Change and Forestry) |
| **+ 2.0%** | HFC, PFC, $SF_6$ |
| **- 1.8%** | Kyoto Mechanism ( Emission Trading, JI, CDM ) |
| **- 6.0%** | Total |

ECCJ

# Reflection of Global Warming Issue to Energy Conservation Policy

< 3E + CO2 Reduction >

Rational Use of Energy
= Contribution to CO2 Reduction



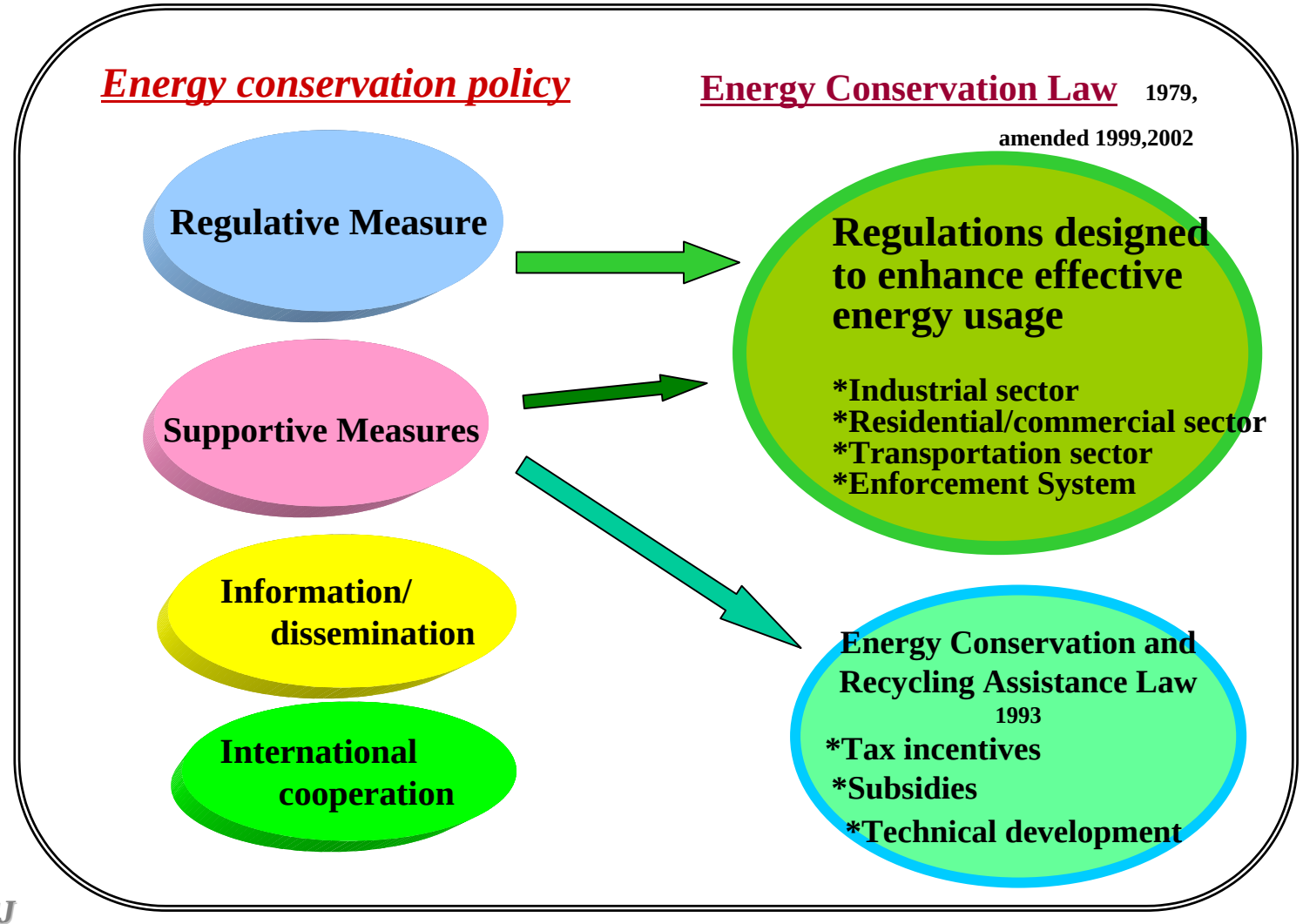

**Global Warming Issue**
< CO2 Reduction >

**reflect to**

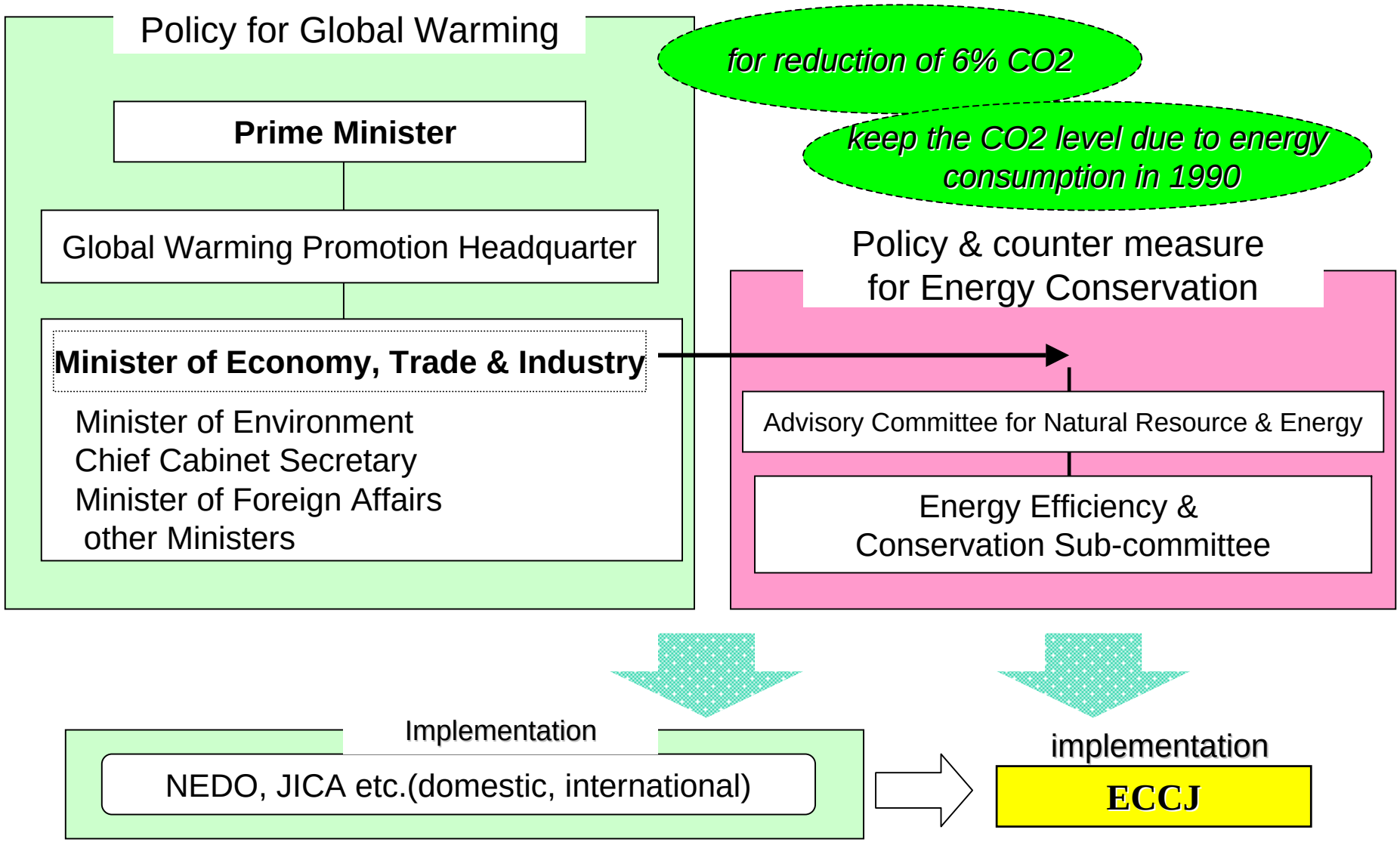
***Energy Conservation Policy***

ECCJ

# 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 $CO_2$ reduction

  Revision of Global Warming Prevention Principles＜Feb. 2002＞

  Ratification of Kyoto Protocol＜Jun. 2002＞

Consolidation of Laws, etc.：

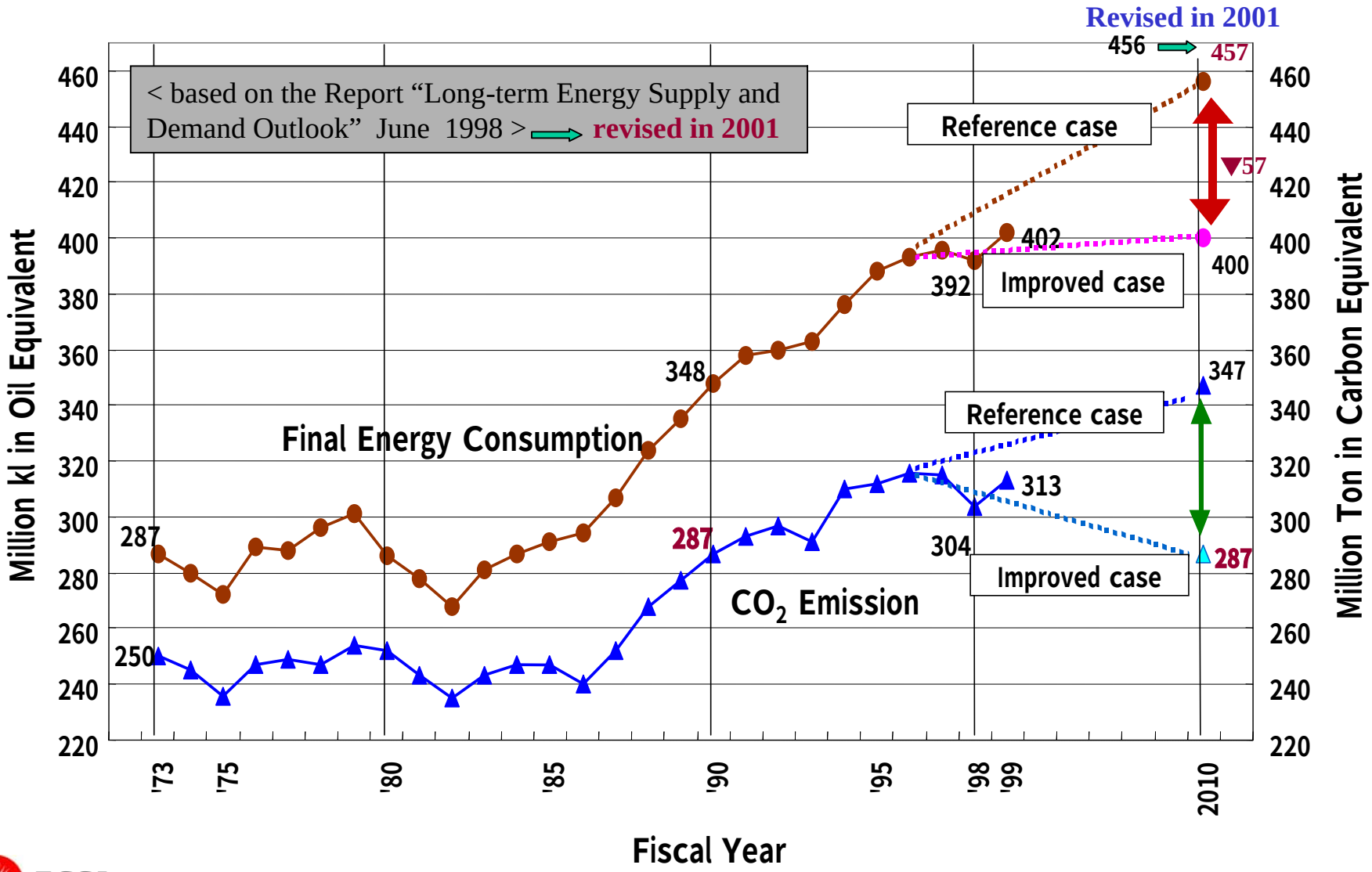
Revision of Global Warming Prevention Law＜2002.4＞

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 $CO_2$ Emission due to Energy Use

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




ECCJ

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

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

**3 Features**

1. Put high regard on the measures taken up to now
2. Adopt long-term and sustainable measures
3. 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 1st 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 1st category designated factories to evaluate whether they keep the standard required by the Law.*** (2001Fy~)
- ***Obligation reinforced for 2nd 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 1st 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)***

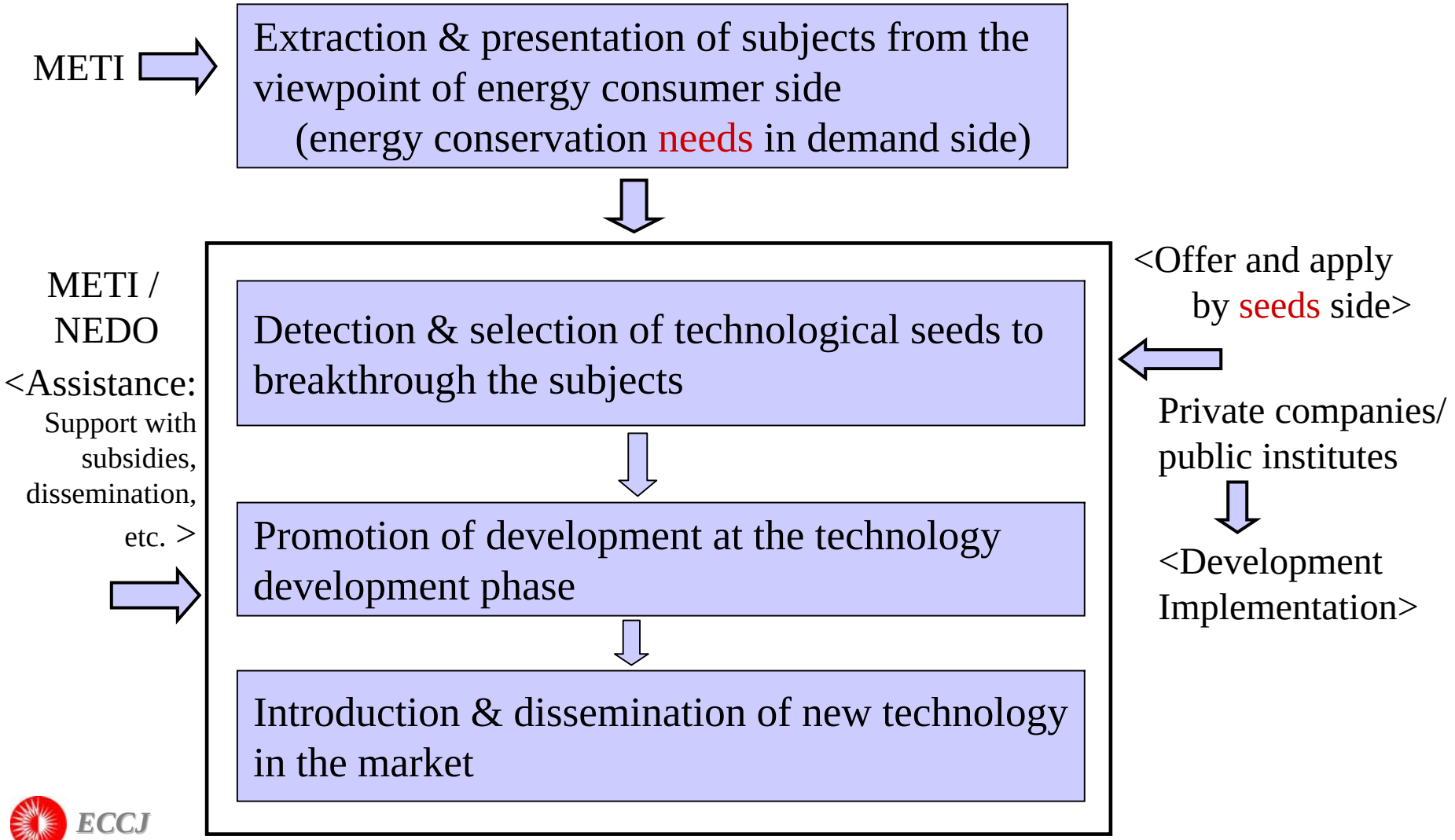
- Technological development by governmental bodies
- Supporting technological development by enterprises
- ***High performance boilers, lasers, lights and so on***

ECCJ

# Technology Development Strategies of Energy Conservation

…realize effects early by *needs-oriented technology development system*…

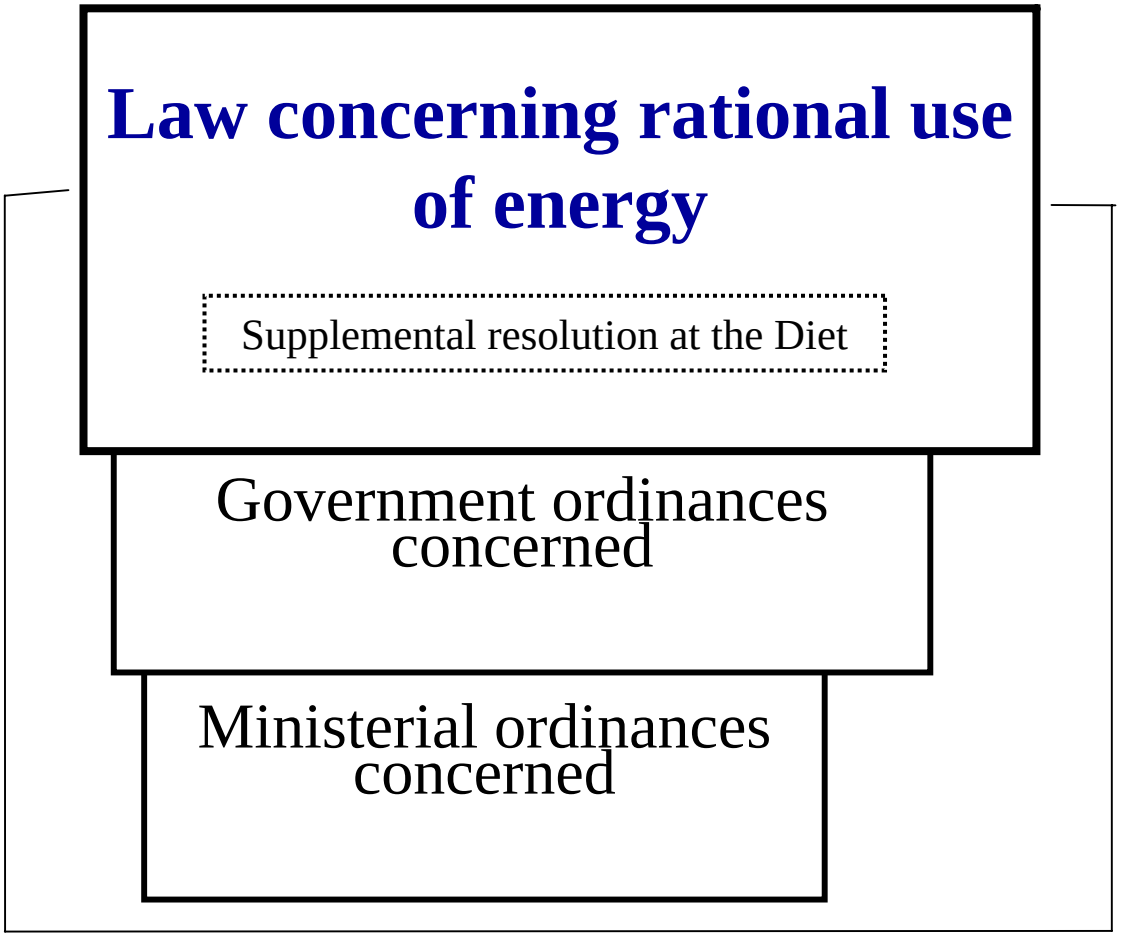
Published in June, 2002




ECCJ

# 3. Outline of Energy Conservation Law

# Structure of the Energy Conservation Law ・・・1




Energy conservation and recycling assistance law

and another concerning laws, ordinances

ECCJ

# Structure of the Energy Conservation Law ---2

**(Law concerning rational use of energy)**

(1979 enforced, 1999, 2002 amended and reinforced)

**<basic objective>**

**Enhancing rational use of energy and energy efficiency in order to achieve 3E's harmonization.**

- **Regulations regarding factories and business premises**
- **Regulations regarding buildings (newly built, extended)**
- **Energy efficiency standard for appliances and automobiles (Top runner program)**
- **Others (supportive measures/finance, tax, R&D, publicity, etc.)**

**<ECCJ's Status> ECCJ should be the core organization responsible for promotion of energy conservation. (supplemented with the resolution at the Diet )**

ECCJ

# Regulation and Target for Industrial Sector

ECCJ

**target**

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

**Major Energy Consumers**
**(designated 1st category factory) 6,100**

---

**Reinforced in 2003**
**to contain business promises (1,000 ---incld.)**

≧3,000 kl/y or
≧12 million kWh/y

**Newly designated In Apr. 1999**

**Small Energy Consumers**
**(designated 2nd category factory) 7,300**

≧1,5000 kl/y or
≧6 million kWh/y

**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 to improve**

* Selection of energy management officer
* Periodical reports (added)

**Reinforced in 2003**

**Guidance of energy management**

(Judgement Standards)

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

**Operation Standard of Equipment**

---

* Target Points
* Measures to attain targets

(Management Standards)

* Management system
* Management manual
for main equipment
(operation,measurement,record, maintenance etc.)

# Designated Energy Management Factories

**Reinforced in 2003**

| | Class 1 (one) Designated Factories<br>[6,100factories as of April 2004] | Class 2 (two) Designated Factories<br>[7,300factories as of April 2004] |
|---|---|---|
| Designation Standards | All factories and business promises (buildings)<br><The restriction of targeted industry (manufacturing, mining, energy supply) is abolished from April, 2003><br>Heat : 3,000 KL- coe or more/year<br>Electricity: 12 mil.KWH or more/year | No limitation on industrial category<br>(all factories and business promises/buildings)<br>Heat : 1,500 KL- coe or more/year<br>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<br>For class 1 Buildings, energy management officers permitted. | 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.

Energy management officers should be selected from licensed persons (the License to be acquired through the state seminar) or from licensed persons of energy manager.

# Regulations regarding buildings
**(newly built, extended)**

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.
   * Owners of specified buildings should report on energy saving measures before the construction.

   (specified buildings : other than housings, with floor space of 2,000m2 or more)

   **This article was added and enforced in April 2003**

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

## Energy Efficiency Standard for Appliances and Automobiles

# Top Runner Program –Concept--

Fuel efficiency (km/L)

Old energy efficiency standard (more than average)

Fuel efficiency (km/L)

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*

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

ECCJ

Energy Labeling Items

* Base year:1997 (automobiles:1995)

# Expansion of the scope of Top Runner

(***8 items were added in December 2002***)

Energy Labeling Items

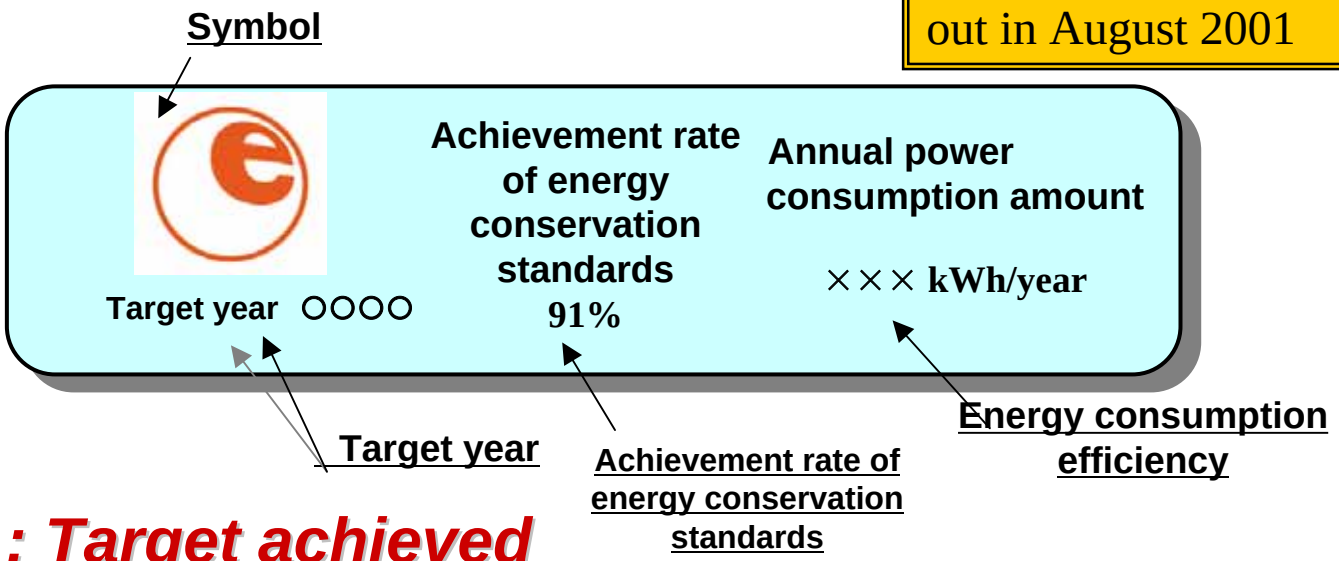
- Gas Stove (heater)
- Oil Stove (heater)
- Gas Home Cooker (Cooking Range)
- Gas Hot Water System
- Oil Hot Water System
- Toilet Seat with heater & hot water
- Automatic Vending Machine
- Electric Transformer

ECCJ

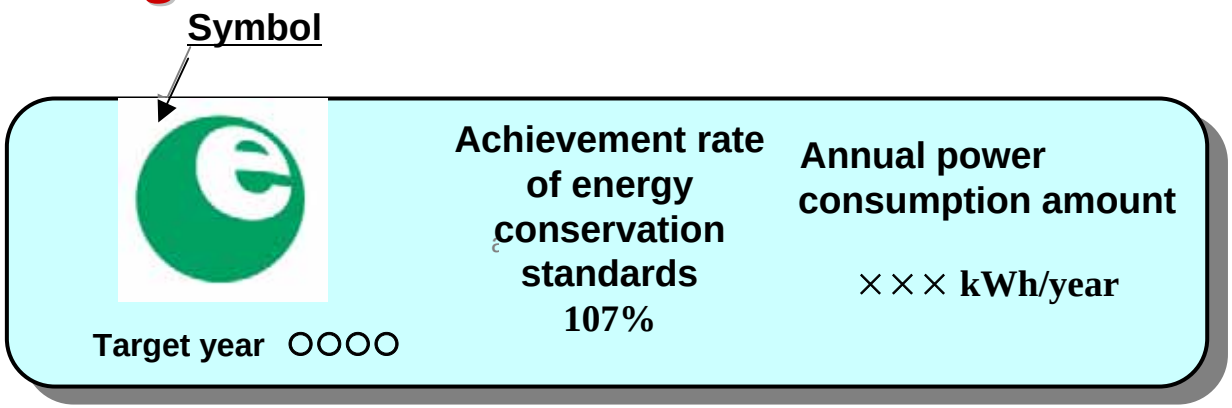
# Energy Labeling -- Method of Indication --

## ☆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.**

ECCJ

# *4. Energy Manager System (supplement)*

# 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**

| Fuel consumption, annually | Number Required |
|---|---|
| 3,000 or less than 100,000 kl-oe | 1 |
| 100,000 kl-oe or more | 2 |

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

| Fuel consumption, annually | Number Required |
|---|---|
| 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**

| Electricity consumption, annually | Number Required |
|---|---|
| 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

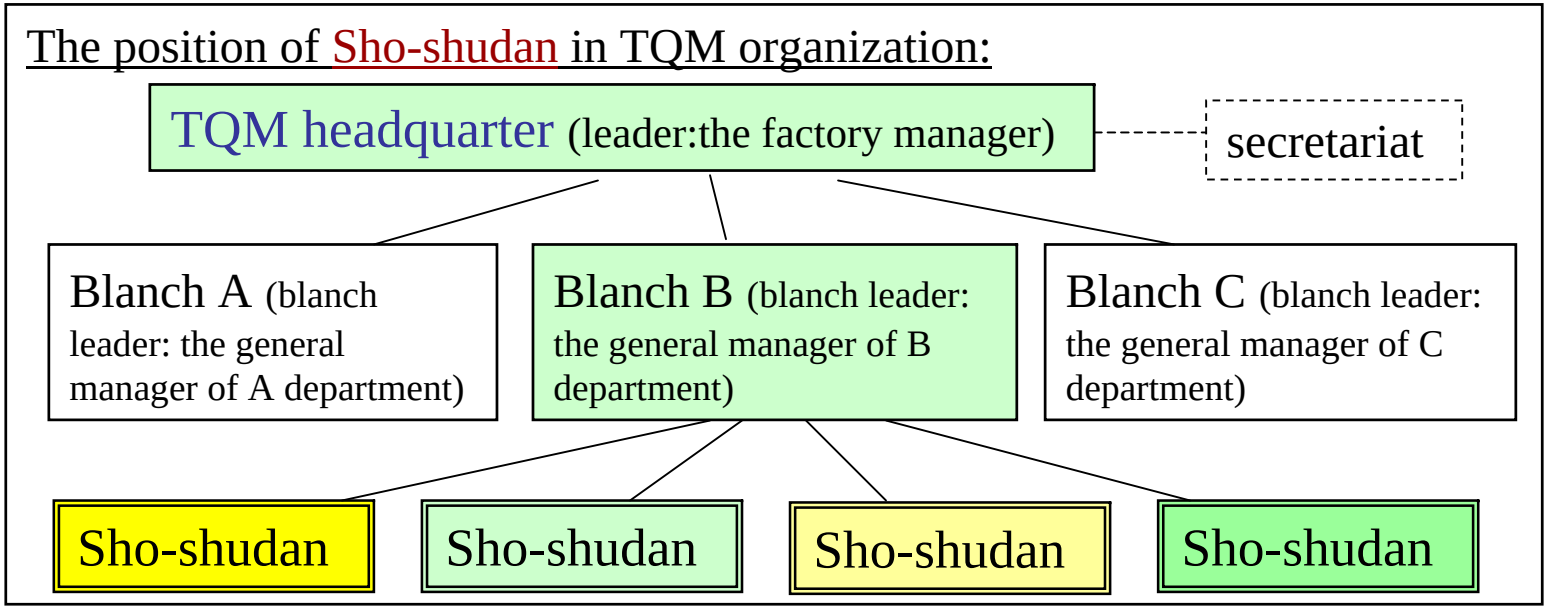
# *5. Self-help Efforts of Energy Conservation by Enterprises*

# 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.**




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

ECCJ

# 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

Large effect

High level

(Investment level)

<Top management>

Middle level

(Technological level)

<Engineers>

Low (easy) level

(operational & facility management level)

<Workers>

Small effect

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,

< T Q M >

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

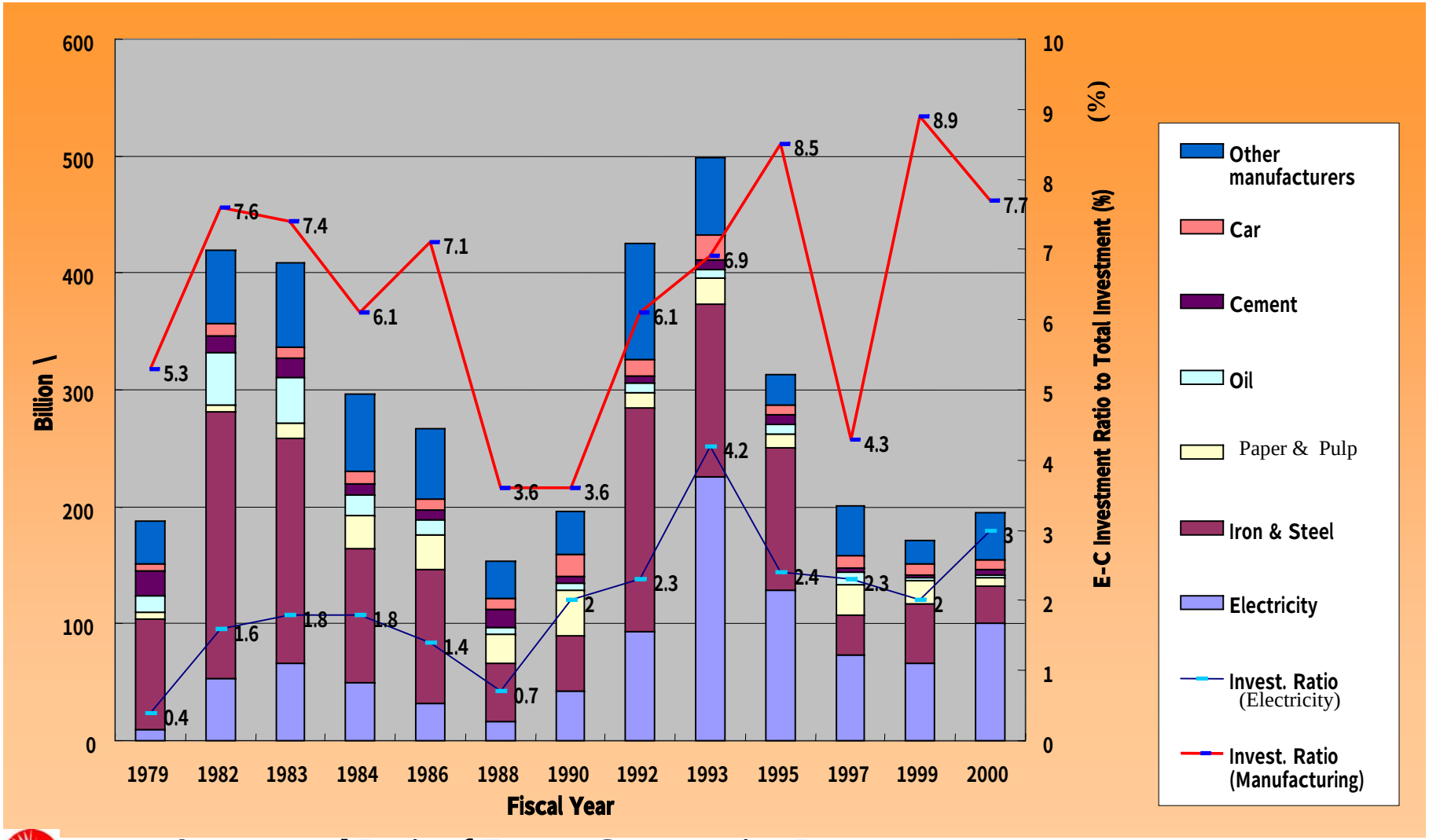
Every departments / Every parsons should be participating to the activities.

< T Q M >

# Trend of the Investment for Energy Conservation Facilities

**Major Manufacturing Companies & Electricity**

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




ECCJ **Amount and Ratio of Energy Conservation Investment**

# Voluntary Action Plan by KEIDANREN

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

- **Participants : 35 Industries** (Coverage Ratio : 83% of CO2 emissions in the industrial and energy-conversion sectors ------ as of Nov. 2003)

***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.**

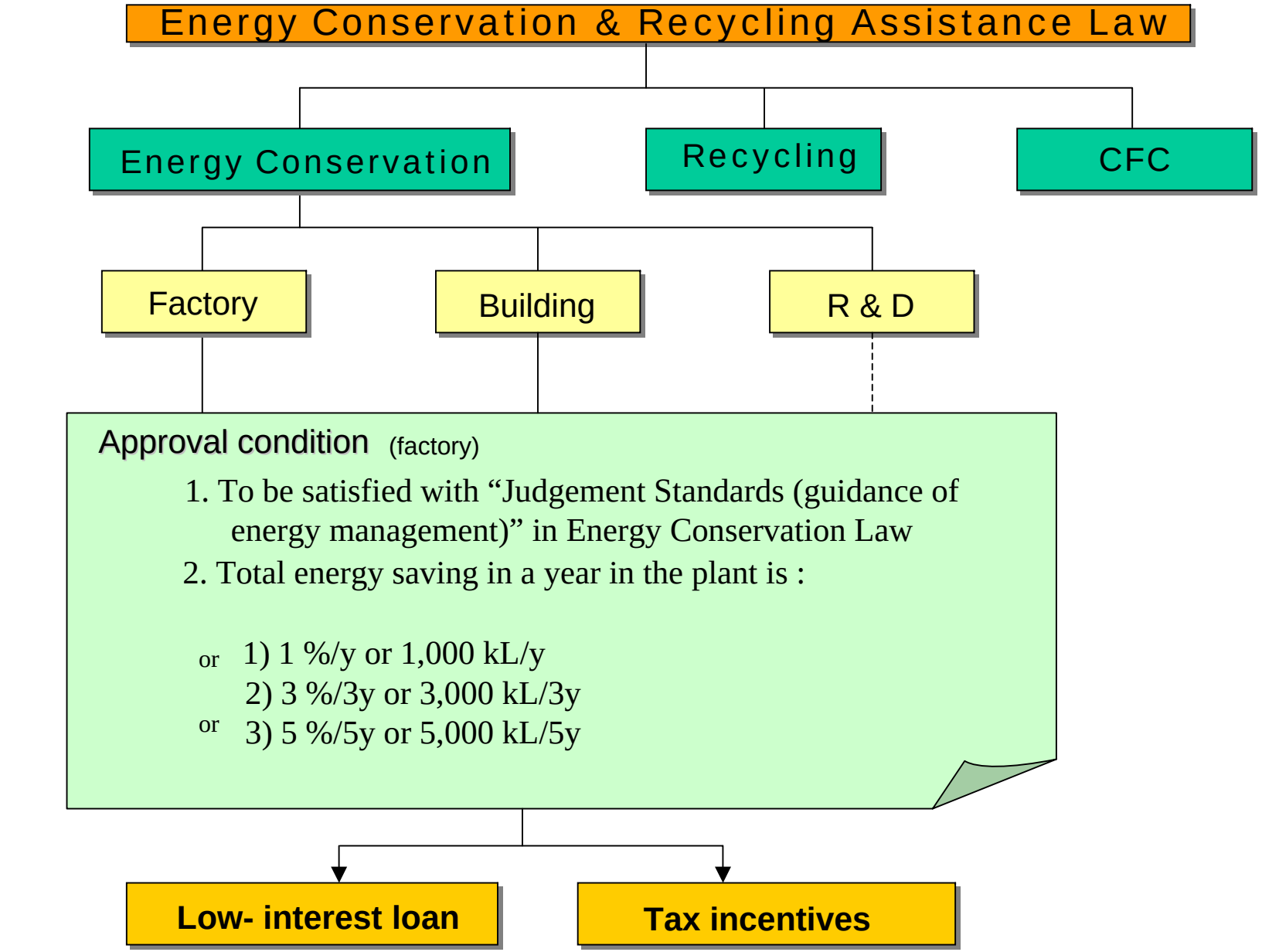
***Target in Year 2010***

**To reduce CO2 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 >**

## *6. Supportive System by Government (Investment and Technology Development)*

# Supportive Measures (1)



# Tax Incentives

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

| Intended for | Tax incentives |
|---|---|
| ・91 facilities<br>・52 facilities for small and medium companies<br>・Others | 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)<br>or<br>2. Special depreciation of up to 30% of the equipment acquisition cost |
| Systems approved on the basis of the "Assistance Law"<br>(Energy savings of 5% or 5,000 kL) | |

* 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 1998 | FY 1999 | FY 2000 | FY 2001 | FY 2002 | FY2003 |
|---|---|---|---|---|---|---|---|---|
| No. of cases | 10,544 | | 24,609 | 19,981 | 15,417 | 13,320 | 10,060 | Under summing up |

## Supportive Measures (2)

# Subsidy

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

1) 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
4) Introduction of HEMS, BEMS (ENERGY MANAGEMENT SYSTEM )
5) Supporting ESCO enterprises
6) Purchasing low CO2 emission auto mobiles
7) R&D Projects for high energy efficient technologies and systems

<others>

# Development of Energy Conservation Technology

---- promoted by **NEDO**

(**N**ew **E**nergy and Industrial Technology **D**evelopment **O**rganization )

- 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 :** * 2,843 companies (as of April 2004)

**Staff :** * 220 persons (as of April 2004)

**Budget :** * 5,731 million yen in 2004FY (52 million U$)

**Fields of activity :** * Industrial, Residential/Commercial and Transportation sectors

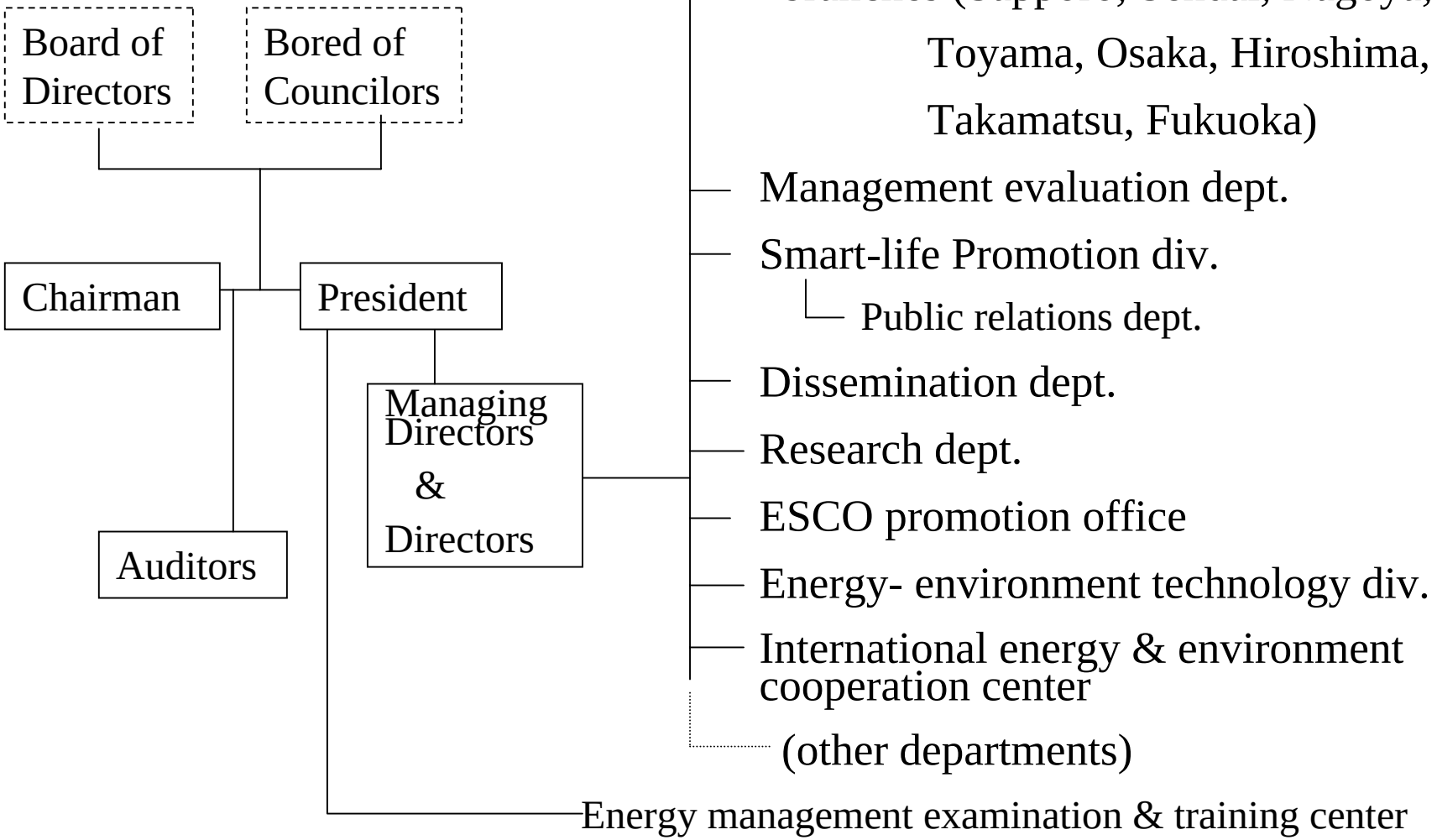
# History of ECCJ under Change of Energy-related Situation

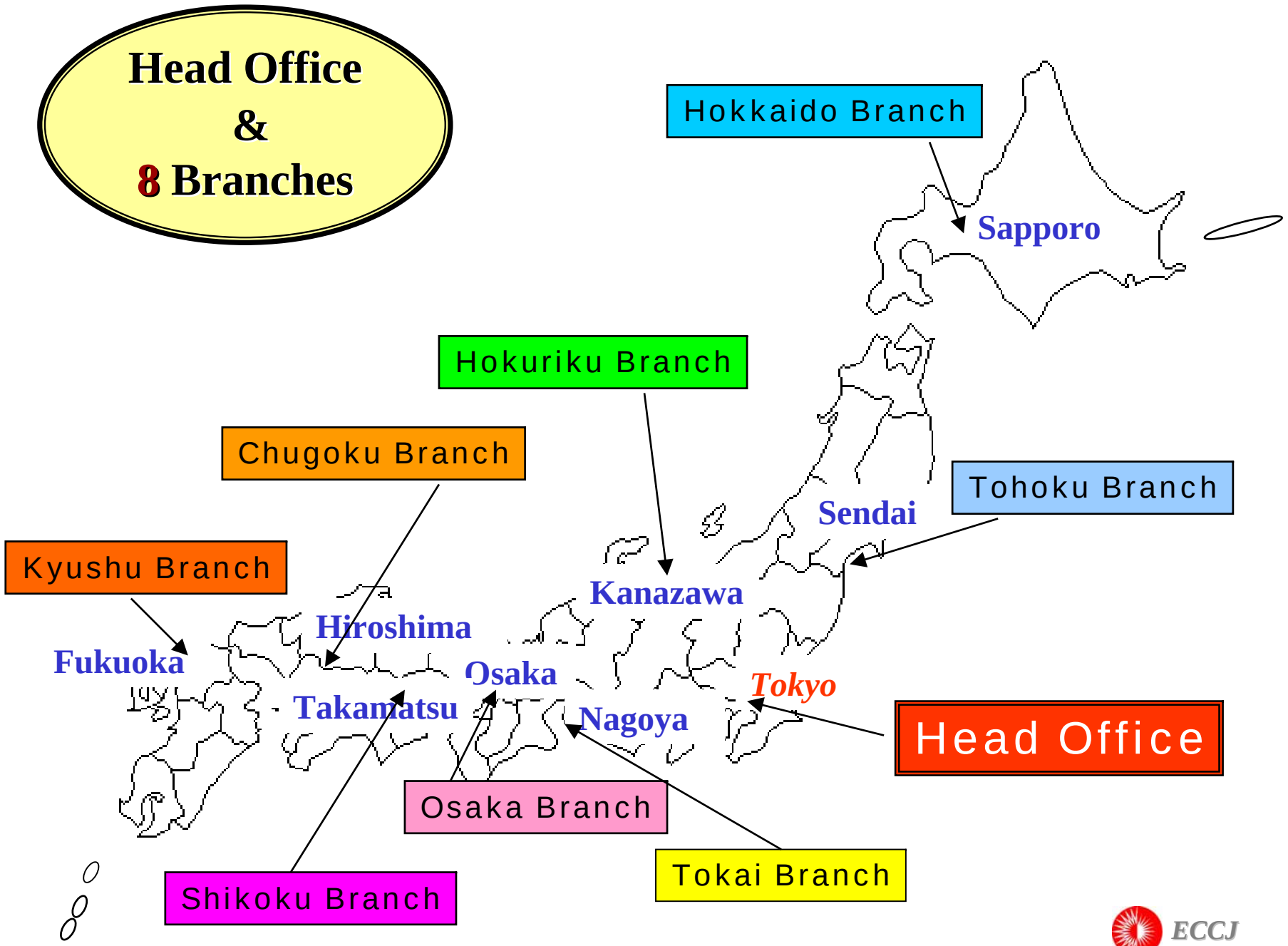
| History of ECCJ | Year | Change of Energy-related Situation |
|---|---|---|
| Heat-management Association established in Kinki district | 1947 | Heat-management Regulation enacted |
| Heat-management Association established in the other districts | 1948 | |
| Central Heat-management Conference started | 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)

**as of April 2004**

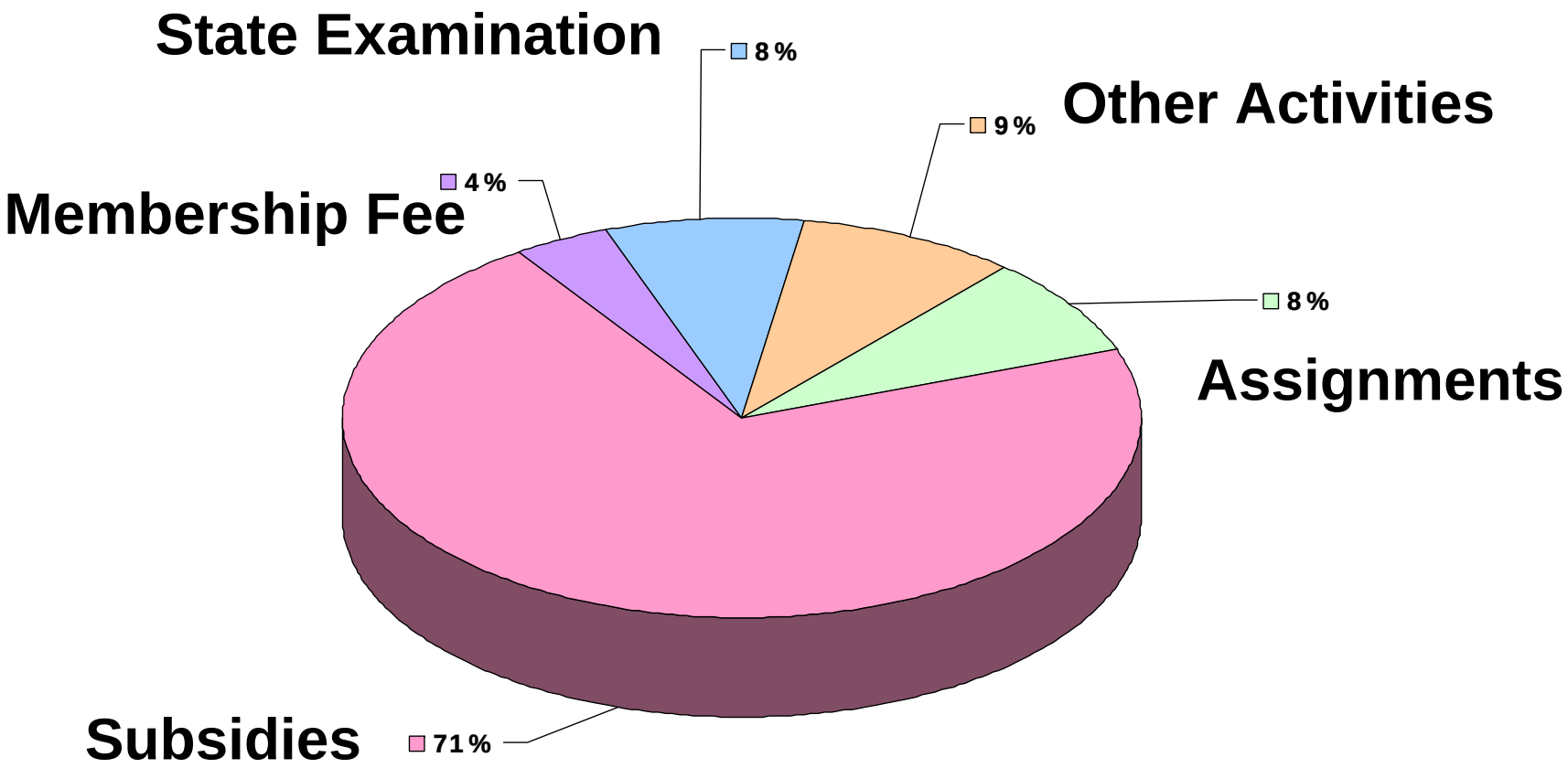
< established Oct. 16, 1978 >




Head Office
&
8 Branches
Hokkaido Branch
Sapporo
Hokuriku Branch
Chugoku Branch
Tohoku Branch
Sendai
Kyushu Branch
Kanazawa
Hiroshima
Fukuoka
Osaka
Tokyo
Takamatsu
Nagoya
Head Office
Osaka Branch
Tokai Branch
Shikoku Branch

# Budget in 2004Fy

**US$ 52Million**




ECCJ

# Main Activities of ECCJ

**ECCJ is the core organization responsible for promotion of energy conservation. Its activities were authorized by the Diet when the E-C Law was enacted.**

## for Industrial sector

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, R&D Project
⑤ Disseminating (conference for successful cases of E-C activities, excellent energy conserving equipment, etc.)
⑥ ISO14001 seminar for environmental inspectors

## Civil, Commercial & Transportation

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 Dissemination of Energy conservation indicator "E-C Navigator"
⑦ Energy education at elementary and middle schools
⑧ ESCO research and development

## Overall

① Energy conservation campaign & exhibition (ENEX)
② Commendation (grand energy conservation prize)
③ Information & data base, Publicity and publishing
④ Survey and monitoring
⑤ International cooperation

# 7-2. For industrial sector

# Public Programs on Energy Conservation Auditing Performed by ECCJ

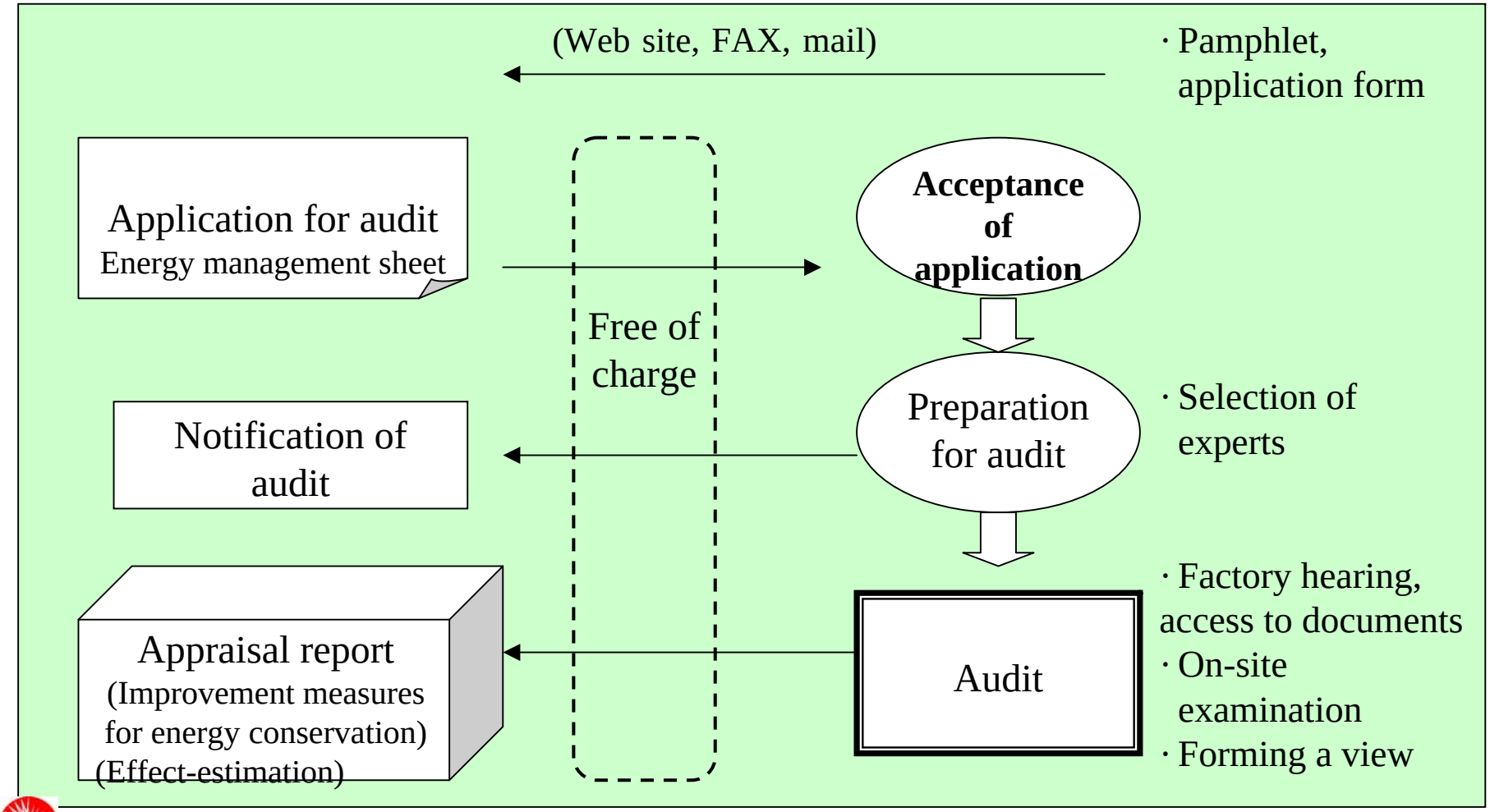
| Program | Applicable factory | Overview | Funded by |
|---|---|---|---|
| Energy Conservation Auditing for Factories<br><br>(Free-of-charge) | Medium sized factories | On-site discussions<br>Document review<br>On-site inspections<br>1 day<br>Report of findings →<br>Proposals on improvement<br>100 factories/year | METI |
| Energy Conservation Auditing for Buildings<br><br>(Free-of-charge) | Buildings | On-site discussions<br>Document review<br>On-site inspections<br>1day<br>Report of findings →<br>Proposals on improvement<br>350 buildings/year | METI |
| Energy Conservation Auditing for Factories<br><br>(Free-of-charge) | Large sized factories | Document review<br>On-site inspections with measuring devices<br>3 days<br>Report of findings →<br>Proposals on improvement & introduction of new technologies<br>70 factories/year | METI / NEDO |

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

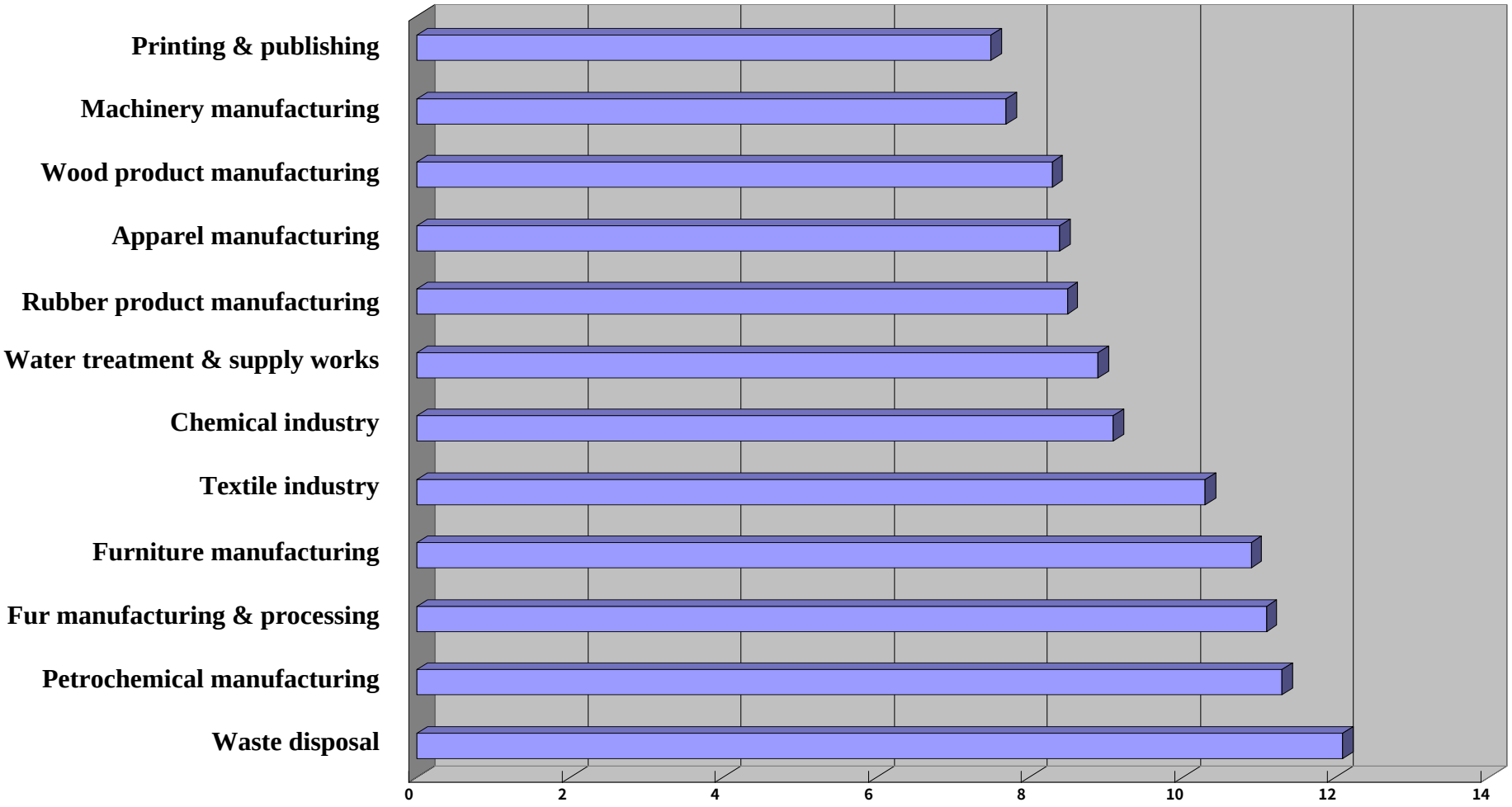
Number of factories audited: **1,742** (Fiscal years 1997 – 2003)

**(Details)**

| | |
|---|---|
| Electromechanical apparatus manufacturing | 300 (17.2%) |
| Food manufacturing | 157 ( 9.0%) |
| Chemical industry | 145 |
| Transport equipment manufacturing | 140 |
| Plastic products manufacturing | 135 |
| Metal product manufacturing | 130 |
| Water treatment & supply works | 104 |
| General machinery and apparatus manufacturing | 92 |
| Ceramic/Cement product manufacturing | 73 |
| Precision machinery and apparatus manufacturing | 57 |
| Nonferrous metal manufacturing | 50 |
| Textile industry | 50 |
| (Others) | |

# Energy-saving effect by 1 day-audit

(Average energy-saving rate by industry)




ECCJ

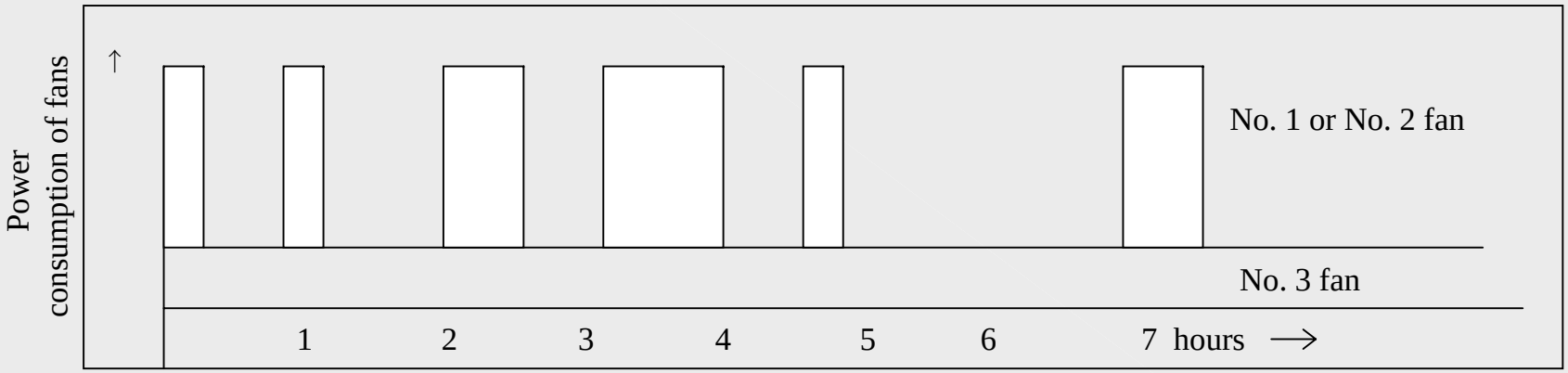
# Case example of audit (1): Water supplying works

Problems: l. 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 1ºC.
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

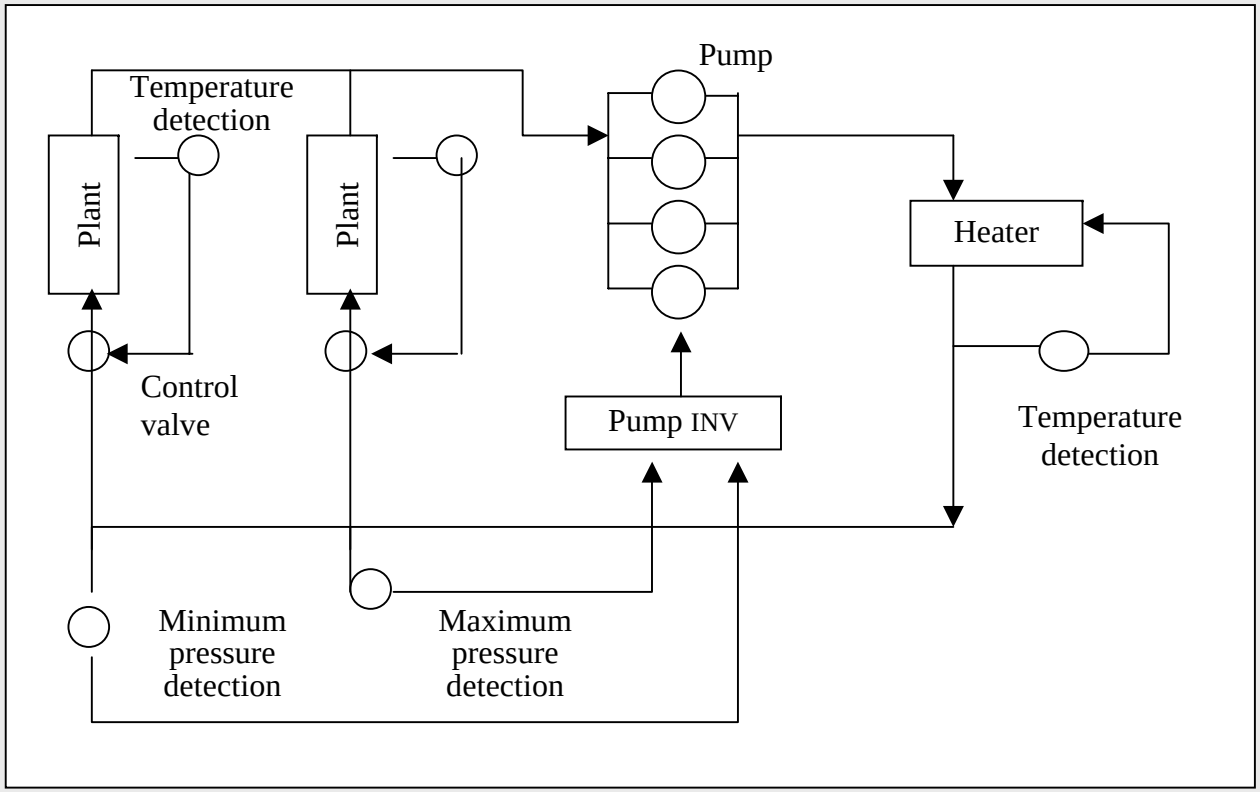
# Case example of audit (3): Petrochemical product manufacturing

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%

ECCJ

# 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

***ECCJ organizes and implements every year***

**the National Convention of Excellent Successful Cases**

***from 1976***


***6-7February, 2003 Tokyo***

## Number of successful cases presented at

### the National Convention of Excellent Successful Cases in Energy Conservation Activities

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

# Grand prize at the National Convention of Excellent Successful Cases

## In Energy Conservation Activities

<2001 FY, Central & 9 Regional Conventions>

1. 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"

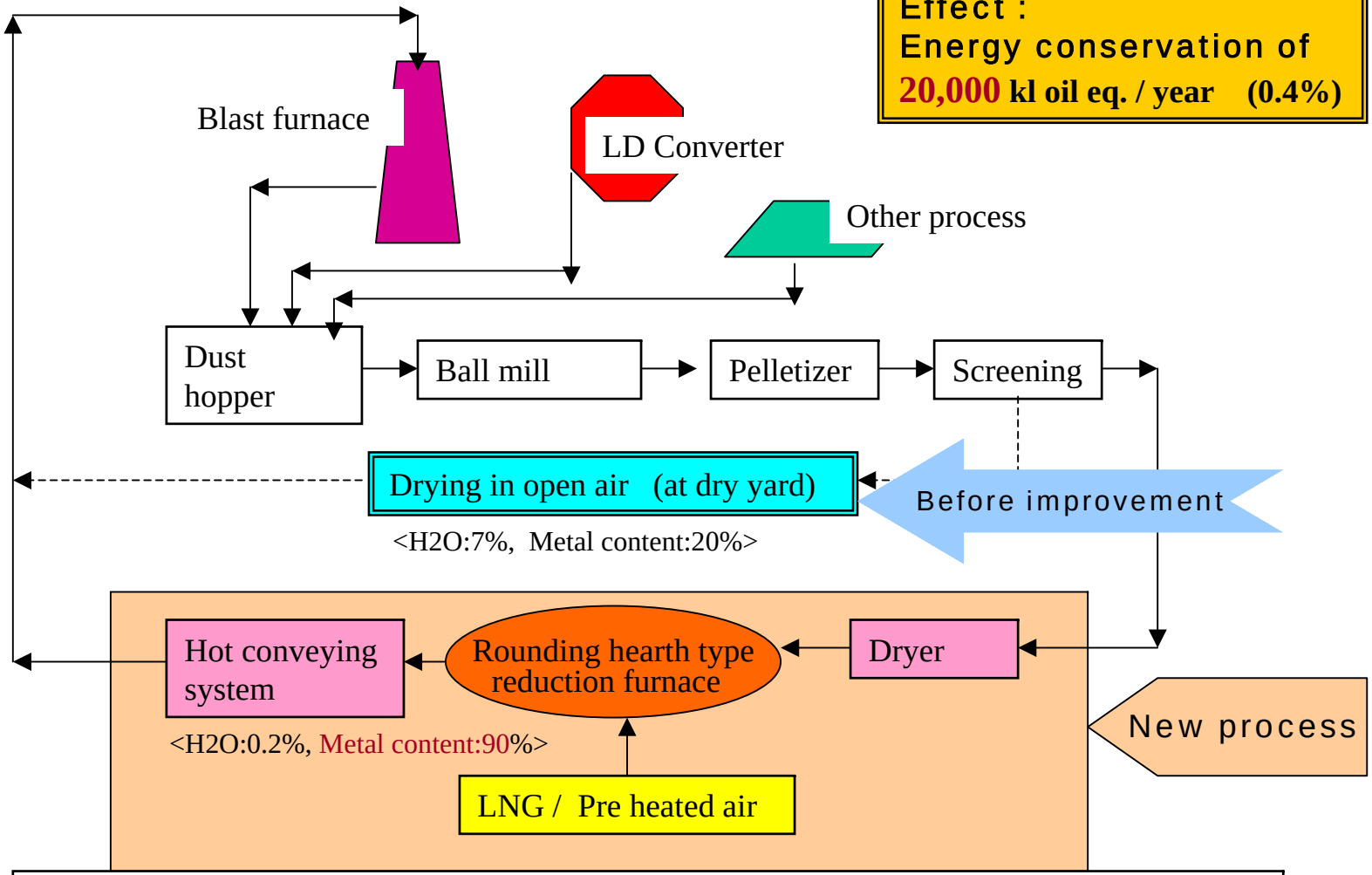
2. Prize of the Director of Agency for Natural Resources and Energy (5)
3. Prize of Regional Bureaus of METI (17)
4. Prize of the Chairman of ECCJ (22)
5. Prize of excellency (15)
6. Prize of encouragement (5)

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 1st Class

–Symposium for energy management officer ・・・ Specified for 2nd Class

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

–Mass meetings for announcement of excellent cases to disseminate and promote them

・・・ 1st Class, 2nd Class, and ESCO business (4,600 participants / 11 places)

–Energy-related lecture meetings (at each branch), etc.

## 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

ECCJ

# 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 | 9,823 |
| Succeeded | 3,163 |
| (in 2003 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)

ECCJ

# Technology --- R & D Projects

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

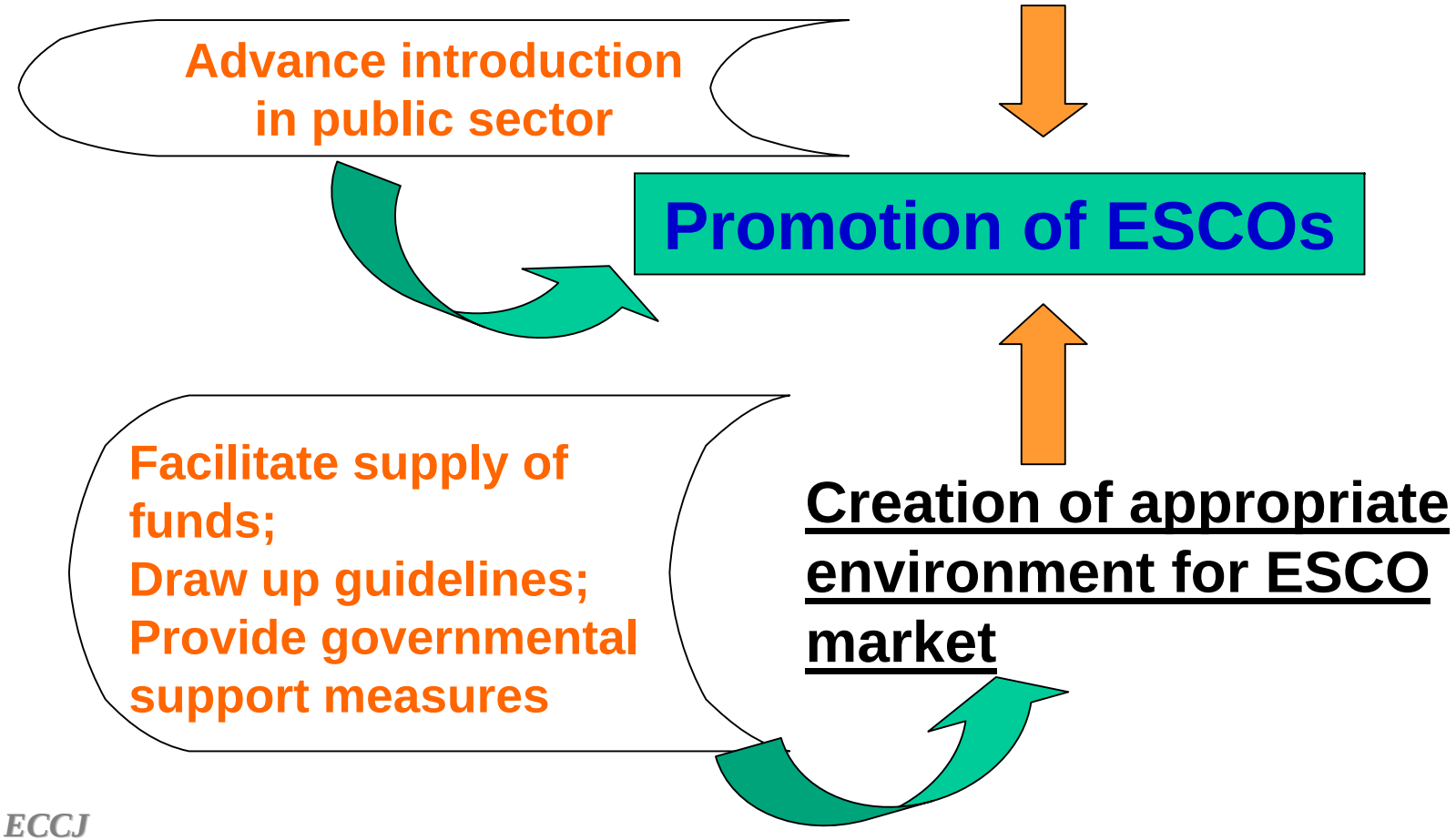
1. **Eco- energy city project** ( New Sunshine Program ) <Ended in 2000>
2. **High temperature Air combustion technology** ( HiCOT )
3. **High efficiency waste heat recovery system**
   ( high-temperature thermoelectric system )
4. **Supercritical fluid technology**
   [ high efficient decomposition system of PCB & DXN ]
5. **Optimal Control System for Energy Conservation in Factories,Shops,Offices and Houses** <Ended in 2002>

# Assistance to ESCO projects promotion

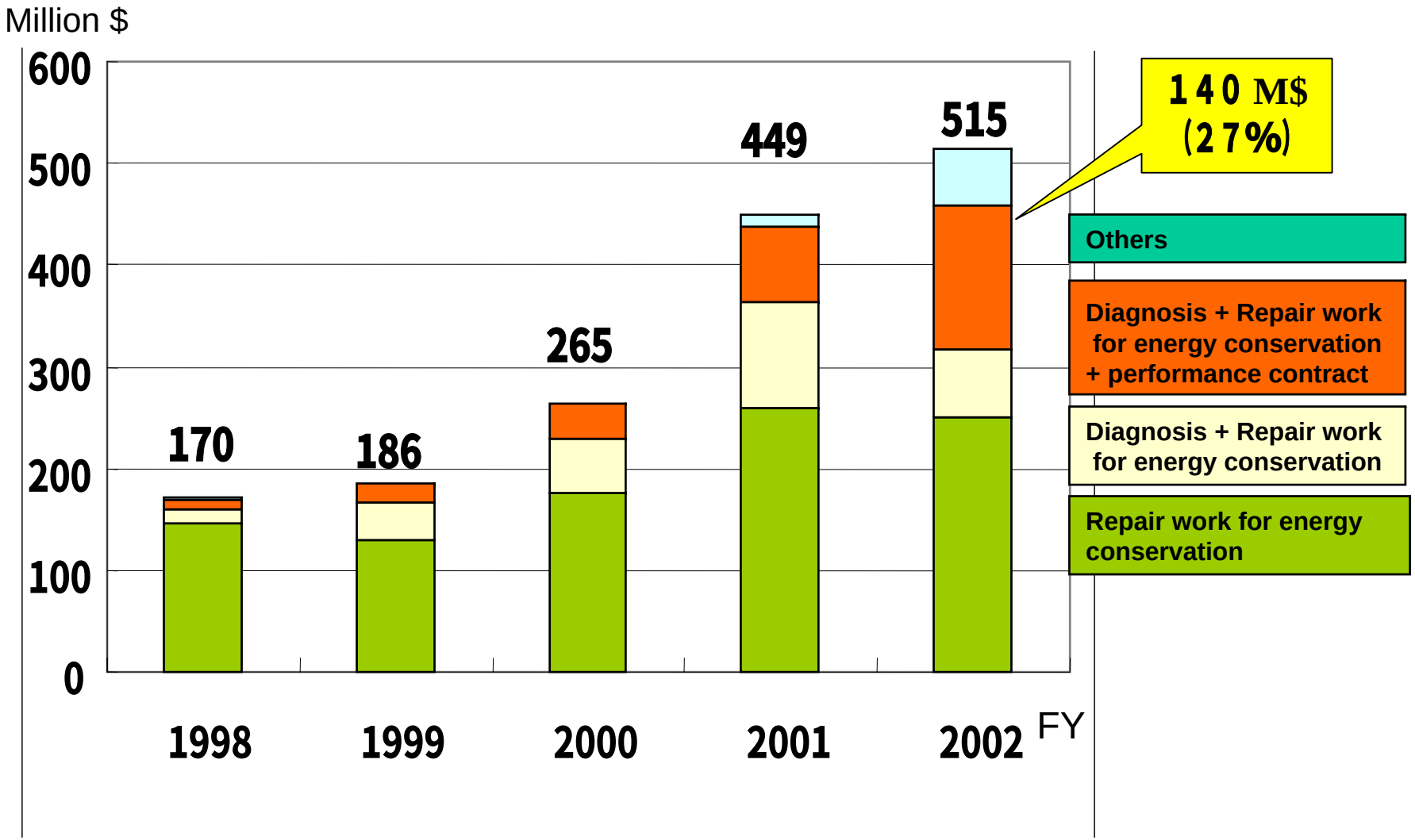
*To promote energy conservation by ESCOs*

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

## Establishment of recognition of ESCO business



# Amount of orders received by ESCO




by ESCO Promotion Council, as of August 2003

ECCJ

# 7-3. Promotion toward "Smart Life"

*for Civil, 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

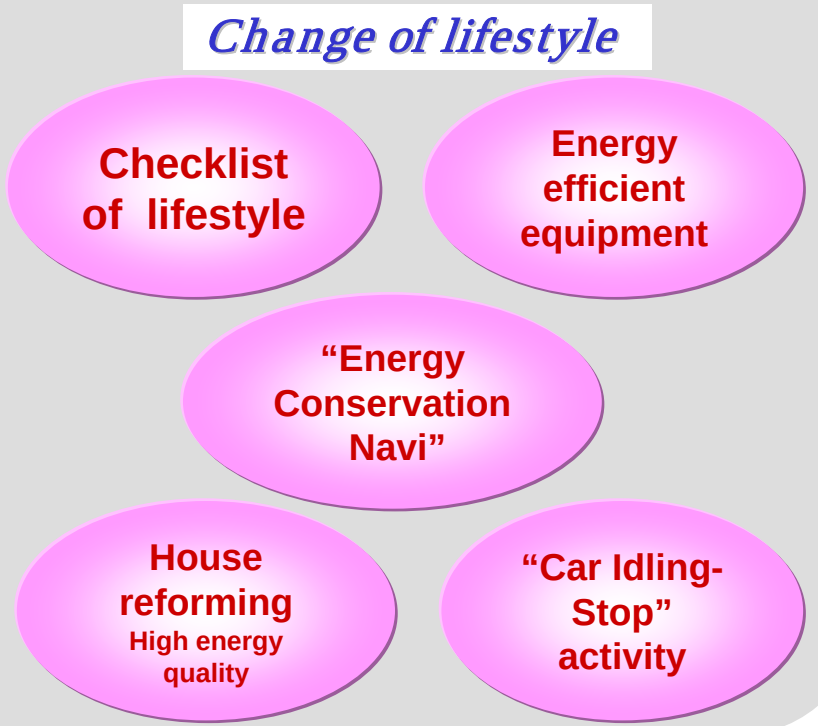
Sustained awareness of energy conservation

## *Action*

- Summer and winter campaigns (PR activities through mass-media, Commendation ceremonies )
- ENEX exhibitions
- Education (posters contests, textbooks, seminars)
- Grass roots activities (Ene. con. 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



# Awareness ---- Change of life style

***smart life activities***


Guidance book for energy conservation in daily life

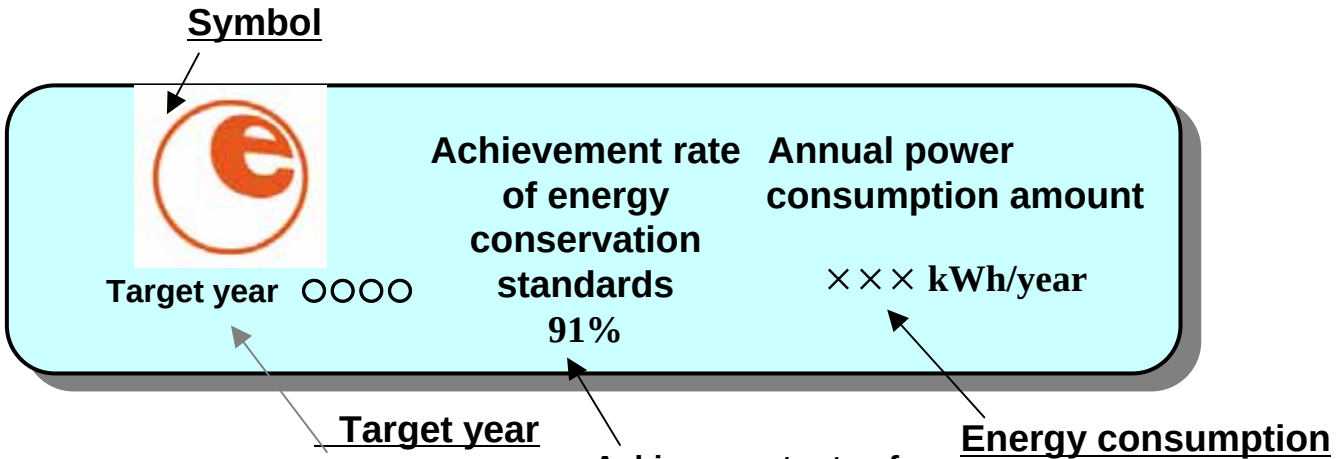
Check List of Life Style (in winter season)

ECCJ

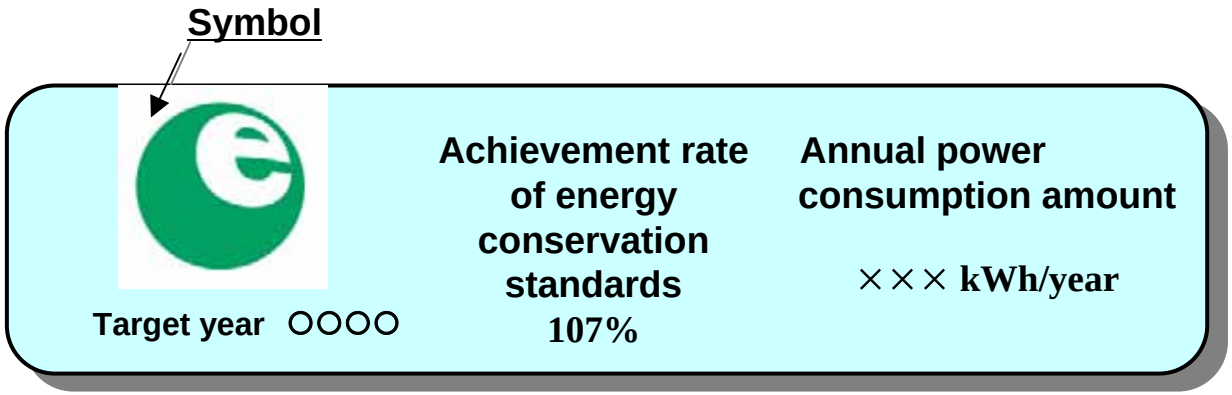
# Dissemination of Energy Labeling

-- Method of Indication --

## ☆Case 1: Target still not achieved




## ☆Case 2 : Target achieved




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

# Ranking Catalogue for Energy Efficient Appliances

**Target products：Air conditioners,TVs, VCRs, Refrigerators, Cloths washers, Lighting equipment, Copiers (7 products in total)**

(Sumple: Refrigeraors --- 351 - 400 Litter Models in Rated Internal Volume) <2003 Summer version>

| Rank | Manufacturer | Model | Price (Yen) | Energy Consumption | | | Electricity cost (Yen/Y) | Rated internal volume (Litter) | Number of Doors |
|---|---|---|---|---|---|---|---|---|---|
| | | | | "e" mark | Achievment rate of EC Standards (%) | Electricity consumotion (kWh/Y) | | | |
| 1 | Matsushita | NR-E382U | open | | 217% | 180 | 4,140 | 375 | 5 |
| 2 | Matsushita | NR-C372M | open | | 169% | 220 | 5,060 | 365 | 3 |
| 3 | Hitachi | R-K37RPAM | open | | 155% | 250 | 5,750 | 370 | 5 |
| 3 | Sanyo | SR-HS37G | open | | 154% | 250 | 5,750 | 365 | 5 |
| 3 | Toshiba | GR-NF374K | open | | 152% | 250 | 5,750 | 365 | 5 |
| 6 | Mitsubishi | MR-YL38ND | open | | 137% | 280 | 6,440 | 384 | 3 |
| | | | | | | | | | |
| 15 | Toshiba | GR-A40T | open | | 87% | 630 | 14,490 | 395 | 3 |
| Maximum Value | | | | | 217% | 630 | 14,490 | 395 | 5 |
| Average Value | | | | | 137% | 347 | 7,989 | 370 | 4 |
| Minimum Value | | | | | 87% | 180 | 4,140 | 355 | 3 |

ECCJ

45

# 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**

ECCJ

# <Smart Driving> Promotion of Stopping Idling

- **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.**

*** The saving of 7% of gasoline consumption was achieved in the running test in the urban areas!!** … by JAF Report

**Effect expected : Saving of** oil equivalent to 1,390,000 kl/year

- < This is equivalent to 8.2% of the energy conservation goal in the transportation sector >

Measures :

- **Drivers' activity to manually stop idling while vehicles are stationary**
- **Popularization of hybrid vehicles and vehicles equipped with the automatic idling stop system ← subsidy by METI**
- **Popularization of a device to automatically turn the engine off and on linked to the foot-brake operation ← subsidy by METI**

# *Demonstration campaign*

## Traveling and Symposiums

## through the Japanese Islands from north to south

**from 3th to 23th August, 2002** (from Wakkanai City to Kagoshima City)

**3 sedans for the campaign** (**2,000 cc** 2 sedans equipped with a automatic device to turn the engine off and on, 1 ordinary sedan)

**Symposiums :** at 5 Cities (Sapporo, Sendai, Kanazawa, Okayama and Kumamoto)

***Traveling distance*** :3,718km




**Ratio of idling stopped time to traveling hours :**
**Urban area --- 25.9%**
**Rural area --- 7.9%**

**Effect of gasoline saving by idling stop :**
**Urban area --- 13.4%**
**Rural area --- 3.4%**

ECCJ

# Spread of E-Co Navi

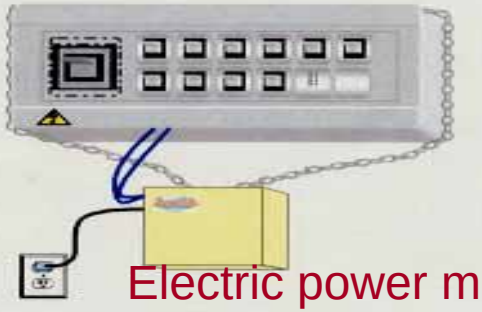
## Outline of Energy Cost Indication System

**"Energy Conservation Navigator"**

(Energy cost indicator)

- **Actual energy fee**
- **Target energy fee**
- **Previous energy fee**

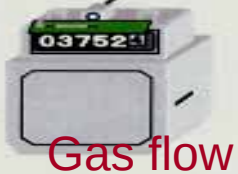
Distribution box (breaker)



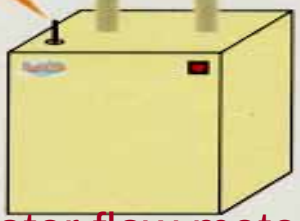
Wireless

Electric power meter

Wireless




Gas flow meter



Gas and water flow meter

Water flow meter

ECCJ

# Effect of the E-Co Navi

## (Energy Cost Indicator)

◎ **Electric power consumption before and after:**

(based on the data from 784 houses)

**Before installation**

(August 1998),

**1.915 million kWh**

**Reduction by about 20%**

**After installation**

(August 1999 ),

**1.528 million kWh**

**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 saving activities, 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$^{Fy}$, 4,600 are installed . Monitoring by ECCJ has been continuing up to the present.**

ECCJ

# 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**

**<Support>**

ECCJ

**E-Co Navi**

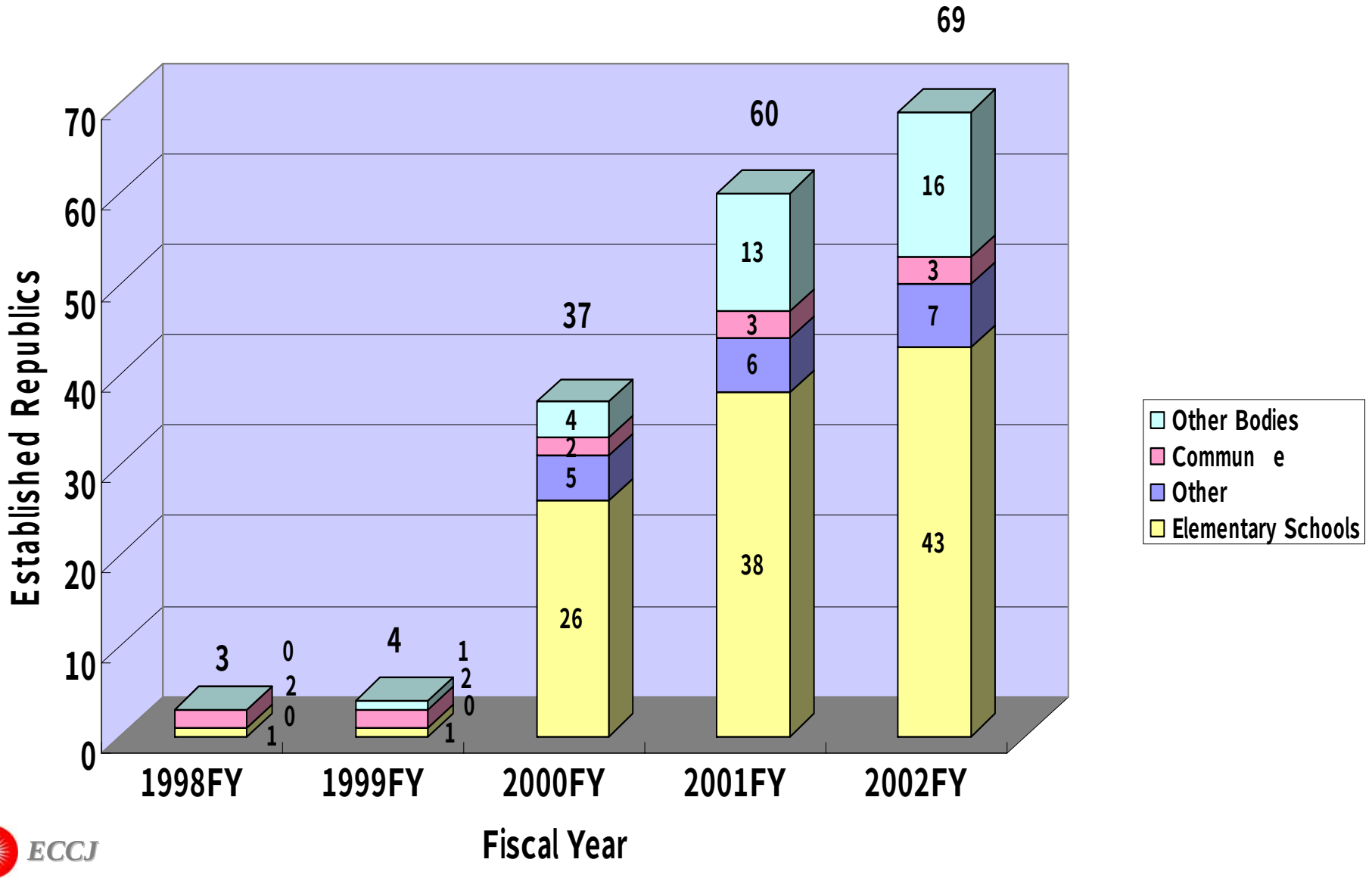
**Flag**


ECCJ

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

14% (¥280,000/y) in 1999

# Establishment of “Energy Conservation Republic”




ECCJ

# Education Programs at primary/middle model schools

**Appointment of Model Schools**
**(FY2001~2003)**
**540 Primary schools**
**90 Middle schools**

**Role of Model Schools:**
1) Carry out education and build up system for energy conservation to match school characteristics.
2) Establish leadership in community through keeping interactive collaboration.

**ECCJ's Supports (3 years) for :**

① Construction of network among schools, homes and communities.
- Supply and use of "Energy Conservation Navi"

② Promotion of education for energy conservation in classwork.
- Contests of advertisement poster and essay
- Supply of text-books, brochure and VCR for energy conservation

③ Capacity building for spread of energy conservation activities.
- Training seminars for school teachers and community inhabitants

④ Publicity of energy conservation activities.
- Upload in ECCJ homepage
- appearing in "Ambassador News"

ECCJ

# 7-4. Publicity

# Publicity (1)

## 1. Exhibition (ENEX 2004) --- February 2004

**Tokyo ; 55,499 visitors <exhibitors: 275>**
**Osaka ; 27,359 visitors <exhibitors: 221>**

## 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 : 5,934 (Fy2001~3)

## 8. Internet home page

< contact here please >

ECCJ home page ; http://www.Or.Jp/index_e.Html

(Language; Japanese, English, Chinese, Korean)

# ENEX 2003 in Tokyo

February 2003





ECCJ

# E N E X --- CONTINUED

Model house

Excellent home appliances


Excellent automobiles


School boys' experiments using power kits

# Commendation (2003FY)

**1.** Grand prize for high energy efficiency appliances & cars

**for home use & business use**

**＊Grand prize : 23 (97 applied)**

**containing 3 grand prizes honored by METI minister**

**① Air conditioning & refrigerating system for convenience store**

**② Inverter controlled turbo chiller for building air conditioning system**

**③ automatic idling-stop systemed car**


(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.**

ECCJ

# Information & Data Base

As of April, 2004

## 1. Data base

**Successful cases : 2,400** <Fy1989~2003>

**(energy conservation activities in industrial sector)**

**Papers, books : 52,000**

## 2. IEA / CADDET

**National team : NEDO**

**Demonstrated advanced technologies**

**3,200**

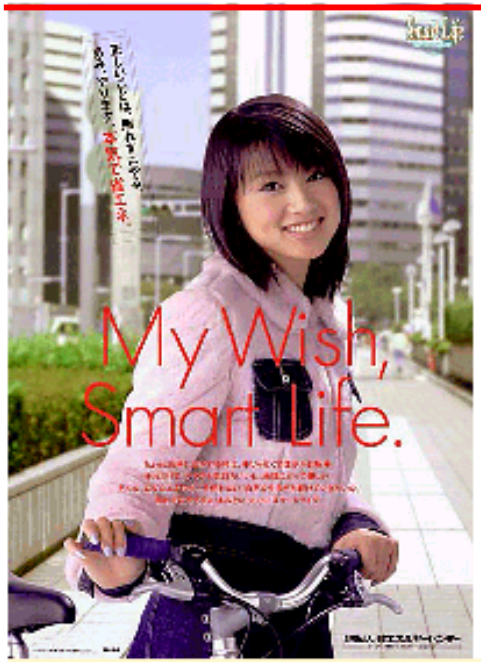
Total : 57,600

# News PAIPER



## Ene Con Ambassador

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 proofreaded.




### 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.30 **on 25 March 2004**





ECCJ

# Publication

Monthly magazine & books

# 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.

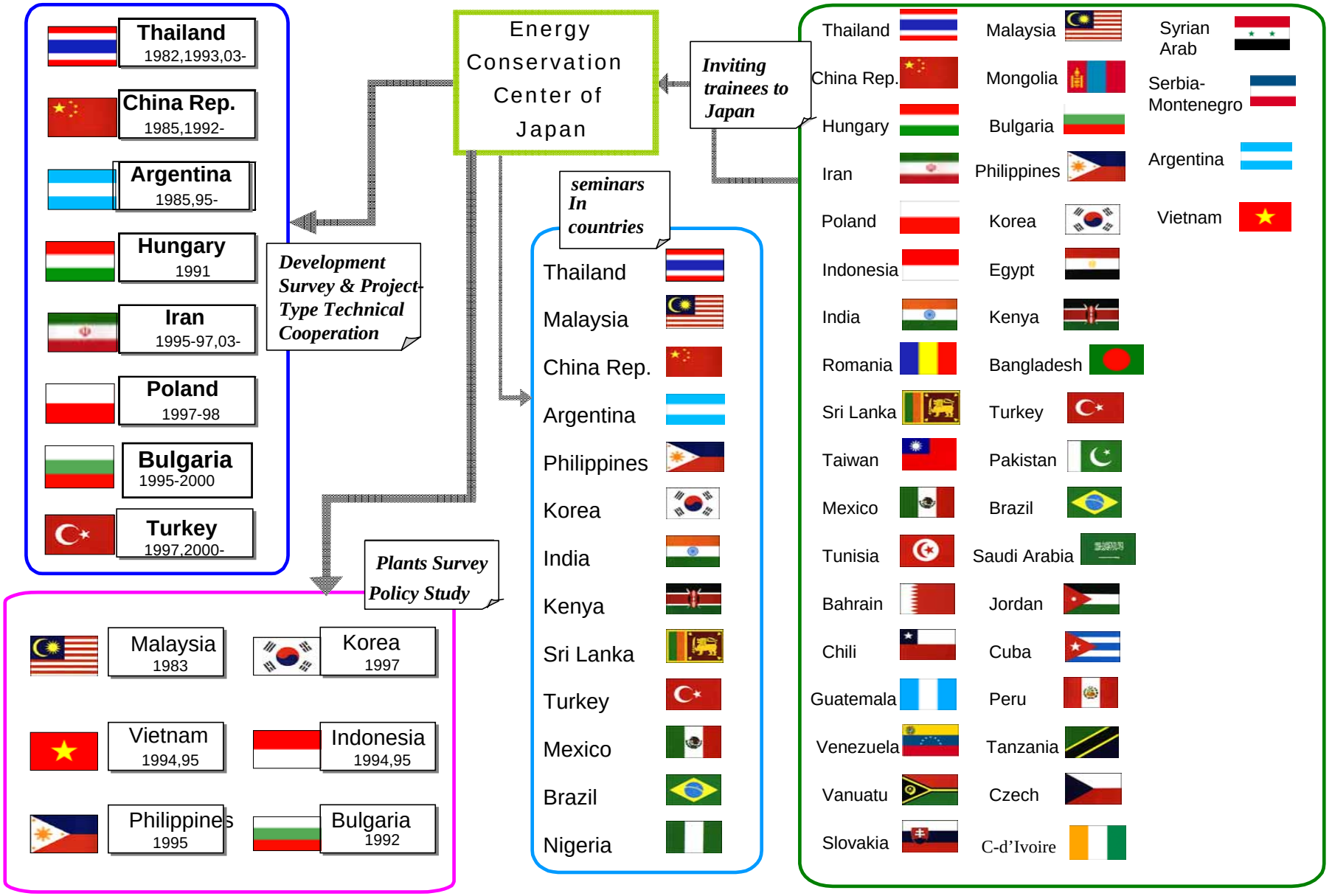
*Dispatching experts to overseas for seminars.

## <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).**

ECCJ

**<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 fined 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.**

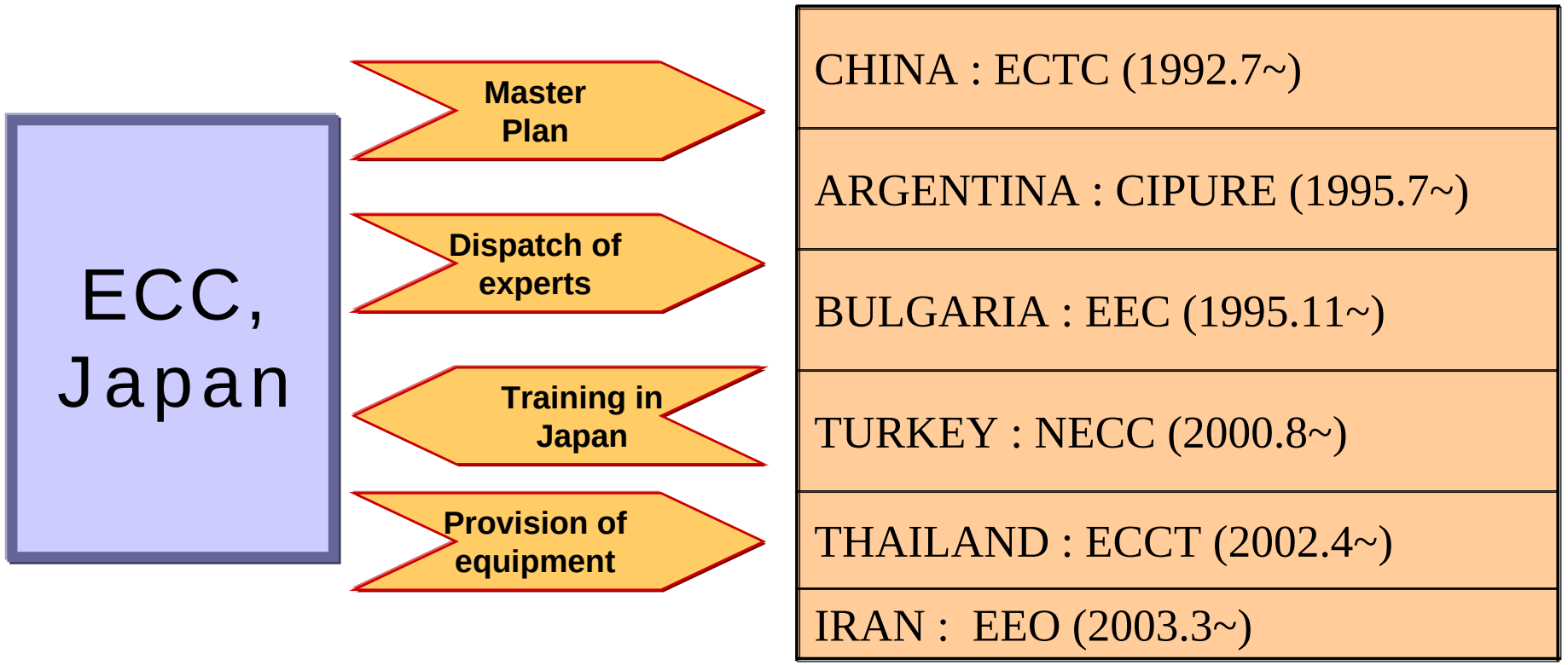
**Duration: July 22, 2002 – January 25, 2003 (1st step:10 days, 2nd step:3 weeks, 3rd step:10 days)**

**Factories for auditing survey: 天津大沽化工厂、 沈陽化工厂**

**Program: 1st step: pre survey (general information on energy consumption, preparation for the full-scale audit)**
**2nd step: The auditing survey. Discussion of the audit results and tentative counter measures.**
**3rd 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



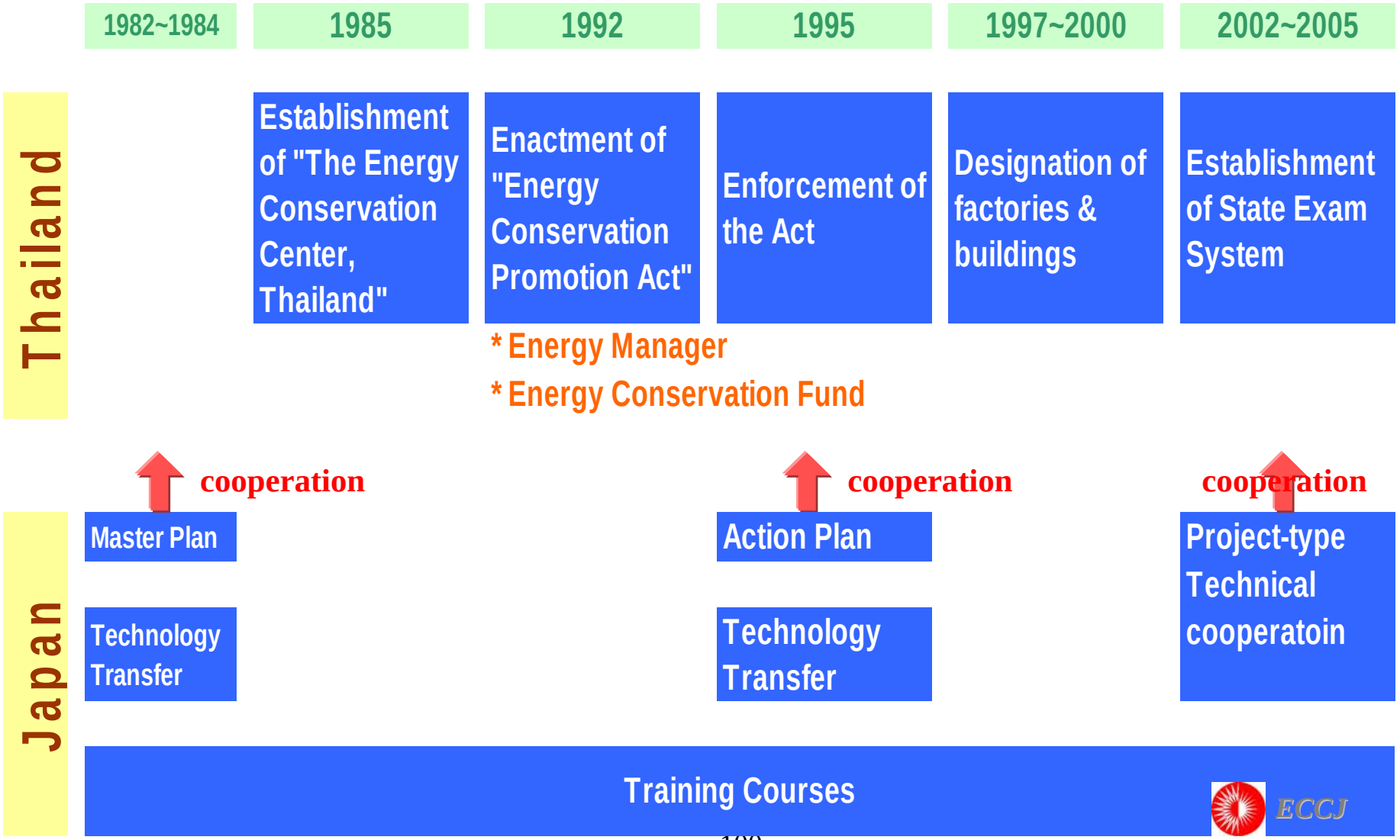

**ECTC** : Dalian China energy conservation training center
**CIPURE** : The rational use of energy center
**EEC** : The energy efficiency center
**NECC** : The national energy conservation center
**ECCT** : The energy conservation center ,Thailand
**EEO** : Energy efficiency office / MOE, Iran

In preparation

**Poland (2004.?~)**

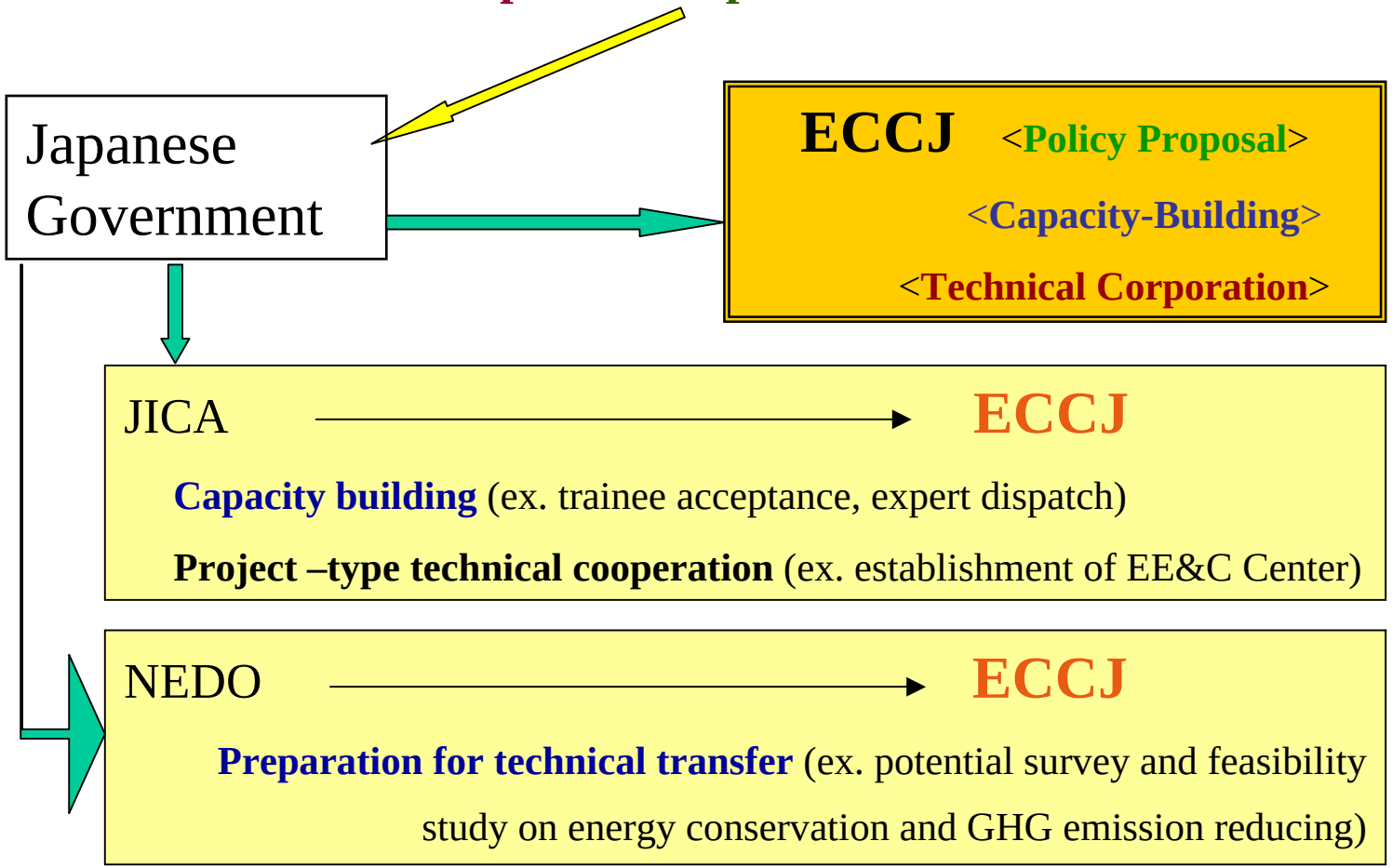
ECCJ

# Example of Cooperation for Energy Conservation in Thailand



# Scheme of International Cooperation

**Your Government's Proposal to Japanese Government**



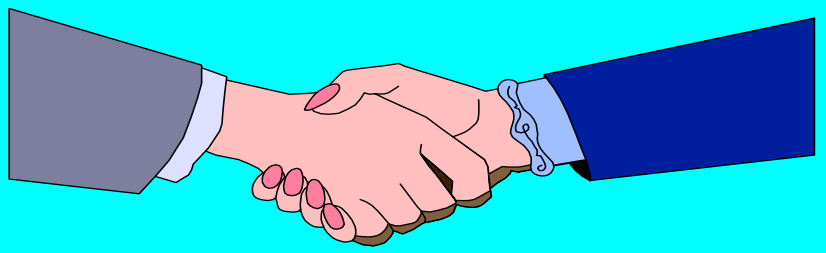
# 7-6. More Information
## <ECCJ Web Site>

- **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:**

**<English, Chinese, Korean, Japanese>**

- **URL: http://www.eccj.or.jp/index_e.html**

***Thank you***



***The Energy Conservation Center, Japan***