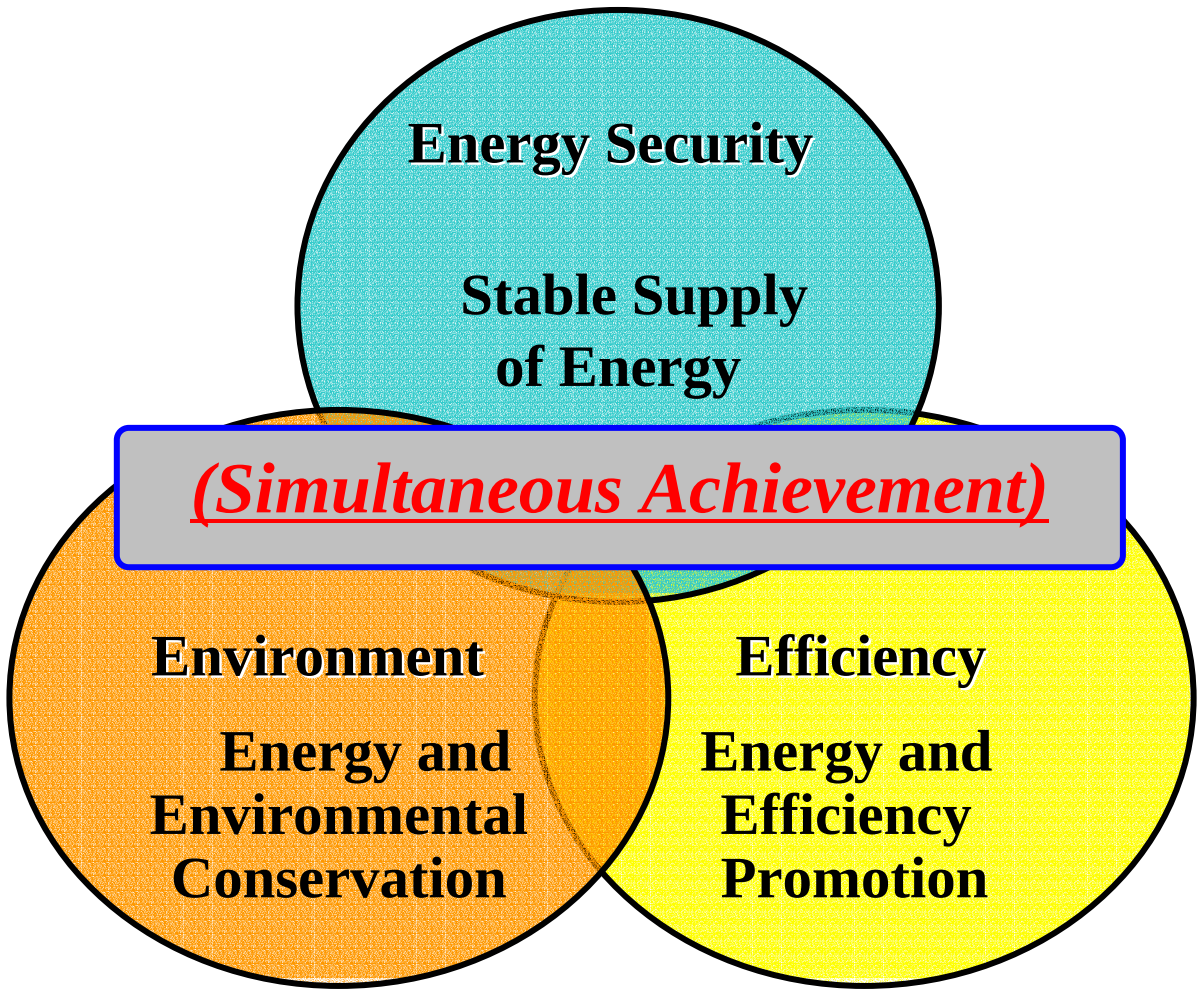
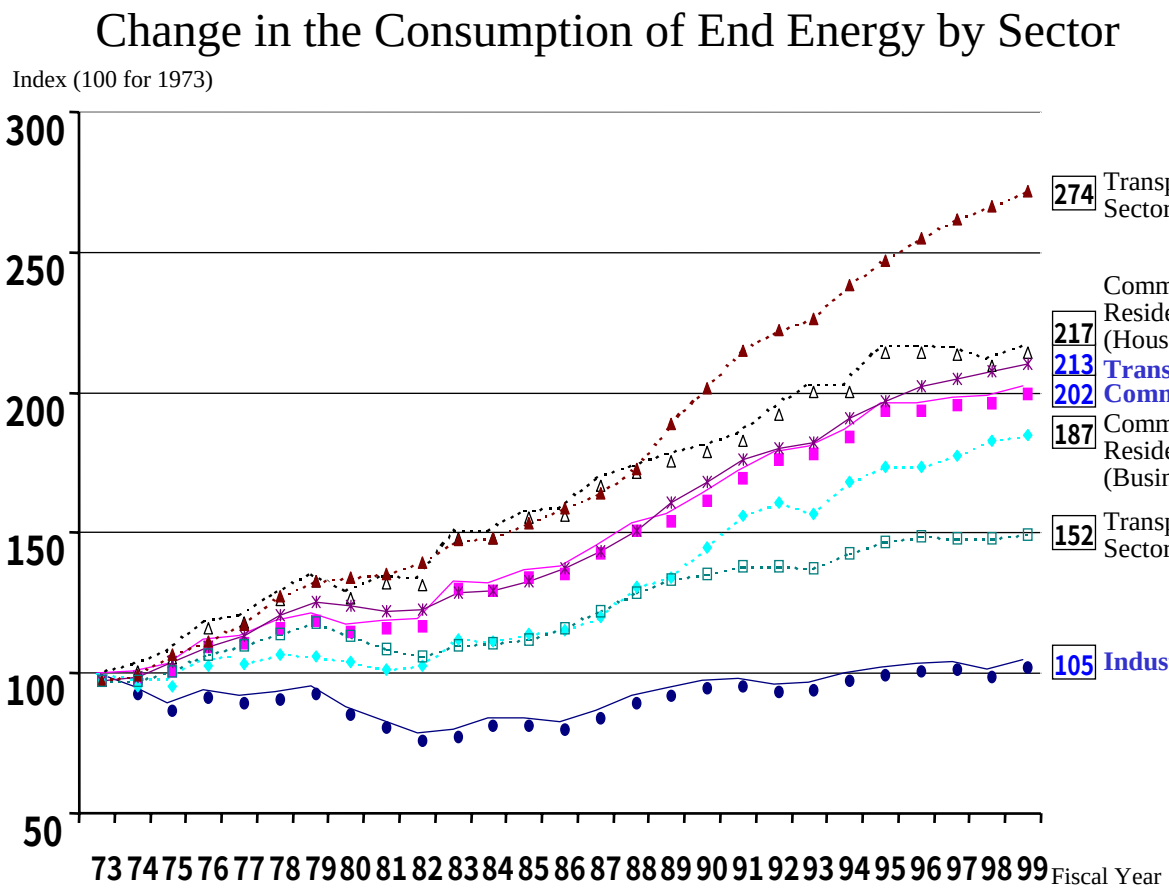
# Basic Goals of Energy Policy



# Change in the Consumption of End Energy by Sector



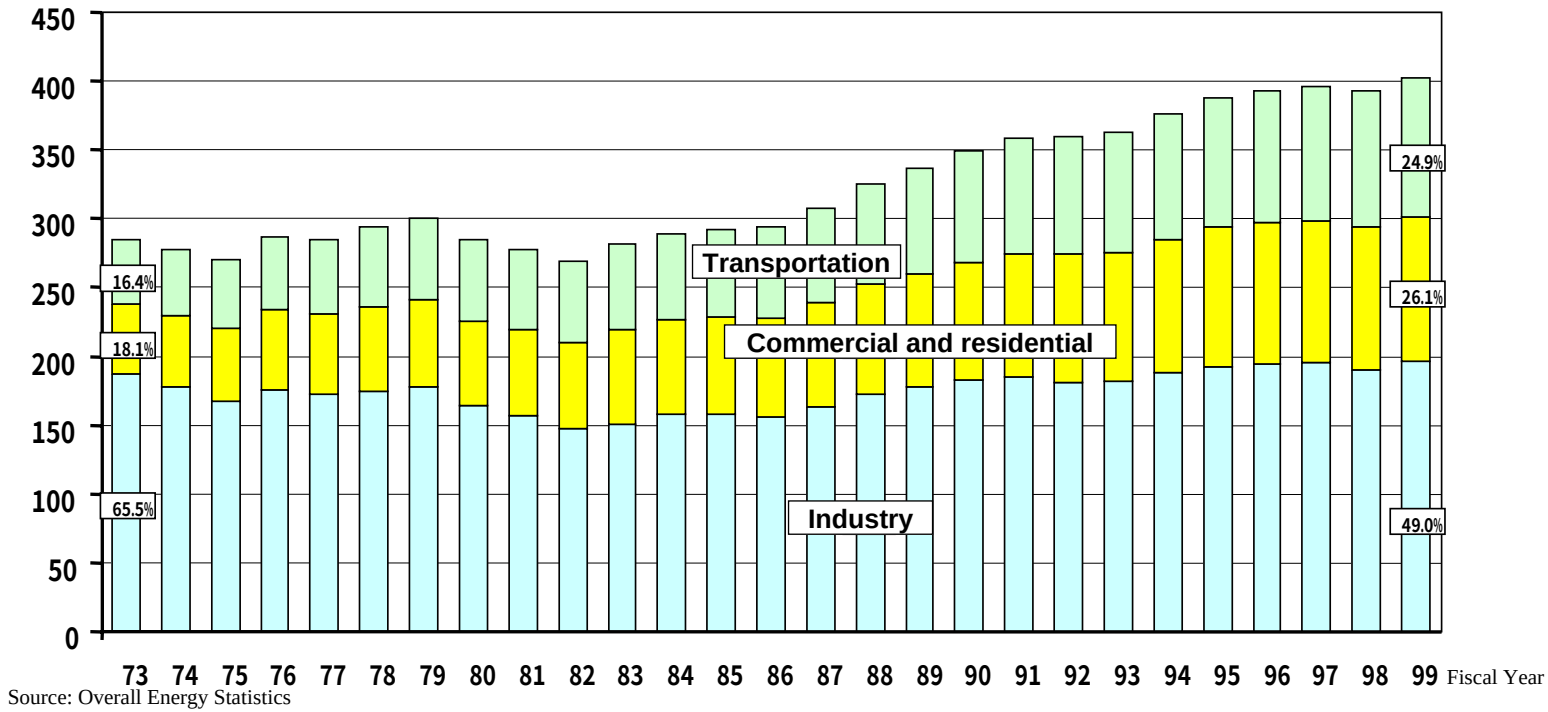

Source: Overall Energy Statistics

- The Industry sector generally **remains stable** after the Oil Crisis.
- On the other hand, both the Commercial and Residential sector and the Transportation sector are **increasing sharply**. They **increased** even in fiscal 1998 when the total consumption of end energy decreased.

# Change in the Consumption of End Energy

Change in the Consumption of End Energy in Japan

(Crude oil equivalent; in millions; kl)




Source: Overall Energy Statistics

- The ratio of the Industry, Commercial and Residential, and Transportation changed from 4 to 1 to 1 (at the time of the Oil Crisis) to 2 to 1 to 1 (in 1999) respectively.

# Change in the Structure of Energy Supply

**Change in the Structure of Energy Supply in Japan**

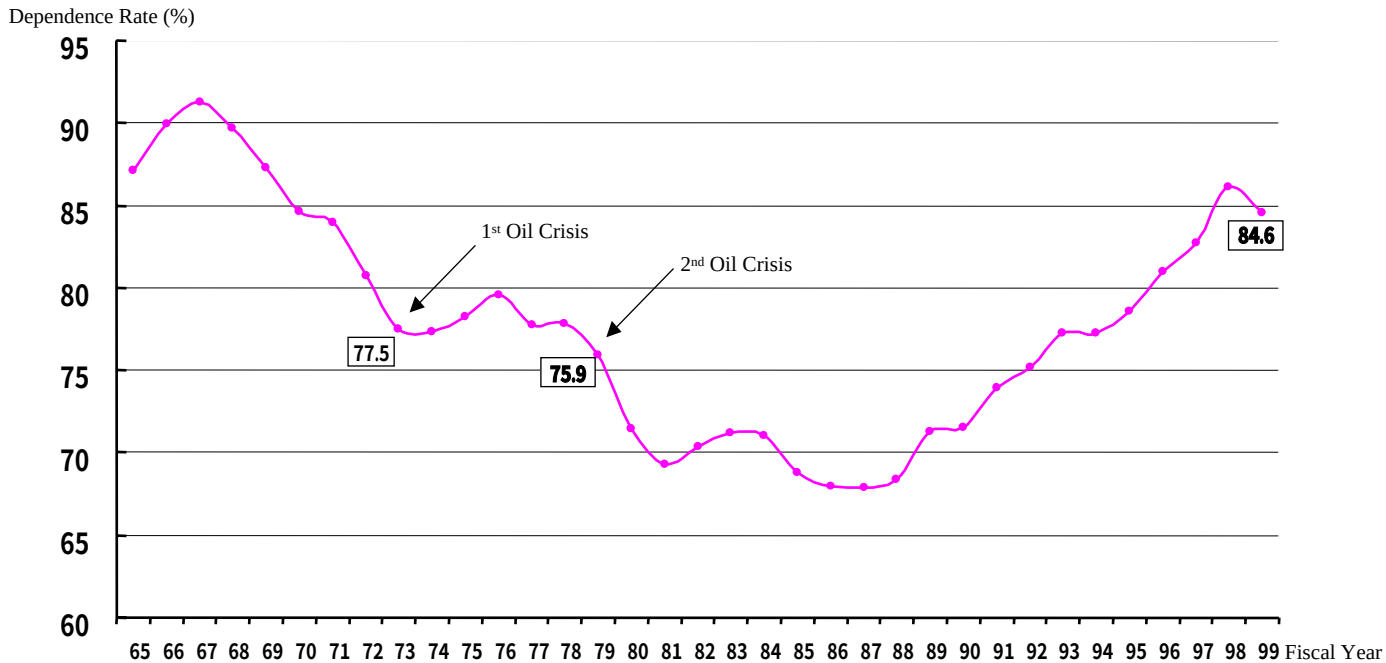
| Fiscal Year | | 1973 | 1979 | 1986 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Energy Total Supply Crude Oil Equivalent (Millions) | | 414 | 442 | 435 | 526 | 531 | 541 | 548 | 577 | 588 | 597 | 604 | 589 | 593 |
| Percentage of Total % | Oil | 77.4 | 71.5 | 56.6 | 58.3 | 56.7 | 58.2 | 56.6 | 57.4 | 55.8 | 55.2 | 53.6 | 52.4 | 52.0 |
| | Coal | 15.5 | 13.8 | 18.2 | 16.6 | 16.9 | 16.1 | 16.1 | 16.4 | 16.5 | 16.4 | 16.9 | 16.4 | 17.4 |
| | Natural Gas | 1.5 | 5.2 | 9.8 | 10.1 | 10.6 | 10.6 | 10.7 | 10.8 | 10.8 | 11.4 | 11.6 | 12.3 | 12.7 |
| | Nuclear Power | 0.6 | 3.9 | 9.4 | 9.4 | 9.8 | 10.0 | 11.1 | 11.3 | 12.0 | 12.3 | 12.9 | 13.7 | 13.0 |
| | Hydroelectric Power | 4.1 | 4.6 | 4.6 | 4.2 | 4.6 | 3.8 | 4.3 | 2.9 | 3.5 | 3.3 | 3.7 | 3.9 | 3.6 |
| | Geothermal Power | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| | New Energy | 0.9 | 1.0 | 1.2 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 |

Source: Overall Energy Statistics

- The oil dependence rate reduced to fifty some percent after the Oil Crisis. On the contrary, nuclear power and natural gas increased to 13.0% and 12.7% respectively.
- The increase in construction of nuclear power plants
  16-20 plants (former plan) → 13 plants (FY2000 plan)

# Increase in Oil Dependence on the Middle East

Change in Japan's Oil Dependence on the Middle East



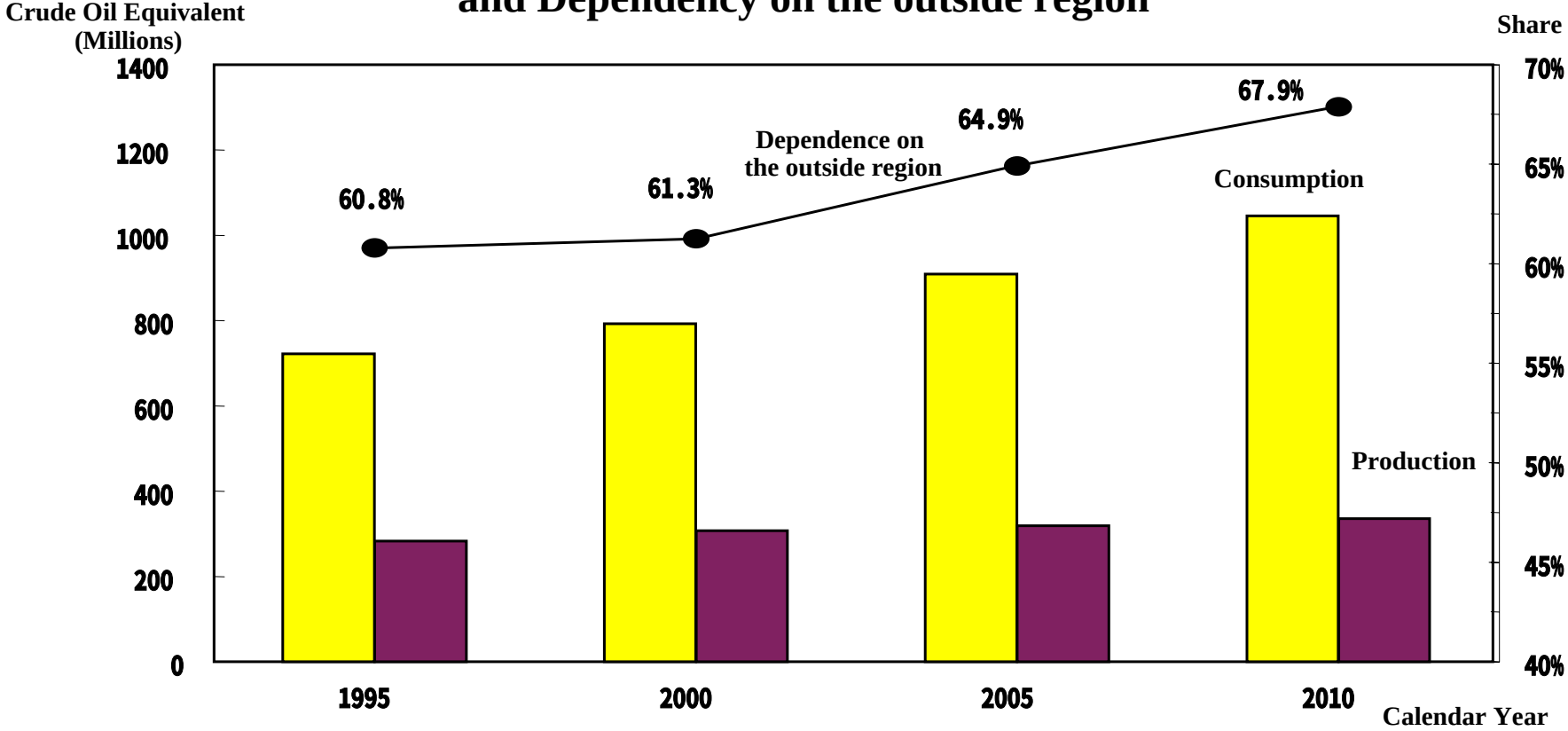

Source: "Energy Production, Supply and Demand Statistics", Ministry of Economy, Trade, and Industry

- Japan's oil dependence on the Middle East has topped the level at the time of the oil crises.

  77.5% (Oil Crisis) → 84.6% (FY1999)

# Energy Supply Structure in Asia

## The Forecast of Asian Oil Consumption, Production, and Dependency on the outside region



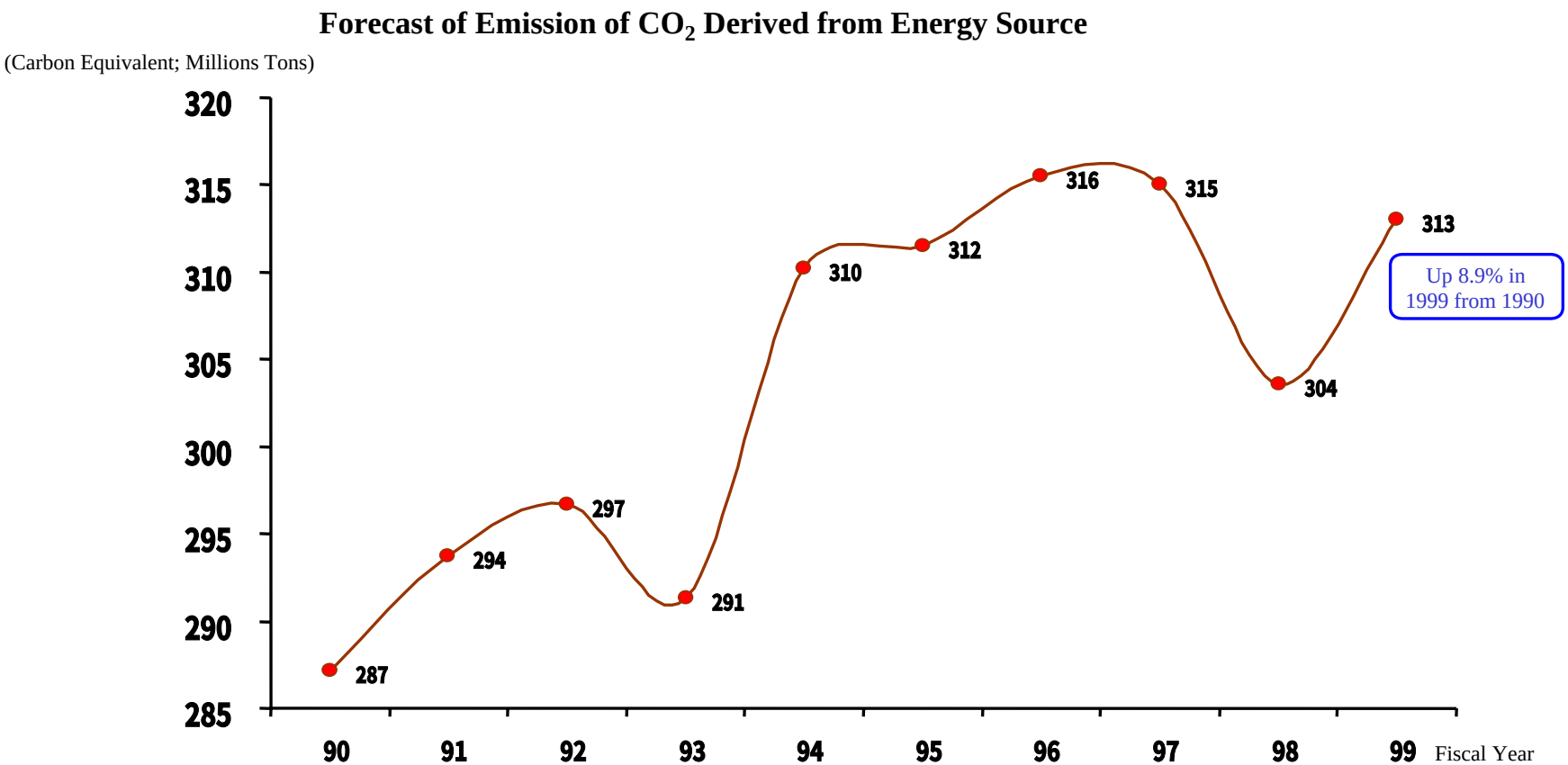

Source: Asia Pacific Energy Research Centre
Note: Asia refers to Japan, China, Korea, Taiwan, and ASEAN countries.

# *Emission Control of $CO_2$ Derived from Energy Sources*

Breakdown of 6% Reduction in Greenhouse Effect Gases

| | |
|---|---|
| -2.5 % | Emission control of $CO_2$, methane, and nitrogen monoxide |
| Including<br>0%: Emission control of $CO_2$ derived from energy source (Maximal adoption of measures in terms of both supply and demand for energy)<br>-0.5% Emission control of methane, nitrogen monoxide, etc.<br>-2.0% Development of innovative technologies and more efforts by every citizen | |
| -3.7% | Change in the use of land and absorption by forests |
| +2.0% | Emission control of CFC substitutes (HFC, PFC, SF6), etc. |
| Others ( -1.8% ) | Utilization of joint implementation, emission trade, etc. |

# Change in Emission of $CO_2$ Derived from Energy Sources



# Forecast of Consumption of End Energy

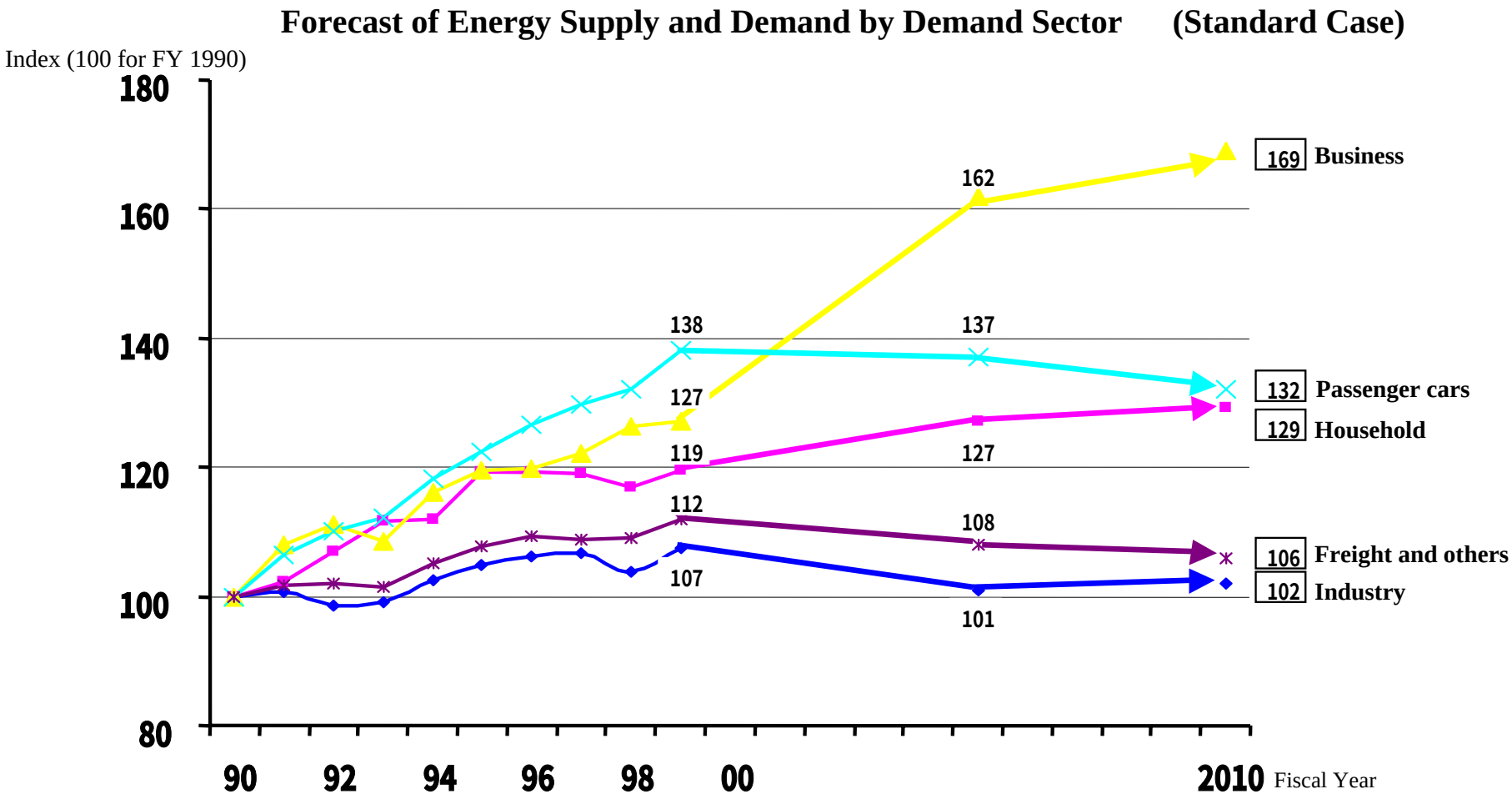
○Forecast of Consumption of End Energy

(Crude Oil Equivalent; in millions; KL)

| FY / Sector | 1990 FY | | 1999 FY | | 2010 FY (Previous Measures Case) | | 2010 FY Standard Case | | 2010 FY Target Case | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | % of total | | % of total | | % of total | | % of total | | % of total |
| Industry | 183 | 52.5 | 197 | 49.0 | 192 | 48.0 | 187 | 45.8 | 185 Approx. | 46 Approx. |
| Commercial and Residential | 85 | 24.4 | 105 | 26.I | 113 | 28.3 | 126 | 30.8 | 120 Approx. | 30 Approx. |
| Household | 46 | 13.3 | 55 | 13.8 | 60 | 15.1 | 60 | 14.7 | 58 Approx. | 14 Approx. |
| Business | 39 | 11.2 | 50 | 12.3 | 53 | 13.2 | 66 | 16.I | 63 Approx. | 16 Approx. |
| Transportation | 80 | 23.0 | 100 | 24,9 | 95 | 23.7 | 96 | 23,4 | 94 Approx. | 24 Approx. |
| Passenger car | 39 | 11.0 | 53 | 13.2 | 48 | 12.0 | 51 | 12.5 | 50 Approx. | 12 Approx. |
| Freight, etc. | 42 | 12.0 | 47 | 11.7 | 47 | 11.7 | 45 | 10.9 | 45 Approx. | 11 Approx. |
| Total | 349 | 100 | 402 | 100 | 400 | 100 | 409 | 100 | 400 Approx. | 100 |

(Calculated in June, 1998)

# Forecast of Energy Supply and Demand by Demand Sector



# Forecast of Primary Energy Supply

○Forecast of Primary Energy Supply

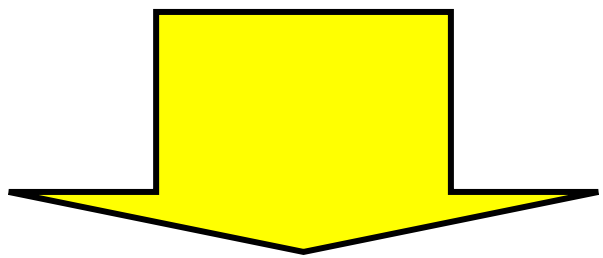
(Crude Oil Equivalent; in millions; KL)

| FY / Item | 1990 FY | | 1999 FY | | 2010 FY | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Standard Case | | Target Case | |
| Primary Energy Supply | 526 | | 593 | | 622 | | 602 Approx. | |
| Segmentation by Energy | Real Value | % of total | Real Value | % of total | Real Value | % of total | Real Value | % of total |
| Oil | 307 | 58.3 | 308 | 52.0 | 280 | 45.0 | 271 Approx. | 45 Approx. |
| Coal | 87 | 16.6 | 103 | 17.4 | 136 | 21.9 | 114 Approx. | 19 Approx. |
| Natural Gas | 53 | 10.1 | 75 | 12.7 | 82 | 13.2 | 83 Approx. | 14 Approx. |
| Nuclear Power | 49 | 9.4 | 77 | 13.0 | 93 | 15.0 | 93 | 15 Approx. |
| Hydroelectric Power | 22 | 4.2 | 21 | 3.6 | 20 | 3.2 | 20 | 3 Approx. |
| Geothermal Power | 1 | 0.1 | 1 | 0.2 | 1 | 0.2 | 1 | 0.2 Approx. |
| New Energy, etc. | 7 | 1.3 | 7 | 1.1 | 10 | 1.6 | 10 | 3 Approx. |
| Renewable Energy (Fn.) | 29 | 5.6 | 29 | 4.9 | 30 | 4.8 | 40 | 7 Approx. |

(Fn.) Renewable energy includes new energy, hydroelectric power, and geothermal power.

# New Energy Conservation Measures

- ◇ **Fulfillment and reinforcement of a voluntary action plan**
- ◇ **Promotion of energy conservation at plants and other business places**
- ◇ **Introduction and reinforcement of "Top-runner system"**
- ◇ **Promotion to adopt a high-efficiency boiler**
- ◇ **Promotion to adopt an energy management system with utilization of IT technology**



7 million KL (6 million t –C) by new means, in addition to crude oil equivalent 50 million KL by existing measures

# Current Energy Conservation Measures & Future Energy Conservation Measures

## Industry Sector: 20.50 million KL

| | | : subtotal |
|---|---|---|
| **<Current measures>** | | 20.10 million KL |
| ○ | Measures based on the Keidanren Voluntary Action Plan on the environment | 20.10 million KL |
| ○ | Energy conservation measures at midsize plants, etc. | |
| **<New measures>** | | 0.40 million KL |
| ◎ | High-performance industrial furnace (for small and midsize businesses) | 0.40 million KL |

## Commercial and Residential Sector: 18.60 million KL

| | | |
|---|---|---|
| **<Current measures>** | | 14.00 million KL |
| ○ | Improvement of appliance efficiency by top-runner regulation | 5.40 million KL |
| ○ | Enhancement of energy conservation features of houses and buildings | 8.60 million KL |
| **<New measures>** | | 4.60 million KL |
| ◎ | Expansion of top-runner appliances | 1.20 million KL |
| ◎ | Accelerated adoption of high-efficiency appliances | 0.50 million KL |
| ◎ | Reduction in standby power consumption | 0.40 million KL |
| ◎ | Adoption of Home Energy Management System (HEMS) for households | 0.90 million KL |
| ◎ | Adoption of Building Energy Management System (BEMS) for businesses | 1.60 million KL |

# Current Energy Conservation Measures & Future Energy Conservation Measures (Continued)

## Transportation Sector: 16.90 million KL

| | |
|---|---|
| **<Current measures>** | 15.90 million KL |
| ○ Improvement of appliance efficiency by top-runner regulation | 5.40 million KL |
| ○ Promotion to adopt clean energy cars | 0.80 million KL |
| ○ Energy conservation measures concerning traffic systems | 9.70 million KL |
| **<New measures>** | 1.00 million KL |
| ◎ Accelerated introduction of cars that meet top-runner standards | 0.50 million KL |
| ◎ Promotion of diversification of car models such as a hybrid car | 0.50 million KL |

## Across Sectors: 1.00 million KL

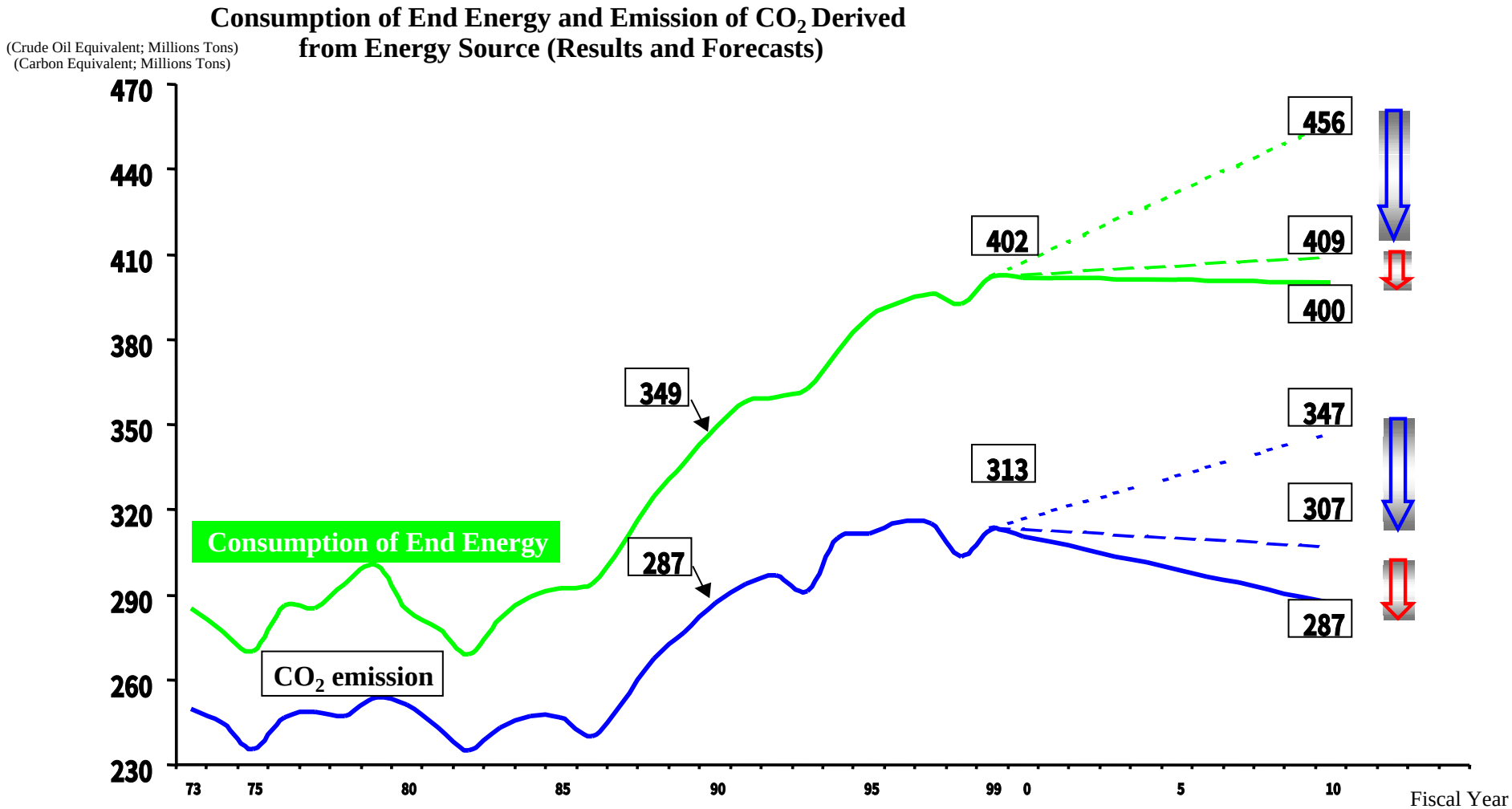
| | |
|---|---|
| ○ Technology Development | 1.00 million KL |
| • High-performance boiler (Industry-related technology) | 0.40 million KL |
| • High-performance laser (Industry-related technology) | 0.10 million KL |
| • High-efficiency light (Commercial and residential-related technology) | 0.50 million KL |
| • Enhancement of clean energy cars (Transportation-related technology) | |

(Note: This item is included in the promotion of diversification of car models such as a hybrid car)

## T o t a l: 57.00 million KL

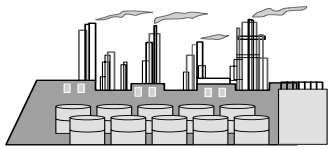
**<Current measures>** 50.00 million KL; **<New measures>** 7.00 million KL

# Forecast of Long-range Energy Supply and Demand and $CO_2$ emission



# Measures against Factories According to Revised Energy Conservation Law and Voluntary Action Program

Plants with much energy usage



Energy Manager

Notice of the appointment of an energy manager

Drawing up mid- and long-range plans and submitting them (annually)

Countries

Plants and establishments with a middle scale of energy usage

Schools

Department Stores

Hotels

Office Buildings

Energy Management Officer

- Arranging an energy management officer
- Taking an energy conservation class
- Keeping track of how energy is used

- Expansion, fulfillment, and reinforcement of regulation measures in the revision of Energy Conservation Law in 1998

→Making and submitting a future plan

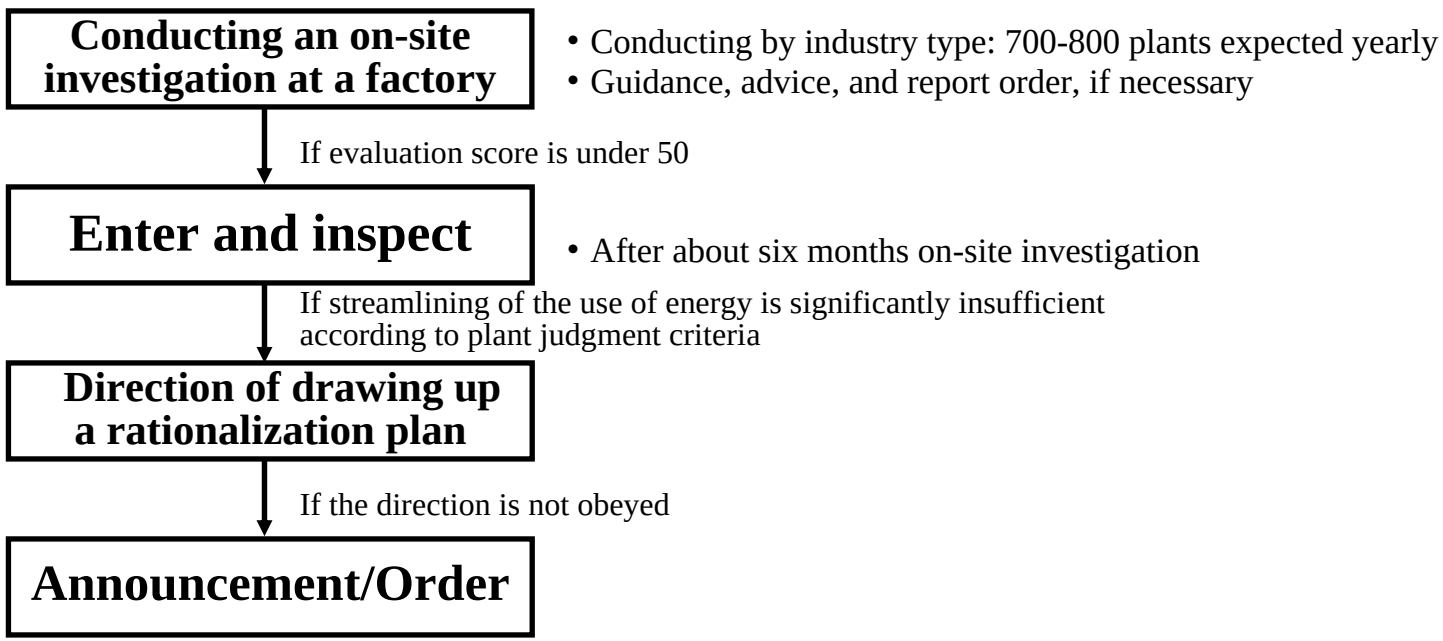
Adopting measures against midsize plants, etc.

- Drawing up a voluntary action program by industries, primarily Keidanren, and following it up

# Reinforcement of Measures Concerning the 1st Category Designated Energy Management Factories

## ◇ Direction of 1st category designated energy management factories from fiscal 2001

- According to the evaluation based on objective standard after the investigation into the status of their compliance with the criteria regulated in the standard for the rational use of energy at factories, whether or not they need official direction is decided. The factory which doesn't adequately rationalize the energy use is directed to draw up and submit a plan for streamlining.



# *Reinforcement of Measures Concerning the 2nd Category Business Places*

## ◇ Reinforcement of judgment criteria in the energy conservation law

- Thorough energy management by each tenant in a tenant building
- Thorough monitoring of each energy facility
- Clarification of management standards for similar-type place of business

## ◇ Reinforcement of the application of the Energy Conservation Law (Thorough measures based on the Energy Conservation Law)

- We work toward the establishment of a scheme that leads to an advice in order to fully operate an advice system for the 2nd category business places based on the Energy Conservation Law
- Thorough recording at the 2nd category business places (thorough management of energy consumption rate)

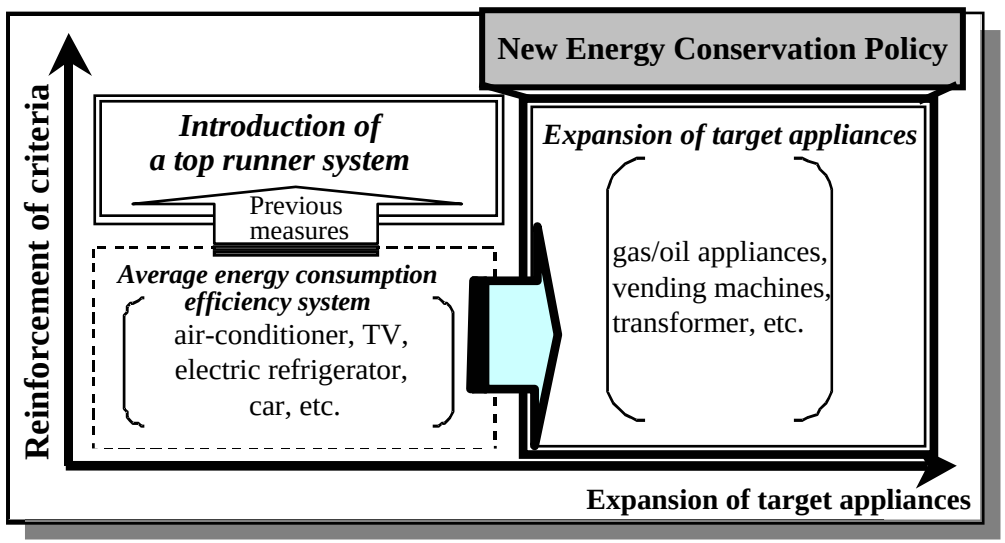
**Sharp increase in energy consumption at office buildings**

**In case it is difficult to achieve the goal**

**Reinforcement of regulatory measures**
For example
•Periodic report
•Energy conservation audit system
•Assurance at the same level as the first type, etc.

- **Review of judgment criteria**
- **Reinforcement of the application of the energy conservation law**

# *Expansion of a top-runner regulation-targeting appliance*




- Appliances consuming gas and oil will be added to a top-runner regulation-targeting appliance.

(heaters, gas water heaters, oil water heaters, cooking appliances (gas oven), fan heaters, electric toilet seats, vending machines, and transformers for receiving electricity; total eight types)

# *Promotion of High-efficiency Boilers*

**Heat-pump Boiler with $CO_2$ used as refrigerant**

**Utilizing the principle of a heat pump used in an air-conditioner and heating with heat of about three times more than input energy realized energy saving of about 30% compared to a traditional combustion-type boiler**

**Latent-heat Collection Boiler**

**Collecting latent heat, which is contained in exhaust gas and was not utilized before, realized energy saving of about 15% compared to a traditional combustion-type boiler.**

- Energy demand for hot-water supply occupies about a third of total energy consumption in the household.
- Efforts to smoothly introduce to the market a new high-efficiency boiler such as a heat-pump boiler with $CO_2$ used as refrigerant and latent-heat collection boiler

# Reduction in Standby Power Consumption

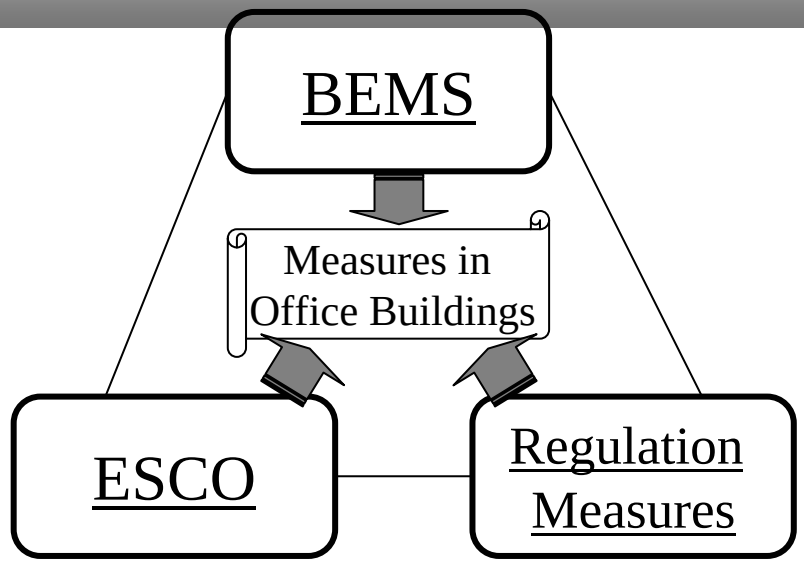
<Outline of Voluntary Measures by Industries Concerned>

- In regards to products that essentially require standby power, industries concerned work toward the goal that standby power consumption should be dropped to 1 W and under by the end of fiscal 2003 (by the end of freezing year 2004 for an air-conditioner).
- In regards to major home electrical appliances except for the above-mentioned products, industries concerned also work toward the goal that standby power consumption of products themselves should be downed as much as possible toward zero by the end of fiscal 2003.

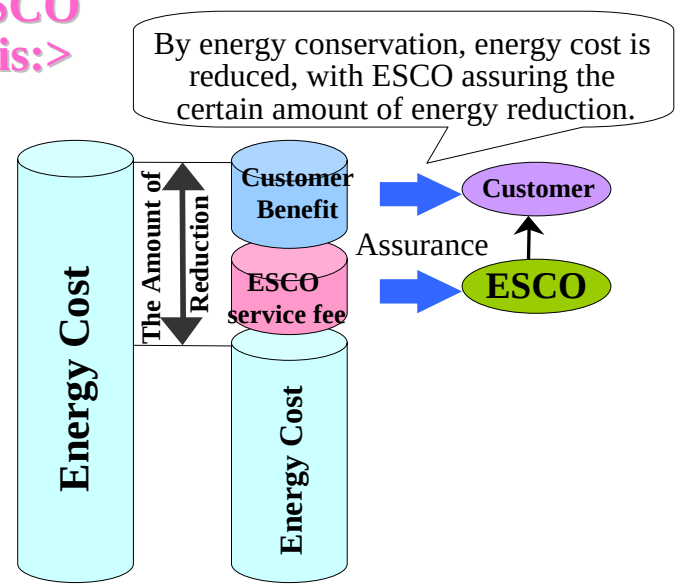
Industries concerned:
Japan Electronics and Information Technology Industries Association (JEITA)
Japan Electrical Manufactures' Association (JEMA)
Japan Refrigeration and Airconditioning Industry Association (JRAIA)

- Standby power consumption in the household sector totals about 10 % of all power consumption in the household sector.
- Establishment of the environment to smoothly realize aggressive, voluntary programs for reduction in standby power consumption presented by manufacturers

# *Measures for Reduction in Energy Consumption in Office Buildings*




**<The ESCO project is:>**




- In the commercial sector, a large increase in energy consumption is expected in the future.
- Promotion to adopt the office building energy management system (BEMS) with the utilization of IT technology
- Improvement of the environment for promotion of adoption of the ESCO project
- Reinforcement, expansion, and fulfillment of regulation measures against office buildings

# *Energy Conservation Measures in the Transportation Sector*

## ◇ Acceleration of implementation of measures for improvement of automobile fuel efficiency

- Introduction of a labeling system and adoption of supporting measures in order to enhance the effectiveness and to accelerate the implementation of a voluntary plan of automobile manufacturers to introduce cars that satisfy top-runner fuel efficiency earlier than they expected in their previous plan

## ◇ Implementation of measures to give people more optionss

- An offer of options that facilitate citizen's energy conservation activity through diversification of hybrid car models and the improvement of the environment to introduce an AT car with an automatic stop-idling feature

## ◇ Easing traffic and cargo distribution systems, and automobile traffic management

- Steady implementation of existing measures and reinforcement of measures to promote alternative transport means with a better energy consumption rate by making traffic and distribution systems more efficient, taking a step for modal shift, and so on
- In that case, it is important to respect the autonomy of local governments and support the promotion of measures suited to local situations.

# *Main Points of Draft Amendment of Revised Energy Conservation Law*

## ◇ Abolition of industrial category-based limitations on the target for designation of the 1st category energy management factory

- The scope of business places targeted for the 1st category designated energy management factory, which is currently limited to manufacturing and four other industrial factories that utilize substantial amount of energy, will be expanded to all industries, including large-scale office buildings and other similar sites. Those designated business places will be subject to the mandatory preparation and submission of future energy conservation plans (mid and long-term plans) and regular reporting.

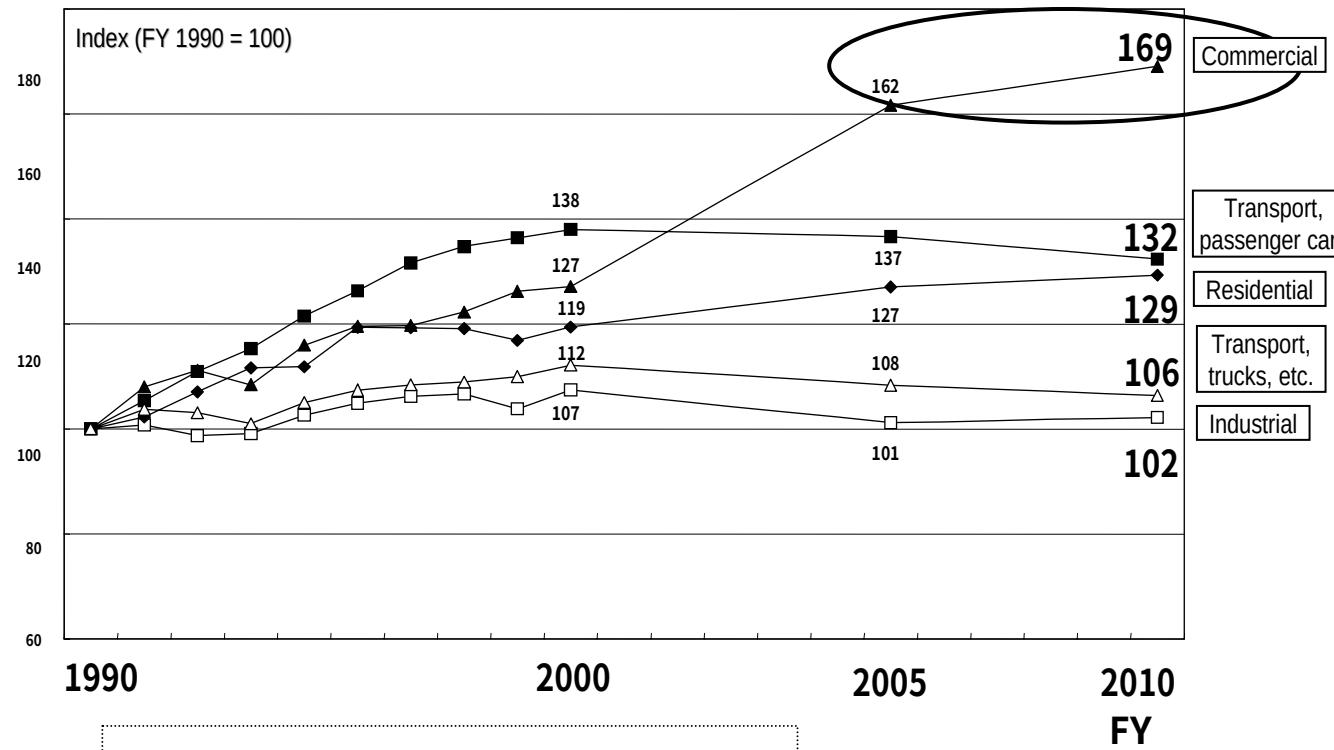
## ◇ Regular reporting relating to the 2nd category designated energy management factories

- In light of online government initiatives and other recent developments that help reduce the regulatory burden on enterprises, regular reporting on energy consumption, etc. by the 2nd category designated energy management factories will be made mandatory.

# Background to Draft Amendment of Energy Conservation Law

## 【Graph 1】

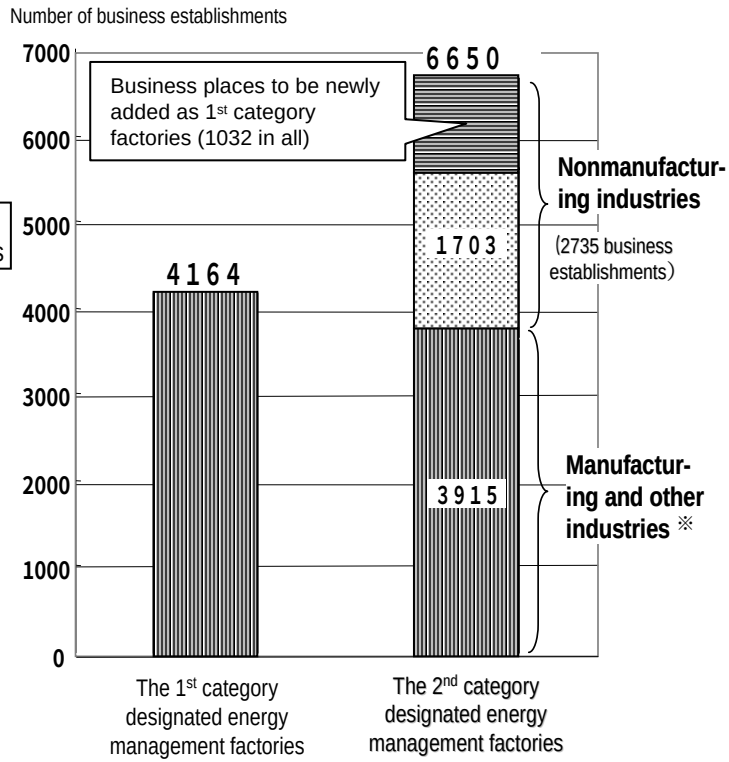
### Energy Consumption Outlook by Sector (2001 Standard Case)




※2001 Standard Case

A new energy consumption outlook adopted through a recent reassessment (2001) of the existing-measures-only scenario put together in 1998

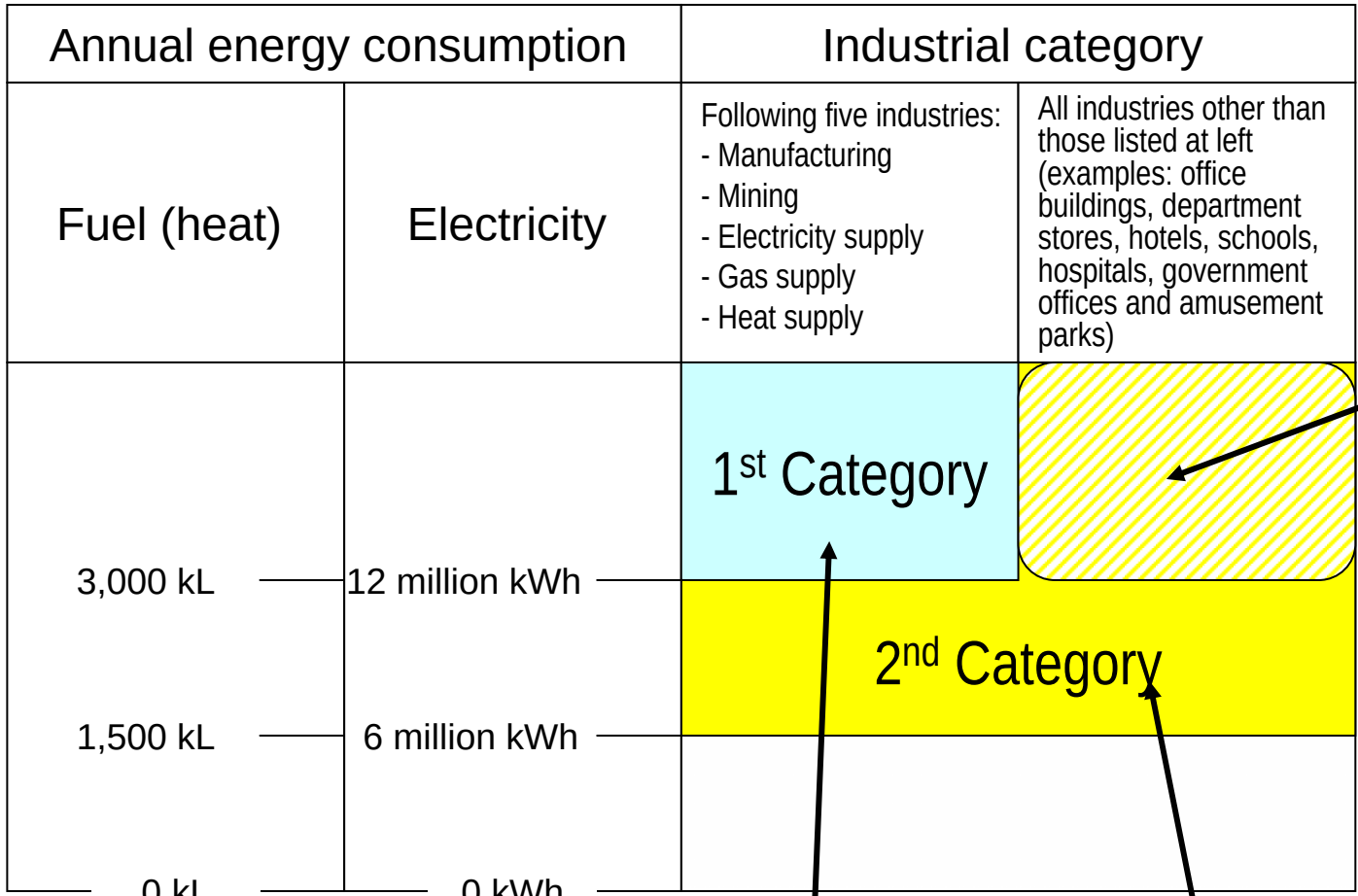
## 【Graph 2】 Number of Designated Energy Management Factories under Energy Conservation Law




※ Also includes mining, electricity supply, gas supply and heat supply

Source: Report of Advisory Committee for Resources and Energy

# Classification of Designated Energy Management Factories and Proposed Legislative Changes




**Current regulatory obligations**

- ✧ Appointment of an energy manager
- ✧ Recording of energy consumption, etc.

**Proposed changes**

**Tighter control of residential and commercial sector**

- ✧ Preparation and submission of mid and long-term plans
- ✧ Participation of a certified energy manager in the preparation of mid and long-term plans
- ✧ Regular reporting (instead of recording)

**Current regulatory obligations**

- ✧ Appointment of an energy manager
- ✧ Recording of energy consumption, etc.

**Current regulatory obligations**

- ✧ Appointment of an energy manager (holder of an official energy manager's certificate (certified energy manager) only)
- ✧ Preparation and submission of mid and long-term plans
- ✧ Regular reporting

**Proposed changes**

- ✧ Regular reporting (instead of recording)