

Japan's New National Energy Strategy
- How best can we realize our energy security?-

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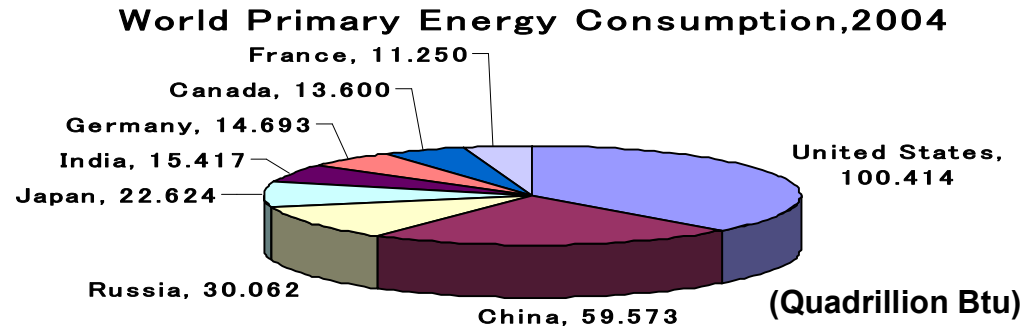
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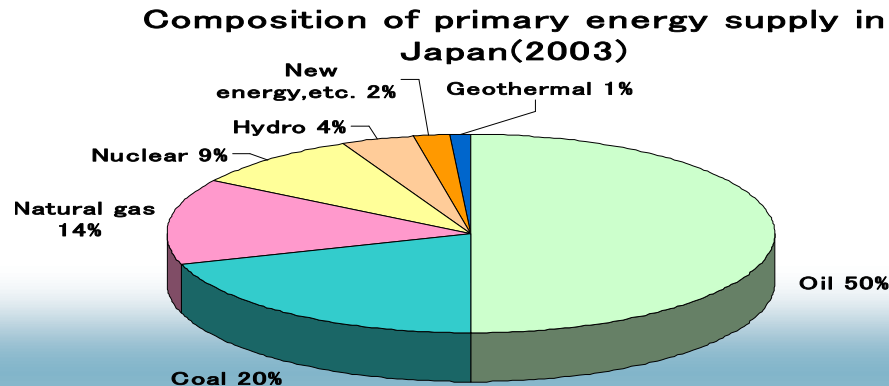
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I-1. Total Primary Energy

(1) Japan is the 4th largest consuming country of primary energy in the world after USA, China, and Russia.



(2) Japan's share of oil in total primary energy sources is about 50 %



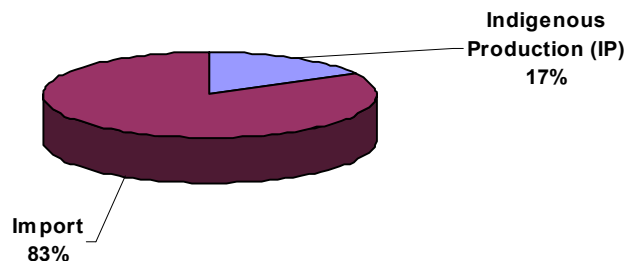
I-1. Total Primary Energy

(3) Japan imports about 87% of its needs for primary energy, if counting in nuclear power as part of its indigenously produced energy.

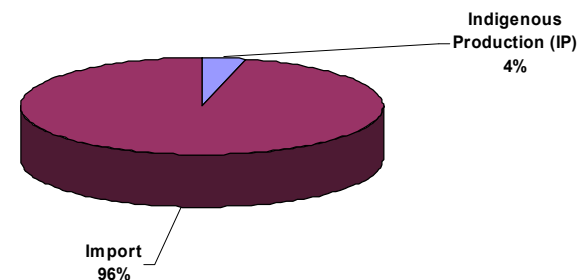
If excluding nuclear power, then Japan depends on import for about 96% of its primary energy needs.

<Japan's Dependence on Import for its primary energy needs>

Case 1 - Nuclear Power counted in IP

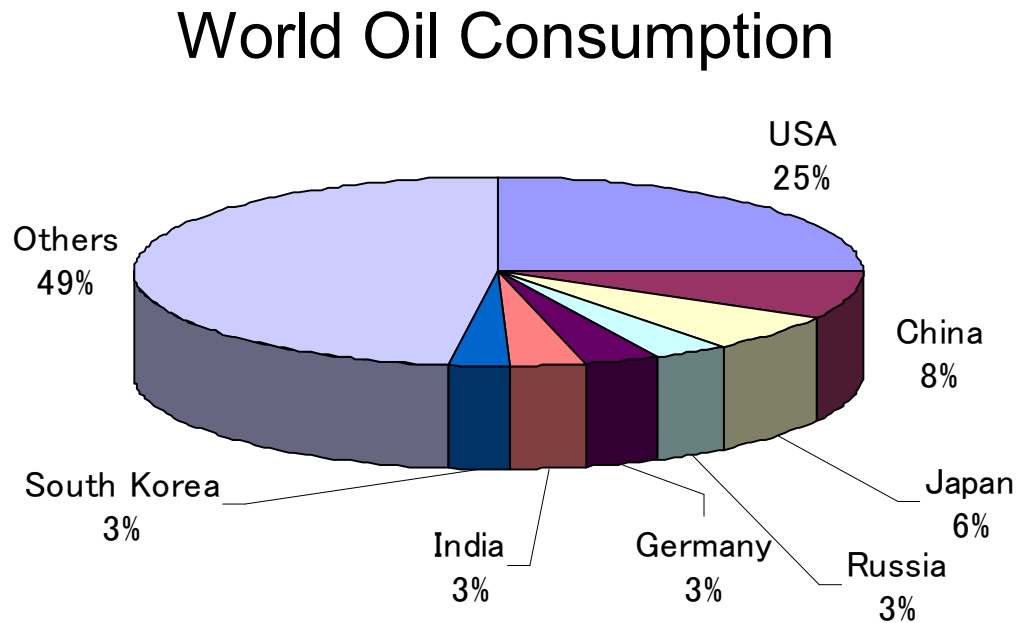


Case 2 - Nuclear Power not counted in IP



I-2. Oil

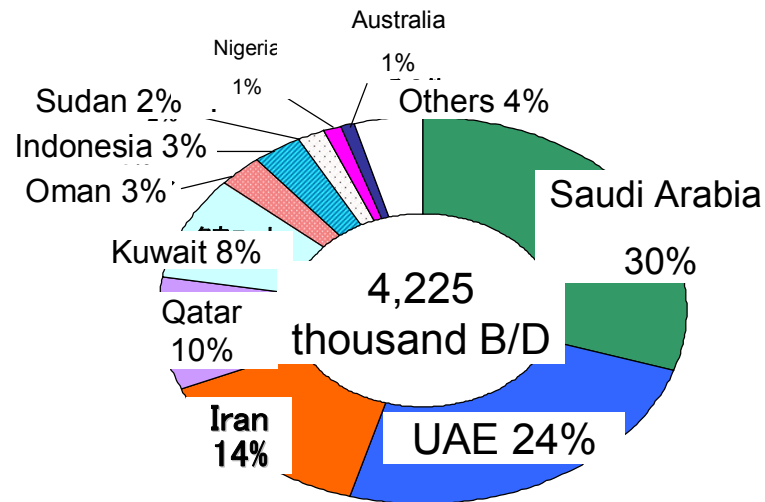
(1) World's No.3 consuming country of oil after USA and China



I-2. Oil

(2) Japan's imports almost all oil, mainly from Middle East.

Japan's crude oil imports by country



I-2. Oil

(3) Japan position is peculiar when compared to other OECD countries.

(%)

	Japan	USA	UK	Germany	France	Italy
Dependence on Oil	50	40	35	31	34	48
Dependence on Import	100	62	-36	97	98	93
Dependence on the M.E	89	24	6	10	29	32

Source : IEA "Energy Balance of OECD Countries" (2002-2003)
IEA "Oil Information" (2005)

II. Outline of New Energy Strategy

-1. Objectives of New Energy Strategy

- (1) To establish energy security measures that the Japanese nation can trust and rely on**
- (2) To establish the foundation for sustainable development through the comprehensive and integrated solution of energy and environmental issues**
- (3) To actively contribute to the overcoming of Asian and world nations' energy problems**

II-2. Establishment of numerical targets

- 5 Goals-

Setting 5 practical and achievable goals for the year 2030 to attain the objectives of New Energy Strategy.

(1) Reducing oil dependence

Through the establishment of a state-of-the-art energy supply-demand structure, oil dependence ratio will be reduced from the current 50% to less than 40%.

[Demand Side]

(2) Reducing oil dependence in the transport sector

Through the improvement of fuel economy and the adoption of bio-fuel, the transport sector's dependence on oil will be reduced from the current nearly 100% to less than 80%.

(3) Energy Conservation

At least another 30% of energy efficiency will be aimed at and attained.

[Supply Side]

(4) Nuclear Power Generation

The ratio of nuclear power to all power generation will be maintained or increased at the level of 30 to 40% or more

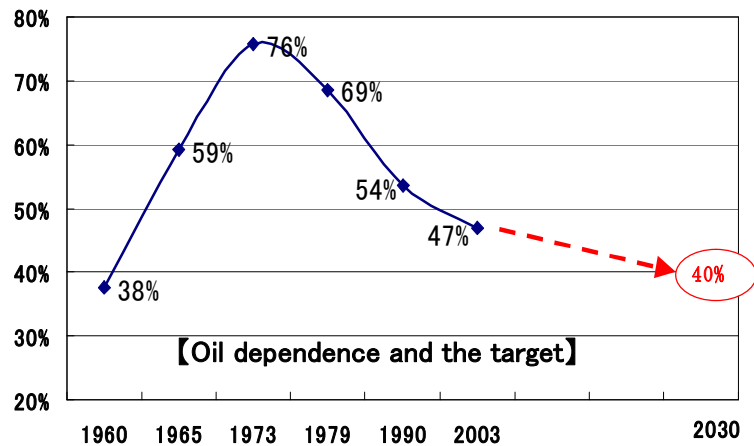
(5) Overseas Oil Development

The ratio of Japanese developed oil in total oil import will be increased to around 40%

Goals for Reducing Oil Dependence

Reducing oil dependence

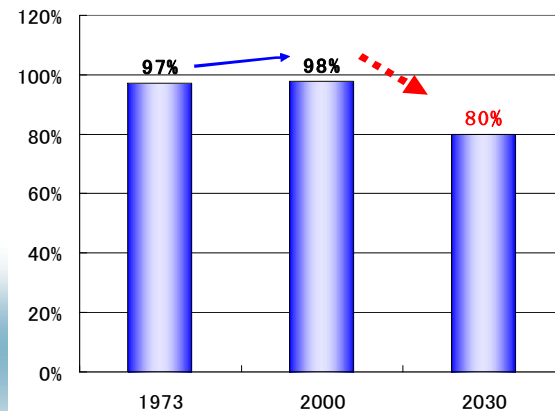
- Over the past 30 years, since the first oil crisis, Japan's dependence on oil as its primary energy source has decreased by 50%. The goal is to reduce oil dependence to less than 40% by 2030.



Reducing oil dependence in the transport sector

- Furthermore, the goal is to reduce the oil dependence of the transport sector, which is now approximately 100%, to below 80%.

【Oil dependence in transport sector and the goal】



III. Concrete Measures for Achieving 5 Goals

1. Reducing oil dependence

Reducing overall oil dependence as primary energy source to less than 40% will be realized through the structural change of energy demand and supply. And this will be carried out by the implementation of a variety of plans and actions to achieve the other 4 Goals.

III-2. Reducing oil dependence in the transport sector

The following 3 pillars of policy will bring down this ratio from nearly 100% to 80%.

- (1) Improvement of Fuel Efficiency
- (2) Introduction of Biomass Fuels
- (3) Promotion of the Use of Electric and Fuel Cell Vehicles

2.-(1) Improvement of Fuel Efficiency

The Japanese government is studying to improve fuel efficiency by introducing the following standard.

- ◆ Fuel efficiency standard for passenger vehicles
Improvement by **23.5%** from 13.6 km / liter in 2004 to **16.8 km / liter in 2015**, equivalent to “from 32.2mile/gallon to **39.7mile/gallon**.”

The above target will be attained by the rapid **progress in engine performance** and promotion of the further spread of diesel engine cars (**Diesel shift**). Improvement of octane value is also under study.

2.-(2) Introduction of Biomass Fuels

- ◆ Regulations on the fuel quality have been or are being revised to the effect that the bio-ethanol may be mixed with gasoline upto the maximum rate of 3% and the bio-diesel fuel (BDF) with ordinary diesel oil by 5% at the maximum respectively.
- ◆ As for ethanol, preparations are under way for its introduction in the form of ETBE. And this plan will be materialized before long. Regarding BDF, a number of tests on safety and conformity, etc. are being conducted. Together with GTL, it is also expected to be introduced in the near future.
- ◆ Introduction and diffusion of bio-fuels are being encouraged. And raising of their mixture ratio with ordinary fuels is under study.

2.-(3) Electric Vehicles and Others

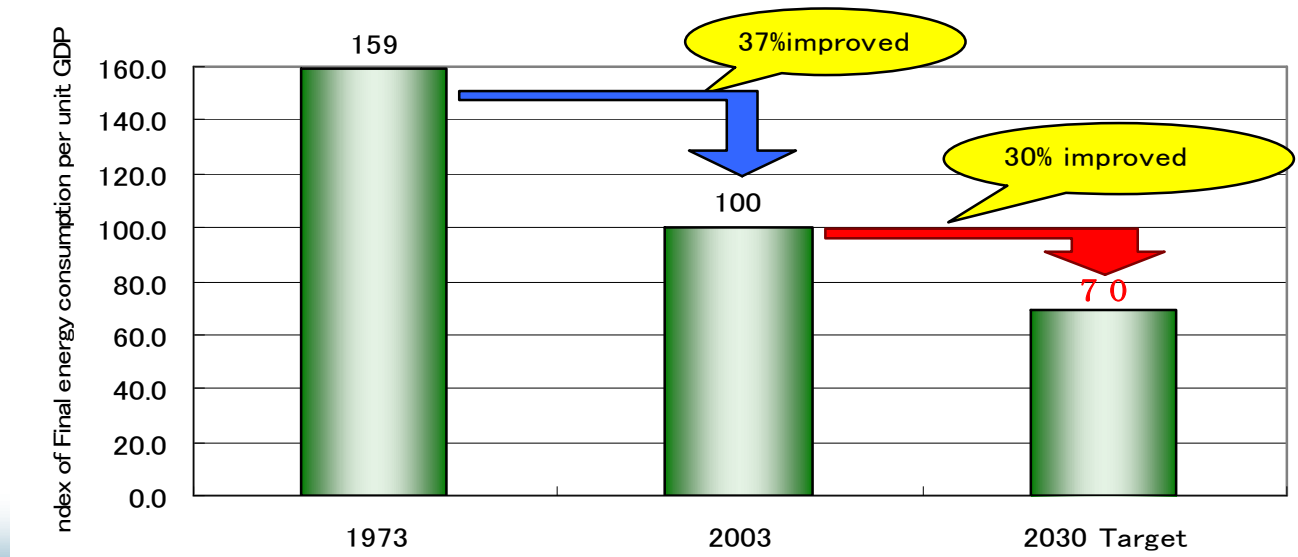
- ◆ To further promote the diffusion of electric vehicles and hybrid cars. Although the relevant technologies have already been established and recognized worldwide, further advancement of technologies will be among the important issues to be addressed.
- ◆ To encourage the stepping-up of technical R&D for fuel cell vehicles to bring out into the world highly efficient fuel cells and to realize the drastic cost reductions.
- ◆ To provide the required infrastructure for hydrogen supply to bring about the earlier introduction of fuel cell vehicles.

III- 3. Promoting Energy Conservation

(1) The trend

- ◆ Having achieved almost 40% greater energy efficiency over the past 30 years, Japan has become the top country in energy conservation.

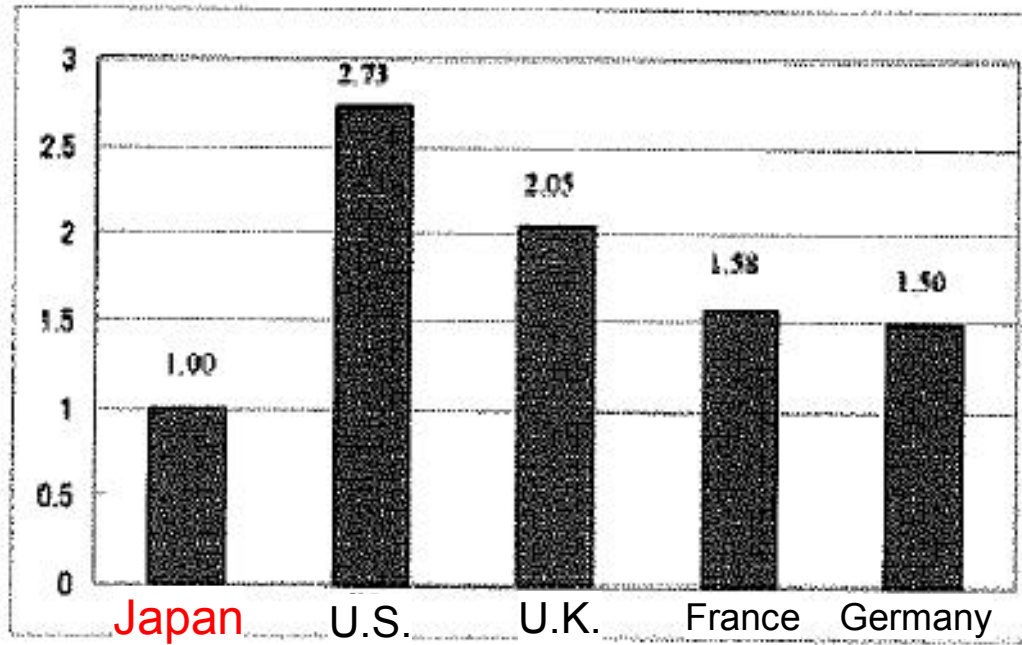
【Energy Efficiency Index per GDP and the future target】



(Source) IEA Energy Balance 2004

Comparison of Energy Consumption against GDP Country

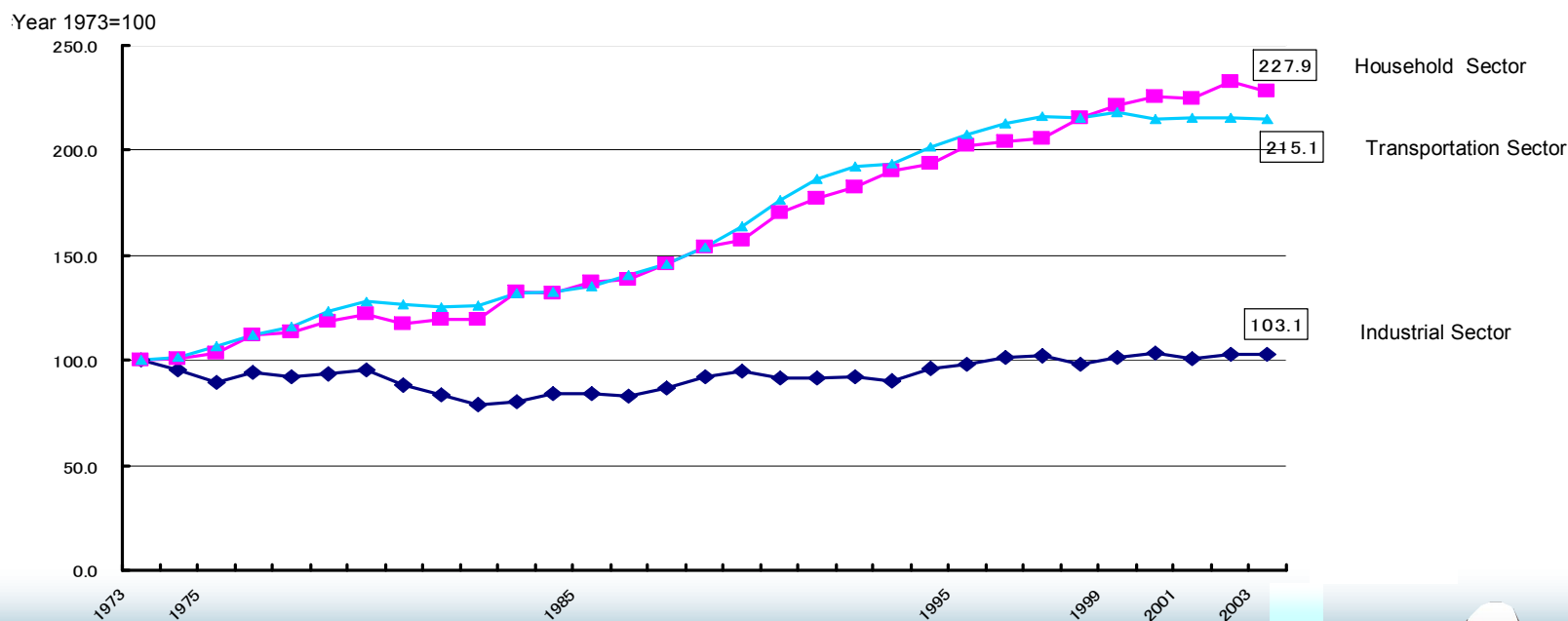
Japanese has a low rate of unit energy consumption per GDP compared to other industrialized nations.



*The above figures show final energy consumption (tons in oil equivalent) / Real GDP (against 1995 prices) (Annual figures for FY2000) when the Japanese figure is set at 1.
(Source) Compiled by the Natural Resources and Energy Agency based on energy and economic statistics data

- ◆ The final energy consumption in **the industrial sector** has remained generally steady and flat since the oil crisis. In contrast, **household and transportation** sectors have showed a significant increase.

<Transition of Final Energy Consumption by Sector>



3.-(2) Energy Conservation Policy

The high achievement is largely attributable to the following 2 policies promoted through joint efforts by government and Industries under the support of general public.

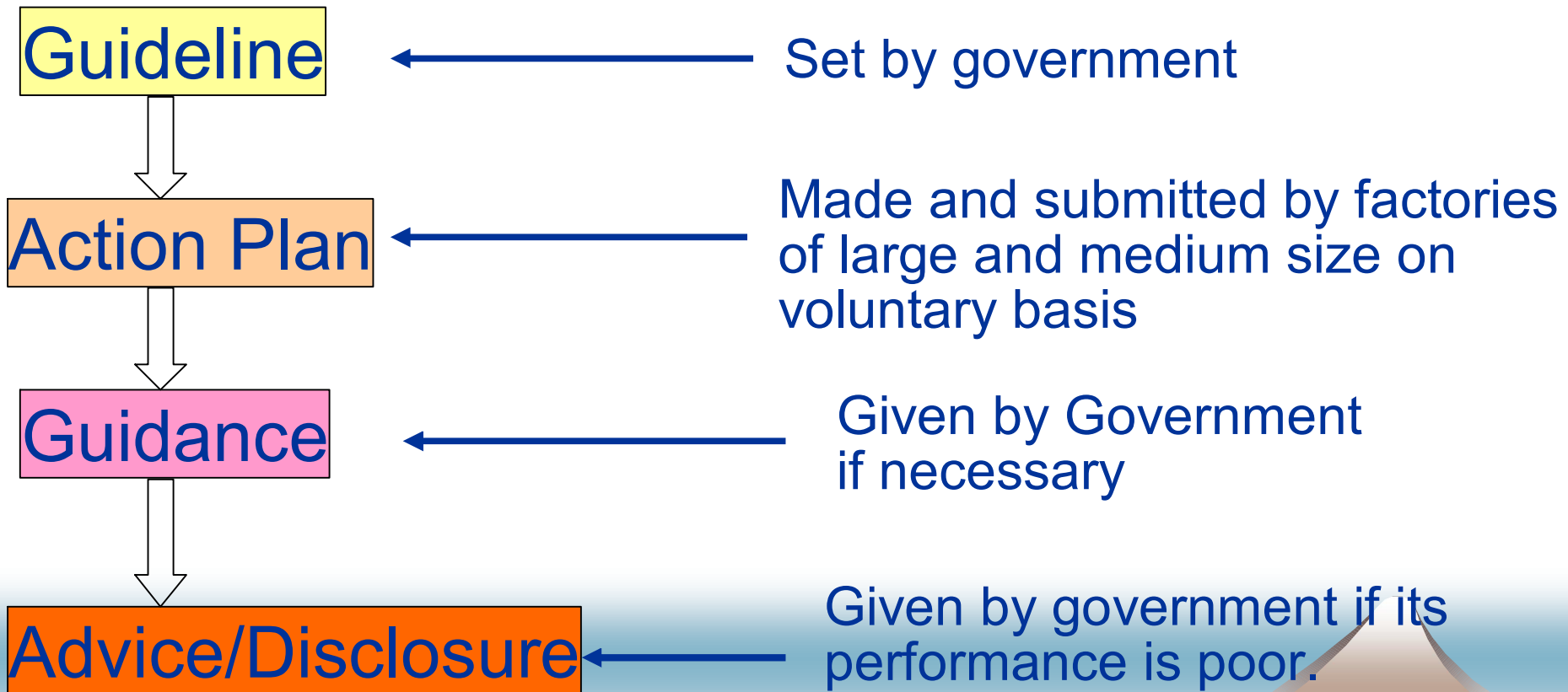
“the Guidance Policy” — Through rationalization and modernization by industry or enterprise

“the Top-Runner Program” — Through development and diffusion of new products or commodities

“Guidance Policy” for Energy Conservation

This policy was originally based on industry voluntary ,and primarily introduced in manufacturing sector.

Scheme of “Guidance Policy”



Introduction to “Top Runner Program”

- ◆ “Top Runner Program” is a system in which the best performance of the facilities, plants, equipment, and instruments, etc. already in practical or commercial use is adopted as the standard for energy efficiency.
- ◆ This program was originally introduced to home appliances such as refrigerator and air-conditioner. By this program substantial number of commodities achieved 10 – 30% of energy saving.

3.-(3) Ambitious New Target for Energy Conservation

- ◆ Setting as a new target of further 30% improvement in energy efficiency is no doubt an **extremely ambitious strategy** for Japan, as its starting level is already so high that there remains very little to be saved in excess of its barest minimum.
- ◆ Unlike the Industrial Sector, the Household Sector as well as the Transport Sector are facing greater difficulties in improving energy efficiency, as they have to rely more on the individual persons' efforts and behavior.
- ◆ To realize the new target, other industry sectors and general public should be involved in energy conservation policies.

3.-(4) Policy Direction for the Realization of New Targets

- ◆ **Establishment of Technological Strategy for Energy Conservation**

In order to realize the new targets, introduction and diffusion of groundbreaking technologies enabling a breakthrough in the related fields will be indispensable, as well as a step-by-step improvement in the conventional technologies.

For the above purpose, through the reviewing of the issues for R&D, and their implementation system, a comprehensive and efficient technological strategy should be worked out.

- ◆ ***Further Reinforcement of “Guiding Policy”***

This policy should be applied to service and transportations industries, and should cover small businesses, too.

- ◆ ***Active introduction of “Top Runner Program”***

This method should be used more widely and actively in consumer’s goods and be expanded to production machines and facilities. The adoption will trigger the utilization of new products, and create new types of management and production.

3.-(5) Toward the Establishment of Energy Efficient City

- ◆ The Commercial & Residential Sector is falling behind in its achievement of energy conservation. And to enable this sector to make substantial progress in this direction, individual efforts for energy saving on the part of respective buildings and residences will not suffice.
- ◆ The city composed of buildings, residences, and inhabitants therein as a whole, should aim at the establishment of a new energy efficient city, including the related hardware and software.
- ◆ Japan is behind the US and Europe in the field of city planning. It should, therefore, grapple with this task of city planning from a new perspective of energy efficiency, which may give some useful hints or even advantages in that endeavor.

III-4. Advancing Nuclear Power Generation

(1) Nuclear power is a source of energy excellent in supply stability and free of CO₂ emission. Japan has, therefore, been actively engaged in its introduction to achieve the following result:

<As of December 31, 2005>

☆ Number of units in operation : 54

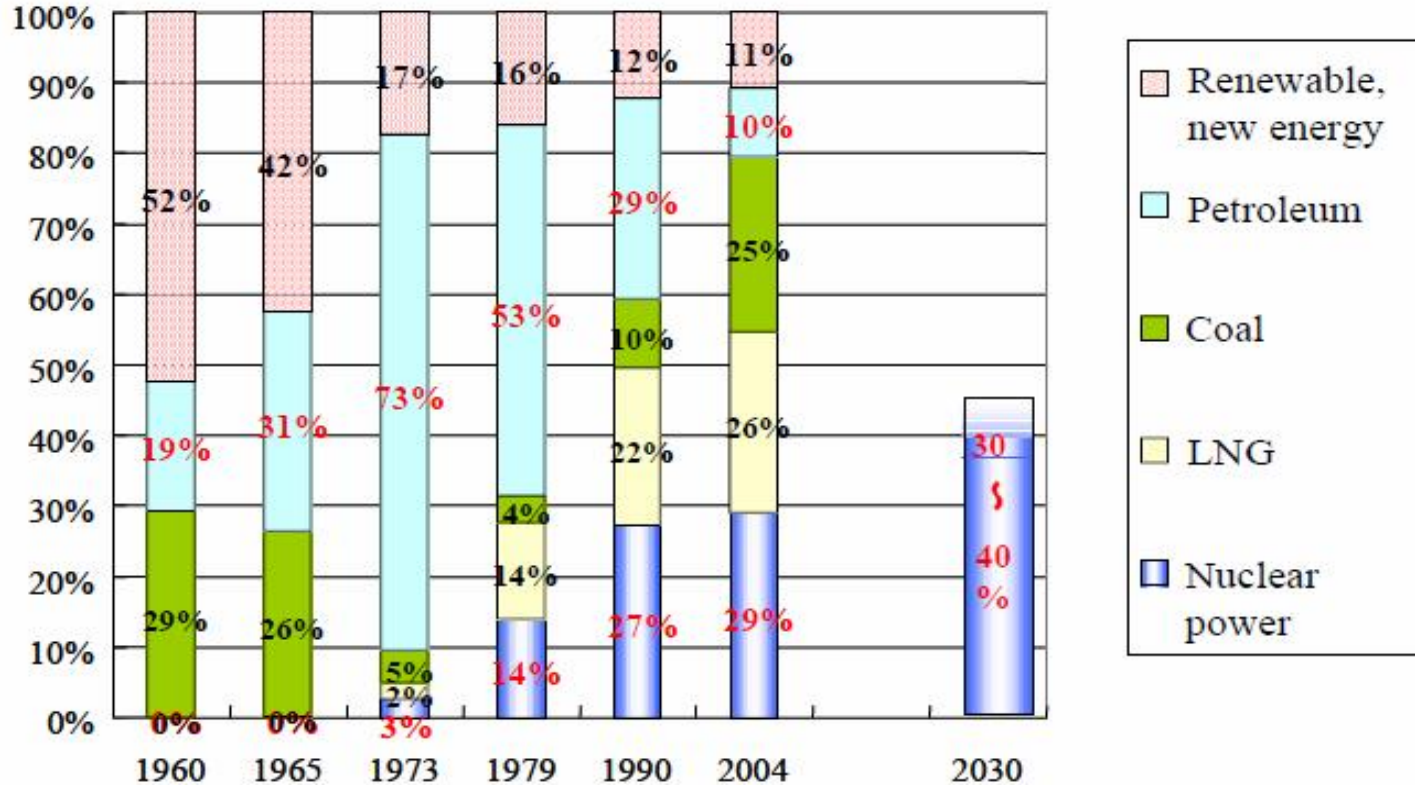
☆ Total capacity of power generation : 48,220,000 kw

☆ Share of total power generation in Japan : about 29%

(2) Though facing the issues such as the need for large investment funds, and disposal of radioactive wastes, further advancement of nuclear power generation is a task to be effectively and aggressively grappled with.

(3) Even after 2030, Japan will aim to bring its usage ratio to above 30 to 40% of the power energy volume. As well as systematically and comprehensively tackling various issues such as the steady promotion of nuclear fuel cycle based on the current light-water reactor, and the early practical application of the fast-breeder reactor, Japan will promote the research and development of fusion energy technology.

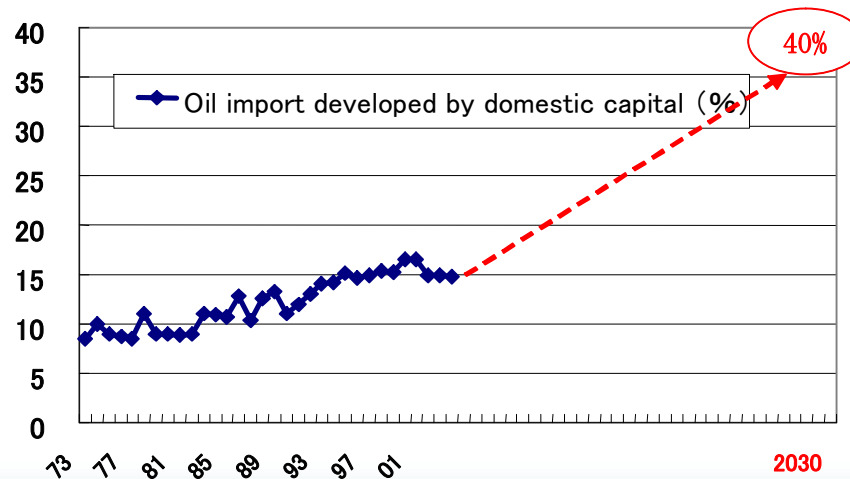
< Nuclear power generation ratio and target value >



III-5. Overseas Energy Development

(1) *The overseas energy development by domestic capital per import energy ratio is increasing from 8% and is now maintained at around 15%. The target is to lift it to 40%.*

【The rate of development by domestic capital and the future target】



5.-(2) Comprehensive Strategy for Securing Resources

In order to attain the 40% target of Japan's overseas energy development by own capital as well as for the realization of ideal energy security, the following pillars of strategic policies will be implemented.

- To strengthen the overall relationship with the sources, through the provision of extensive cooperation in accurately responding to their needs.
- To drastically strengthen the supply of risk money related to oil & gas upstream companies. The government has decided to raise the upper limit of its funding to the companies from the previous 50% to 75% as from April 1, 2007.
- To formulate a resource securing policy by FY2007 and through strengthening the strategic ties with the policy-based finance and economic assistance activities at large, support the acquisition of overseas rights by our country's resource development companies led by core enterprises.
- To actively develop the efforts of oil supply source diversification to include Africa, South America, Canada in addition to Russia and Caspian Sea region. Japan has already started its import of 250,000 bpd of Sakhalin crude oil. Exploration and development of the Caspian region is also on course.

IV. International Cooperation

Asia Energy and Environment Cooperation Strategy

- ◆ This is to strategically develop energy environment cooperation including the energy conservation sector, with Asian nations such as ASEAN and China in order to establish symbiosis with Asia.
- 1. To promote energy conservation based on “The Asia Energy Conservation Program” to be established. And to support the necessary technical transfer by companies with technical capabilities.
- 2. To promote “ The New Energy Cooperation in Asia” through establishing systems for introducing new energies in Asian countries, building the system of trainee acceptance and experts dispatching.
- 3. To disseminate the clean use, production and safety technologies of coal in Asia, which include coal liquefaction technologies through demonstration experiments and human resource development.
- 4. To build the stockpiling system in Asia through the building of regional frameworks.
- 5. To promote regional cooperation on nuclear power for peaceful use in Asia and strengthen the ties between the related safety regulatory institutions in the region.