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東京大学 THE UNIVERSITY OF TOKYO

Energy and Green House Gas Mitigation Technologies

Japan Society for the Promotion of Science-Imperial College London-University of Tokyo Symposium on Climate Change

Thursday 28th and Friday 29th September 2006

energy futures lab

Imperial College London, South Kensington Campus, London SW7 2AZ

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JSPS-Imperial College-UT Symposium
06/9/28 16:35-17:10 Imperial College London

On the Post-Kyoto Framework for long term and substantial CO2 emission mitigation

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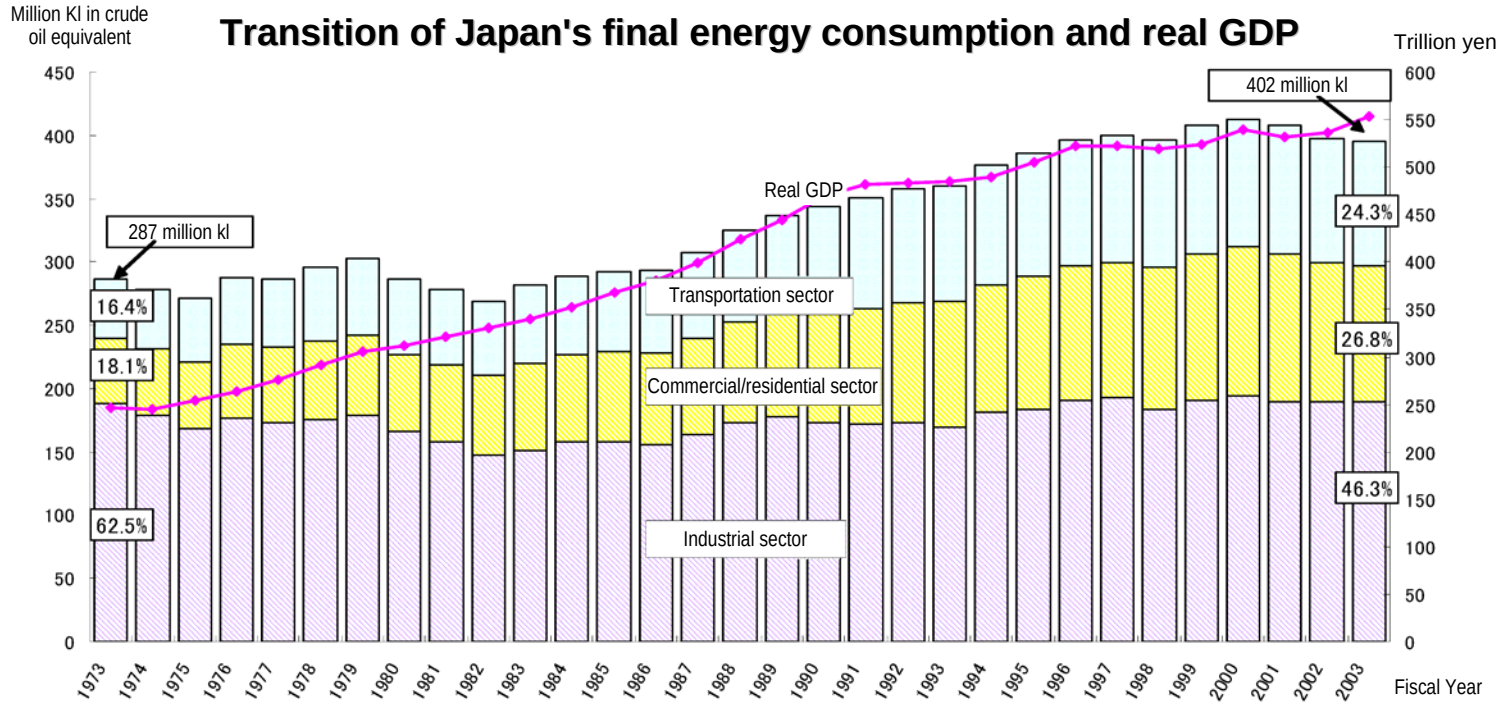
Keio University

Contents

- Recent Japanese situation to meet Kyoto Protocol
- Japanese discussion about Post-Kyoto Framework
- Recent effort to prepare for Post-Kyoto Discussion
- Essential issue for deep CO2 mitigation
  - Personal observation-

Transition of Final Energy Consumption (2)

- Japan's final energy consumption has increased almost continuously, except immediately after the two oil crises and during the recent economic recession.
- The ratio of industrial: commercial/residential: transportation uses shifted from 4:1:1 (oil crisis) to 2:1:1 (FY2003).



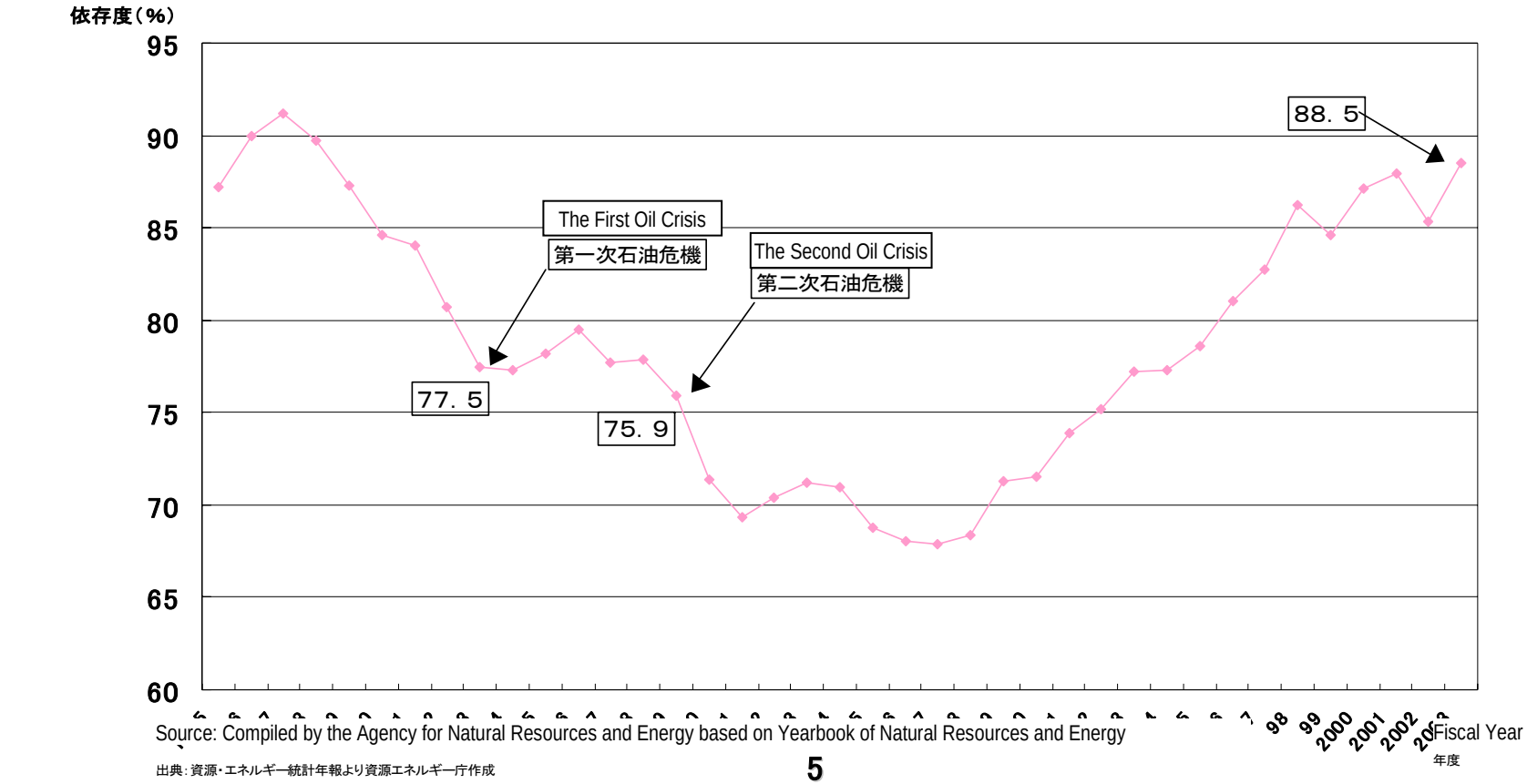
Source: Energy Balance Tables in Japan, Annual Report on National Accounts

(Note) Note that, due to revision of the aggregation method in Energy Balance Tables in Japan, values for FY1990 onwards and values for preceding years are the results of utilizing different methods.

Rising Crude Oil Dependency on Middle Eastern Countries

○ The rate of crude oil dependency on Middle Eastern countries has largely surpassed the rate at the time of the oil crises.
77.5% (First oil crisis) ⇨ 88.5% (FY2003)

Transition of Crude Oil Dependency on Middle Eastern Countries in Japan

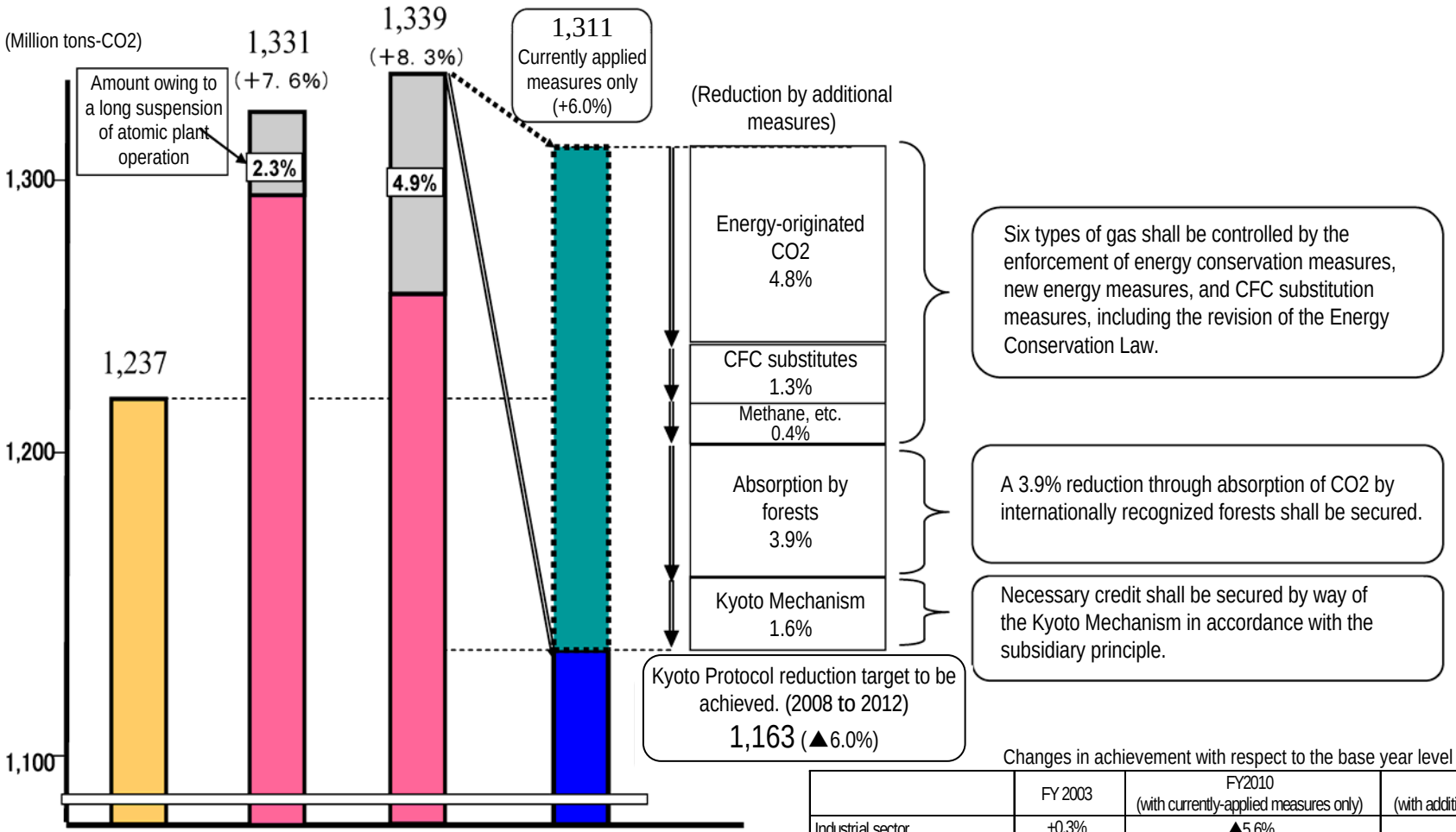


Source: Compiled by the Agency for Natural Resources and Energy based on Yearbook of Natural Resources and Energy

出典：資源・エネルギー統計年報より資源エネルギー庁作成

Picture Toward Achieving the 6% Reduction Target of the Kyoto Protocol

- The Kyoto Protocol's 6% reduction target for CO2 will be achieved by suitably combining the emissions reduction measures for GHG (-0.5%), measures for carbon dioxide absorption by forests (-3.9%), and utilization of the Kyoto Mechanism (-1.6%).



Six types of gas shall be controlled by the enforcement of energy conservation measures, new energy measures, and CFC substitution measures, including the revision of the Energy Conservation Law.

A 3.9% reduction through absorption of CO2 by internationally recognized forests shall be secured.

Necessary credit shall be secured by way of the Kyoto Mechanism in accordance with the subsidiary principle.

Changes in achievement with respect to the base year level by sector

	FY 2003	FY2010 (with currently-applied measures only)	FY2010 (with additionally-applied measures)
Industrial sector	+0.3%	▲5.6%	▲8.6%
Commercial/residential sector	+33.9%	+22.1%	+10.7%
Transportation sector	+19.8%	+19.3%	+15.1%

Basic Concept of the Plan to Achieve the Kyoto Protocol Target

Realizing 6% reduction of GHG emissions

- Promotion of measures related to forests and the forestry industry
- Expansion of the use of wood and timber

Measures for carbon dioxide absorption by forests (for 3.9% reduction)

Utilization of the Kyoto Mechanism (for 1.6% reduction)

- Contribution to preventing global warming, including CO2 emissions reduction in developing countries
- Flexible plans and measures for the limit of efforts made domestically

Reduction in domestic emissions
(0.5% reduction from the "reduction based on current measures + 6%")

★ Drastic improvement of the Energy Conservation Law, promotion of energy conservation measures through emphasized utilization of the special account for energy, and industry's efforts to achieve the target specified in their voluntary action plan.
(▲2.9% contribution)

★ Increased operating rates of atomic power plants (▲1.9% contribution)

(Note) Under certain preconditions, CO2 emissions are estimated to be lowered by 0.2% by improving the operating rates of atomic power plants by 1%.

★CFCs and other gases
(▲1.7% contribution)

Challenge of emissions reduction for the whole nation

- Development of national movement
- Promotion of campaigns led by national and local governments
- Expansion of the measures in terms of dimension, from "one-dimensional" measures to "linear" and "network-type" measures.
- PDCA-based measures (Plan-Do-Check-Action)

★Visualization of objective data

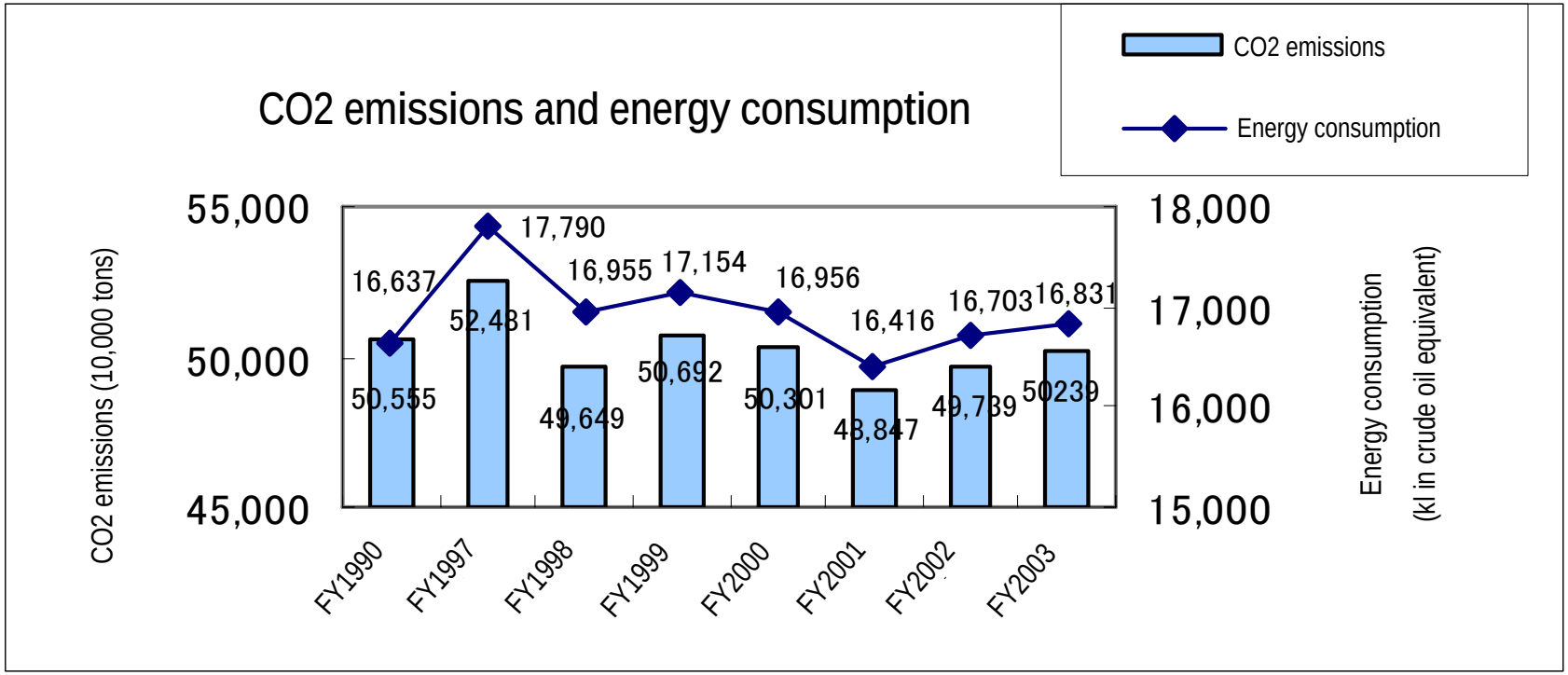
The potential of emissions reduction of each party shall be determined. Each party shall recognize the target and take necessary measures toward achieving it.

- Preparation of new energy consumption statistics
- Guideline for nationwide activities
- Emissions report/publication system

1. **Improvement of environmental conservation, economic vitality, and industrial competitiveness**
2. **The whole nation and companies of all industries are responsible for maintaining an environmentally developed nation. (High environmental consciousness and world-leading industrial technologies)**

Energy Consumption Trend under Nippon Keidanren's Voluntary Action Plan on the Environment

- Nippon Keidanren has drawn up a voluntary environmental action plan with the common goal of “reducing CO2 emissions from the industrial and energy conversion sectors to at least the FY1990 level by FY2010.”
- Implementation of the plan has reduced CO2 emissions against the FY1990 level and energy consumption has leveled off.



Source: Nippon Keidanren (Japan Business Federation) data

II. Energy Conservation Measures by Sector

II-1. Overview of Energy Conservation Measures

Overview of Energy Conservation Measures

Industrial sector

- Energy control at factories and business establishments shall be thoroughly and strictly managed in accordance with the Energy Conservation Law (including the appointment of energy managers, preparation and submission of periodical reports and mid- and long-term plans concerning the use of energy). As a result of revision of the law, the divisions of heat and electricity, which were separated in the past, shall be integrated for control purpose (effective April 2006).
- Promotion of construction of large-scale energy-saving facilities (20.3 billion yen budget for FY2005)
  - An accelerated increase in the use of “High-performance industrial furnaces” in small and medium manufacturers
  - Positive introduction of innovative energy-saving facilities (such as next-generation coke ovens)
  - Utilization of heat or the like at industrial complexes in a manner that goes beyond individual corporate frameworks

Commercial/ residential sector

- Reinforcement of energy-saving performance in compliance with the Energy Conservation Law (Top Runner standard); standard is reinforced for 9 items, such as the addition of LCD and plasma televisions, and reviewed standard for air conditioners.
- An accelerated increase in the introduction of high-efficiency hot-water systems (Target: 8 million units, approximately 20% of all households by 2010) (10.8 billion yen budget for FY2005)
- Promotion of the presentation of easy-to-understand energy-saving information over the counter at home appliance shops and promotion of distribution of energy-saving devices as well as energy-saving information to users by power/gas companies [in conformance with the Revised Energy Conservation Law]
- Submission of energy-saving measure application reports shall be compulsory for residential houses that are larger than the specified size as with newly constructed buildings (non-residential) [in conformance with the Revised Energy Conservation Law] (in cooperation with the Ministry of Land, Infrastructure and Transport)

Transportation sector

- Establishment of fuel economy standard for large-sized trucks and the like [in conformance with the Energy Conservation Law] (in cooperation with the Ministry of Land, Infrastructure and Transport)
- Submission of energy-saving measure plans and reports on the energy used shall be compulsory for consigners as well as carriers [in conformance with the Revised Energy Conservation Law] (in cooperation with the Ministry of Land, Infrastructure and Transport)
- Introduction of high-efficiency maintenance and the promotion of technological development (in cooperation with the Ministry of Land, Infrastructure and Transport)
- Promotion of conversion of commuters' means of transportation from their private cars to public transportation with the cooperation of passenger transportation companies and factories [in conformance with the Revised Energy Conservation Law] (in cooperation with the Ministry of Land, Infrastructure and Transport)
- Improvement of physical distribution bases for enhanced physical circulation and distribution efficiency, use of IC tags, assistance for realization of cooperative transportation/distribution systems [in conformance with the Law for Improving Physical Circulation and Distribution]

Energy supply sector

- Reduction in CO_2 emissions intensity upon electric power generation
- Support for introducing new energy such as wind power, solar energy, biomass, etc.

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Overview of the Law Concerning the Rational Use of Energy

The revised version of the law with additional provisions of measures for transportation etc. was promulgated in August 2005 and will be enforced in April 2006.

Fundamental policies: **The Minister of Economy, Trade and Industry shall make public fundamental policies related to the measures to be taken by energy users etc. for the rational use of energy**

Factories and Business Establishments

Publication of responsibilities and criteria for enterprises

Type 1 Designated Energy Management Factory
(Annual energy use: 3,000 kl)
- Appointment of Energy Manager
- Submission of mid- and long-term plans
- Submission of periodical reports on energy use

←When the Ministry finds the rational use of energy to be significantly insufficient in consideration of the criteria, it shall instruct, announce to the public, or order (penalize) the particular factory

Type 2 Designated Energy Management Factory
(Annual energy use: 1,500 kl)
- Appointment of a qualified person for energy management of type 2 designated factory
- Submission of periodical reports on energy use
- The divisions of heat and electricity, which were separated in the past, shall be integrated for control purposes (represented in crude-oil equivalent).

←When the Ministry finds the rational use of energy to be significantly insufficient in consideration of the criteria, it shall advise the factory in question

[Modified points of the law]
- ○ The divisions of heat and electricity, which were separated in the past, shall be integrated for control purposes in view of today's actual circumstances at factories and business establishments.
- ○ Consequently, the level of energy use as the standard to designate factories was lowered to increase the number of factories and business establishments subject to designation. (From approximately 10,000 to 13,000)
- ○ Establishment of registered examination body system. (If a factory or business establishment is examined and verified by a registered examination body, the factory or the like shall be excused from the submission of periodical reports.)

Transportation

1. Carriers (Freight, passenger)

Publication of responsibilities and criteria for enterprises

Designated carriers

(Vehicle ownership: More than 200 trucks or more than 300 items of rolling stock or the like)
- Submission of mid- and long-term plans
- Submission of periodical reports on energy use

←When the Ministry finds the rational use of energy to be significantly insufficient in consideration of the criteria, it shall advise, announce to the public, or order (penalize) the operator in question.

2. Consigners

Publication of responsibilities and criteria for enterprises

Designated consigners

(Annual cargo: 30 million ton kilometers)
- Submission of plans
- Submission of periodical reports on energy use required for consignment transportation

←When the Ministry finds the rational use of energy to be significantly insufficient in consideration of the criteria, it shall advise, announce to the public, or order (penalize) the consigner in question.

[Modified points of the law]
- ○ Measures for the transportation sector are newly added. (Periodical reports shall be prepared from April 2007.)

In conjunction with the systems related to the calculation, reporting, and publication of the emissions of GHG specified in the Partially Modified Law Concerning the Promotion of Measures against Global Warming enacted in the current Diet session, emissions of energy-originated carbon dioxide is required to be obtained on the basis of the data in the periodical reports submitted in compliance with the Energy Conservation Law.

Residences and Buildings

Publication of responsibilities and criteria for owners of residences or buildings and clients for construction
- The clients, those who will modify buildings, and the owners of specified buildings shall be instructed or advised in connection with the design, construction, and maintenance of the buildings.
- The Ministry of Land, Infrastructure and Transport announces guidelines for the design and construction of residences.

Designated buildings
(Buildings including residences having a total floor area of 2,000 m^2 or larger)
- Submission of notification of energy-saving measures to the competent authorities* by the clients and owners (specified clients etc.) who will construct or extensively modify designated buildings.

←When the competent authority finds the energy-saving measures to be significantly insufficient in consideration of the criteria, the authority shall advise or announce to the public the name of the owner in question.
(* Competent authorities: Prefectural authorities, with district construction surveyors, governing construction authorization procedures)
- Periodical reports on maintenance of buildings with respect to measures by the designated clients etc. of buildings who have submitted notification to the competent authorities

←When the competent authority finds energy-saving measures to be significantly insufficient in consideration of the criteria, the authority shall advise the client etc. in question.

[Modified points of the law]
- ○ Owners of buildings are newly designated as those subject to the measures (maintenance, repair, and modification)
- ○ Notifications in the case of extensive modifications are also designated compulsory.
- ○ Residences having a total area of 2,000 m^2 or larger are included in the category of designated buildings, with requirements for notification newly designated.

Measures for Machinery and Equipment

Responsibilities for manufacturers or importers of energy-consuming equipment

Designated equipment
Publication of criteria
(Top Runner standard)
- Energy conservation standards of passenger vehicles, air conditioners, television, etc., which are required to be higher than the performance of the respective top-running brands of commercialized products.
- LCD and plasma televisions, DVD recorders, and heavyweight vehicles are newly listed as products subject to the measures.

←When the Ministry finds it necessary to improve performance significantly, it shall advise or announce to the public.

Provision of information

Information for general consumers
- Promotion of distribution of energy-saving devices as well as provision of energy-saving information to users by power/gas companies and publication of achievements
- Promotion of presentation of easy-to-understand energy-saving information over the counter at home appliance shops (annual power consumption values, fuel economy, etc.)

[Modified points of the law]
- ○ Responsibility for provision of information is newly specified.

Factory/Business Establishment Measures Under the Energy Conservation Law (1)

○ Plan-based and voluntary energy control at relevant factories and business establishments shall be thoroughly and strictly managed in accordance with the Energy Conservation Law. Those factories and business establishments shall submit periodical reports on the use of energy, prepare and submit mid- and long-term plans for measures to achieve energy conservation targets, and appoint energy managers in accordance with the law.

Factories/business establishments with high energy consumption
(Type 1 Designated Energy Management Factories)

- Annual fuel (thermal) use: 3000 kl in crude oil equivalent or larger
- Annual electricity use: 12 million kwh or larger

○Factories

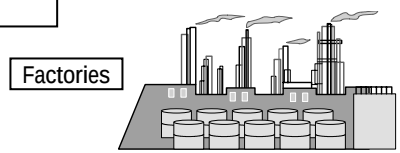
Measures

- Appointment of Energy Manager (Mandatory to possess a license for a qualified person for energy management of type 1 designated factory)
- Preparation & Submission of Periodical Reports
- Formulation & Submission of Mid- and long-term Plans

○Business Establishments

Measures

- Appointment of a qualified person for energy management of type 2 designated factory (Training Required)
- Preparation & Submission of Periodical Reports
- Preparation and Submission of mid- and long-term plans (Participation by a qualified person required)



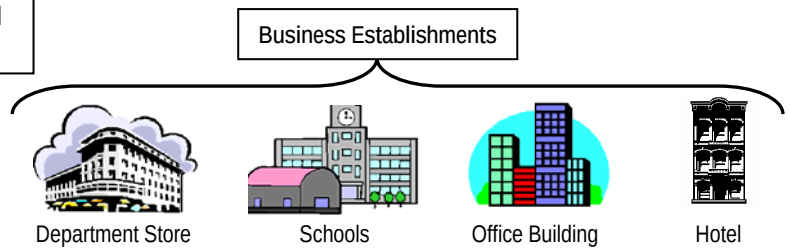
Factories/business establishments with medium energy consumption
(Type 2 Designated Energy Management Factories)

- Annual fuel (thermal) use: 1500 kl in crude oil equivalent or larger
- Annual electricity use: 6 million kwh or larger

○Factories and business establishments

Measures

- Appointment of a qualified person for energy management of type 2 designated factory
- Preparation & Submission of Periodical Reports

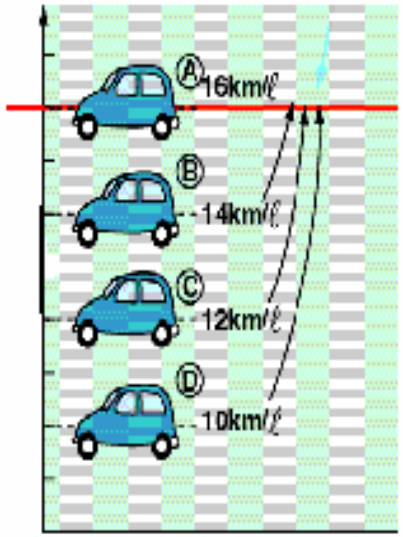


Improving Equipment Efficiency with the Top Runner Program

○ The **Top Runner Program*** was introduced in 1998 for the energy conservation standards for home/office appliances and the fuel economy standard of automotives. The program standards for LCD and plasma televisions and heavyweight vehicles are to be added.

Example of Top Runner Program

Fuel Economy (km/ℓ)



Energy conservation standard based on the Top Runner Program

Energy-Conservation Target for Specific Equipment

	Specific Equipment	Target Year	Energy conservation effects
①	Passenger vehicles (Gasoline and LP gas)	2010	Gasoline: 23% LP gas: 11%
	Passenger vehicles (diesel)	2005	15%
②	Freight vehicles (gasoline)	2010	13%
	Freight vehicles (diesel)	2005	7%
③	Air conditioners (cooling & heating)	2004(partly 2007)	63%
	Air conditioners (cooling only)	2007	14%
④	TV sets	2003	16%
⑤	Videocassette recorders	2003	59%
⑥	Fluorescent lights	2005	17%
⑦	Copying machines	2006	30%
⑧	Computers	2005	83%
⑨	Magnetic disc units	2005	78%
⑩/⑪	Electric refrigerators/freezers	2004	30%

The energy conservation effect is as compared with that of FY1997 (and as compared with FY1995 for automobiles, and FY1998 for electric refrigerators/freezers).

	Specific Equipment	Target Year	Energy conservation effects
⑫	Space heaters	2006	Gas:1%/Oil: 4%
⑬	Gas cooking appliances	2006 (partly 2008)	Main cooking section: 14% Grill section: 27% Oven section: 20%
⑭	Gas water heaters	2006 (partly 2008)	Gas instantaneous water heater/Gas bathtub water heater: 4% Gas room heater (those without water heating device): 3% Gas room heater (those with water heating device): 1%
⑮	Oil water heaters	2006	4%
⑯	Electric toilet seats	2006	10%
⑰	Vending machines	2005	34%
⑱	Transformers	2006 (partly 2007)	30%

Energy conservation effect in comparison with FY2000 (against FY1999 figures for transformers)

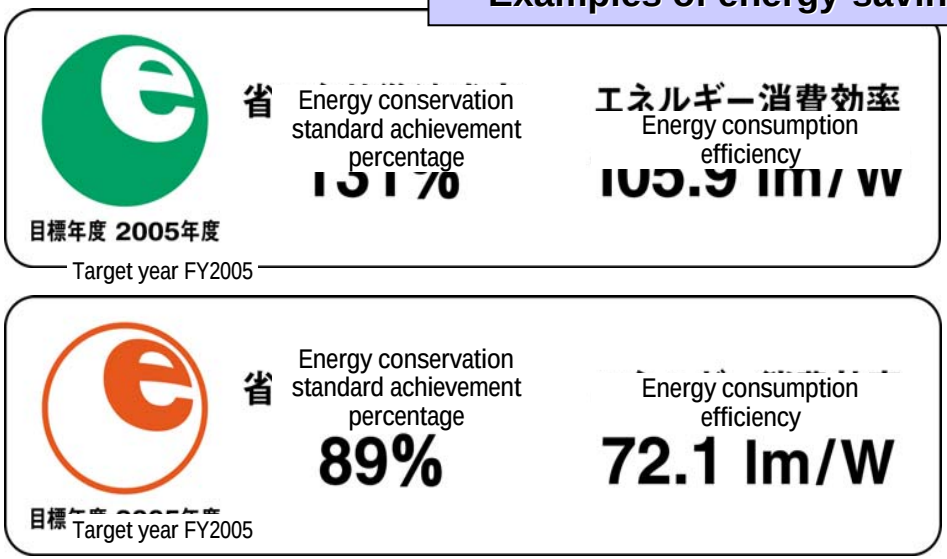
***Top Runner Program:**

The concept of the program is that fuel economy standards for vehicles and energy conservation standards for electric appliances, etc. shall be set exactly the same as or higher than the best standard value of each product item currently available in the market.

Energy-Saving Labeling System

○ The energy-saving labeling system has been introduced to inform consumers of energy efficiency of home appliances and to promote energy-efficient products.

Examples of energy-saving labeling



Label for the product's main unit

○ As of April 2005, labeling is applied to the following 13 products: air conditioners, refrigerators, freezers, fluorescent lights, TV sets, space heaters, gas cooking appliances, gas water heaters, oil water heaters, electric toilet seats, computers, magnetic disks, and transformers.

Energy Efficient Product Retailer Assessment System

- In order to promote energy efficient products, it is essential to introduce measures for retailers, who are the contact point between manufacturers and consumers.
- Recognition should be extended to retailers who actively promote energy-efficient products or provide appropriate energy conservation information.
- The energy efficient product retailer assessment system was introduced in FY2003.

Logo

2003年度

省エネ型製品普及推進優良店

- Targeted retailers:
- All home appliance retailers whose sales coming from home appliances account for 50% or more of total sales

Modified in FY2005

・Large home appliance retailers having a total floor space of at least 800 m^2, whose sales from home appliances account for 50% or more of total sales

- "Outlets that Excel at Promoting Energy-Efficient Products" are selected each year and publicized along with their rankings. Effective FY2004, Minister of Economy, Trade and Industry Award and Minister of Environment Award are awarded to large stores.
- Selected retailers are authorized to carry a special logo.

Introduction of Energy Conservation Measures in the Transportation Sector (1)

Business operators subject to energy conservation responsibility

Energy conservation efforts of transportation business operators in the transportation sector are specified to be compulsory. Business operators who manage their own transportation needs are also specified to be responsible for such efforts.

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erations (trucks

Compulsory items

Examples of items include in the plans

- Use of large-sized vehicles and containers
- Preparation of a manual for reducing the number of transportation/distribution counts by improving the transportation lot
- Preparation of a manual to increase circulative cargo transportation and backhauling
- Introduction of an efficient vehicle dispatching system, and others

* These items are specified in the judgment criteria (announcement).

ulfill the submitted plans requires documentation and submission of the reasons.

2. Periodical reports (to be submitted to the Minister of Land, Infrastructure and Transport) [once a year]

Examples of items included in the reports

- Energy consumption for transportation (kl)=Amount of gasoline, diesel oil, etc.
- Energy consumption intensity for transportation= Energy consumption for transportation (kl) ÷ Total transportation volume etc.
- If the energy consumption intensity for transportation fails to improve by 1%* or more against the previous year, the reasons must be reported

* Examined on the basis of the actual status of rational use of energy for transportation. These items are specified in the judgment criteria (announcement).

Legislative actions

- If efforts are significantly insufficient and intensity has not been improved → Advice is given for proper measures
- If the advice was not followed → The name of the business operator is made public.
- If measures in accordance with advice were not taken, without a valid reason → An order is issued to comply with the advice.
- If the order is disobeyed → A fine is imposed (One million yen or less)

Introduction of Energy Conservation Measures in the Transportation Sector (2)

Energy conservation efforts of business operators who act as consigners as well as transportation business operators in the transport sector are specified to be compulsory. Business operators who manage their own transportation needs are also specified to be responsible for such efforts.

Business operators subject

Energy conservation efforts of business operators who act as consigners as well as transportation business operators in the transport sector are specified to be compulsory. Business operators who manage their own transportation needs are also specified to be responsible for such efforts.

Compulsory items

Examples of items included in the plan:

- Appointment of officers in charge of energy conservation
- In-house training
- Promotion of the use of railroad and cargo ships (modal shift)
- Shift from private cargo vehicles to business-use cargo vehicles
- Study on the feasibility of the use of 3PL (third-party logistics)
- Preparation of a manual for cooperative physical distribution with other companies
- Standardization and downsizing of products for improving the loading ratio

* The business operators themselves may select the types of efforts out from the judgment criteria (announcement) in accordance with their ability.

Any failure to fulfill the submitted plans requires documentation and submission of the reasons.

2. Periodical reports (to be submitted to competent minister) [once a year]

Examples of items included in the reports

- The total of cargo weight and total of transportation volume (ton kilometers) of the consignment transportation for each transportation mode *1
- Energy use (kl) required for consignment transportation for each transportation mode *1
  = Calculated by totaling [cargo weight] x [transportation distance] x [ton-kilometer intensity] of each cargo type
  *1: Applicable modes include 2-t truck, 4-t truck, 10-t truck, railroad, cargo ship, airplane, etc.
- Energy consumption intensity for consignment transportation= Energy consumption for consignment transportation (kl) ÷ Sales volume or transportation cost etc.*2
- If the energy consumption intensity for consignment transportation fails to improve by 1% or more against the previous year, the reasons must be reported. *3
  *2: Values closely associated with the energy consumption for consignment transportation. (The reporting party shall decide as to which value is to be used in the calculation. However, the selection shall be the same as in the report submitted in the previous year, if any).
  *3: Examined on the basis of the actual status of rational use of energy for consignment transportation. The item is specified in the judgment criteria (announcement).

Legislative actions

- If efforts are significantly insufficient and the energy unit has not been improved → Advise is given for proper measures
- If the advice was not followed → The name of the business operator is made public.
- If measures in accordance with the advice were not taken, without valid reason → An order is issued to comply with the advice.
- If the order is disobeyed → A fine is imposed (One million yen or less)

The following slides are referred from METI report at the Global Environmental Sub-Committee, Industrial Structure Council*, Japan

named as

Sustainable Future Framework on Climate Change

- Interim Report (Summary) -

Special Committee on a Future Framework for Addressing Climate Change

Global Environmental Sub-Committee, Industrial Structure Council*, Japan

December 2004

*The Industrial Structure Council is an advisory body for the Minister of Economy, Trade and Industry (METI). Council members usually comprise prominent persons from various fields including academia, industry and NGOs.

Introduction

<Evaluation of the Kyoto Protocol>

- The Kyoto Protocol is an epoch-making agreement, as developed countries committed to reducing their greenhouse gas (GHG) emissions; thereby it serves as an important first step toward long-term and concrete measures. It has already led to remarkable achievements, including enhanced public awareness of climate change, promotion of policies and measures for emission reductions and introduction of the Kyoto mechanisms.
- However, the Kyoto Protocol determines developed countries' emission reduction only up to 2012. Moreover, the world's largest emitter, the United States, seceded from the Protocol. Global emissions are predicted to increase with the majority of increase coming from developing countries.

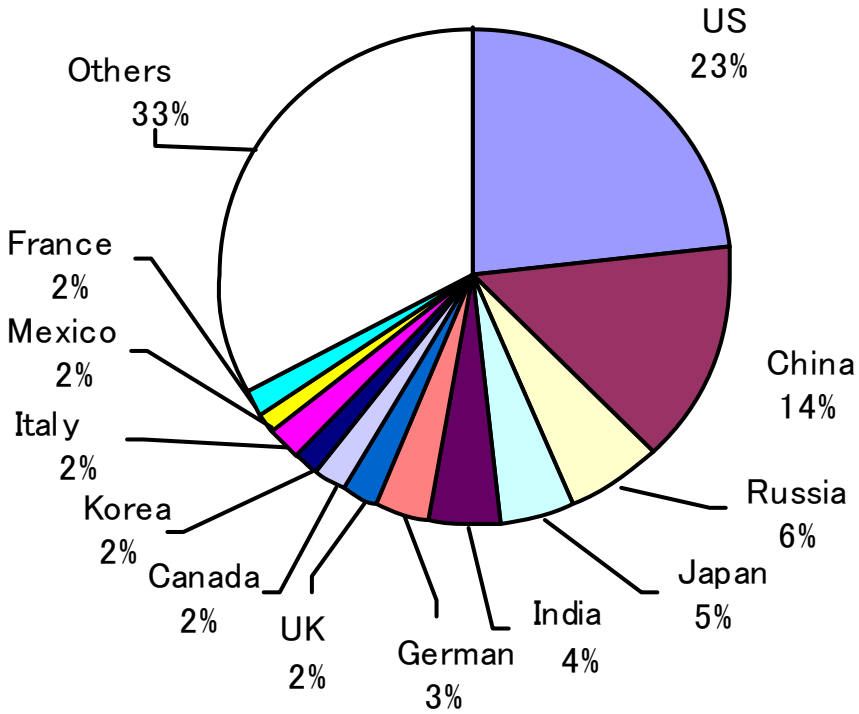
As the ultimate solution to climate change, the current increasing trend of global emissions must be reversed to a decreasing trend in the early part of this century, and thereafter emissions need to be reduced to less than half of the current level in the long run.

In addition to the efforts to reduce emissions in developed countries domestically, global measures need to be adopted to substantially limit and reduce emissions over the long term.

It will be necessary to further develop and enhance the Kyoto Protocol on the basis of lessons learned from it

Current CO2 emission by countries

- *CO2 emission of the largest five countries exceed 50% of world emission,*
- *Of which, only Japan committed to reduce emission, Russia keeps the same level, and all others has no cap.*



(source) OECD/IEA CO2 Emissions from Fuel Combustions

International situation regarding climate change

＜United States＞

➢The US is the world's largest emitter, accounting for a quarter of global CO_2 emissions. The emissions in 2012 are expected to increase by approximately 30% over 1990. Furthermore, in the medium to long-term, the US is estimated to have a higher population growth rate than other major developed countries, and its CO_2 emission increase after 2000 will likely be responsible for about half of the total increase by developed countries.

➢Even though it signed the Kyoto Protocol in 1998, the US (reduction target: - 7%) renounced it in March 2001, citing the negative effect on the US economy and the non-participation of developing countries in reduction obligations.

➢Behind the US's decision was the Byrd-Hagel Resolution, adopted unanimously at the Senate in 1997 (95 votes in favor with none opposed) before COP3. Ratification of international agreements in the US requires approval by two-thirds or more of the Senators.

➢The US's approach to climate change aims at improvement of emission intensity from short-term perspectives, and technological solutions such as carbon sequestration and hydrogen use from long-term perspectives.

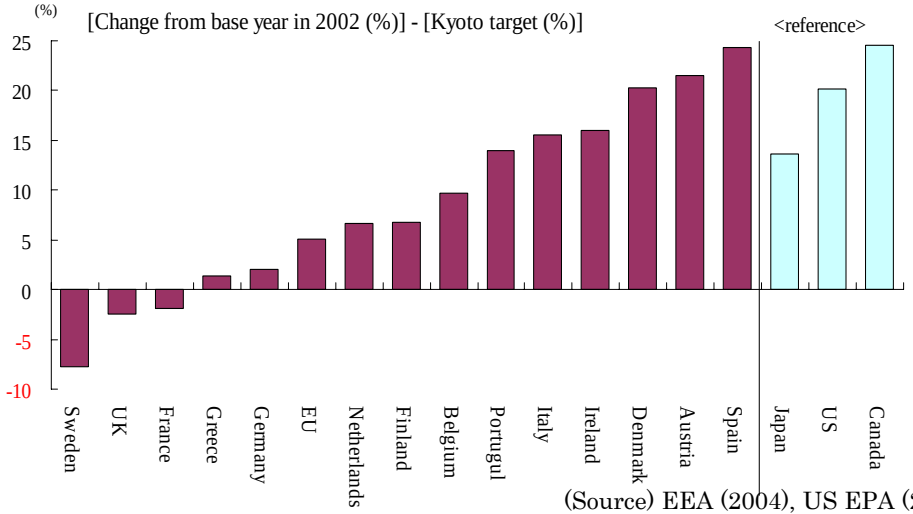
➢The prevailing view in the US is that the Kyoto Protocol is a "non-starter" (i.e., nothing will arise from the Kyoto Protocol).

International situation regarding climate change
(continued)

＜European Union＞

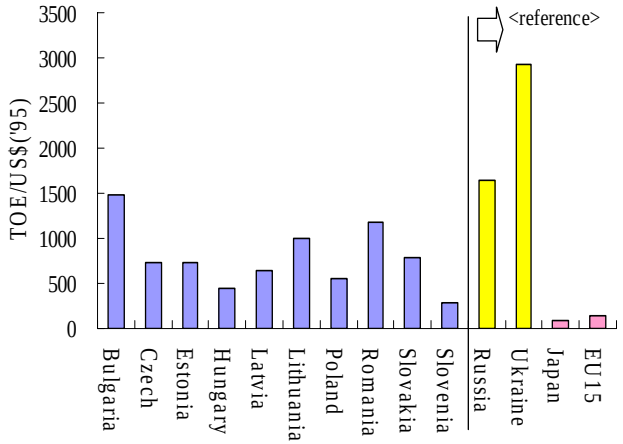
- Overall GHG emissions were down compared to 1990; however, reaching its target under the Kyoto Protocol (- 8%) will not be an easy task for the EU either. The emission reduction thus far is largely due to factors that are not directly related to climate change policies (e.g., the unification of East and West Germany, the fuel switch from coal in the UK, and reduced methane emissions due to mine closures).
- The EU will commence operation of a cap-and-trade emissions trading scheme (EU-ETS) from 2005; however, many countries could not conduct strict allocation of quotas due to concerns over industrial competitiveness and economic growth (they allocated larger emission quotas than their recent emission levels). Therefore they are embarking on efforts to gain emission reduction credits outside their region through CDM and JI.
- Some major countries in the EU have independently announced the medium to long-term reduction targets that developed countries should take. The EU apparently consider that the main elements of commitments in the future framework should be placed within the Kyoto Protocol approach (i.e., reduction of absolute emissions by developed countries).
- By forming a “bubble” of 27 countries under the next framework, the EU could include huge reduction potential by energy-saving in the Central and Eastern European countries and, hence, ensure considerable flexibility.

Fig: Difference between GHG emissions and Kyoto targets in the EU



(Source) EEA (2004), US EPA (2004), etc.

Fig: Energy efficiencies of Central and Eastern European countries



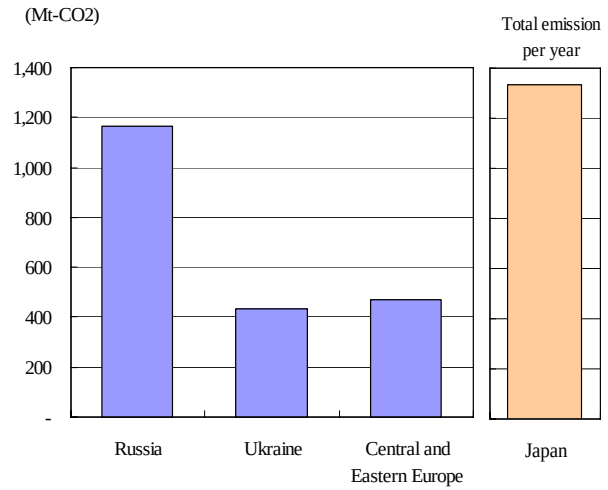
(Source) IEA (2003)

International situation regarding climate change
(continued)

＜Russia＞

- Despite a large amount of surplus up to its target under the Kyoto Protocol (0%) (about 1.2 billion tons yearly, nearly equivalent to the total amount of Japan's annual GHG emissions), opinions in the country have been divided due to concerns that its economic growth would be obstructed and questions of the scientific integrity of the Protocol.

Fig: Surplus in economies in transition



(Source) UNFCCC (2004)

- Since 1999 Russia has exhibited remarkable economic growth, and its CO_2 emissions bottomed out in 1999. Russia should be required to work toward emission limitation or reduction in the next framework. Thus, hot air should not be used as an incentive for participation.

International situation regarding climate change
(continued)

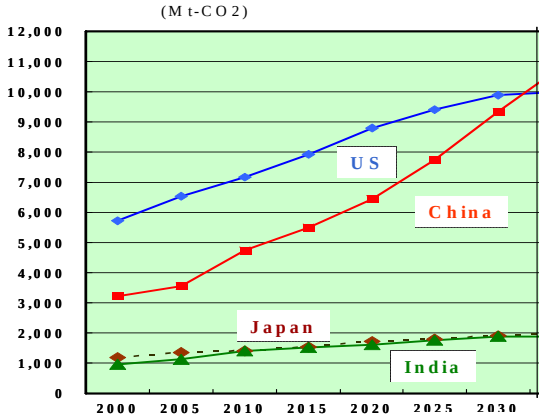
<China>

- It is expected that, in the next 20 years (2000 to 2020), China will see its economy grow four-fold and its primary energy consumption double. In 2030, its primary energy consumption is expected to triple the 2000 figure. This will put China's primary energy consumption in 2030 on a par with the sum of current consumption levels of Japan and the US.
- In terms of CO_2 emissions, some studies estimate that China will surpass the US to become the world's largest emitter around 2030. It is also expected that China's future CO_2 emission increase will likely account for about half of the emission increase in all developing countries.
- China has substantial room for energy conservation, and can attain an energy-saving of 26%, according to some studies. Furthermore, it is estimated that, compared at the same reduction costs, China can achieve ten times more reduction of CO_2 emissions than Japan.
- On the other hand, rapidly increasing energy consumption raises concerns over a stable energy supply in China. In addition, coal-dominated energy consumption leads to serious environmental problems, such as SOx and NOx emissions. And there is a possibility that SOx and NOx-caused acid rain will have a wide impact in East Asia, including Japan.

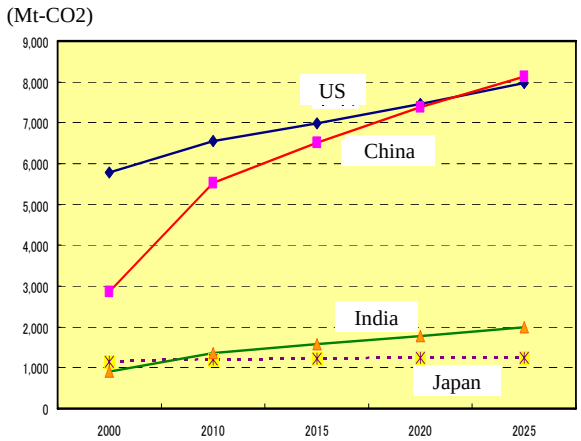
<India>

- India's primary energy consumption is expected to double by 2030 and it is highly likely that its CO_2 emissions will rival Japan around 2010.

Fig: CO_2 emissions from major countries



(source) RITE (2004

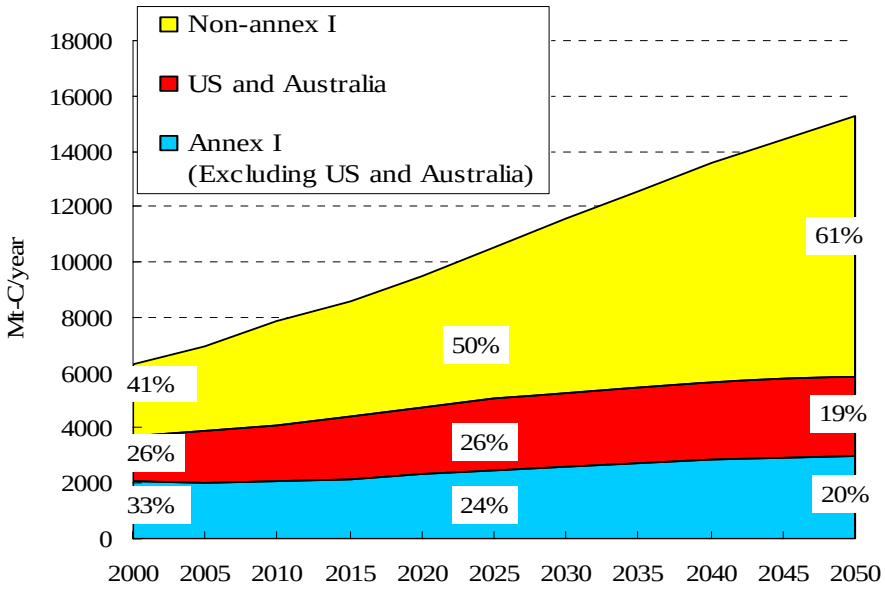


(Source) DOE (2005)

Long-term outlook of CO_2 emissions

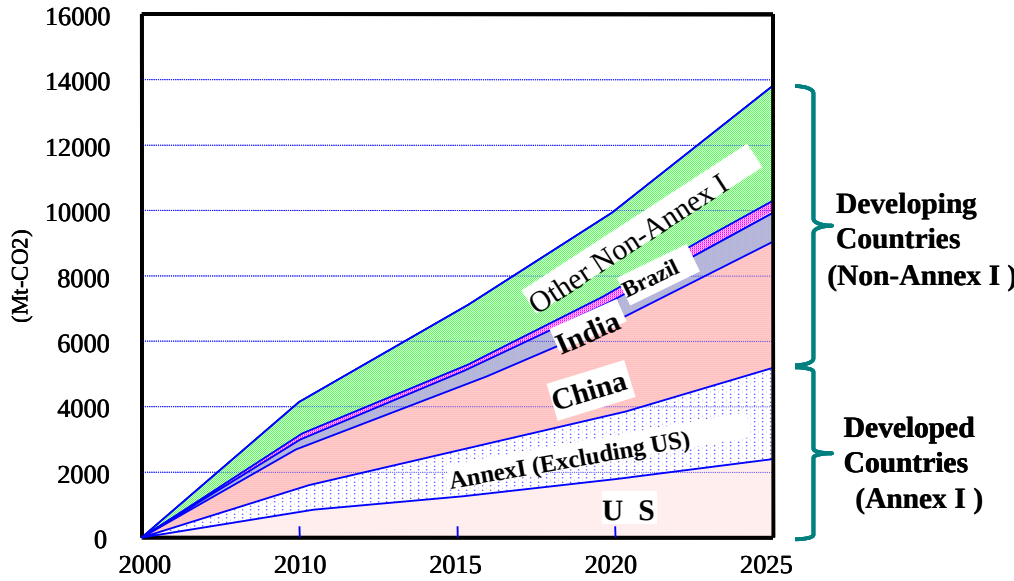
➢ *In addition to the reinforced domestic efforts by developed countries, global measures need to be adopted to substantially limit and reduce emissions over the long term.*

Fig : Long-term outlook of CO_2 emissions



(source) RITE (2004)

Fig.: Outlook of CO_2 emission increase from 2000



(Source) DOE (2004)

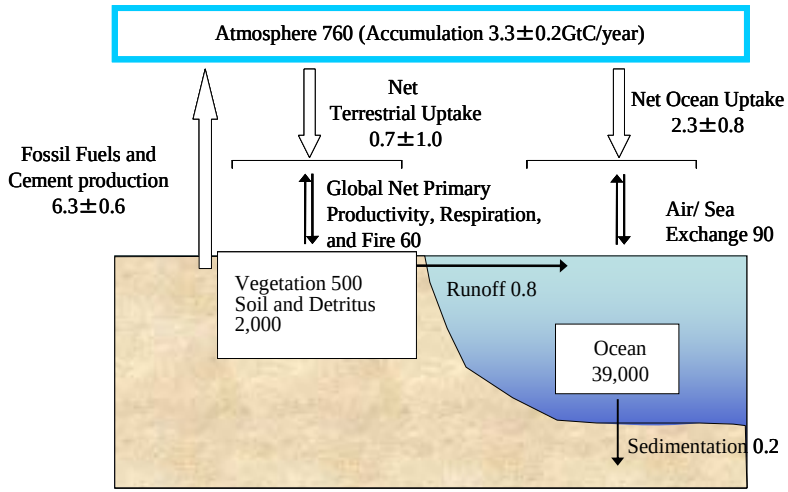
World Energy Outlook (2004) / Key Points

- On current policies, world energy needs will be almost 60% higher in 2030 than now.
- Energy resources are more than adequate to meet demand until 2030 and well beyond.
- But projected market trends raise serious concerns:
  - Increased vulnerability to supply disruptions
  - Rising CO_2 emissions
  - Huge energy-investment needs
  - Persistent energy poverty
- Asia's importance to world energy markets and its share in CO_2 emissions will continue to grow.
  - Most of the region's incremental demand and emissions will come from developing Asia - notably China and India.
- A truly sustainable energy system will call for faster technology development and deployment.
- Urgent and decisive government action is needed.

Medium and long-term outlook of climate change

- As stated in Article 2 of the UNFCCC, the ultimate objective for addressing climate change is “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”.
- In order to stabilize the atmospheric concentration of CO_2, carbon emissions from the burning of fossil fuels need to be balanced with the terrestrial and ocean carbon uptake. To balance emissions and uptake, emissions must be drastically reduced to less than half of the current level.
- The IPCC scenario for stabilizing at 550 ppm (WRE550) shows that, although emissions need to be reduced to less than half of the current level, about one-fourth reduction will be necessary in comparison with the future emission peak.
- The stabilization of GHG concentrations in the atmosphere is an enormous challenge facing mankind.

Fig.: Carbon Cycle (1989-1999)

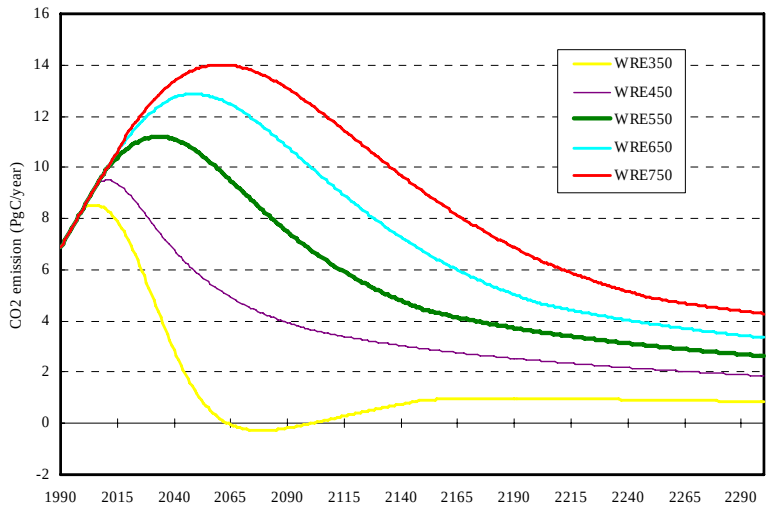


Note 1) Numbers in boxes show carbon stock in GtC. Numbers with arrows show carbon flow in GtC/year.

Note 2) Error ranges are expressed as 90% confidence intervals.

（Source）IPCC (2000)

Fig : Emission scenario to stabilize atmospheric CO_2 concentrations



(Source) IPCC (2001)

Key issues on a future framework

(1) Participation of major emitters

➢The Kyoto Protocol as a starting point has a structure that does not provide incentives for participation in commitments due to its nature of commitments regarding emission limitation or reduction and the punitive compliance scheme in its implementation rules.

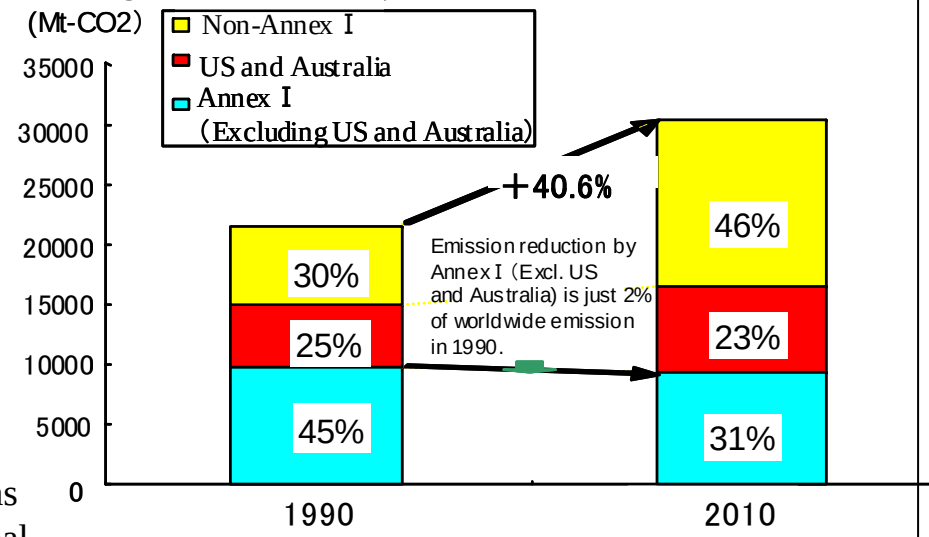
[During the first commitment period]

➢Emission reduction under the Kyoto Protocol by the Annex I Parties (excluding the US and Australia) amounts to only of global emissions in 1990. Even if these countries achieve their reduction targets, global CO_2 emissions in 2010 will increase by approximately 40% compared to 1990.

[After the first commitment period]

➢The share of emissions from Annex I Parties (excluding the US and Australia) in global emissions will fall dramatically to 20% in 2050. Even if these countries reduce their CO_2 emissions by half by 2050, this will only result in a 10% reduction of global emissions, which will in any case double compared to 1990.

Fig： Effect of the Kyoto Protocol



Fig： Long-term outlook of CO_2 emissions

➢Emissions from developing countries will increase dramatically in the future. By 2020-2030, developing countries will surpass developed countries in terms of CO_2 emissions, and in 2100 emissions from developing countries will be three times those from developed countries.

➢Participation of the US is a prerequisite for gaining participation by major developing countries. Unless the US does participate, it is highly unlikely that major developing countries such as China and India will take part in efforts to limit emissions.

Key issues on a future framework *(continued)*

(2) Commitments

➢Characteristics of short-term targets on absolute emissions

•It does not lead to significant reductions

-Implementation of policies and measures that will constrain economic growth is considered as unrealistic by each country in the short-term in which available technologies are limited and drastic change in energy-related infrastructure is difficult.

•It has a risk of hot air

-Hot air actually seen in countries in economic transition is enormous as follows: Russia 1.2 billion tons; Ukraine 0.4 billion tons; and Central and Eastern European countries 0.5billion tons (compared to Japan's overall annual emissions of 1.3 billion tons).

•It does not sufficiently encourage technology development

-Setting short-term targets does not encourage each country to allocate sufficient resources to policies and measures which bring only long-term effects, such as technology development.

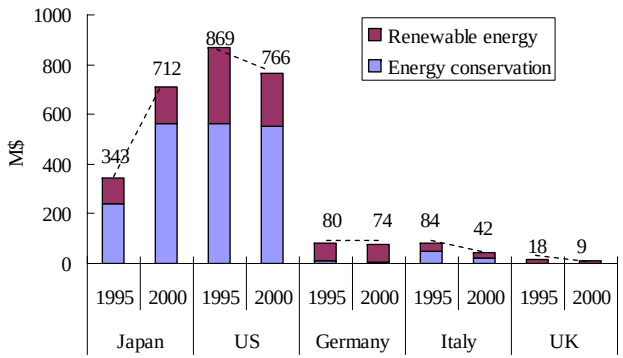
•It may be less cost-effective

-Compliance costs in short-term targets, even if their reduction is small, will likely be larger than the cost in significant emission reduction to be achieved in the long-term under new technologies and infrastructures.

•It is difficult to set equitable targets

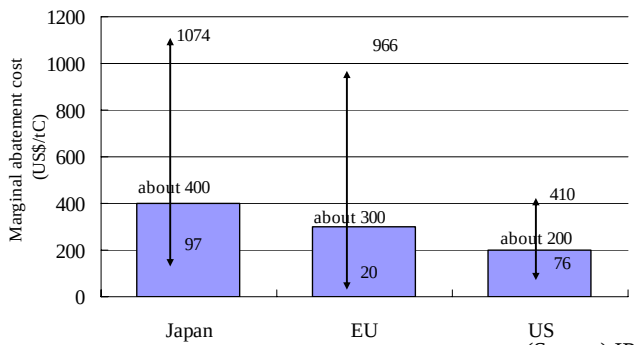
-Politically-determined targets result in large differences in compliance costs for each country

Fig : Energy-related R&D investment by government



(Source) IEA (2002)

Fig : Cost calculation for each country to achieve Kyoto target



(Source) IPCC (2001)

Key issues on a future framework *(continued)*

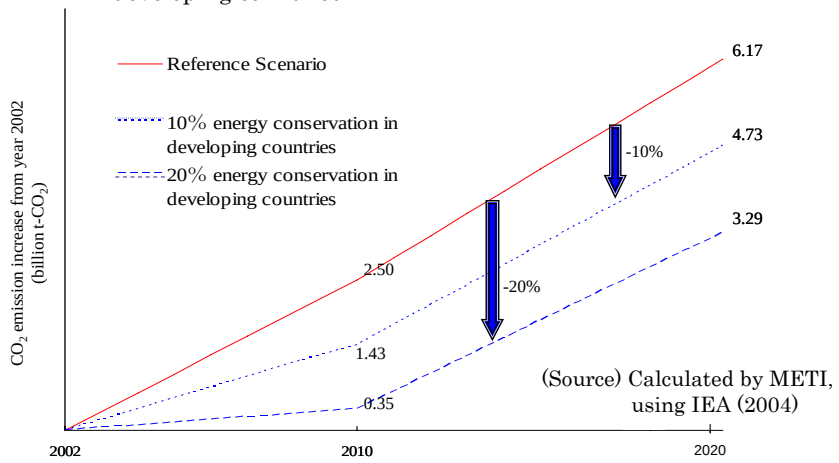
Basic principles on commitments

・Commitments must create incentives to participate for a wide range of major emitters, including developing countries.
・Through its commitments, each country makes efforts toward the drastic and long-term emission reduction that is needed to stabilize GHG concentrations.

➢Measures that lead to emission limitations in developing countries

- Energy-related investment in developing countries between 2001 and 2030 will amount to 8 trillion dollars (1.2 times the investment in developed countries). Considering the long life-time of such infrastructure, introduction of energy-saving technologies or non-fossil fuels in energy and industrial investment has significant impact on medium and long-term global emission trends.
- The potential for energy-saving in developing countries is high and, if 20% of energy is saved in developing countries as a whole, the increase in CO_2 emissions from developing countries in 2020 will decline to roughly half of what it would be without energy-saving measures.
- In Japan, past efforts to save energy have contributed to strengthening industrial competitiveness. Through improvements in energy efficiency, developing countries can also boost their economic prosperity

Fig: Potential of CO_2 emission reduction by energy conservation in developing countries

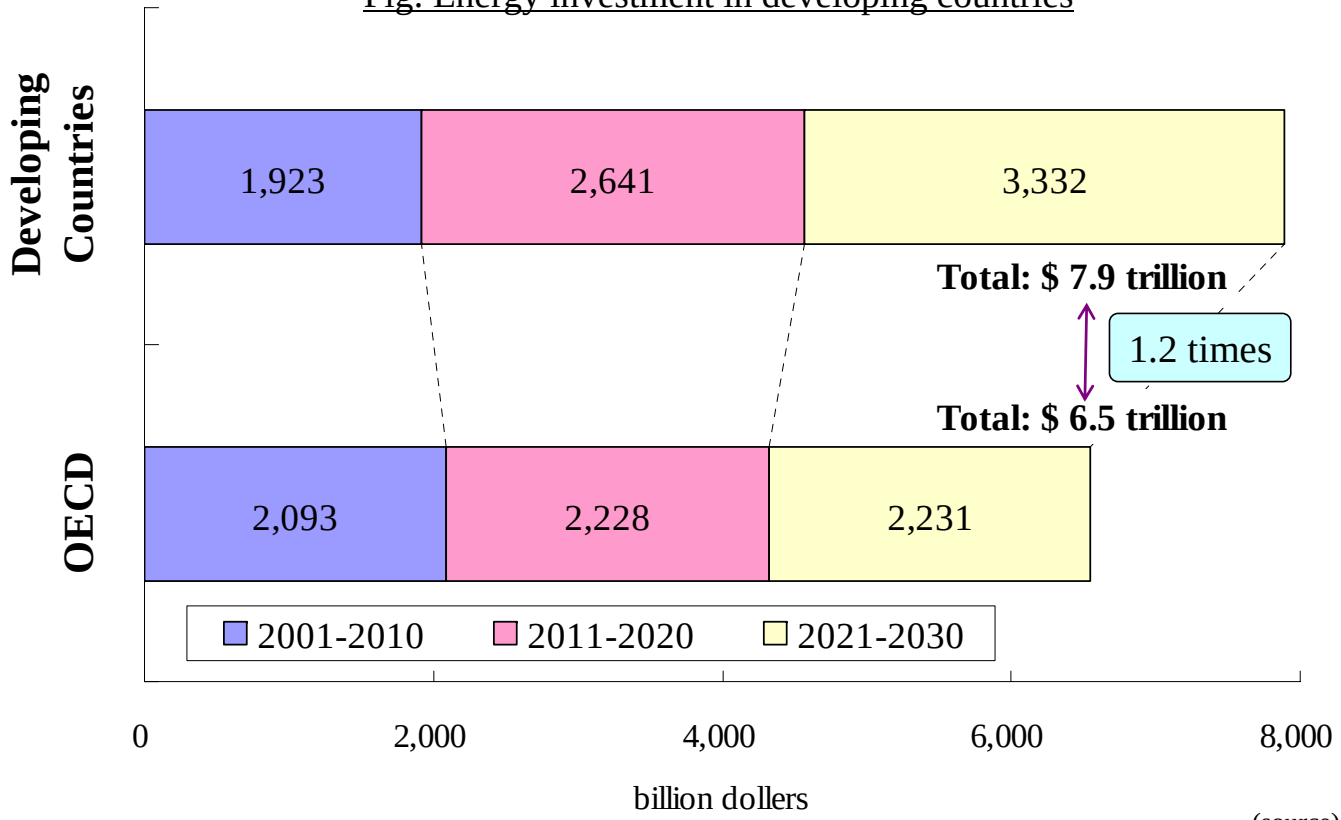


- Given the principle of "common but differentiated responsibilities", developed countries should take the lead in combating climate change and it is particularly important to introduce incentives for participation of developing countries, through technology transfer, for example. If assistance to developing countries is acknowledged as part of developed country commitments and thereby is encouraged, incentives to participate in mitigation efforts will emerge among developing countries. Commitments for emission limitation in developing countries should be achieved through cooperation between developed and developing countries.

Ref: Energy investment in developing countries

- *Energy and industry-related infrastructures are expected to be built in developing countries at a much faster rate than in developed countries.*
- *Given the long lifetime of these infrastructures, how such investment is implemented in developing countries will essentially "lock in" the medium and long-term trend of global emissions.*

Fig: Energy investment in developing countries



(source) IEA (2003)

Key issues on a future framework *(continued)*

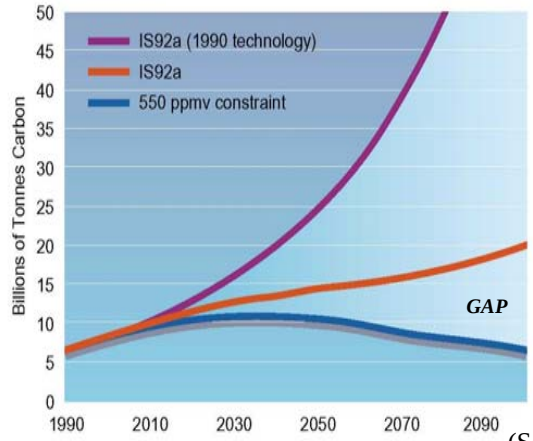
➢Measures that bring about fundamental emission reduction

【Development of innovative technologies】

A BAU scenario (IS92a) presented in the IPCC's SAR estimated that, even though it incorporates considerable progress in energy technologies, emissions equivalent to almost double of the current emission level must be reduced through additional technological innovation in order to achieve the 550-ppm stabilization scenario.

As seen in the case of development of photovoltaic power in Japan, new technologies, if successfully developed, can contribute to global emission reduction.

Fig. : Importance of innovative technologies in CO_2 emission reduction



(Source) Battelle (2000)

【Use of existing technologies】

In promoting diffusion of existing technologies, governments must encourage private-sector efforts through policies and measures. If cross-border and sectoral intensity targets such as energy efficiency (benchmarks) are set, the commitments would ensure a good balance between environment and economy, and equity.

➢Measures for addressing the hot air issue

In the countries with great amount of hot air, incentives to reduce emissions may not sufficiently function in spite of their high potential of energy saving. It would be more effective to promote concrete actions toward improvement of their energy efficiencies.

➢Long-term perspectives for promoting fundamental actions

A longer commitment period should be established in a future framework, so that each country can take, in a cost-effective manner, such measures as development of innovative technologies and construction of infrastructure of energy, transport, etc, which require a long period of time until their effects on emission reduction appear.

Design of the future framework

1. Commitments to actions

Each country commits to the following specific actions in accordance with its own comparative advantages. In the interest of gaining wider participation, a certain degree of flexibility should be given to each country with regard to which commitments it wants to emphasize.

(1)Cooperation for emission limitation in developing countries

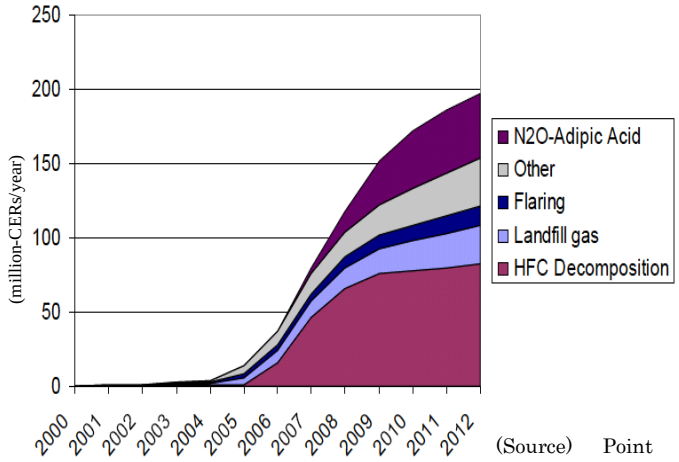
➢Cooperation by governments

- Taking account of regional impacts of energy supply and environmental issues, promotion of regional cooperation for energy-saving and environment is important. With regard to Asia, China in particular, Japan should encourage energy-saving and environmental cooperation and play an active role not only in addressing climate change, but also in stabilizing energy supply/demand and solving air pollution in Asia, both of which have significant impacts on Japan.

➢Cooperation through private sector (fundamental reform of CDM)

- CDM is a significant scheme that simultaneously contributes to developed countries' achievement of emission reduction targets and to sustainable development in developing countries. However projects contributing most to sustainable development of developing countries such as energy-saving and renewable energy have not been realized because of difficulty in demonstrating additionality.
- Projects for HFC and nitrous oxide can enjoy high returns as investments, but the number of projects is limited. Therefore, if operation of CDM continues as it is in the future, CDM will practically end without leading to any energy-related actions.

Fig： Supply of CERs until 2012



(Source) Point Carbon

Design of the future framework *(continued)*

➢ Cooperation through private sector (fundamental reform of CDM) *(continued)*

・The CDM scheme needs to be re-designed so as to make it easier for developed countries to cooperate for sustainable development in developing countries, and CDM should provide incentives for energy conservation in developing countries. The followings are the starting points that can be a guidance for future discussions:

<Incentives for developing countries to take action>
- Facilitate as CDM the actions to comply with host government's regulations.
- Encourage so-called "unilateral CDM" (emission reduction project of GHGs implemented solely by a developing country without cooperation from a developed country).

<Accelerated diffusion of energy-saving and renewable energy technologies>
- Prepare a "positive list" for energy-saving technologies and approve projects which introduce one of the listed technologies as CDM.
- Approve reductions by ESCO projects as CER.
- Encourage so-called "Sectoral CDM"

<Role of developed countries toward substantial reduction>
- Discount CER which are credited to developed countries for net emission reduction.

<Others>
-Approve nuclear energy projects on the premise of ensuring nuclear safety and non-proliferation.
-Approve additionality for projects that have pay-back periods longer than a certain criterion (for example, two years).
-Approve emission reduction below the current level as CER.

・While there is a principle of "supplementarity" for CDM and JI, international emission reduction through CDM and JI should be considered as one of the key actions, in addition to domestic actions, under the future framework.

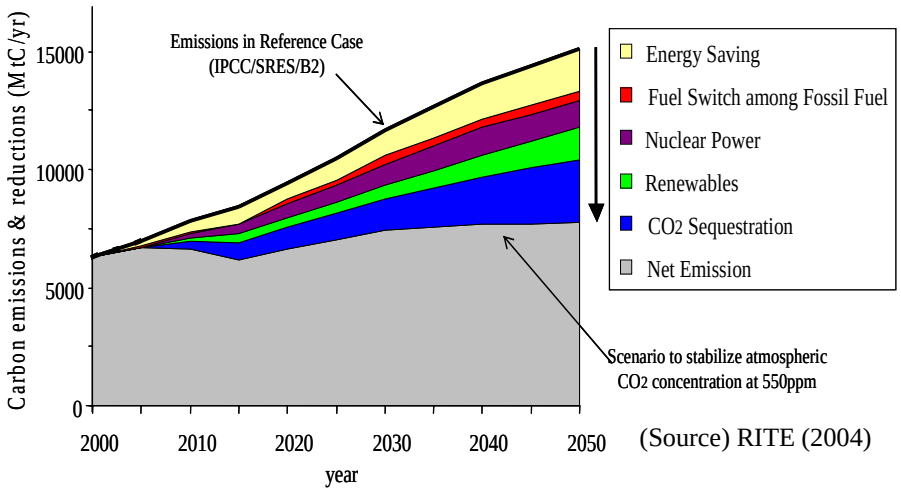
Design of the future framework *(continued)*

1. Commitments to actions *(continued)*

(2)Development and diffusion of innovative technologies

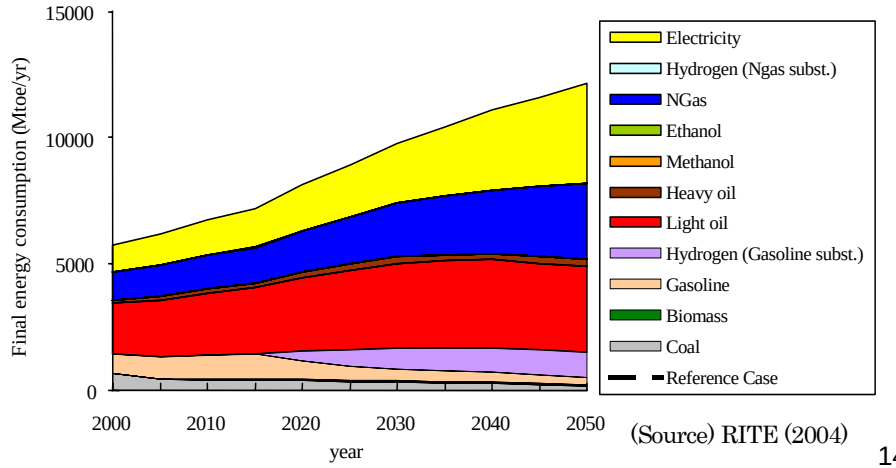
- To stabilize GHG concentrations, CO_2 sequestration and storage, renewable, nuclear energy and fuel switch among fossil fuels will play a major role on the energy-supply side, and hydrogen technology and energy-saving will do likewise on the energy-demand side.
- It is necessary to move toward development of multiple technologies, as a single technology will not be able to stabilize GHG concentrations.
- In the area of carbon sequestration and hydrogen technology, international cooperation should be strengthened. It is also worthwhile examining possible establishment of international funds to supply research grants, as seen in the precedent of Human Frontier Science Program (HFSP).
- Innovative technologies, once developed, need to be diffused on a global scale. From this point of view, a new scheme developed from the current CDM will be important.

Fig.: CO_2 emission reduction by various technologies



(Source) RITE (2004)

Fig.: World-wide final energy consumption by various fuels



(Source) RITE (2004)

Design of the future framework *(continued)*

1. Commitments to actions *(continued)*

(3)Cross-border and sectoral intensity improvement

- From the viewpoints of promoting diffusion of existing technologies and addressing the hot air issue, it is appropriate to aim for the world's highest energy efficiency or emission intensity attainable with existing technology. This should be done through the so-called "top runner approach" on a cross-border basis and for each major sub-sector.

- Industry sector

  - Given shared concerns over industrial competitiveness and leakage to developing countries, it is particularly important for each country to implement measures aiming for the world's highest energy efficiency or emission intensity for major sub-sectors (specified through benchmarking by international industry groups).

  - Should these actions be taken, the CO_2 reduction potential based on the examples of the electric power (thermal power), iron and steel, cement, and paper pulp industries, could reach at least 2 billion tons and reduce the current global CO_2 emissions (approximately 23 billion tons) by some 10%.

- Residential and transport sectors

  - In the residential and transport sectors, each country can improve social system infrastructure such as transport, and introduce and reinforce energy-saving standards in order to facilitate introduction of highly efficient equipment. If actions for introduction of highly efficient equipment were to be taken, the CO_2 reduction potential based on the examples of automobiles, refrigerators, air conditioning, lighting, and building insulation could be at least 1 billion tons and reduce the current global CO_2 emissions by some 5%.

Design of the future framework *(continued)*

2.Numerical targets

- Since the impact of climate change is determined by overall global emissions, numerical targets should also be set in terms of global emissions, on the basis of reduction potential through commitments to specific actions.
- The setting of national numerical targets alone should be considered difficult to solve climate change. Such specific actions as cooperation for developing countries and technology development should be strengthened as commitments in the future framework. It would be necessary to regard numerical targets as complementary commitments that are introduced as incentives to domestic emission reduction efforts in each country.
- The next commitment period should be set on a longer-term basis (such as from 2013 till 2030 or 2050). Such longer-term target setting will make it easier to gain participation from a broader range of countries.
- Given the hot air issue, the year 1990 should not be regarded as an unchangeable base year for future numerical targets.
- With developed countries' support for emission limitation, major developing countries should set some numerical targets as commitments that ought to be attained through cooperation between developed and developing countries.

Design of the future framework *(continued)*

3.Review process

➢Periodical pledge and review

A system should be introduced to review the contents of overall commitments periodically, taking account of the global emission trend and the progress in technology development. It can prevent efforts for short-term reduction from not being made properly. It is also essential to praise successful cases of policies and measures and thereby utilize this review as a "learning process" for the Parties.

➢Compliance scheme

Severe compliance schemes may not only lead countries that have once participated in the framework to withdraw from it, but also undermine willingness of a wide rage of countries, including major emitters, to participate in the future. The compliance schemes of other environmental conventions or protocols have, in general, compliance-assisting or compliance-promoting measures.

The compliance scheme should not be punitive. Instead, if a country fails to attain its target, other countries should review the causes for this and provide technical and financial assistance to promote future actions.

➢System development as a prerequisite for review

Major emitters should commit to development of emission inventory, and submit an annual report on emissions.

4.Adaptation

➢It will be important to strengthen adaptation capacity to the adverse effects of climate change and to reduce damages, while attempting to mitigate climate change through emission reduction measures. Research on integrated approach of mitigation and adaptation is expected to advance in the IPCC.

How to proceed with international discussions

➢Major emitters' initiative

If the top fifteen GHG emitters in the world are brought together, they will cover some 80% of global emissions. First of all, these fifteen major emitters should constitute the "critical mass" and seek for an agreement among themselves.

➢Involvement by energy and industry policy circles

In the future international negotiation, contribution by energy/industry policy circles of major emitting countries is important.

➢Involvement by industry sectors and NGOs

It is expected that industry sectors and NGOs in each country deepen international discussions on actions they can take and contributions they can make. For the industry sectors, sectoral international collaboration on benchmarking, their policy suggestions to national governments and contributions to the IPCC process are important. NGOs have carried out broad activities, such as enhancement of public awareness and various measures on a grass-roots basis. In the future, NGOs are expected to reinforce these activities and produce further concrete outcomes, taking into account possibility of international collaboration.

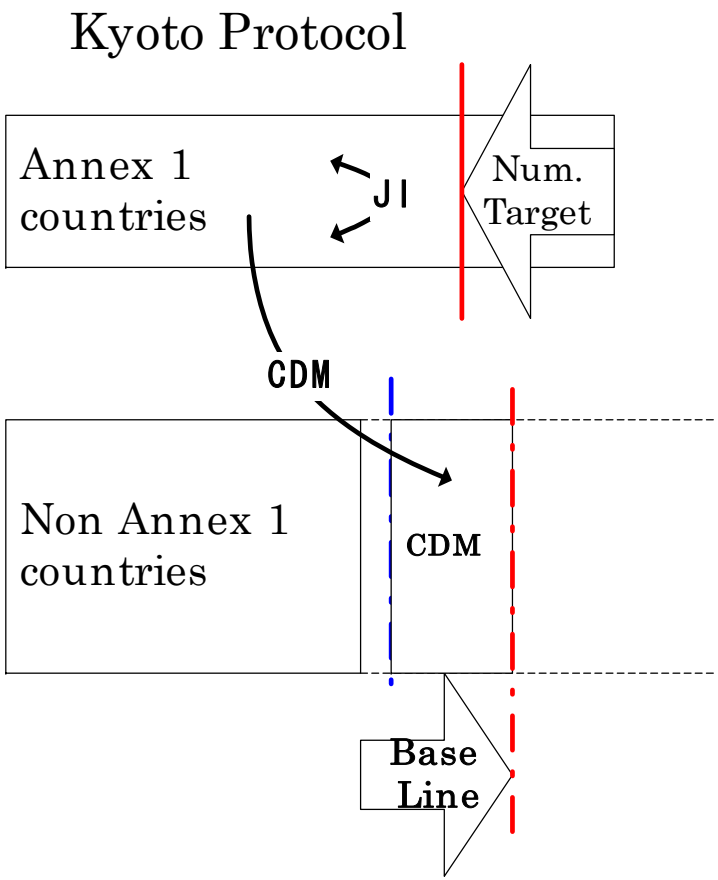
Summary

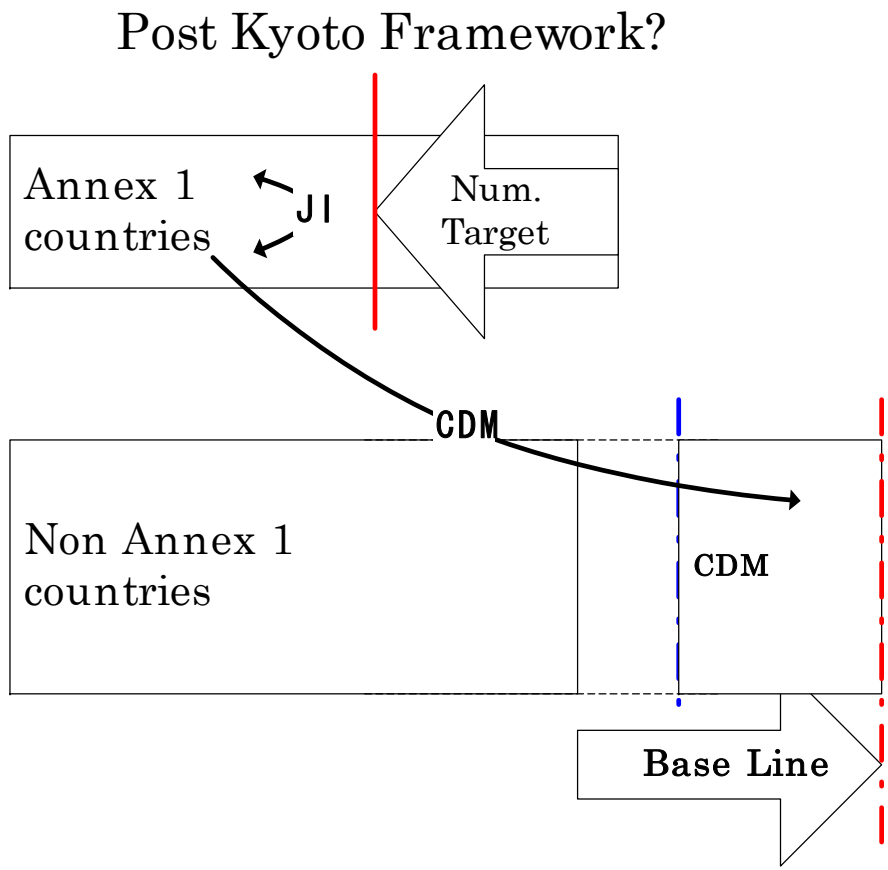
- Major issue in Kyoto Protocol：lack of participation of major emitting countries, difficulty in CDM operation(becoming smooth now with experience)
- Deep cut is required in long term
  - Participation of major countries including developing countries is indispensable
  - Needs incentive to participate
  - For Developing countries, energy conservation is most effective, and CDM can be good measure if appropriate framework, process and baseline is established.
  - For long term, it is difficult to set valid numerical target, rather to promote effective tools which can be realized
    - ＝＞Sector CDM，R&D for future deep CO2 reduction
- Finally, CO2 emission cap may be necessary for all countries (numerical target?)
    - Long term prospects is necessary

Questions in Current framework

- What is the meaning of numerical targets only for the limited members of article 1 countries？
- What is the carbon credit by unilateral CDM or discounted CDM without any cap.
  - There is no limit of CO2 emission if baseline growth of CO2 emission is admitted.
  - more credit by expanding the “baseline” CO2 emission by economic growth: no incentive to reduce “baseline” CO2 emission for developing countries
  - No effect for CO2 reduction in global sense

Concern about Post Kyoto Framework





Major issues to be discussed

- Is it possible to cut the vicious cycle between US-Developing countries to avoid participation?
  - How to convince USA? Almost impossible, no incentive
  - How to induce Developing countries? CDM ODA?
- Is it possible to cooperate with EU countries to realize effective and practical action?
  - EU countries and Japan are only countries which have substantial CO2 cap in the first commitment period.
- What is the future stable level of CO2 concentration?
  - Step by step numerical target?
    - Raising debate for cap every time of perid
  - To discuss long term target for the future?
    - How to set roadmap during the term, monitor the process?

Japanese action afterwards

energy conservation

- Revision of Energy conservation Law
  - Energy control at factories and business establishments
  - Promotion of construction of large-scale energy-saving facilities
  - Reinforcement of energy-saving performance by Top Runner standard
  - Promotion of the presentation of easy-to-understand energy-saving information at sales points
  - Enforcement of Submission of energy-saving measure application reports for larger residential houses
  - Reinforce fuel economy standard for large-sized trucks
  - Enforcement of Submission of energy-saving measure plans and reports or consigners as well as carriers
- Promotion of CDM by the government, JI, or GIS

Japanese action afterwards

- Participation to APP (Asia Pacific Partnership)
  - Partnership of major CO2 emitters: more effective
    - Especially USA, China and India participate, outside key roll players of Kyoto Protocol
  - Focus on Short term energy conservation and long term innovative technology R&D
  - For Japan, alternative effort when FCCC negotiation fails
- Promote and support IEA task to develop Energy indicators regarding sector approach

Vision of Asia Pacific Partnership

Reference

from Statement at July, 2005

6 Partners

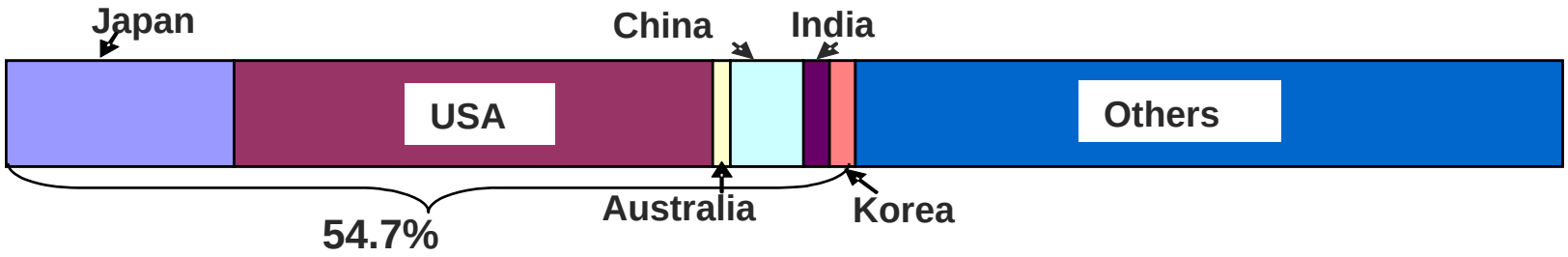
- Enhance cooperation to meet both our increased energy needs and associated challenges, including those related to air pollution, energy security, and greenhouse gas intensities.
- Develop, deploy and transfer cleaner, more efficient technologies and meet national pollution reduction, energy security and climate change concerns, consistent with the principles of the UNFCCC.
- Promote and create an enabling environment for the development, diffusion, deployment and transfer of existing and emerging cost-effective, cleaner technologies and practices, through concrete and substantial cooperation so as to achieve practical results.

Reference

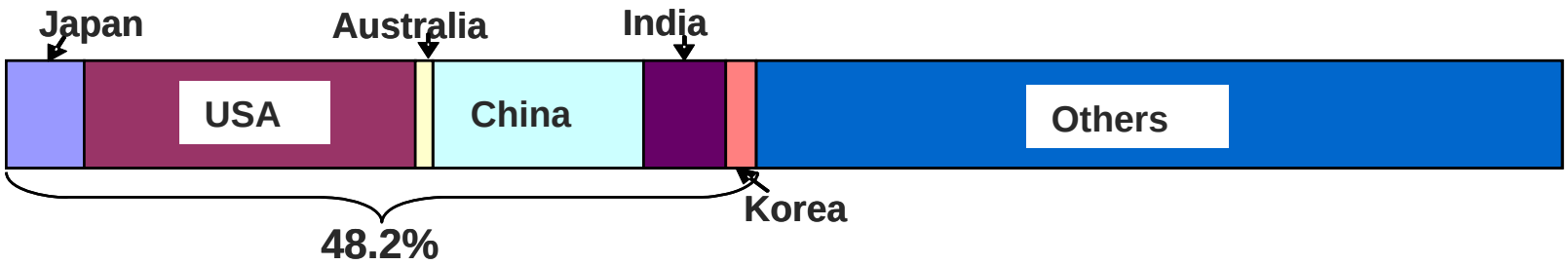
2. Outlook of the Partners

- 6 Pertners assume a half of the global share on GDP, Primary Energy Consumption, and CO2 Emissions.
- The data shows the signitficance of APP.

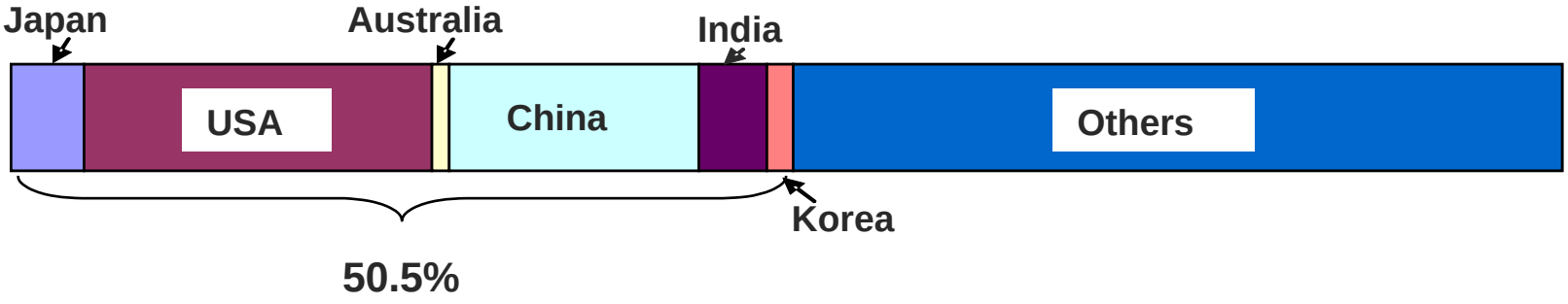
Real Gross Domestic Product（FY2003）



Primary Energy Consumption（FY2003）



CO2 Emissions（FY2003）



Reference

4. Charter for the APP

1) Shared vision

◆Advance clean development and climate objectives, recognizing that development and poverty eradication are urgent and overriding goals .

◆Enhance cooperation to meet both our increased energy needs and associated challenges, including those related to air pollution, energy security, and greenhouse gas intensities

2) Purposes of the Partnership

◆Create a voluntary, non-legally binding framework for international cooperation to facilitate the development, diffusion, deployment, and transfer of existing, emerging and longer term cost-effective, cleaner, more efficient technologies and practices

◆Explore the Partners' respective policy approaches relevant to addressing interlinked development, energy, environment, and climate change issues

Reference

5. Communiqué for the APP

1) Task Forces

(1) Cleaner fossil energy, (2) Renewable energy and distributed generation, (3) Power generation, (4) Steel, (5) Aluminium, (6) Cement, (7) Coal mining, (8) Building and appliances

2) Tasks

◆Review the current status within the thematic area with regard to clean development and climate

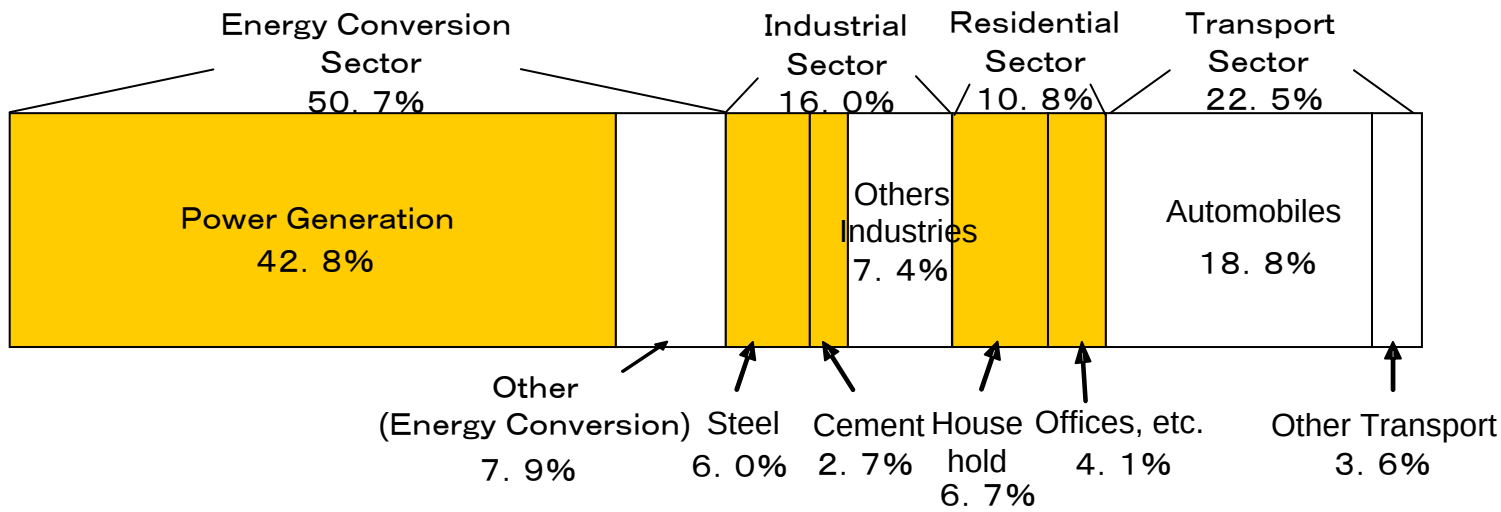
◆Share knowledge, experience and good practice of how efficiency can be improved

◆Systematically roadmap, where appropriate, relevant existing and emerging technologies

◆Develop an action plan that identifies specific opportunities for co-operation and wherever possible, ambitious and realistic goals

Reference

◆CO2 emissions in the 6 Partners from the sectors under 8 Task Forces



Note) Percentages of CO2 emissions from Iron and steel, and cement are much lager than the above, since they include emissions from industrial processes as well as energy consumption.

･･･APP 8TF（60% of CO2 emissions from 6 partners）

Source: Estimated from data in IEA (2004), "CO_2 Emissions from Fuel Combustion", IEA(2005), "World Energy Statistics 2005"
Note: Sectoral emissions have been estimated based on the records of primary energy supply, sectoral energy consumption and CO2 emissions by fuel.

Reference

6. Work Plan for the APP

1) Approach

◆Government/industry Task Force to develop sustainable solutions to shared challenges through bottom-up practical action, harnessing the power of private sectors

2) Priority

◆Task Forces to formulate detailed action plans outlining both immediate and medium-term specific actions, including possible “flagship” projects and relevant indicators of progress, if possible by mid-2006

3) Tasks

◆Review the current status of their sector with regard to clean development and climate
◆Share knowledge, experience and good practice examples of how industrial efficiency, energy efficiency and environmental outcomes can be improved
◆Identify specific opportunities for cooperation including with relevant international financial organisations such as the Asian Development Bank and the World Bank
◆Define the current state of the technology in terms of cost, performance, market share and barriers
◆Identify cost and performance objectives and the actions needed to achieve these objectives
◆Identify, wherever possible, ambitious and realistic goals

IEA task for G8 regarding benchmarking for energy efficiency

Reference

Gleneagles Plan of Action and the G8's Expectations for the IEA

■ Matters sought by the G8

In the 2005 Gleneagles summit, the G8 seeks the following from the IEA as part of its plan of action for addressing climate change:

(1) develop energy indicators to assess efficiency, and identify policy best practices; and

(2) advise on alternative energy scenarios and strategies aimed at a clean clever and competitive energy future.

■ The G8's expectations for the IEA

Whereas climate change issues had been addressed solely by environmental policies in the past, the G8 intend to implement practical solutions that also encompass economic policies and energy policies on a global scale. Therefore, the G8 expect the IEA to make positive contributions in addressing climate change issues as the international authority on energy policies.

Necessary Measures for Responding to G8's Demands

■ Addressing climate change issues from an energy policy perspective

90% of the CO_2 emissions come from energy use, and measures by energy policies are important. Effective measures for CO2 emission reduction are:.

(1) promoting introduction of renewable energy sources;
(2) increasing the use of nuclear energy; and
(3) promoting energy conservation.

Reference

■ Importance of promoting energy efficiency

Technology already exists, simplest and economic (free lunch) yet effective and has high impact

Can be implemented worldwide including developing countries.

The energy efficiency indicators, created by the IEA in response to the G8's demands, will be effective to promote global measures toward improving energy consumption efficiency.

CF: Renewable energy sources:high costs and supply capacity limitation.
Nuclear energy requires sufficient consideration in terms of its safety.

Effectiveness of Studies for Improving Energy Efficiency by Sector (2)

■ Promotion of technology transfer

The technology needs of developing countries become clear by focusing on individual sectors. Instead of an ambiguous general idea that “technology transfer is insufficient,” **more individual, concrete approaches can be made**, and effective measures can be promoted.

■ Promotion of developing countries’ efforts

-Detailed indicators taking account of environmental impacts that attract developing countries, developing countries can be encouraged to set their own goals.

-Clear indicator of CO2 emission level, e.g., the total emissions per GDP, is not always easy, for they need the correct values for total national emissions and GDP in developing countries. Sectoral goals that can be set by evaluating sector specific data are **more appropriate and feasible for developing countries**.

■ Realization of equity

Possible to set equitable goals by a bottom-up method, by evaluating the status of technology level of individual sector in each country, taking into account social / economic conditions. Furthermore, goal-setting on intensity basis can better reflect the **Best Available Technologies.**

■ Prevention of leakage

If goals are set by sector **across national borders**, there will be little distortion in competitive conditions will among companies in the same sector, so **leakage can be prevented**.

Reference

Important Qualities Expected for the IEA's Energy Efficiency Indicators

Reference

Allowing

Refined analyses within sectors,

Extensive participation in common frameworks,

Appropriate evaluation of contributions made by individual technologies

Points to Note in Developing Energy Efficiency Indicators

- Allowing reasonable and fair evaluation of efforts by individual entities considering its backgrounds and circumstances.
- For encouraging technology development, **especially in home electrical appliances and in the industrial sector.**
- Collecting data that serves as the basis for creating the indicators based on common methodologies across the countries/regions
- Considering the characteristics and regional attributes of each sector

IEA WG and objective sectors

- The following WGs are organized to provide information and evaluate individual standard, indicator and best practice.
- 1. Energy outlook 2006. Focusing on alternative energy scenario
- 2. Technology outlook in the world
- 3. Indicators, Specifications and standards
- 4. Construction sector
- 5. Electric appliances
- 6. Road Transportation sector
- 7. Industries
  - Power generation, Iron and Steel, Cement,
- 8. Clean Combustion technology