"Meeting Energy Needs, Reducing Environmental Impact"
A Climate Change Forum

Framework Beyond 2012

How to Find Ambitious and Practical Common Ground

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JETRO New York Center

“Make the U.S. a Leader on Climate Change”

- Only real solution to climate change requires all major emitting nations to join in the solution.

- Developing nations like China and Brazil must not be far behind in making their own binding commitments.

- To develop an effective and equitable global program, US will re-engage with UNFCCC.

- US will invigorate the MEM effort and bring all the major emitting nations together to develop effective emissions reduction efforts.

(excerpts from “New Energy for America”)

- We will make it clear that America is ready to lead.

  To protect our climate, we must call together a truly global coalition.

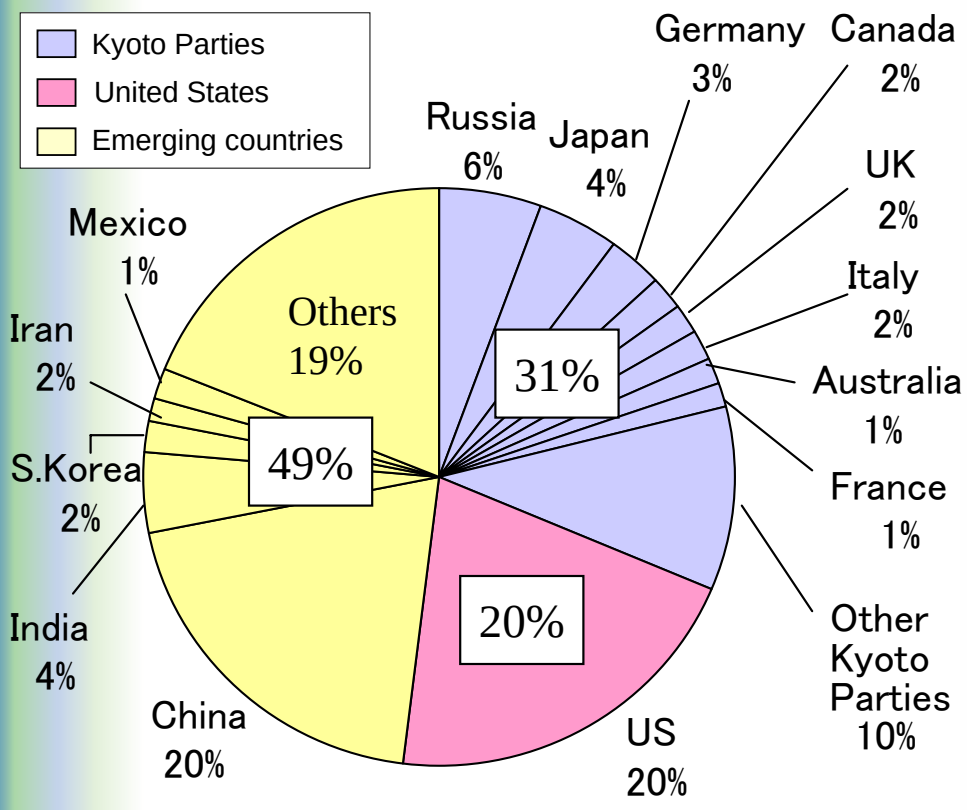
  We will ensure that nations like China and India are doing their part, just as we are now willing to do ours.

(excerpts from the speech on Energy Independence and Auto Efficiency Standards—Jan 26,2009)

Lessons of Kyoto Protocol

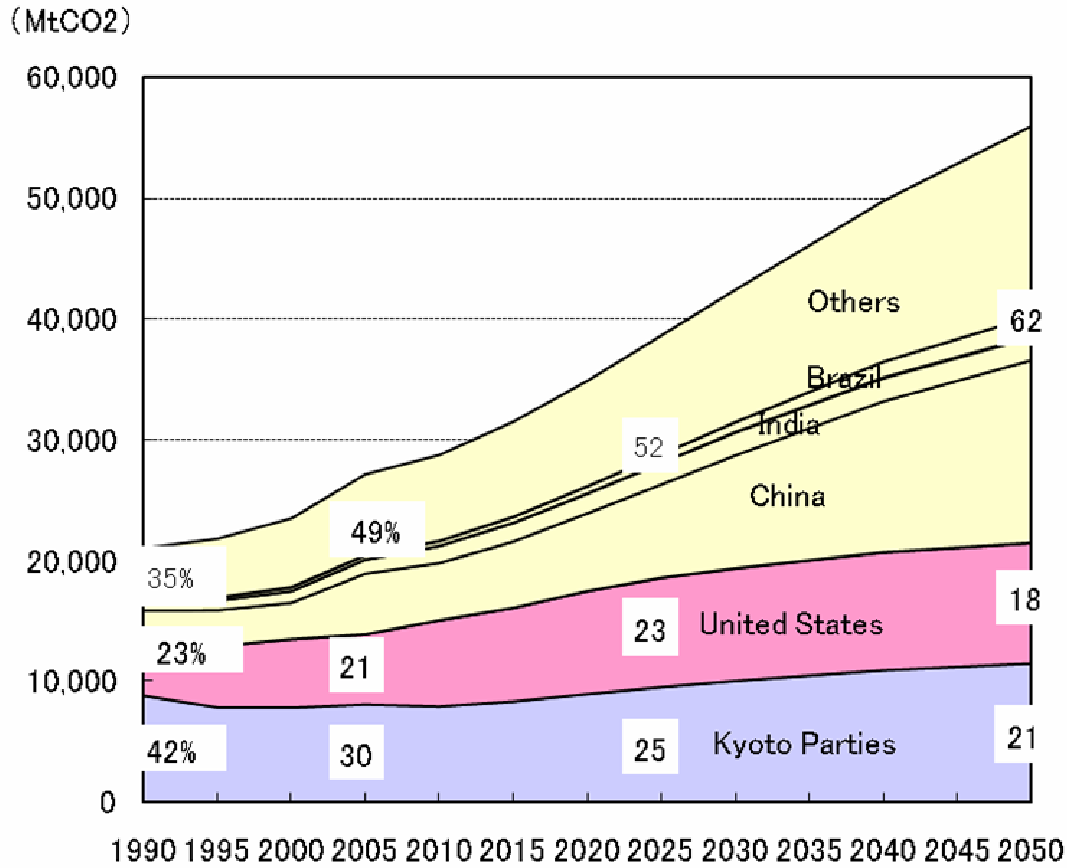
- Kyoto Protocol is the first international agreement on reduction of CO2 emission.
- Only 30% of global emissions are covered by Kyoto Parties.
- United States, China and India have no obligation.
- Emissions of emerging countries continue to increase significantly, and share will rise 62% in 2050.

Global CO2 Emission from Fuel Combustion (2006)



(Source) IEA

Estimation of future Global CO2 emissions



Source: Research Institute of Innovative Technology for the Earth (RITE)

Key Concept of Commitment of Future Framework

Bali Action Plan "b(i) b(ii)", mitigation

b(i) Developed Countries

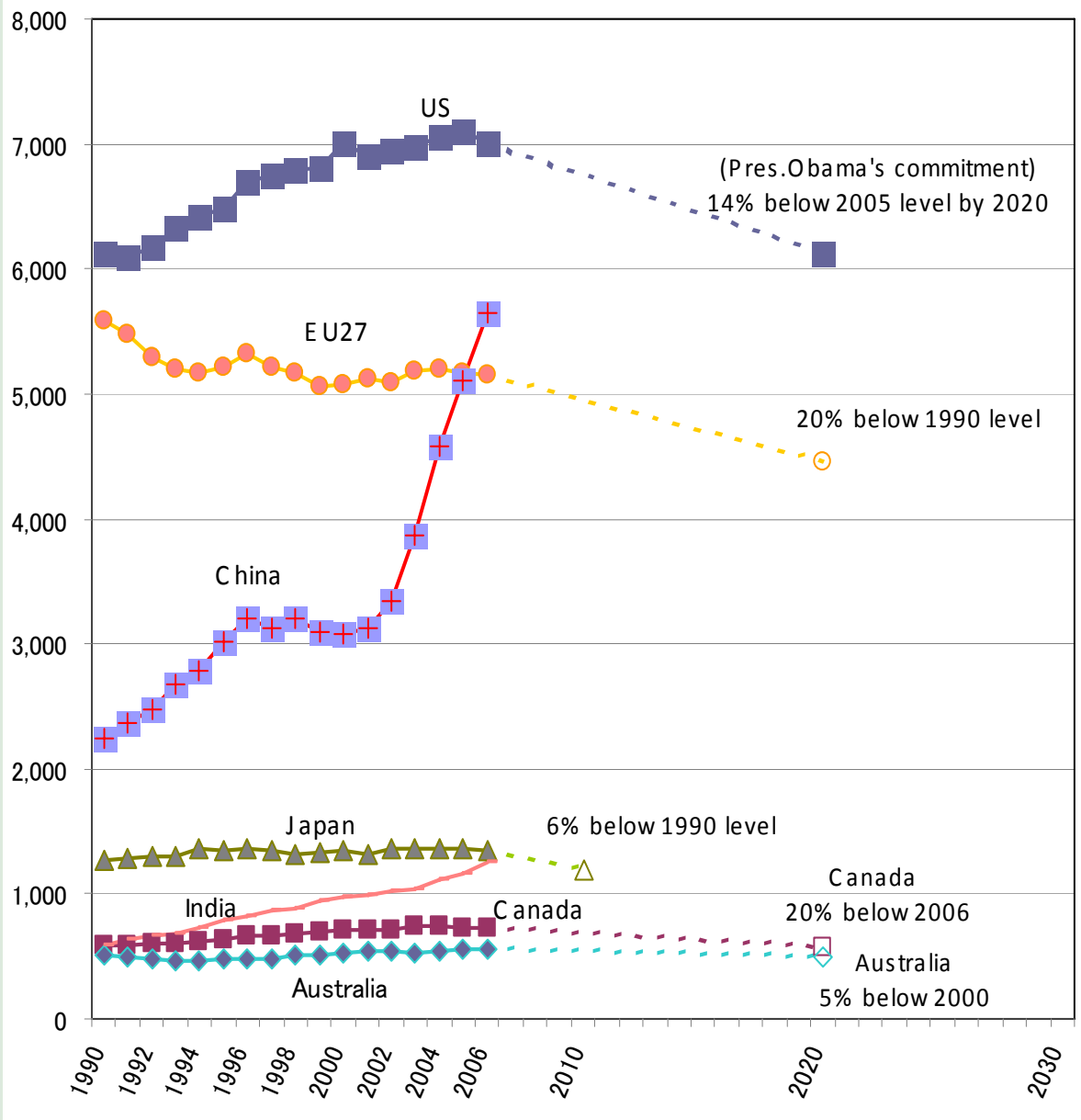
- Measurable, reportable and verifiable (MRV) nationally appropriate mitigation commitments or actions, including quantified emission limitation and reduction objectives (QELROs)

b(ii) Developing Countries

- Nationally appropriate mitigation actions in the context of sustainable development, in a measurable , reportable and verifiable (MRV) manner
- Supported and enabled by technology, financing and capacity-building

Mid-term CO2 Reduction Targets

Targets of reduction of CO2 emissions [Mt-CO2]



Source：UNFCCC、IEA、EEA
Note: Land-use change and forestry are not included, except for Australia.
China and India's emissions are energy-related only.

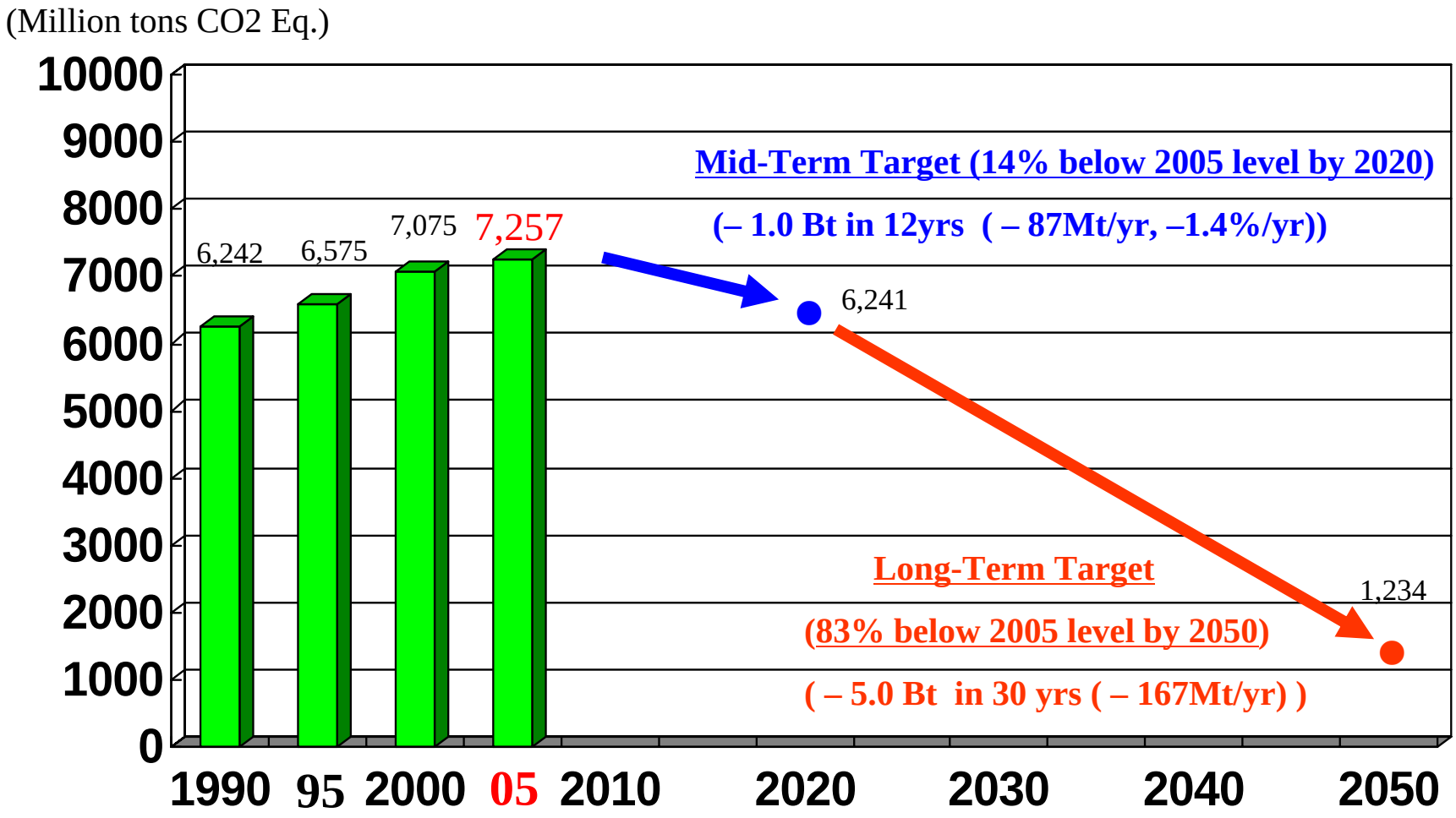
Reduction targets in 2020

	Comparered to 2005 level	Comparered to 1990 level
US (Pres.Obama's commitment: 14% below 2005 level)	▲14%	±0%
EU (Mid-term target: 20% below 1990)	▲14%	▲20%
Canada (Mid-term target: 20% below 2006)	▲21%	▲3%
Australia (Mid-term target: 5% below 2000)	▲10%	▲5%

President Obama's GHG Reduction Targets

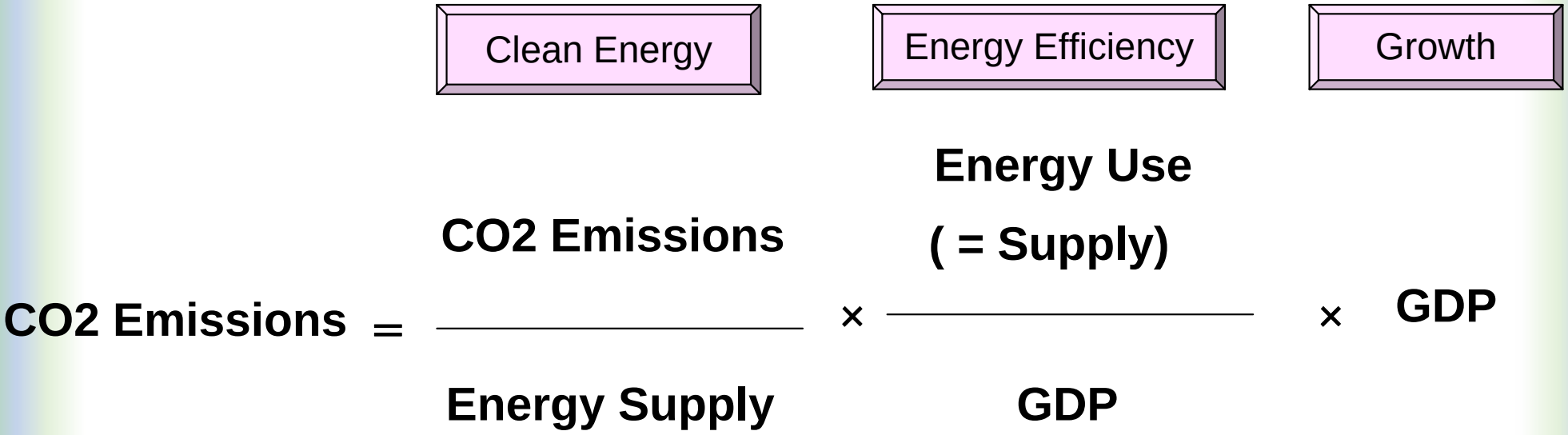
"A New Era of Responsibility: Renewing America's Promise"
(Feb. 26, 2009)

(14% below 2005 level by 2020 & 83% below 2005 level by 2050)



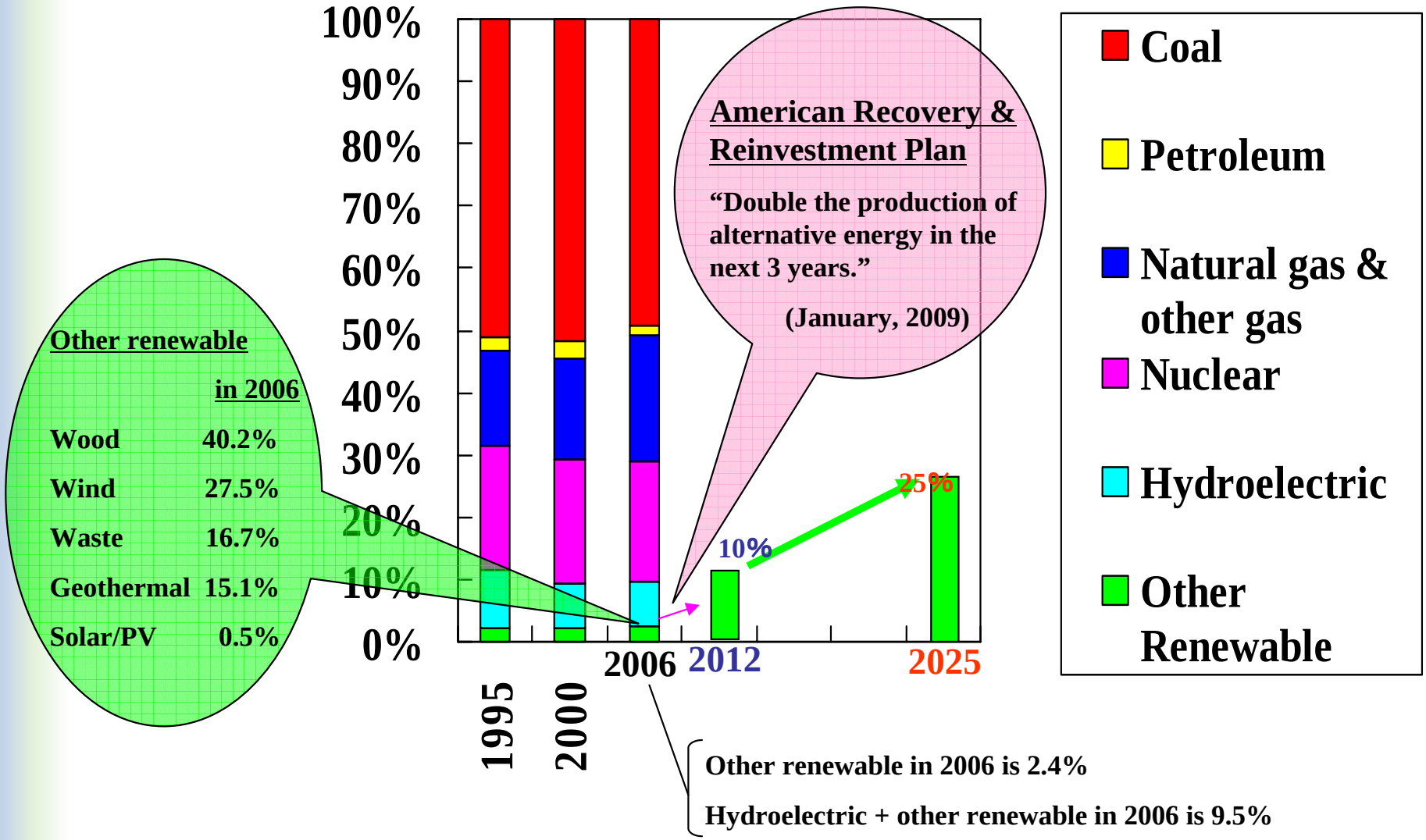
Source: Energy Information Administration, USDOE

Simple Equation



President Obama's Federal Renewable Portfolio Standard

(double in 3 years, 10% by 2012 & 25% by 2025)



Source : Energy Information Administration, USDOE

American Recovery and Reinvestment Act of 2009 ($787.2 Billion)

Clean Energy Programs (over 11 years)

1. Smart Grids — **$ 17.0 Billion**

2. Building/Appliance Efficiency — **$25.8 Billion**
- Federal green building ($ 4.5 Billion)
- State energy program ($ 6.3 billion)
- Renovation of defense facilities ($ 4.4 Billion)
- Weatherization for low-income homes ($ 5.0 Billion)

3. Renewable Energy and Alternative Energy — **$ 6.4 Billion**
- Renewable energy research ($ 2.5 Billion)
- CCS research for coal-fired power plants ($ 3.4 Billion)

4. Clean Vehicle — **$ 3.3 Billion**
- Advanced battery research ($ 2.0 Billion)

5.Transit — **$17.7 Billion**
- Investments in public transportation ($8.4 Billion)
- Investments in high speed rail and Amtrak ($9.3 billion)

6. Green Job Training — **$0.5 Billion**

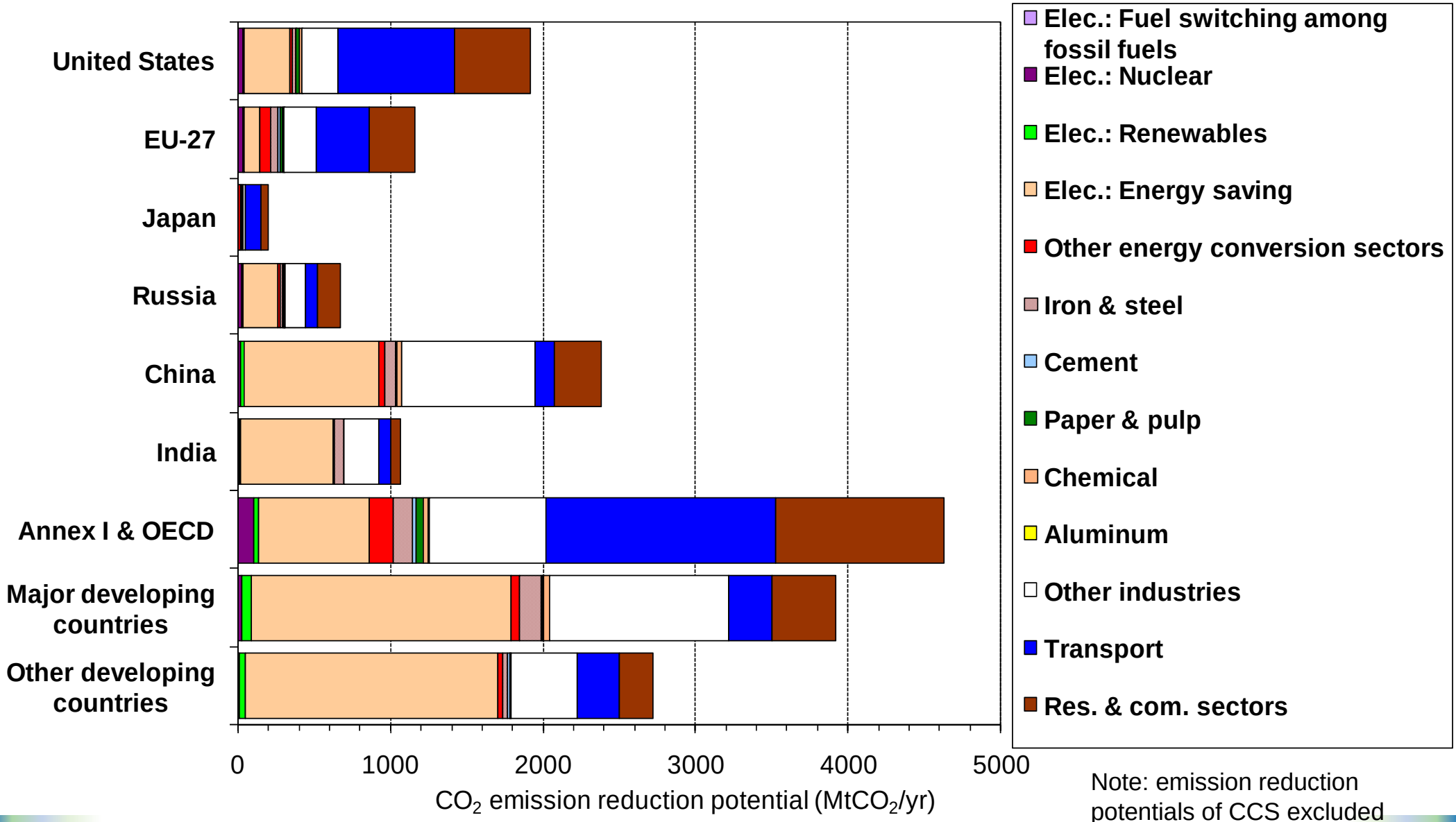
Total $70.7 Billion

(+ Clean Energy Tax Incentives over 10 years $ 20 Billion)

Source: Center for America Progress

Sectoral Emission Reduction Potentials in 2020 (1)

≤0$/tCO2

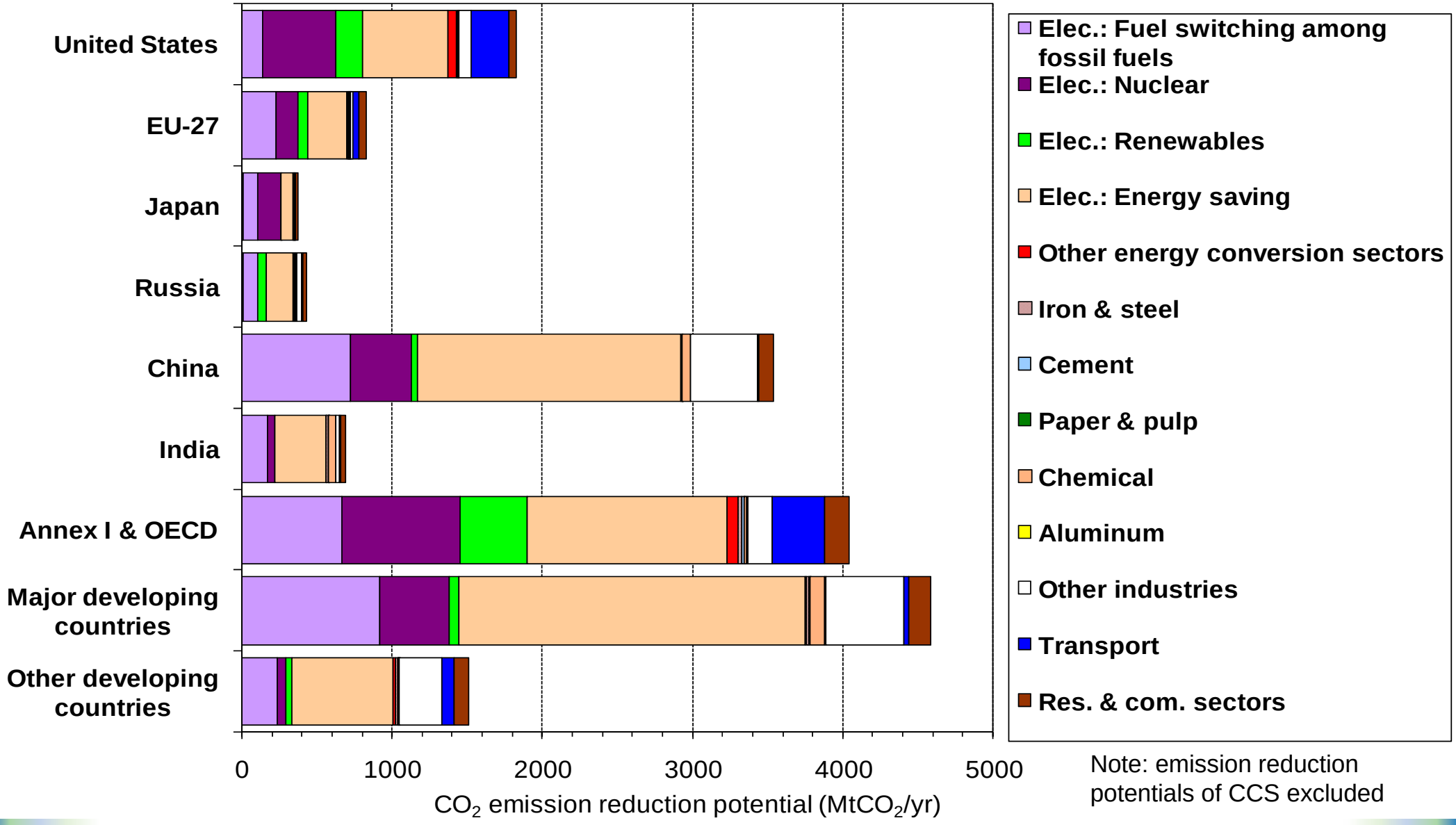


Note: emission reduction potentials of CCS excluded

Source: "Global Emission Reduction Potentials and Scenarios in Energy Supply and End-use Sectors", RITE

Sectoral Emission Reduction Potentials in 2020 (2)

0–25$/tCO2



Note: emission reduction potentials of CCS excluded

Source: "Global Emission Reduction Potentials and Scenarios in Energy Supply and End-use Sectors", RITE

EC Proposed Post-Kyoto Scheme in January 2009 (1)

- Developed countries should reduce 30% below 1990 level in 2020.
- Developed countries' overall target should be distributed in a manner that is fair and ensures comparability of effort, with considering 4 indicators

Example of a distribution of targets for developed countries using 4 indicators *

	Share according to GDP/capita	Share according to GHG/GDP	Share according to GHG '90-'05	Share according to Population '90-'05	Target relative to 2005
	(a)	(b)	(c)	(d)	(e)= (a+b+c+d)
EU27	-10.2%	-10.1%	-5.2%	1.7%	-24%
USA	-14.3%	-12.3%	-15.9%	8.2%	-34%
Japan	-12.8%	-5.6%	-12.5%	1.7%	-29%
Canada	-12.6%	-14.6%	-19.3%	7.8%	-39%
Australia & New Zealand	-12.2%	-16.3%	-19.9%	10.0%	-38%
Other OECD Europe	-17.9%	-4.4%	-11.9%	3.7%	-30%
Commonwealth of Independent States	-1.0%	-20.0%	8.0%	0.6%	-12%
Average developed countries	-10.5%	-12.8%	-8.5%	4.5%	-27%**

* The countries with very high and very low level are modified in some indicators.

** -27% below 2005 level means -30% below 1990 level.

Source: "Towards a comprehensive climate change agreement in Copenhagen - Extensive background information and analysis - part 1 (Commission of European Communities)"

EC Proposed Post-Kyoto Scheme in January 2009 (2)

- CDM should be reformed only to deliver real additional reductions.
- For advanced developing countries and highly competitive economic sectors, CDM should be replaced by a carbon market crediting mechanism.

Reductions in developed and developing countries and trade in emission rights (result of a model calculation)

	2020 target vs 1990 emissions	Achieved domestic reduction in 2020 vs 1990 emissions	Amount bought (+) or sold (−) in 2020 via the carbon market as a % of 1990 emissions	Reduction in 2020 vs baseline emissions	Amount sold via carbon market as % of baseline emissions
Developed countries	−31%	−22%	9%		
EU	−30%	−20%	10%		
USA	−24%	−9%	15%		
Japan	−24%	−6%	18%		
Russia	−38%	−46%	−8%		
Developing country				−19%	−6%
China				−20%	−6%
Brazil				−20%	−6%
India				−13%	−4%

Source: “Towards a comprehensive climate change agreement in Copenhagen - Extensive background information and analysis - part 1 (Commission of European Communities)”

Japan Considering Mid-term Target of Reduction of CO2 Emissions (1)

Implementing CO2-reduction technology to varying degrees in 4 cases

	Case 1* "IEEJ Continuous Effort Case"	Case 2 ** "IEEJ Maximum Introduction Case"	Case 3 "NIES Japan AIM Model-II"	Case 4 "NIES Japan AIM Model-III"
CO2 Reduction ratio based on 1990 (***: GHG not CO2)	+6%	−4%	−15% ***	−25% ***
Cost	−	$52 trillion (total through 2020)	$2.3−2.9 trillion/yr	$5.7−6.9 trillion/yr
	The figures below indicate the improvements in Japan's energy efficiency necessary to implement each of the four technology "case".			
Residential photovoltaic (PV)	1.3M houses (4 times the current number)	3.2M houses (10 times the current number)	6.6M houses (20 times the current number)	17.7M houses (55 times the current number)
Wind Power (compared to current)	4 times	5 times	10 times	10 times
Next generation automobile (ration in stocks)	−	20%	20%	35%
Gasoline mileage (improvement from 2005 to 2020)	−	15%	26%	29%
Energy efficient houses (% of newly-built houses meeting the strictest standard for energy efficiency)	80%	80%	100%	100% & also present houses have to match strict standards
High-efficiency water heater (compared to current)	2.5 times	40 times	63 times	63 times

* "Continuous Effort Case": The efforts to improve the efficiency of equipments up to date are to be continued on the trajectory of existing technologies.

** "Maximum Introduction Case": In addition to the above Continuous Effort Case, this case assumes utmost dissemination of equipments, of which energy efficiency performance will significantly improve with cutting-edge technologies that are already at deployment stage, while not imposing obligatory measures on the people.

Japan Considering Mid-term Target of Reduction of CO2 Emissions (2)

- The Japanese government is now considering a mid-term (2020) target for CO2 reduction.
- The target will be announced in June 2009.

The table below includes estimates of marginal cost ($ / t-CO2) for meeting the CO2 benchmarks in the left-hand column. The percentage is relative to Japan's 1990 emission level.

	Estimate of Japanese A research institute	Estimate of Japanese B research institute
EU's proposal (20% below 1990)	$53 +7%	$50 ±0%
President Obama's commitment (14% below 2005 level)	$54 +7%	$100 −2%
(reference) "Maximum Introduction Case"	$110 −3%	$200 −3%

Japan's proposal for a Post-2012 framework (1)

Basic Structure

New Protocol is preferable option (or significant amendment of KP)

Shared Vision

- **At least 50% reduction of GHG by 2050 to be adopted by all countries as a shared vision**
- **Vision on how to pave the way to reduce global emissions by 2050, including innovative technology and low carbon society**

- **All countries will take effective mitigation actions while developed countries will need to lead the global efforts by fulfilling the significant reductions**
- **Also major developing countries will be required to fulfill international obligations to take mitigation actions, in accordance with their common but differentiated responsibilities and respective capabilities**

Japan's proposal for a Post-2012 framework (2)

Developed Countries

(OECD Members / Equivalent to OECD / Wishing to be developed countries)

- **Commitment by developed countries:**

Party	Quantified emission limitation and reduction commitment (Gg-CO2e)	reduction rates from 1990 (%)	reduction rates from 2000 (%)	reduction rates from 2005 (%)	reduction rates from 2007 (%)
A	xxx	xxx	xxx	xxx	xxx
B	xxx	xxx	xxx	xxx	xxx
…	…	…	…	…	…

* Reduction rates from the base years mentioned above are illustrative and non-exhaustive.

- **Commitment – achieved in principle through domestic measures (international flexibility mechanisms as supplementary measures)**
- **Comparability – sectoral energy efficiency/ GHG intensity with due consideration for the MAC/ others**

Japan's proposal for a Post-2012 framework (3)

Developing countries

A) Major developing countries expected to take further mitigation actions based on economic development stages, response capabilities, shares of GHG emissions

- **Binding targets for:**
  - **GHG intensity or energy intensity in major sectors (e.g., power, iron/steel, cement, aluminum, road transport)**
  - **Economy-wide GHG/GDP or Energy Consumption/GDP (with estimate of total GHG emissions based on GDP forecast)**
- **National measurement system for relevant data related to its targets**

B) All developing countries

- **Voluntary national action plan to be reviewed periodically by COP**

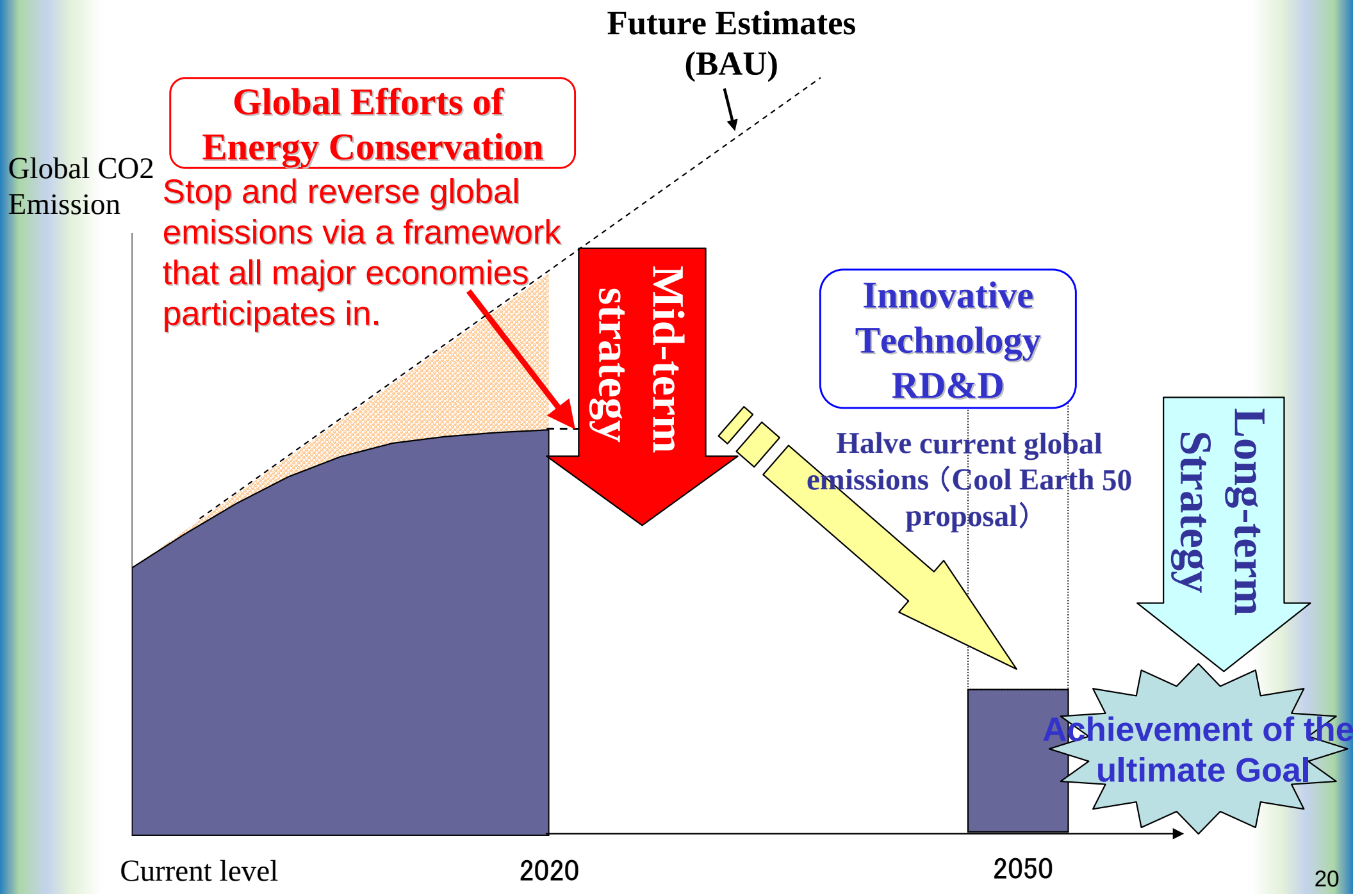
Review of actions by countries with the changes of circumstances

As a result of the review for the change of economic development stages etc., the higher level of commitments/actions can be applied to the countries

2009 Schedule

18 Feb	Informal Ministerial (Nairobi; hosted by Denmark)
25-27 March	Workshop on Sectoral Approach (Bonn)
29 March-8 April	AWG/KP, AWG/LCA (Bonn)
1-12 June	AWG/KP, AWG/LCA (Bonn)
June-July	Greenland Dialogue (Greenland; hosted by Denmark)
8-10 July	G8 Summit/MEM (Maddalena)
Aug-Sept	AWG/KP, AWG/LCA
September	UN General Assembly/ Summit on Climate Change (NY)
Autumn	APP Ministerial (China)
October	Informal Ministerial?
	Another Session of AWG/KP, AWG/LCA?
November	APEC Summit (Singapore)
	East Asia Summit (Thailand)
7-18 December	AWG/KP, AWG/LCA, COP 15 (Copenhagen)

Mid-term Strategy and Long-term Strategy



“Cool Earth-Innovative Energy Technology Program” (1)

- To achieve the long-term target of “halving the world’s emissions by 2050”,
  - development of innovative energy technologies is indispensable.
  - Japan should lead with its world-top-class energy technologies.
- To this end, this program identifies technologies which should be tackled by priority, creates road maps and considers international cooperation.

-“21” Technologies to be Prioritized-

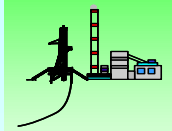
Efficiency improvement ***Low carbonization***

Supply side

Power Generation /transmission

2. High-Efficiency Coal Fired Power Generation

3. Carbon Dioxide Capture and Storage (CCS)



5. Advanced nuclear Power Generation

1. High-Efficiency Natural Gas Fired Power Generation

6. High-Efficiency Superconducting Power Transmission

4.Innovative Photovoltaic power Generation

Transportation

7. Intelligent Transport System

8. Fuel Cell Vehicle

9. Plug-in Hybrid Vehicle /Electric Vehicle

10.Production of Transport Biofuel

Demand side

Industry

11. Innovative materials, Production/Processing

12. Innovative Iron and Steel making process

Commercial

13. High-Efficient house and building

14.Next-Generation High Efficiency lighting

15. Stationary Fuel Cell

16. Ultra High-Efficiency Heat pumps

17. High-Efficiency Information Device and System

18. HEMS/BEMS/Local-level EMS

Cross-cutting

19. High-Performance Power storage

20. Power Electronics

21. Hydrogen Production, Transport and Storage

3. CCS (restated)

“Cool Earth-Innovative Energy Technology Program” (2)

—Promotion of International Cooperation—

Sharing Technology Road Maps

○ Work with IEA to check the current progress of technology development, sharing road maps, to create a framework for cooperation.

Acceleration in R&D by Cooperation

○ Work with foreign research institutions to conduct R&D efficiently while complementing research resources.

Notes for promoting cooperation

○ Consider the protection of IPR and the prevention of unintended leaks of technology.
○ Consider IPR on a government basis to ensure smooth transfer of technology.

Promotion of New International Cooperation

○ Carbon dioxide capture and Storage(CCS）
○ Innovative PV power generation
○ High-performance power storage
○ High-efficiency superconducting power transmission
○ Innovative iron and steel making process
○ High-efficiency information device and system

—Maximum Use of Current International Cooperation Framework —

- IEA Implementing Agreement / General / Developed & Developing Countries including China & India
- APP / General / US, Japan, China, India, S. Korea, Australia, Canada
- Carbon Sequestration Leadership Forum (CSLF) / CCS/ US, Japan, China, India etc
- International Partnership for the Hydrogen Economy (IPHE) / Hydrogen / US, Japan, China, India etc
- Generation IV International Forum / Nuclear / US, Japan, China etc
- Global Nuclear Energy Partnership (GNEP) / Nuclear / US, Japan, China etc