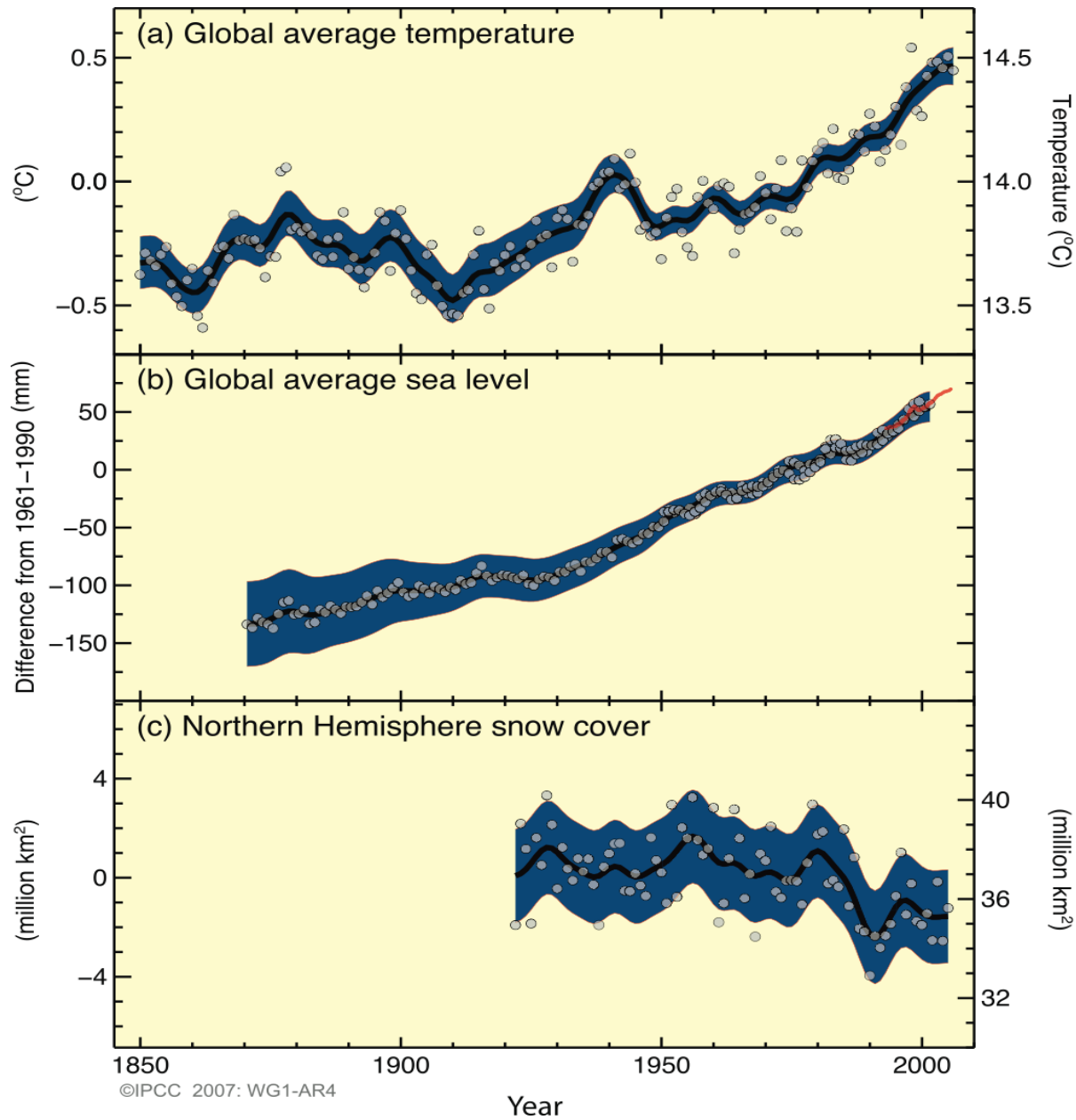


International Trends Toward a Low-Carbon Society and the Role of Local Governments

Yoichi Kaya

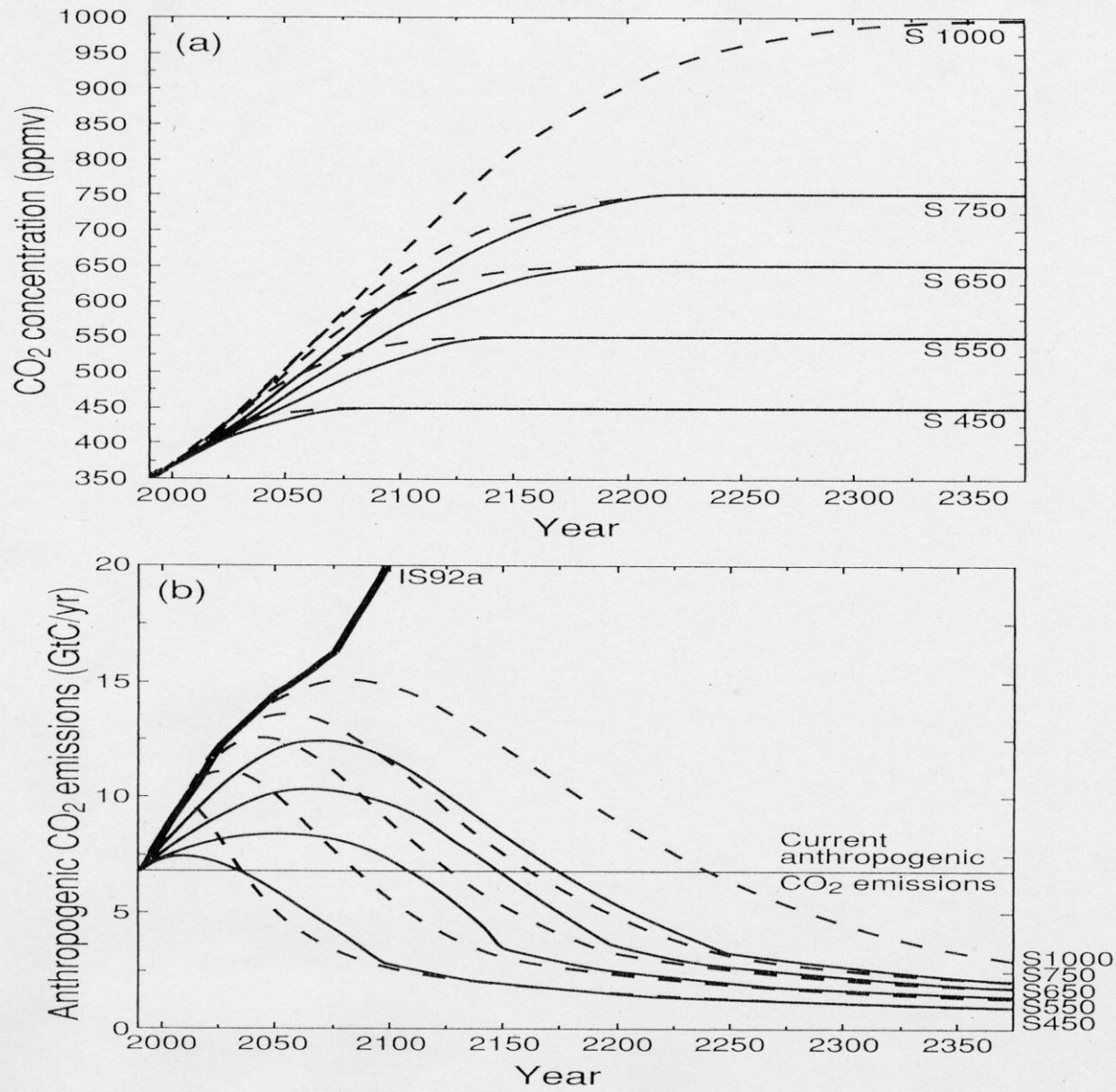
Research Institute of Innovative
Technology for the Earth (RITE)

October 5, 2009



Changes in global temperatures and sea levels over the past 150 years

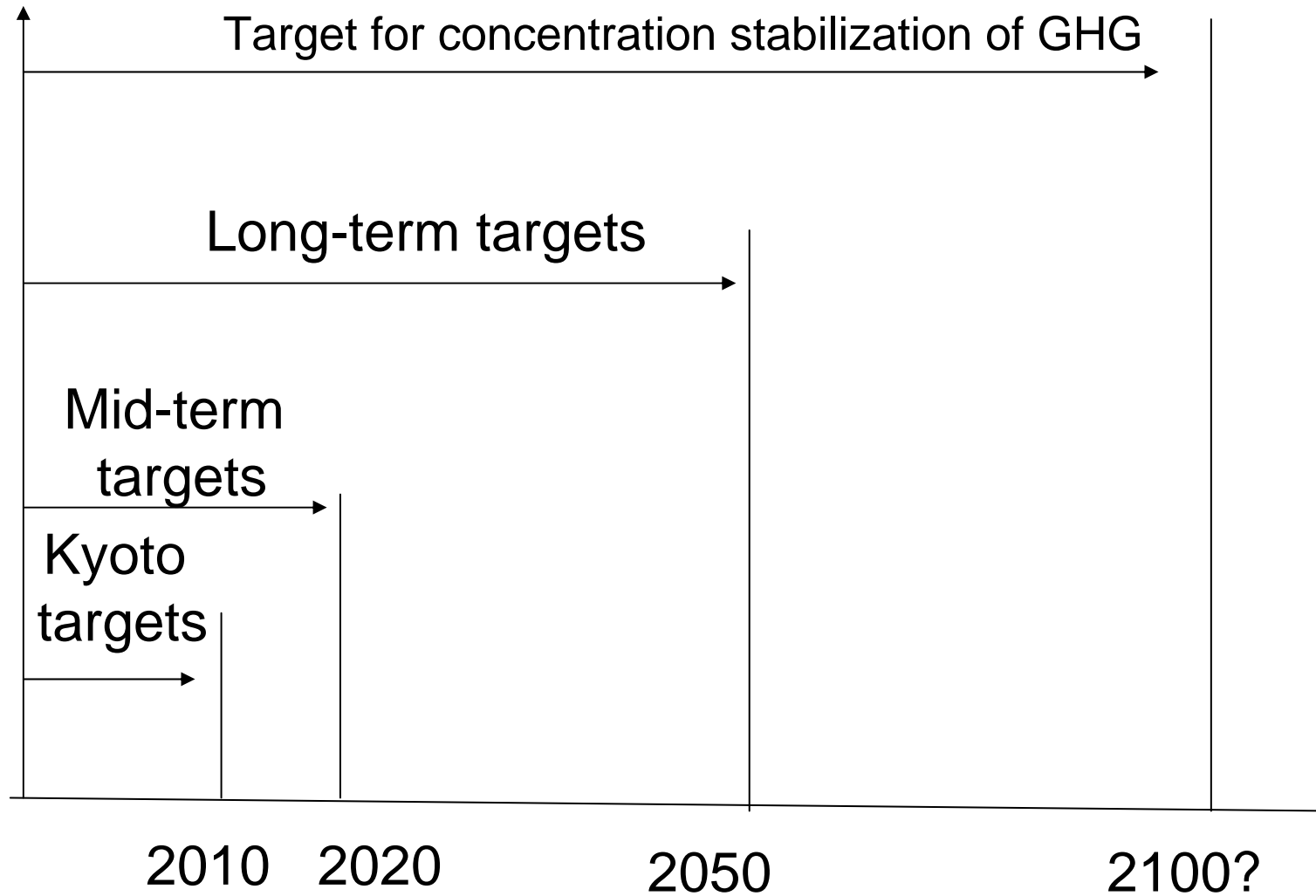
Source:
IPCC
3rd rep.
p.76



CO₂ concentration stabilization scenarios over time

Global warming countermeasures over time

CO2 emissions
reduction volume



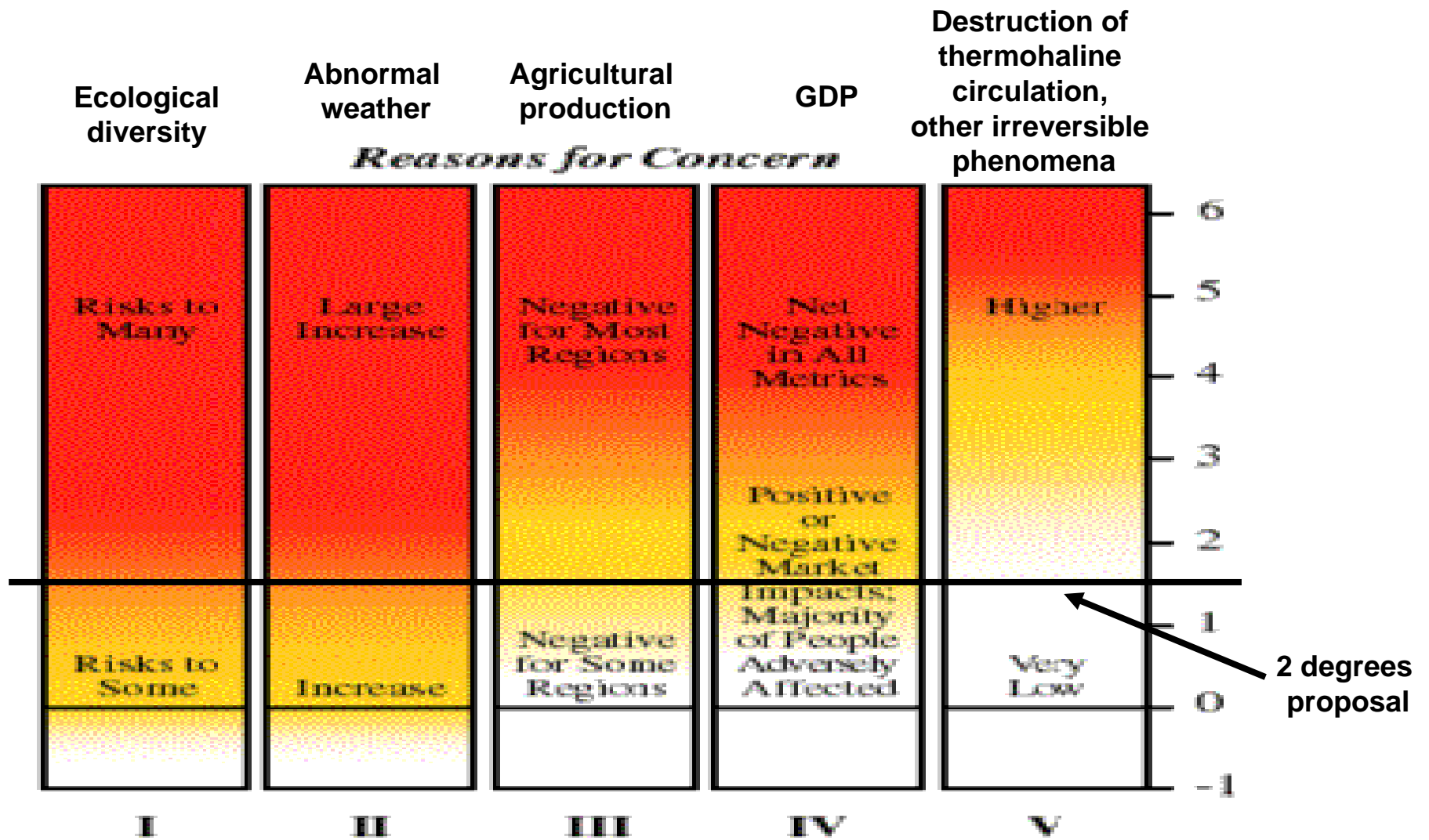
EU Proposal: “Limiting Climate Change to 2 Degrees Celsius”

1. EU “2 Degrees Celsius” proposal made in 1996
Controlling the rise in global average surface temperature to within 2 degrees Celsius above pre-industrial levels.
2. Three perspectives on the evidence for the proposal
 - 1) Warning signs for various risks set at low level (IPCC 3rd report)
 - 2) Lower limit of melting of Greenland ice sheets (IPCC 4th report)
If temperature rises of 1.9 to 4.6 degrees continue for several thousand years, sea levels could rise 7m
 - 3) View that there is no special evidence: Change in evidence

In 1996 there was no particular evidence

It was judged that CO₂ of 550ppm would result in a 2 degree temperature rise

Currently, it is judged that CO₂ of 350 to 400ppm would result in a rise greater than 2 degrees



Rise in average global temperature and its impact
Source: IPCC TAR WGII, p.5

Future Scenarios in the IPCC Fourth Assessment Report

	CO2 concentration ppm	GHG concentration ppm	Rise in global temperature since pre-industrial era in degrees Celsius	CO2 emissions peak year	CO2 emissions 2050 (compared to 2000)	No. of scenarios
I	350-400	445-490	2.0-2.4	2000-2015	-85 to -50	6
II	400-440	490-535	2.4-2.8	2000-2020	-60 to -30	18
III	440-485	535-590	2.8-3.2	2010-2030	-30 to +5	21
IV	485-570	590-710	3.2-4.0	2020-2060	+10 to +60	118
V	570-660	710-855	4.0-4.9	2050-2080	+25 to +85	9
VI	660-790	855-1130	4.9-6.1	2060-2090	+90 to +140	5

**EU
2 degrees
proposal**



GHG levels (post-stabilization)	Region	2020	2050
450 ppm eq	Annex 1	-25 to -40%	-80 to -95%
	Non-Annex 1	Substantial deviation from baseline in Latin America, Middle East, East Asia and Centrally-Planned Asia	Substantial deviation from baseline in all regions
550 ppm eq	Annex 1	-10 to -30%	-40 to -90%
	Non-Annex 1	Deviation from baseline in Latin America, Middle East and East Asia	Deviation from baseline in most regions

Source: Taken from Box 13.7, IPCC AR-4 WG-3
Two GHG atmospheric concentration stabilization scenarios

Various Proposals for 2050

1. Halve global emissions (Toyako and L'Aquila G8 Summits)
 - EU proposal based on the 2 degrees scenario (IPCC SPM)
 - Non-Annex 1 countries disagree
 - Reason: Non-Annex 1 country emissions will be limited to below current levels
2. Annex 1 countries reduce emissions by 80% (L'Aquila Summit)
 - Response to the 450ppm CO₂ eq scenario described in Box 13.7 or the IPCC AR-4 WG3 Report

2020 Target Proposals for Annex 1 Countries

1. EU: -20% from 1990 levels
-14% from 2005 levels
-4% attained from carbon credits
US: 0% from 1990 levels
-14% from 2005 levels
2. COPAWB proposal: 25% reduction
China/South Africa proposal: 40% reduction
Both of these seem to follow the Box 13.7 scenario of IPCC WG-3 Report

Japan's 2020 Target Proposals

1. Targets set by the Aso Administration

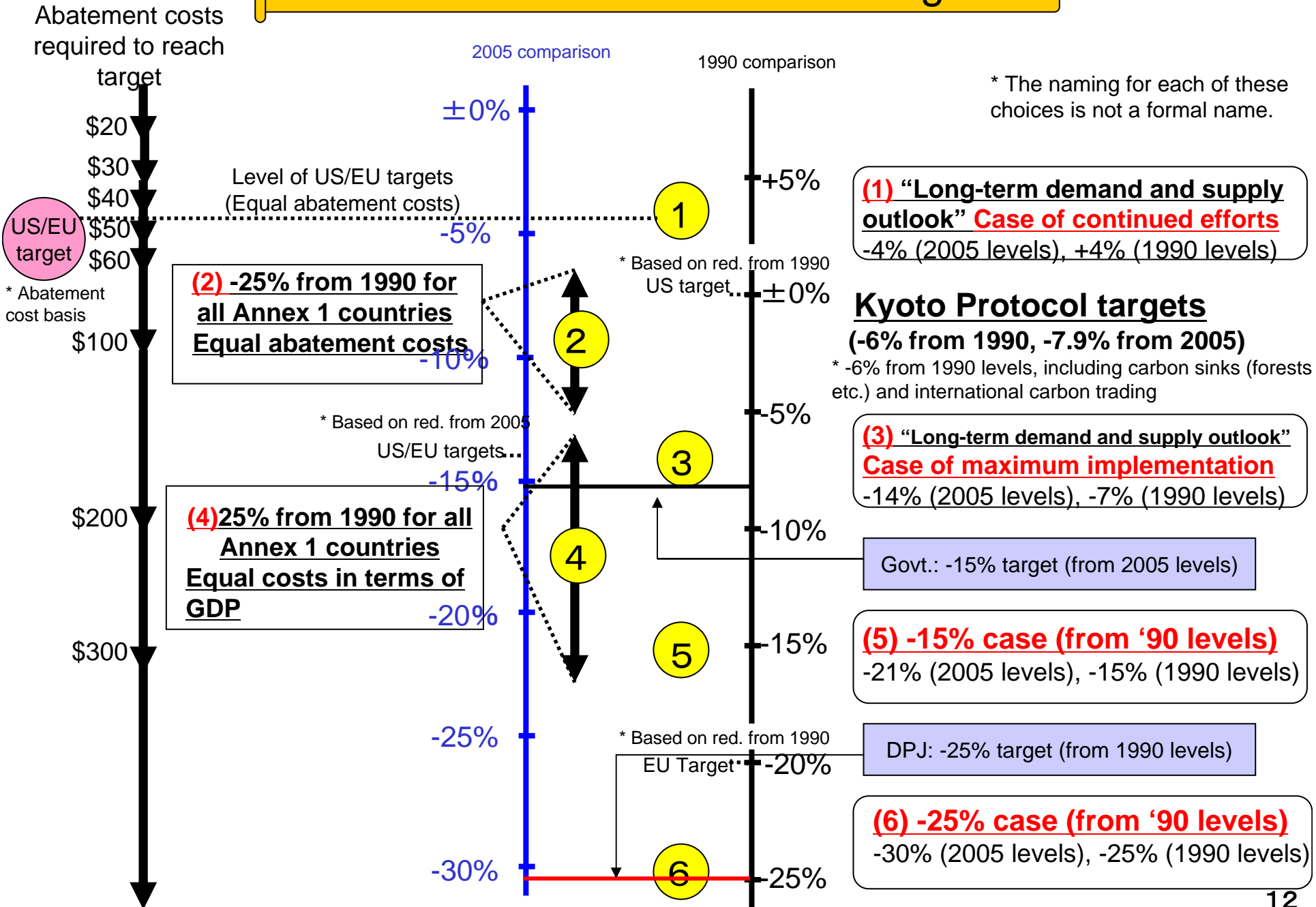
15% reduction in GHG from 2005 levels

2. Democratic Party of Japan target

25% reduction in GHG from 1990 levels

(30% reduction from 2005 levels)

1.6 Six choices for mid-term targets



Considerations Regarding 2020 Targets

1. Consistency with Kyoto targets
Necessity to go beyond 6% reduction from 1990 levels (-0.6% reduction in GHG emissions)
2. Consistency with long-term targets
How to link to -60% to -80% targets for 2050?
3. Equitable base with other Annex 1 countries
Japan has relatively large reduction costs in comparison to other countries
→ Is it acceptable to set lower targets than other countries?
4. Feasibility
What degree of measures can be realized from now?

Various Means of Achieving Targets

1. Power

Development of nuclear power: new construction, improving operating efficiency

Expansion of renewable energy (solar, wind)

Improving thermal efficiency and CCS

2. Energy conservation

3. Various means of expanding renewable energy

4. Move to low-carbon production processes by industry

E.g. Steel blast furnaces: Change to converter furnace method

Major measures	Aso Administration target: -15% reduction from 2005 levels	-20% from 2005 levels	DPJ target: -30% from 2005 levels
Next-generation autos	50% of new car sales 20% of ownership	100% of new car sales 40% of ownership	Same as left
High efficiency water heaters	Current 700,000 units, increased to 28 million units	44 million units	Same as left
Solar power generation (residential)	Current 300,000 households increased to 3.2 million households (70% of new construction)	All new construction 10 million households	Same as left
Wind/thermal power generation	Increase wind power generation from 1.1 million kW to 5 million kW, 520,000kW from thermal	Wind: 10 million kW Thermal: 1.04 million kW	Same as left
Homes and offices	Next-generation standard insulation 80% of new homes and 85% of new offices	Next generation standard insulation in all homes and offices	Same as left
Information and home appliances	Top-runner standard	Sales regulations through top-runner standard	Same as left
Nuclear power	9 new reactors Operating ratio 80%	9 new reactors Operating ratio 90%	Same as left
Industry	Maintain current conditions	Maintain current conditions	20% reduction in production of steel, cement and chemicals, etc.

Public/home involvement

Methods to realize mid-term targets (IEEJ)

Role of Local Governments in the Move Toward a Low-Carbon Society

1. Characteristics of low-carbon society

It is important to have the involvement not only of industry, but also of general consumers

2. Advantages for local governments

1) Close to general consumers

2) Possess many administrative and educational facilities

3. Efforts toward a low-carbon society

1) Stimulate and supplement consumer efforts

2) Introduce energy conservation measures and renewable energy resources in administrative and educational facilities

Conclusion

1. Targets to control global warming must basically be consistent given time constraints
However, whether the final target should be no more than 2 degrees Celsius above pre-industrial levels is unclear
2. Annex 1 countries must consider ambitious targets for the mid- to long-term
3. Local governments have a large role to play in expanding energy conservation and use of renewable energy in pivotal sectors, including transportation and general consumers