Introduction to NAMAs
and
review of Kyoto Protocol Target Achievement Plan (KPTAP)

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1. Background

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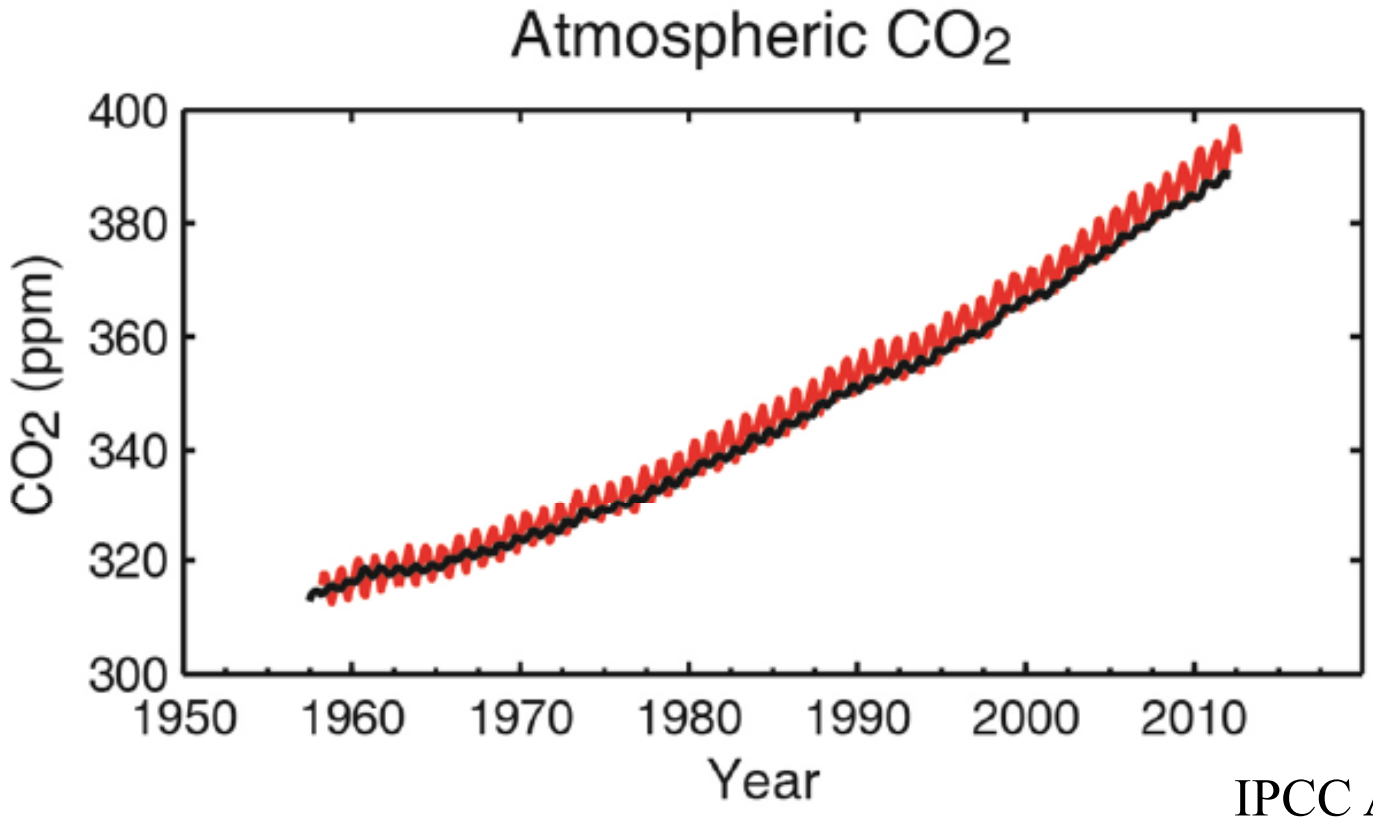
1. Background

The atmospheric concentrations of GHG have increased to levels unprecedented in at least the last 800,000 years. CO2 concentrations have increased by 40% since pre-industrial times.

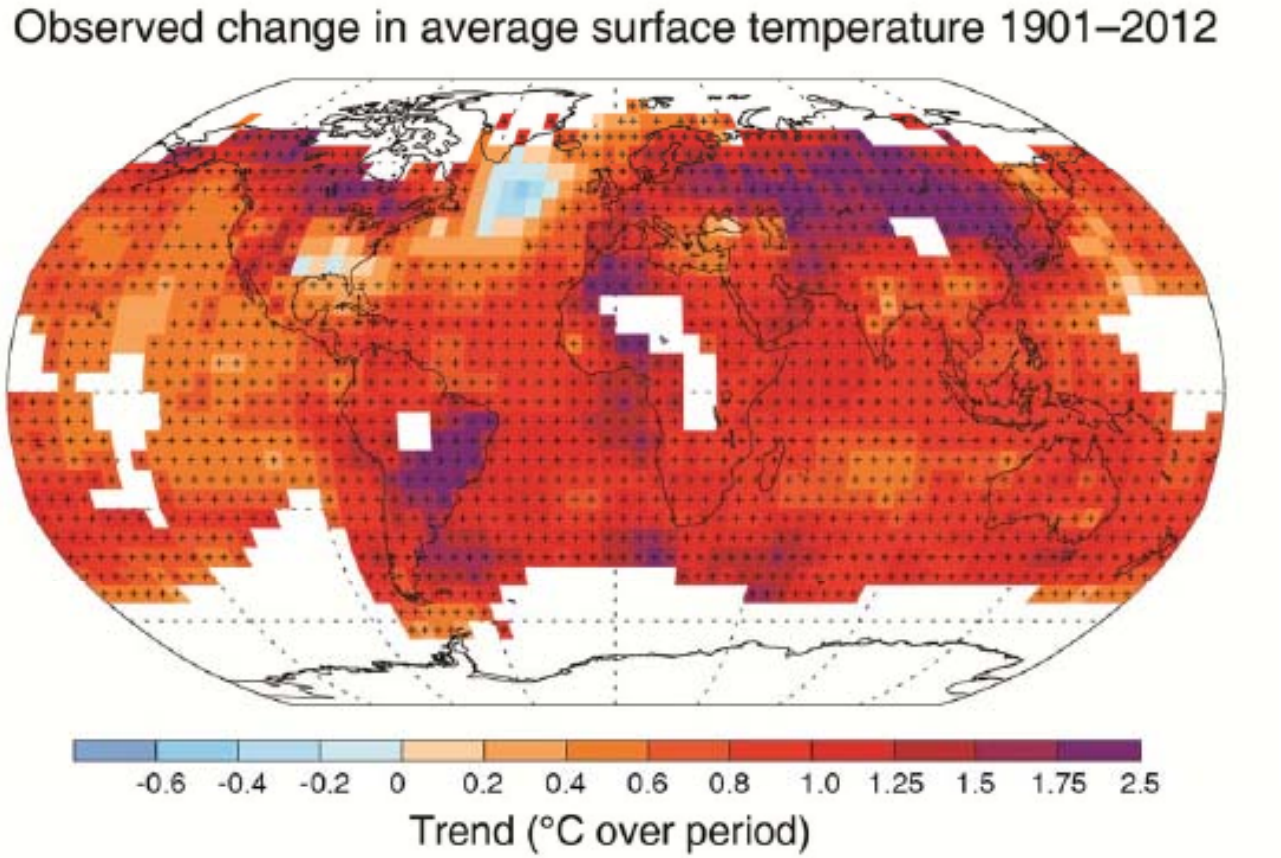
IPCC Fifth Assessment Report (AR5), 2013



IPCC AR5 (2013)

1. Background

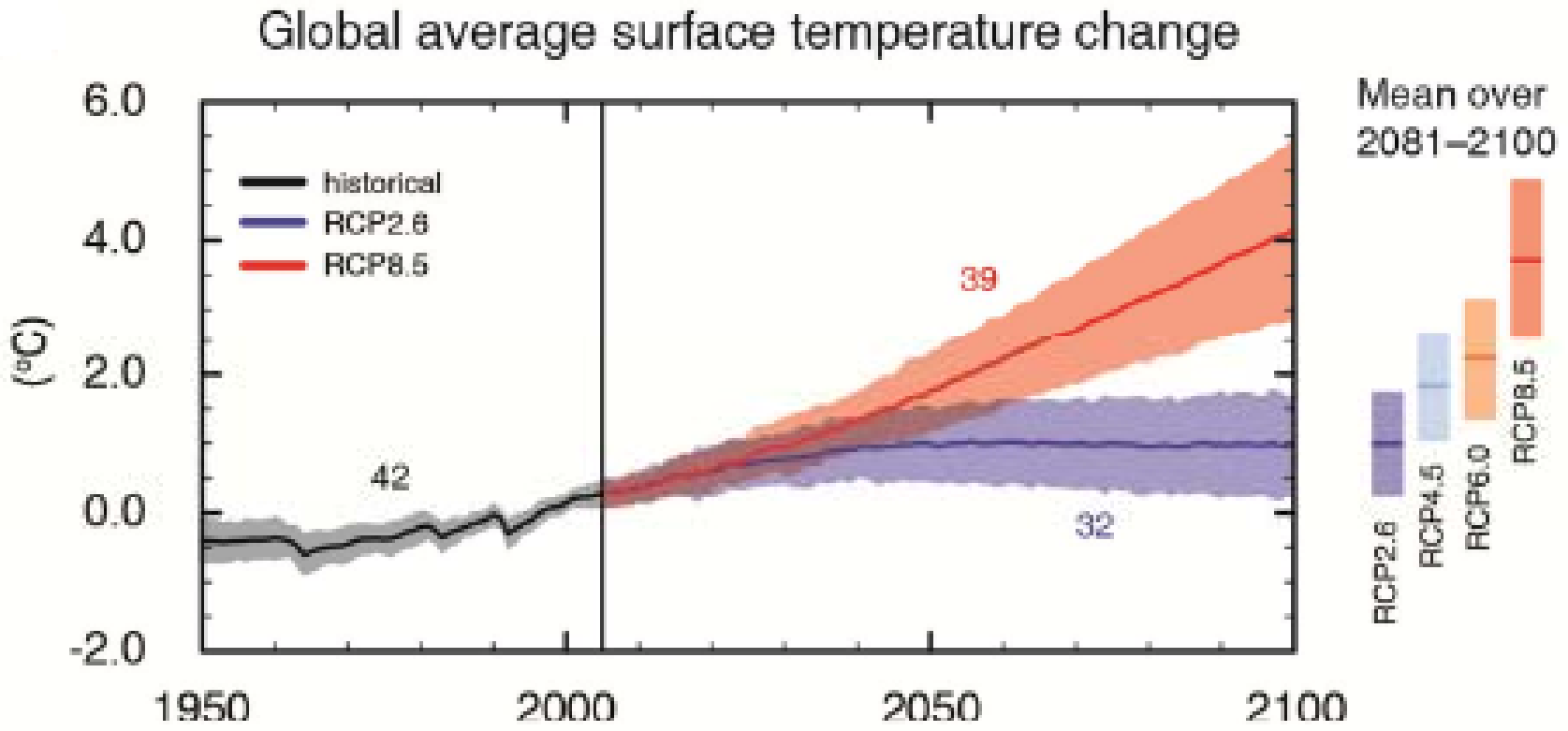
Warming of the climate system is unequivocal by observation. The globally averaged temperature combined land and ocean surface temperature data show a warming of 0.85 ɵC (IPCC AR5)



IPCC AR5 (2013)

1. Background

Human influence on the climate system is clear. Increase of global mean surface temperatures for 2081–2100 relative to 1986–2005 is projected by *CMIP5 model* simulations, that is 0.3 ɵC to 4.8 ɵC (IPCC AR5).



IPCC AR5 (2013)

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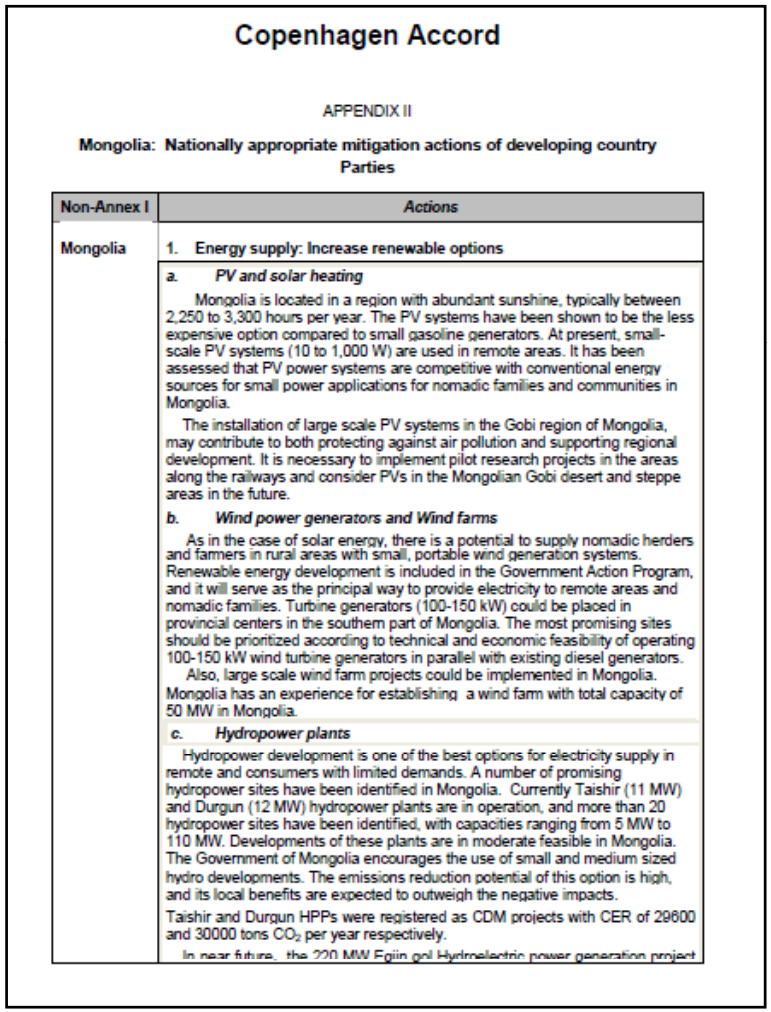
2. Introduction to NAMAs

In order to deal with current and future risk, deep cuts in global emissions will be required by all Countries .

NAMA would be implemented by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner (UNFCCC 1/CP.13, Bali Action Plan).

JCCCA

2. Introduction to NAMAs



Copenhagen Accord

APPENDIX II

Mongolia: Nationally appropriate mitigation actions of developing country Parties

Non-Annex I	*Actions*
Mongolia	1. Energy supply: Increase renewable options
	a. PV and solar heating
	Mongolia is located in a region with abundant sunshine, typically between 2,250 to 3,300 hours per year. The PV systems have been shown to be the less expensive option compared to small gasoline generators. At present, small-scale PV systems (10 to 1,000 W) are used in remote areas. It has been assessed that PV power systems are competitive with conventional energy sources for small power applications for nomadic families and communities in Mongolia.
	The installation of large scale PV systems in the Gobi region of Mongolia, may contribute to both protecting against air pollution and supporting regional development. It is necessary to implement pilot research projects in the areas along the railways and consider PVs in the Mongolian Gobi desert and steppe areas in the future.
	b. Wind power generators and Wind farms
	As in the case of solar energy, there is a potential to supply nomadic herders and farmers in rural areas with small, portable wind generation systems. Renewable energy development is included in the Government Action Program, and it will serve as the principal way to provide electricity to remote areas and nomadic families. Turbine generators (100-150 kW) could be placed in provincial centers in the southern part of Mongolia. The most promising sites should be prioritized according to technical and economic feasibility of operating 100-150 kW wind turbine generators in parallel with existing diesel generators.
	Also, large scale wind farm projects could be implemented in Mongolia. Mongolia has an experience for establishing a wind farm with total capacity of 50 MW in Mongolia.
	c. Hydropower plants
	Hydropower development is one of the best options for electricity supply in remote and consumers with limited demands. A number of promising hydropower sites have been identified in Mongolia. Currently Taishir (11 MW) and Durgun (12 MW) hydropower plants are in operation, and more than 20 hydropower sites have been identified, with capacities ranging from 5 MW to 110 MW. Developments of these plants are in moderate feasible in Mongolia. The Government of Mongolia encourages the use of small and medium sized hydro developments. The emissions reduction potential of this option is high, and its local benefits are expected to outweigh the negative impacts.
	Taishir and Durgun HPPs were registered as CDM projects with CER of 29600 and 30000 tons CO_2 per year respectively.
	In near future, the 220 MW Egiin gol Hydroelectric power generation project

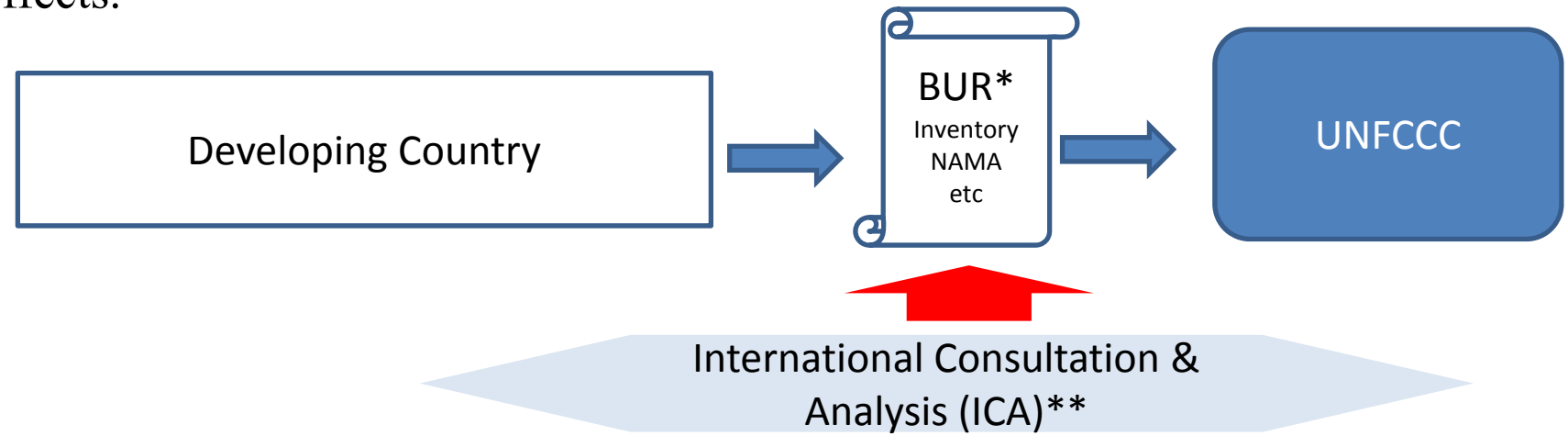
In 2009, Copenhagen Accord (UNFCCC 2/CP.15) requested which developing countries would submit NAMA plan to the secretariat in the format given by UNFCCC.

Submitted NAMA plan by Mongolia in accordance with Copenhagen Accord

2. Introduction to NAMAs

In 2010, the Cancun Agreements (UNFCC 1/CP.16) confirmed that developing countries Parties would take NAMA which aims at achieving a deviation in emissions relative to Business As Usual emissions in 2020.

Decision 2/CP.17 (2012) indicated that progress on NAMA would be aggregated in to a Biennial Update Report (BUR) which should be submitted by 2014; moreover International Consultation and Analysis (ICA) of BUR would be conducted under the Subsidiary Body for aiming to increase the transparency of NAMA and their effects.



2. Introduction to NAMAs

Developing country parties shall provide the following information of NAMA in BUR (UNFCCC 2/CP.17 Annex III):

(a) Name and description of the mitigation action, including information on the nature of the action, coverage (i.e. sectors and gases), quantitative goals and progress indexes;

(b) Information on methodologies and assumptions

(c) Objectives of the action and steps taken or envisaged to achieve that action

(d) Information on the progress of implementation of the mitigation actions and the underlying steps taken or envisaged, and the results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible

(e) Information on international market mechanisms

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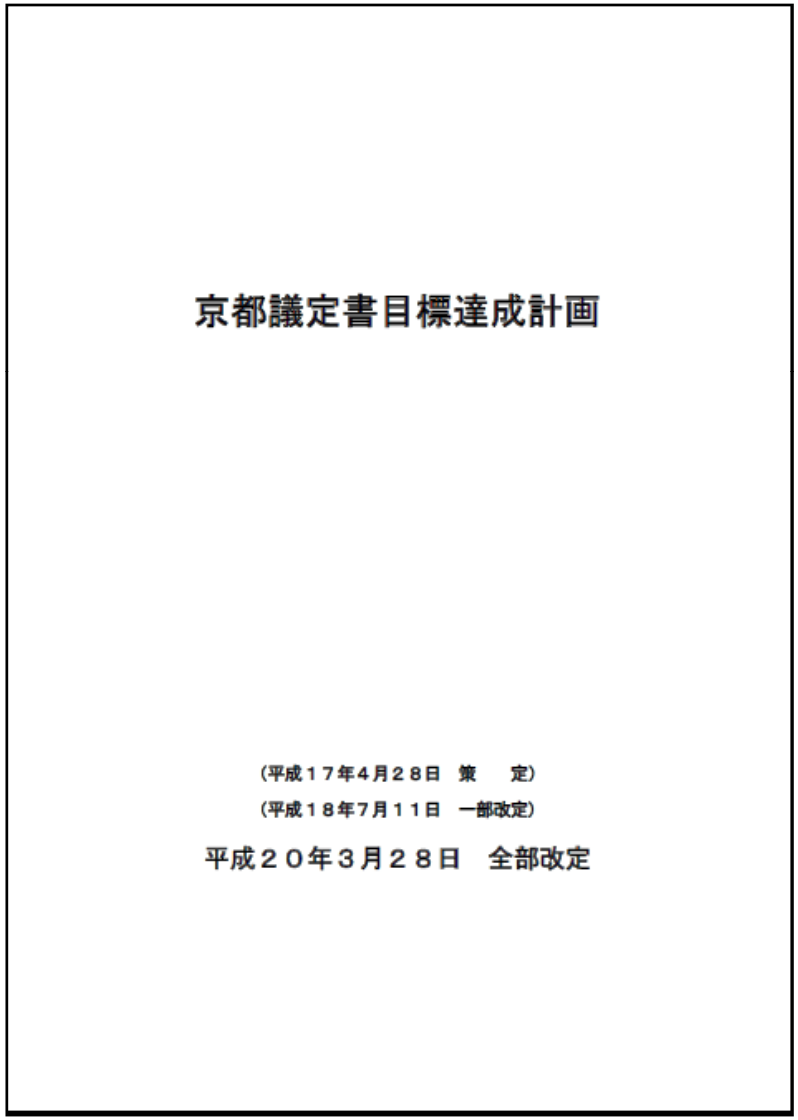
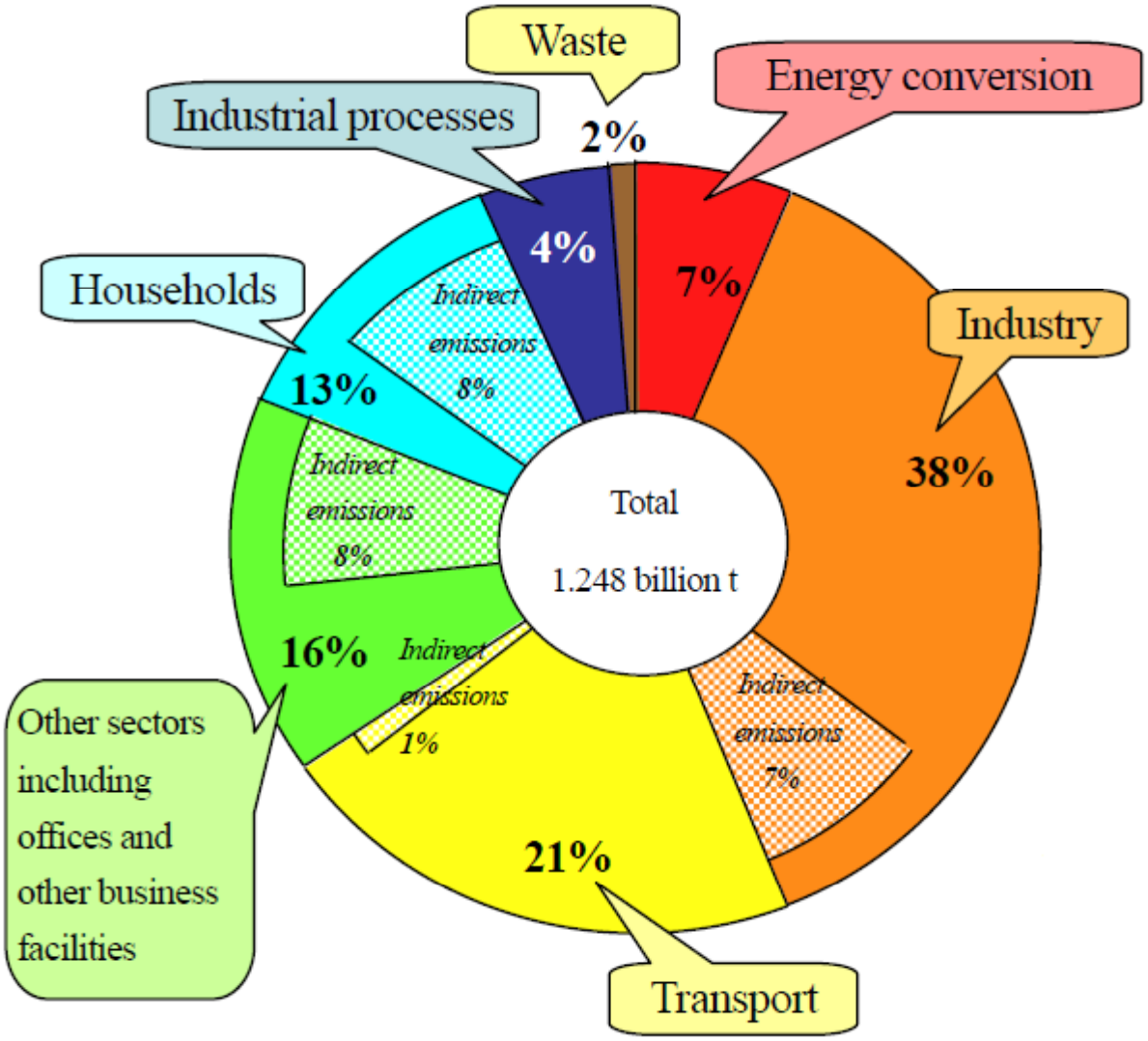

京都議定書目標達成計画

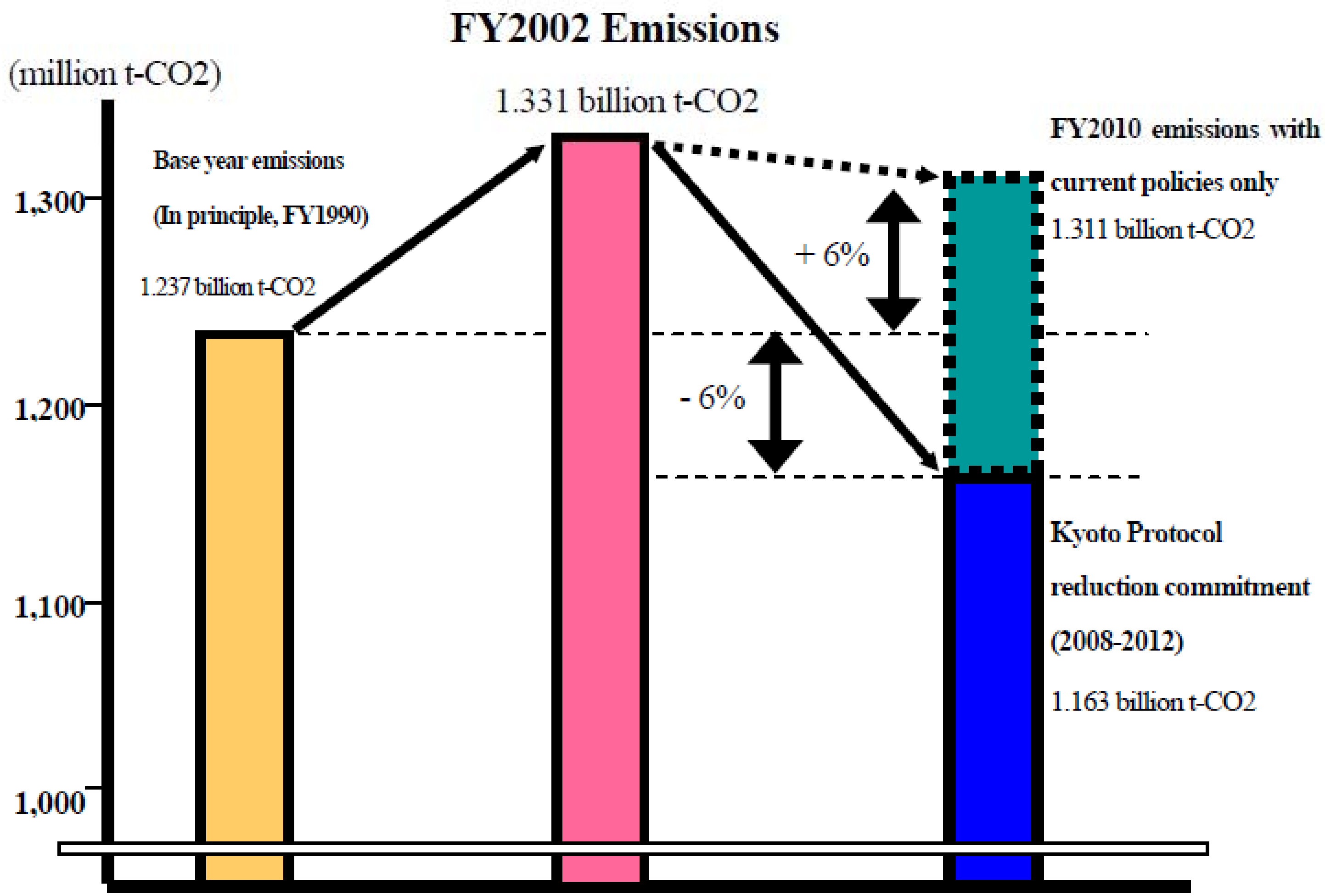
（平成１７年４月２８日　策　　定）
（平成１８年７月１１日　一部改定）
平成２０年３月２８日　全部改定

"Kyoto Protocol Target Achievement Plan (KPTAP)" was formulated which carries on the Outline in order to stipulate the measures necessary to reliably achieve the target of a 6% reduction promised by Japan under the Kyoto Protocol. As described components of NAMA in BUR, KPTAP also considers what to measure, how to measure, when to measure and who should measure, report and verify ex-post effect of the measures.

Similarity between NAMA and KPTAP



Japan's Carbon Dioxide Emission by sector (FY2002)

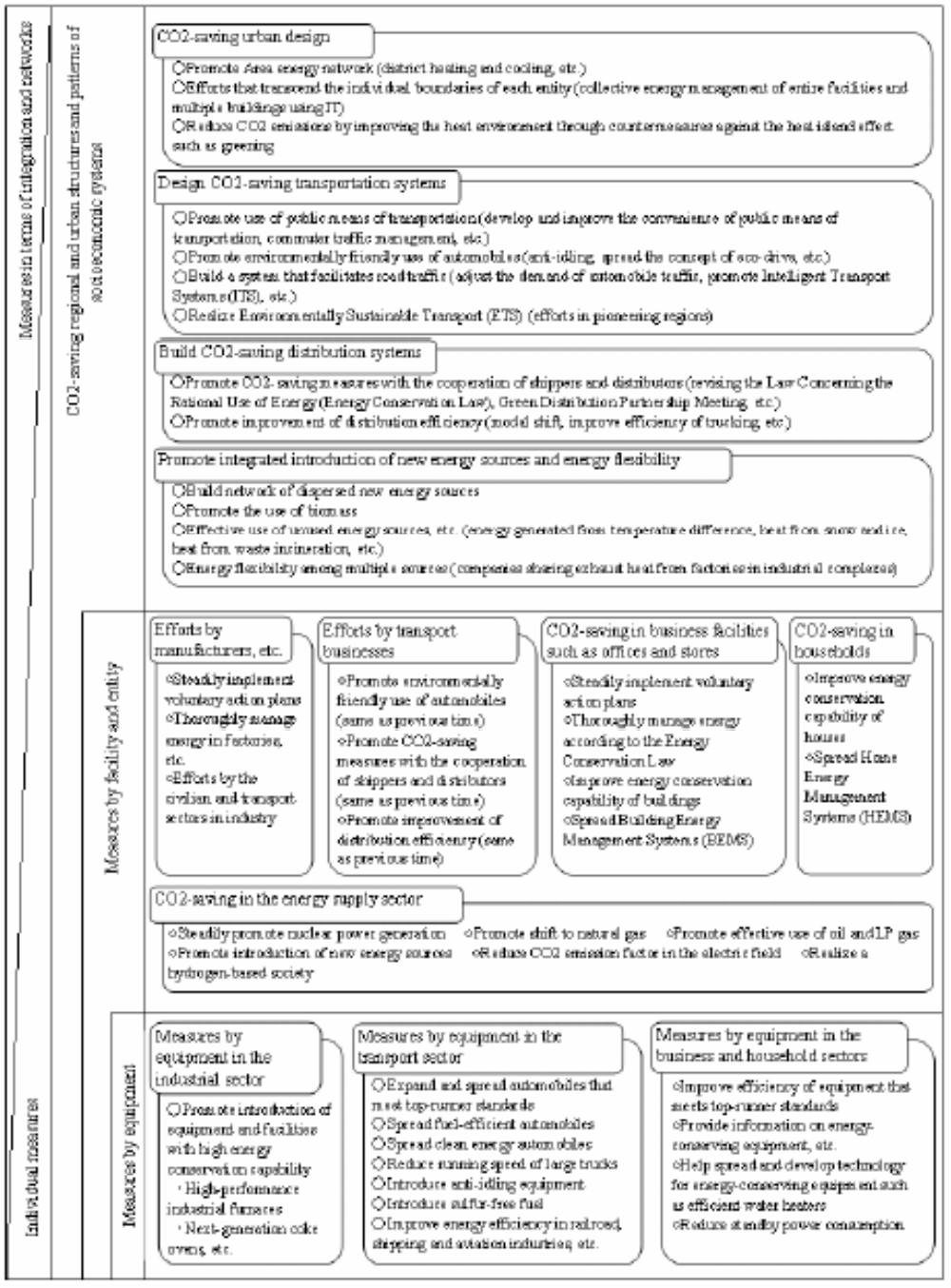


The central government has the role of comprehensively promoting global warming countermeasures and implementing measures undertaken on its own initiative. Local governments, corporations, and citizens are expected to undertake roles appropriate for their respective positions.

Target as rough ideas in Each Sector for Energy-originated Carbon Dioxide

Estimated results	Base year (FY1990)	FY2002 level of emissions		Targets in each sector for FY2010		<Reference> Difference between the FY2010 targets and the FY2002 level of emissions
	A	B	(B-A)/A	C	(C-A)/A	
	million t-CO2	million t-CO2	(Percentage change relative to base year in each sector)	million t-CO2	(Percentage change relative to base year in each sector)	
Energy-originated CO2	1,048	1,174		1,056		
Commercial sector	476	468	(-1. 7%)	435	(-8. 6%)	It is expected that if countermeasures and policies are not formulated, emissions will increase through increases in the volume of production resulting from economic growth, etc. Provisional calculations show that emissions can be reduced by 33 million tons from FY2002 levels through countermeasures and policies.
Civilian sector	273	363	(+33. 0%)	302	(+10. 7%)	
(Other sectors including offices and other business facilities)	144	197	(+36. 7%)	165	(+15. 0%)	It is expected that if countermeasures and policies are not formulated, emissions will increase through increases in the floor area in buildings, etc. Provisional calculations show that emissions can be reduced by 31 million tons from FY2002 levels through countermeasures and policies.

Overview of Measures Concerning Energy-Originated Carbon Dioxide Sources



Components of KPTAP

KPTAP provide mitigation measure information in a tabular format by responsible ministries in each sector

- Individual countermeasures

- Their evaluation indicators

- Expected extent of greenhouse gas emissions reduction

- Roles to be taken by each stakeholder for the countermeasures

- Policies of the central and local governments, etc

1. Macroframe Prospects

The following shows the macroframe settings for the 2010 prospects. These settings are shared by all cases.

(1) Population and labor force

The population is assumed to decrease after it hits its peak in FY2006, based on the "Moderate-Range Estimate" (January 2002) by the National Institute of Population and Social Security Research.

The unemployment rate has been improved from the lowest level (around 5%).

Fiscal year	1990	1995	2000	2005	2010
Total population (million people)	123.61	125.57	126.93	127.71	127.47
Labor force (million people)	64.14	66.72	67.72	67.59	67.09

(NB1) The total population hits its peak in FY2006 (127.74 million people).
(NB2) The labor force reaches its peak in FY1997 (67.93 million people).

(2) Exchange rate

The exchange rate is assumed to fluctuate at 120 yen/U.S. dollar according to the results around the past five years.

(3) Energy prices

Energy prices are assumed to fluctuate stably between FY2000 and FY2010 according to the prospects set by the IEA and U.S. Department of Energy.

(Real terms) Petroleum : $28/b → $21/b
LNG : $252/t → $179/t
Coal : $35/t → $39/t
(FY2010 prices are equivalent to dollars in 2000)

(4) Economic growth

The GDP growth in real terms by FY2010 is assumed to fluctuate as follows based on the prospects indicated in "Kozo Kaikaku to Keizai Zaisei no Chuki Tenbo" (available only in Japanese; literally "Medium-Term Outlook for Structural Reforms, Economics and Finance") (approved by the cabinet on January 21, 2005) and its reference documents (prepared by the Cabinet Office):

Fiscal year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
GDP growth in real terms (%)	0.8	1.9	2.1	1.6	1.5	1.5	1.6	1.5	1.6	1.6	1.5

NB: FY2002 and FY2003 values represent actual values.

(5) Final demand items (macrocomponents)

Future economic growth is assumed to be led by personal consumption, private capital investment or other private demands. In the public sector, on the other hand, expenditure is assumed to be constrained according to "Kozo Kaikaku to Keizai Zaisei no Chuki Tenbo".

Ministry/Agency: Ministry of Land, Infrastructure, Transport and Tourism

Practical countermeasures:

Promotion of Intelligent Transport System (ITS)

Projected emissions reduction:

Approx. 2.6 million tons-CO2

Premise of forecast at the time of cumulating:

[ETC]

- ETC utilization ratio
- Amount of traffic congestion by toll gate
- Number of vehicles passed by toll gate
- Improved speed due to the nonstop effect
- CO2 emission factors by speed and model

Descriptions on evidences and details (e.g. itemization) of how the "projected emissions reduction" is calculated:

1. ETC

Assuming that automobiles will not have to stop at toll gates and traffic congestion will be eased through promoting the use of the ETC system, the projected CO2 emissions reduction is calculated as follows:

CO2 reduction by promoting the use of the ETC system

= [Reduction by nonstop effort] + [Reduction resulting from eased traffic congestion at toll gates]

(1) [Reduction by nonstop effort]: Approx. 165,000 tons-CO2 [1]

The CO2 reductions achieved from the nonstop effect at toll gates are calculated for each toll gate or other factors, and the values are added.

= {(Unit CO2 emissions when automobiles with no ETC system can pass through toll gates) – (Unit CO2 emissions when automobiles with the ETC system pass through toll gates)} × Area length by toll gate × Number of vehicles passing through toll gates (ETC vehicles/day) × 365 days

(2) [Reduction resulting from eased traffic congestion at toll gates]: Approx. 30,000 tons-CO2 [2]

The CO2 reductions achieved by improving traffic congestion through the improved processing capacity at toll gates are calculated, and the values are added.

= {(Unit CO2 emissions during traffic congestion) – (Unit CO2 emissions when traffic congestion is eased)} × Length of traffic congestion × No. of vehicles passing through toll gates (ETC vehicles / hour) × Annual hours of traffic congestion / year

Projected emissions reduction:

Approx. 165,000 tons-CO2 [1] + Approx. 30,000 tons-CO2 [2] = Approx. 200,000 tons-CO2

Ministry/Agency: Ministry of Land, Infrastructure, Transport and Tourism

Practical countermeasures:
Promotion of Intelligent Transport System (ITS)

Projected emissions reduction:
Approx. 2.6 million tons-CO2

Premise of forecast at the time of cumulating:
[VICS]
- VICS penetration rate
- Improved speed due to VICS penetration
- CO2 emission factors by speed

Descriptions on evidences and details (e.g. itemization) of how the "projected emissions reduction" is calculated:

VICS
Assuming that the speed of automobiles will be improved through the promoted penetration of the VICS, the projected CO2 emissions reduction is calculated as follows:

(1) The number of km an automobile travels in 2010 that expects the improved speed through the VICS is estimated to be Approx. 550 billion traveler kilometers. [1]

(2) The unit CO2 reduction is calculated from the average speed difference before and after the introduction of the VICS. (Approx. 4.4 g-CO2/km) [2]

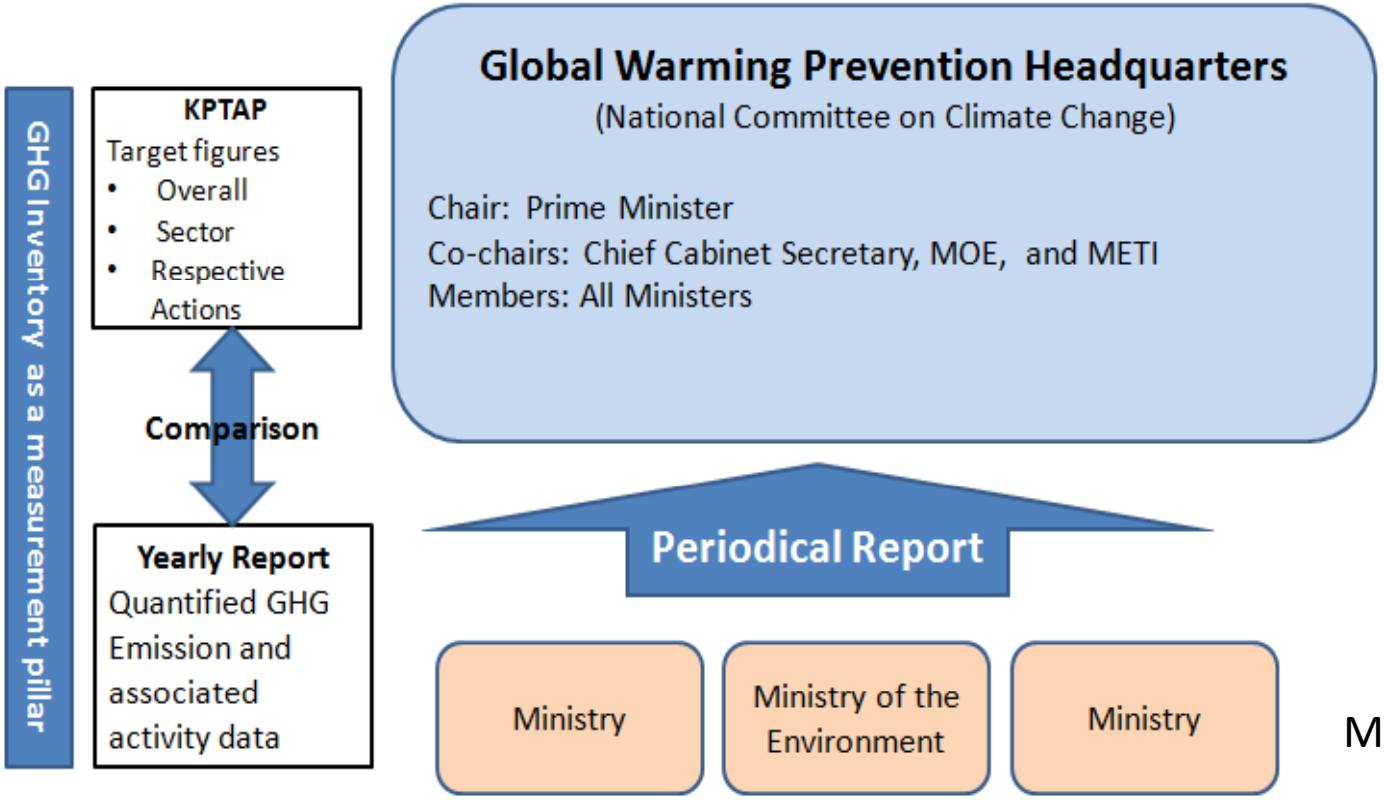
The projected CO2 emissions reduction is calculated with "Number of km an automobile travels in 2010 (in traveler kilometers / year)
= Approx. 550 billion traveler kilometers / year [1] × Approx. 4.4 g-CO2/km [2]
= Approx. 2.4 million tons-CO2

List of Measures and Policies Concerning Energy-originated Carbon Dioxide

Specific Countermeasure	Countermeasure Evaluation Index (Estimates of FY2008-FY2012)		Measure by Each Actor	National Policy	Example of Policies Expected to be Implemented by Local Governments	Countermeasure Effect		
						Estimated Volume of Emissions Reductions		Assumption Made in Calculating the Estimated Volume of Emissions Reductions*
Traffic demand management for automobiles	Length of improved bicycle paths (10,000km)		Traffic business operator: -Promoting measures for traffic demand management (TDM) Citizen: -Using a bicycle	-Promoting measures for traffic demand management (TDM) -Improving and supporting the environment for cycling -Implementing and supporting pilot programs contributing to the promotion of cycling	-Promoting measues for traffic demand management (TDM) -Improving the environment for cycling -Implementing pilot programs contributing to the promotion of cycling	($10,000t-CO_2$)		-Passenger cars' travel distances shorter than 5km -Conversion ratio to cycling -CO_2 emission coefficients for each speed
	2008	approx. 2.6				2008	approx. 26	
	2009	approx. 2.8				2009	approx. 28	
	2010	approx. 3.0				2010	approx. 30	
	2011	approx. 3.2				2011	approx. 32	
	2012	approx. 3.4				2012	approx. 34	
Implementation of Intelligent Transport Systems (ITS): Electronic Toll Collection systems (ETC)	Utilization rate of ETC (%)		Citizen, business operator: -Using ETC Expressway company: -Implementing measures to promote the dissemination of ETC	-Implementing measures to promote the dissemination of ETC	--Promoting the pioneering introduction based on the Green Purchasing Act	($10,000t-CO_2$)		-Vol. of traffic jams for each toll booth -No. of vehicles passing through each toll booth -CO_2 emission coefficients for each speed
	2008	approx. 77				2008	approx. 19	
	2009	approx. 79				2009	approx. 19	
	2010	approx. 81				2010	approx. 20	
	2011	approx. 83				2011	approx. 20	
	2012	approx. 85				2012	approx. 21	
Implementation of ITS: Vehicle Information and Communication Systems (VICS)	Dissemination rate of VICS (%)		Citizen, business operator: -Using VICS	-Promoting the dissemination of VICS	-Promoting the collection and provision of traffic information -Promote the pioneering introduction based on the Green Purchasing Act	($10,000t-CO_2$)		'-Improved speed through dissemination of VICS -CO_2 emission coefficients for each speed
	2008	approx. 19.0				2008	approx. 225	
	2009	approx. 19.5				2009	approx. 230	
	2010	approx. 20.0				2010	approx. 240	
	2011	approx. 20.5				2011	approx. 245	
	2012	approx. 21.0				2012	approx. 250	

Tracking KPTAP

Every year the Global Warming Prevention Headquarters (GWPH) under the cabinet of Japan comprehensively evaluates the progress of countermeasures and strengthens the policies as necessary with reference to the evaluation indexes.



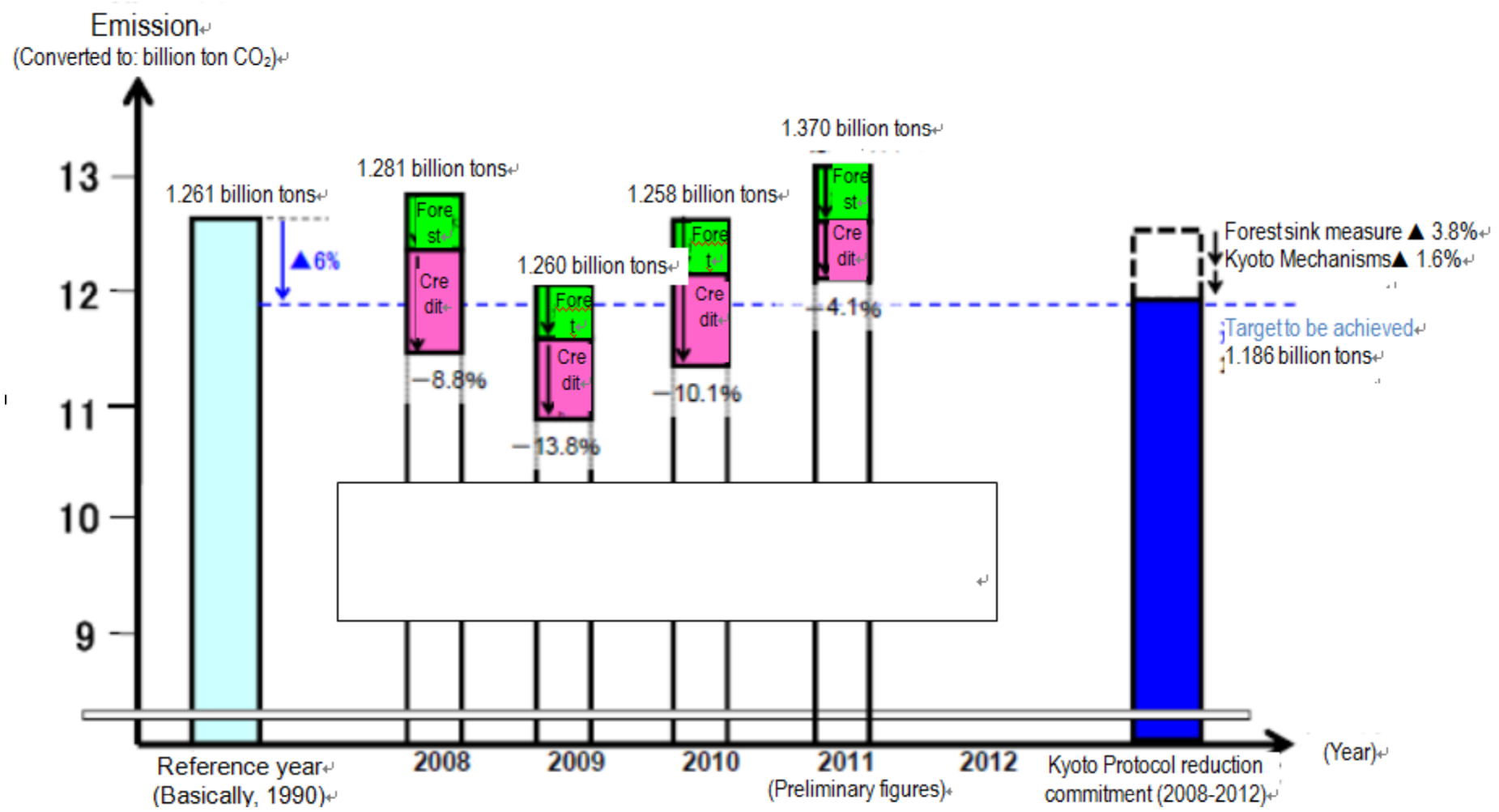
Makoto Kato

Tracking KPTAP

(in millions of ton)

	Reference year (Percentage of total)	2011 figures (Quick estimation) (Comparison with reference year)	2010 target (Comparison with reference year)
Energy-derived carbon dioxide	1,059 (84%)	1,173 (+10.7%)	1,076 through 1,089 (+1.6% through +2.8%)
Industrial sector	482 (38%)	420 (-12.8%)	424 through 428 (-12.1% through -11.3%)
Business and other sectors	164 (13%)	247 (+50.6%)	208 through 210 (+26.5% through +27.9%)
Household sector	127 (10%)	189 (+48.1%)	138 through 141 (+8.5through +10.9%)
Transportation sector	217 (17%)	230 (+5.8%)	240 through 243 (+10.3% through +11.9%)
Energy conversion sector	67.9 (5%)	86.1 (+26.8%)	66 (-2.3%)
Non energy-derived carbon dioxide	85.1 (7%)	69.1 (-18.8%)	85 (-0.6%)
Methane	33.4 (3%)	20.1 (-39.9%)	23 (-32.3%)
Chlorine monoxide	32.6 (3%)	22.0 (-32.6%)	25 (-24.2% through -24.0%)
Three CFC alternatives	51.2 (4%)	23.5 (-54.0%)	31 (-39.5%)
Total	1,261 (100%)	1,307 (+3.6%)	1,239 through 1,252 (-1.8% through -0.8%)

Tracking KPTAP



3. Review of KPTAP

To summarize the data, the government essentially searched performances from 2005 through 2011 to grasp the latest situations (e.g. additional/advanced measures and policies), while evaluating performance trends, as compared to the prediction when formulating the KPTAP . Moreover, the responsible ministries discuss addition and enforcement of next measures and policies in accordance with PDCA cycle described above .

KPTAP

Comparison

Specific Countermeasure	Countermeasure Evaluation Index (Estimates of FY2008-FY2012)	Measure by Each Actor	National Policy	Example of Policies Expected to be Implemented by Local Governments	Countermeasure Effect: Estimated Volume of Emissions Reductions	Countermeasure Effect: Assumption Made in Calculating the Estimated Volume of Emissions Reductions*
Traffic demand management for automobiles	Length of improved bicycle paths (10,000km) 2008 approx. 2.6 2009 approx. 2.8 2010 approx. 3.0 2011 approx. 3.2 2012 approx. 3.4	Traffic business operator: -Promoting measures for traffic demand management (TDM) Citizen: -Using a bicycle	-Promoting measures for traffic demand management (TDM) -Improving and supporting the environment for cycling -Implementing and supporting pilot programs contributing to the promotion of cycling	-Promoting measures for traffic demand management (TDM) -Improving the environment for cycling -Implementing pilot programs contributing to the promotion of cycling	($10,000t-CO_2$) 2008 approx. 26 2009 approx. 28 2010 approx. 30 2011 approx. 32 2012 approx. 34	-Passenger cars' travel distances shorter than 5km -Conversion ratio to cycling -CO_2 emission coefficients for each speed
Implementation of Intelligent Transport Systems (ITS): Electronic Toll Collection systems (ETC)	Utilization rate of ETC (%) 2008 approx. 77 2009 approx. 79 2010 approx. 81 2011 approx. 83 2012 approx. 85	Citizen, business operator: -Using ETC Expressway company: -Implementing measures to promote the dissemination of ETC	-Implementing measures to promote the dissemination of ETC	-Promoting the pioneering introduction based on the Green Purchasing Act	($10,000t-CO_2$) 2008 approx. 19 2009 approx. 19 2010 approx. 20 2011 approx. 20 2012 approx. 21	-Vol. of traffic jams for each toll booth -No. of vehicles passing through each toll booth -CO_2 emission coefficients for each speed
Implementation of ITS: Vehicle Information and Communication Systems (VICS)	Dissemination rate of VICS (%) 2008 approx. 19.0 2009 approx. 19.5 2010 approx. 20.0 2011 approx. 20.5 2012 approx. 21.0	Citizen, business operator: -Using VICS	-Promoting the dissemination of VICS	-Promoting the collection and provision of traffic information -Promote the pioneering introduction based on the Green Purchasing Act	($10,000t-CO_2$) 2008 approx. 225 2009 approx. 230 2010 approx. 240 2011 approx. 245 2012 approx. 250	-Improved speed through dissemination of VICS -CO_2 emission coefficients for each speed

Progress Report

Specific measure	Evaluation indexes and the like for measures	2008	2009	2010	2011	2012	Evaluation of performance trends and the like compared to the predictions*1	Addition and enforcement of measures and policies
		Predicted figures						
Promotion of Intelligent Transport Systems (ITS), such as introduction of ETC.	Emission reduction (10,000 t-carbon dioxide)	19	19	20	20	21	Achieved goals or performance trends resulted higher than the prediction.	During 2012, implemented a mileage discount campaign.
	ETC use rate (%)	77	79	81	83	85		
Promotion of Intelligent Transport Systems (ITS), such as introduction of VICS.	Emission reduction (10,000 t-carbon dioxide)	225	230	240	245	250	Performance trend resulted almost as expected.	During 2012, expanded rest stops and upgraded road traffic information providing systems.
	VICS prevalent rate (%)	19.0	19.5	20.0	20.5	21.0		
Promotion of Intelligent Transport Systems (ITS) (building central control traffic lights)	Emission reduction (10,000 t-carbon dioxide)	100	110	110	120	130	Performance trend resulted almost as expected.	During 2012, achieved centralized control of traffic signals. Planned to systematically implement centralizing traffic signal controls in the future.
	Unit	38,000	40,000	42,000	44,000	47,000		
	10,000 persons	970	1,140	1,300	1,460	1,630		

Fin

Box SPM.1: Representative Concentration Pathways (RCPs)

Climate change projections in WGI require information about future emissions or concentrations of greenhouse gases, aerosols and other climate drivers. This information is often expressed as a scenario of human activities, which are not assessed in this report. IPCC WGI scenarios have focused on anthropogenic emissions and do not include changes in natural drivers such as solar or volcanic forcing or natural emissions, for example, of CH4 and N2O.

For the Fifth Assessment Report of IPCC, the scientific community has defined a set of four new scenarios, denoted Representative Concentration Pathways (RCPs, see Glossary). They are identified by their approximate total radiative forcing in year 2100 relative to 1750: 2.6 W m-2 for RCP2.6, 4.5 W m-2 for RCP4.5, 6.0 W m-2 for RCP6.0 and 8.5 W m-2 for RCP8.5. For the Coupled Model Intercomparison Project Phase 5 (CMIP5) results, these values should be understood as indicative only, as the climate forcing resulting from all drivers varies between models due to specific model characteristics and treatment of short-lived climate forcers. These four RCPs include one mitigation scenario leading to a very low forcing level (RCP2.6), two stabilization scenarios (RCP4.5 and RCP6), and one scenario with very high greenhouse gas emissions (RCP8.5). The RCPs can thus represent a range of 21st century climate policies, as compared with the no-climate-policy of the Special Report on Emissions Scenarios (SRES) used in the Third Assessment Report and the Fourth Assessment Report. For RCP6.0 and RCP8.5, radiative forcing does not peak by year 2100; for RCP2.6 it peaks and declines; and for RCP4.5 it stabilizes by 2100. Each RCP provides spatially resolved data sets of land use change and sector-based emissions of air pollutants, and it specifies annual greenhouse gas concentrations and anthropogenic emissions up to 2100. RCPs are based on a combination of integrated assessment models, simple climate models, atmospheric chemistry and global carbon cycle models. While the RCPs span a wide range of total forcing values, they do not cover the full range of emissions in the literature, particularly for aerosols.

Most of the CMIP5 and Earth System Model (ESM) simulations were performed with prescribed CO2 concentrations reaching 421 ppm (RCP2.6), 538 ppm (RCP4.5), 670 ppm (RCP6.0), and 936 ppm (RCP 8.5) by the year 2100. Including also the prescribed concentrations of CH4 and N2O, the combined CO2-equivalent concentrations are 475 ppm (RCP2.6), 630 ppm (RCP4.5), 800 ppm (RCP6.0), and 1313 ppm (RCP8.5). For RCP8.5, additional CMIP5 ESM simulations are performed with prescribed CO2 emissions as provided by the integrated assessment models. For all RCPs, additional calculations were made with updated atmospheric chemistry data and models (including the Atmospheric Chemistry and Climate component of CMIP5) using the RCP prescribed emissions of the chemically reactive gases (CH4, N2O, HFCs, NOx, CO, NMVOC). These simulations enable investigation of uncertainties related to carbon cycle feedbacks and atmospheric chemistry.