

International Climate Change Regime: Its Structure, Achievements and Challenges

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May 22, 2014

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- What the most recent science tells us
- International climate change regime: basic structure, its achievements and challenges
- State of affairs of climate regime
- Challenges for climate regime beyond 2020

Impacts of climate change

- likely that anthropogenic warming has had a discernible influence on many physical and biological systems.
- very likely that all regions will experience either declines in net benefits or increases in net costs for increases in temperature greater than about 2-3° C and that developing countries are expected to experience larger percentage losses.

Impacts in Asia

- Decrease in **freshwater availability** could adversely affect more than one billion people by the 2050s.
- “Climate change is projected to **impinge on the sustainable development of most developing countries of Asia**, as it compounds the pressures on natural resources and the environment associated with rapid urbanization, industrialization, and economic development.”

Brief History of Climate Negotiations

- 1988 Establishment of IPCC
- 1992 UNFCCC adopted (entry into force in 1994)
- 1995 COP1: Berlin Mandate adopted
- 1997 Kyoto Protocol (KP) adopted
- 2001 Marrakesh Accords (implementation rules) adopted
- 2005 Entry into force of the KP; Negotiation under the KP (AWG-KP) started
- 2007 Bali Action Plan adopted; Negotiation under the UNFCCC (AWG-LCA) launched
- 2009 COP15: Copenhagen Accord
- 2010 COP16: Cancun Agreements
- 2011 COP17: Durban Platform Agreement
- 2012 COP18 : Doha Climate Gateway
- 2013 COP19 (Warsaw)
- 2014 COP20 (Lima)
- 2015 COP21 (Paris)

Negotiating groups

- Group of developed countries
 - EU(28 member states) + α
 - Umbrella Group: (usually) Australia, Canada, **Japan**, NZ, Norway, **Russia**, Ukraine, US + α
- Group of developing countries: G77/China
 - AOSIS (Alliance of small island states)
 - LDC (Least developed countries)
 - OPEC or Arab group
 - African Group
 - ALBA
 - Association of Independent Latin American and Caribbean states (AILAC)
 - BASIC
 - Like minded developing countries group (LMDC)
- EIG: Environmental integrity group

United Nations Framework Convention on Climate Change (1992) (1)

- Ultimate objective (Article 2)
 - “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”
- Principles (Article 3)
 - Common But Differentiated Responsibilities and Respective Capabilities
 - Equity
 - Sustainable Development
 - Precautionary Approach

Article 2 of UNFCCC

The **ultimate objective** of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, **stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system**. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

United Nations Framework Convention on Climate Change (1992) (2)

- **Commitment for all parties**
 - Develop, periodically update, publish and make available to the COP ..., **national inventories**
 - Formulate, implement, publish and regularly update **national and regional programs** containing mitigation/ adaptation measures
- **Commitments for developed countries (Annex I countries)**
 - Adoption of policies and measure; Communication of information; Technology transfer and financing for developing countries
 - **Annex II countries provide financial support and enhance technology transfer.**
- Establishment of the Convention bodies
 - COP; Subsidiary bodies; Secretariat

Kyoto Protocol (1997) (1)

- **Quantified emission limitation and reduction objectives (QELROs)** for developed countries (Article 3.1)
 - Compared to 1990 emissions (baseyear emissions); Commit themselves to reducing their emissions during 1st commitment period (2008-2012)
 - Japan : -6%、 US : -7%、 EU : -8%
 - Coverage of gases: CO₂, N₂O, CH₄, HFC, PFC, SF₆

Kyoto Protocol (1997) (2)

- Kyoto Mechanisms
 - Use of market mechanism
 - **Joint Implementation (JI)** (Article 6) (Green Investment Scheme; GIS)
 - **Clean Development Mechanism (CDM)** (Article 12)
 - **Emissions Trading** (Article 17)

Kyoto Protocol (1997) (3)

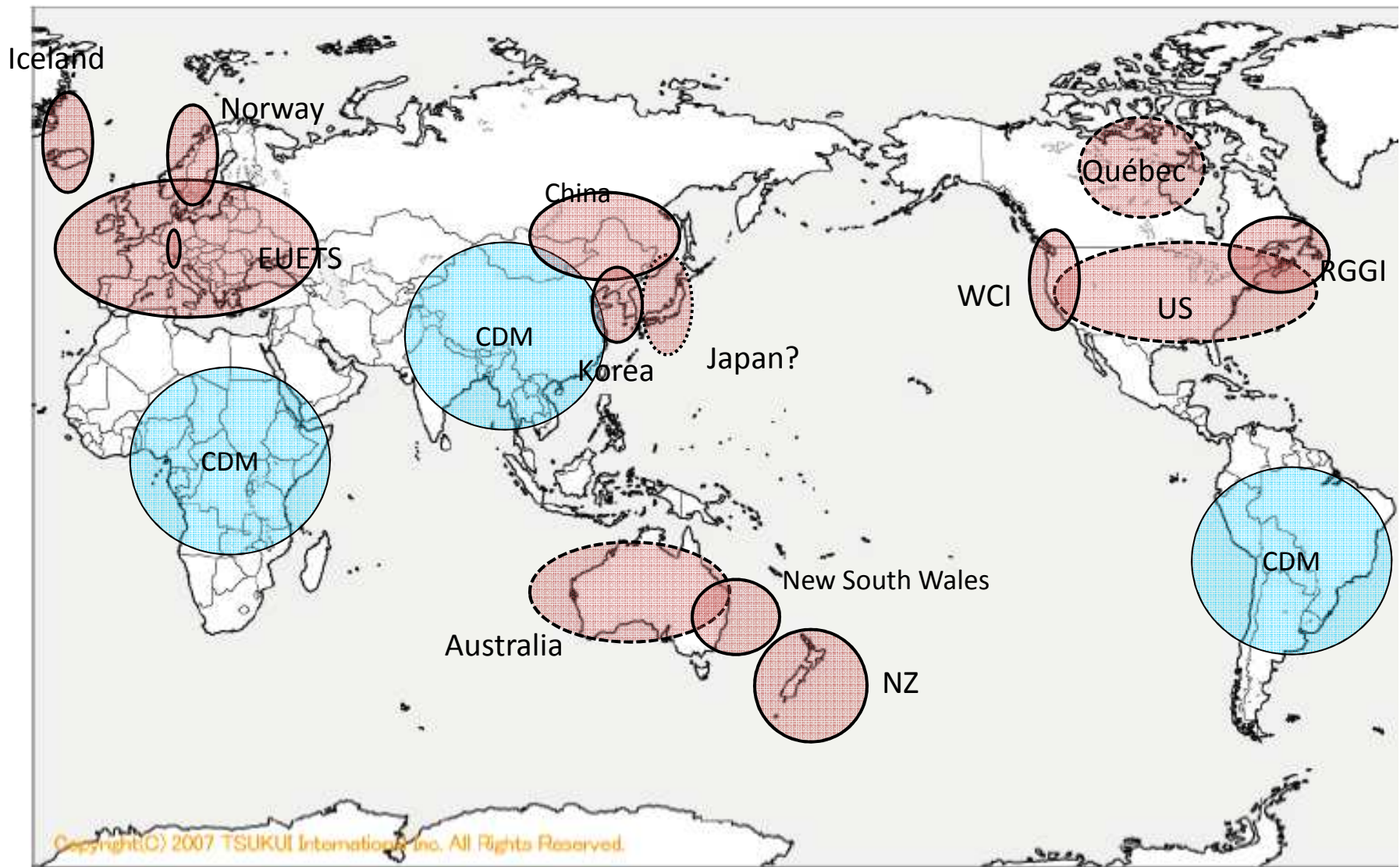
- Other institutional arrangements
 - National inventory
 - Reporting and review
 - Compliance mechanism
 - Adaptation fund

What has been achieved so far

- Paradigm fundamentally shifted from laissez-faire to coordinated control over GHG emissions
- Progress of mitigation measures especially after the adoption of the Kyoto Protocol
 - Mitigation actions taken within developed countries compared to before the adoption of the Kyoto Protocol
 - Progress of CDM activities = emission limitation in developing countries
 - Several innovative idea and tool introduced: market mechanisms (CDM, Emissions tradings)/ autofinancing Adaptation Fund

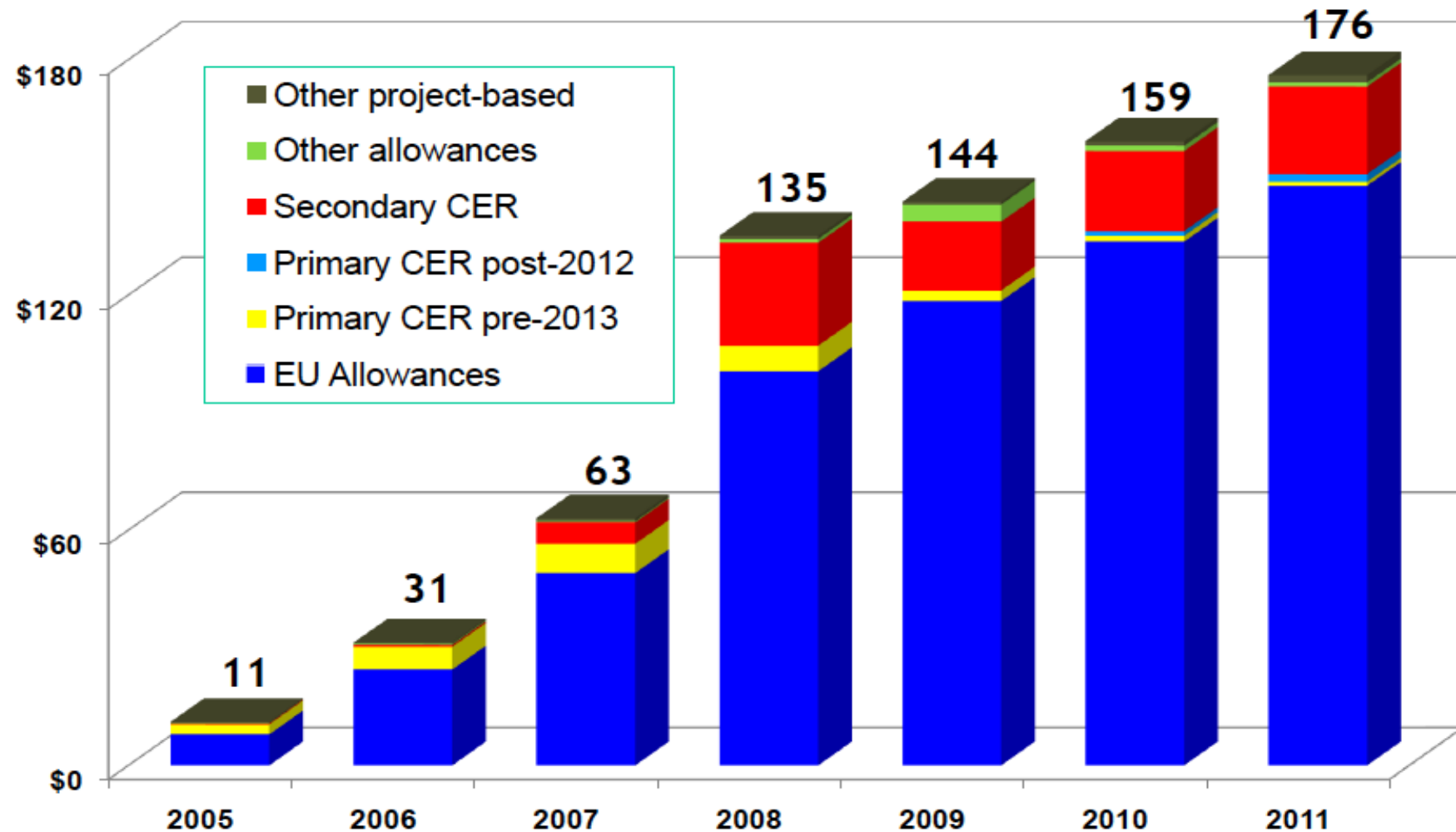
Evolution of Carbon Market

- 3395 CDM projects registered and 3,329 more projects in the pipeline.
- More than 2.7 GtCO₂ is expected to be reduced by 2012, 7.0GtCO₂ more by 2020 through CDM.
 - Corresponds to 2 year's aggregated emissions of Japan and to 3 year's emissions of Germany.
(UNEP Risoe Center, CDM pipeline, as of 1st September 2011)
- In 2007, 7.4 billion US dollar was transacted for CERs.
 - Equivalent 3 times of 4 year (2002-2006) GEF funding (GEF3).
- The CDM Executive Board reported that the amount of investment to developing countries under the CDM by the end of 2006 is 26 billion US dollar.
- Windows for emission reduction in developing countries and for funding necessary for such reduction.
- about 39% of all CDM projects accounting for 64% of the annual emission reductions, especially projects with foreign participants, claim to involve technology transfer (Seres, et al., 2007)



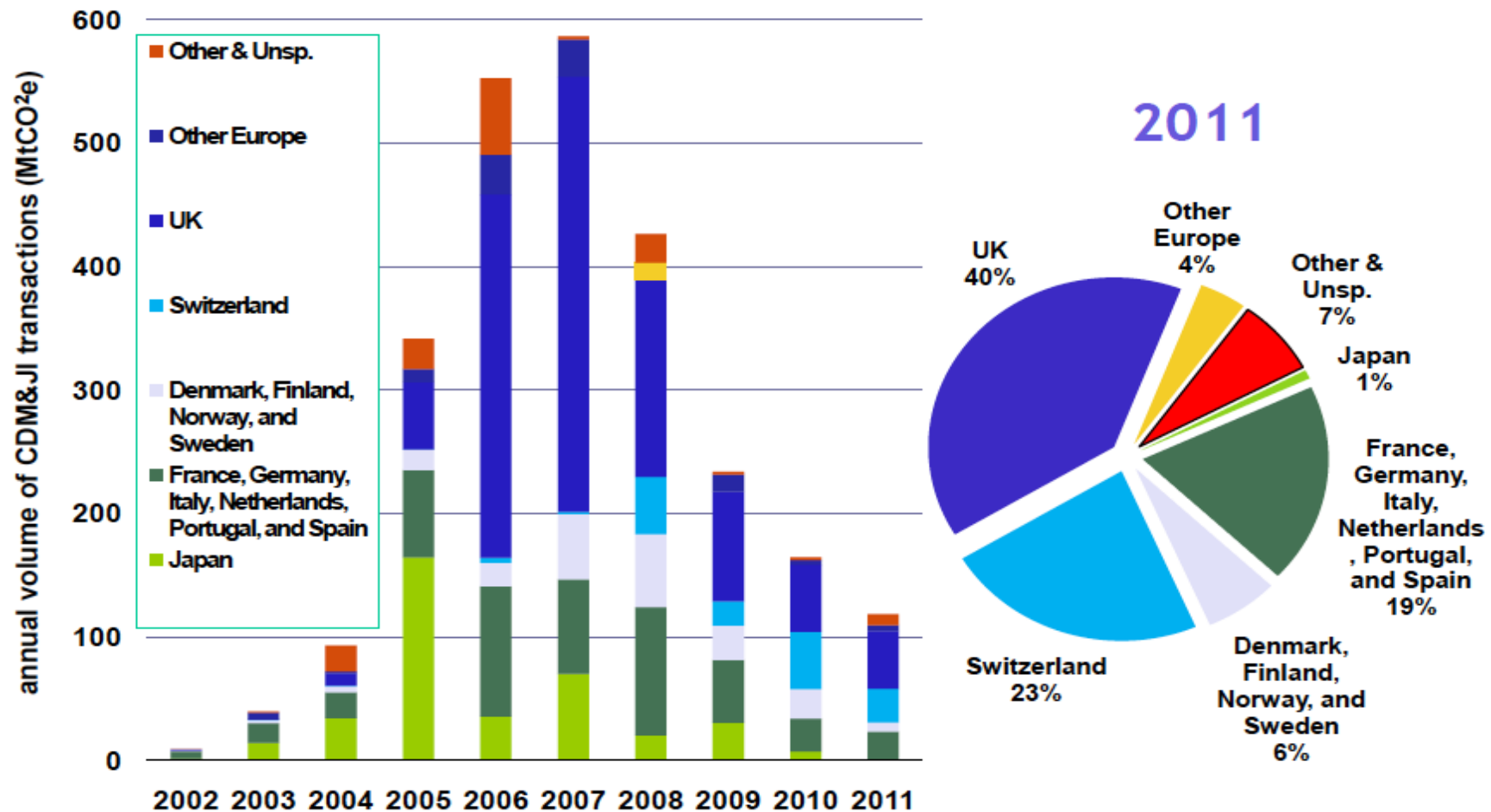
Steady increase of global market

(in Billion US\$)



Source: State and Trends of Carbon Market, 2012

CDM and JI buyers (pre-2013)

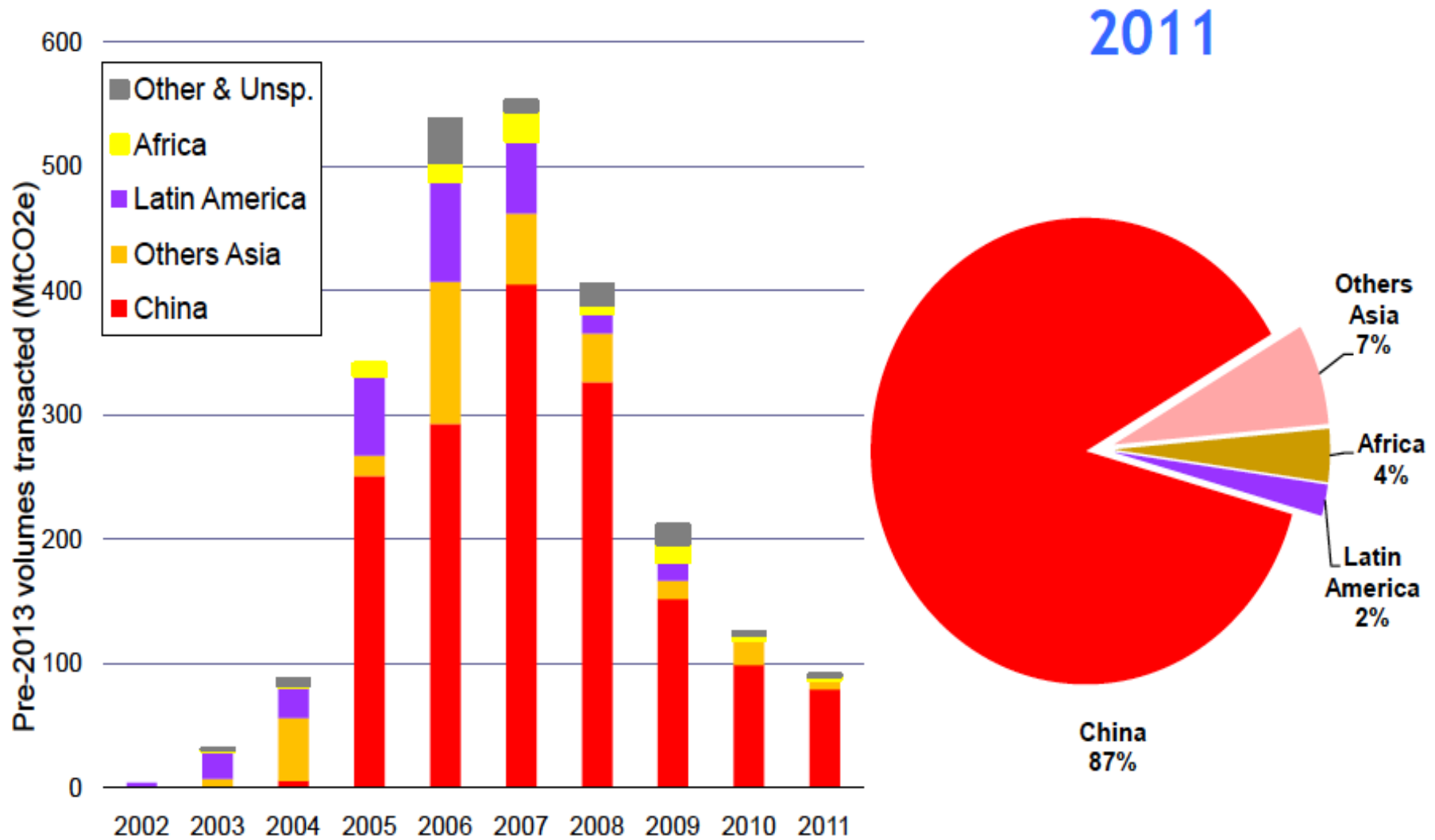


Other Europe includes Ireland, Austria, Belgium, Luxembourg, Iceland and Greece.

Other and Unsp. include s USA, Australia, Canada, New Zealand, Rep. of Korea, and others unspecified.

Source: State and Trends of Carbon Market, 2012¹⁷

Who's selling (pre-2013)



Source: State and Trends of Carbon Market, 2012

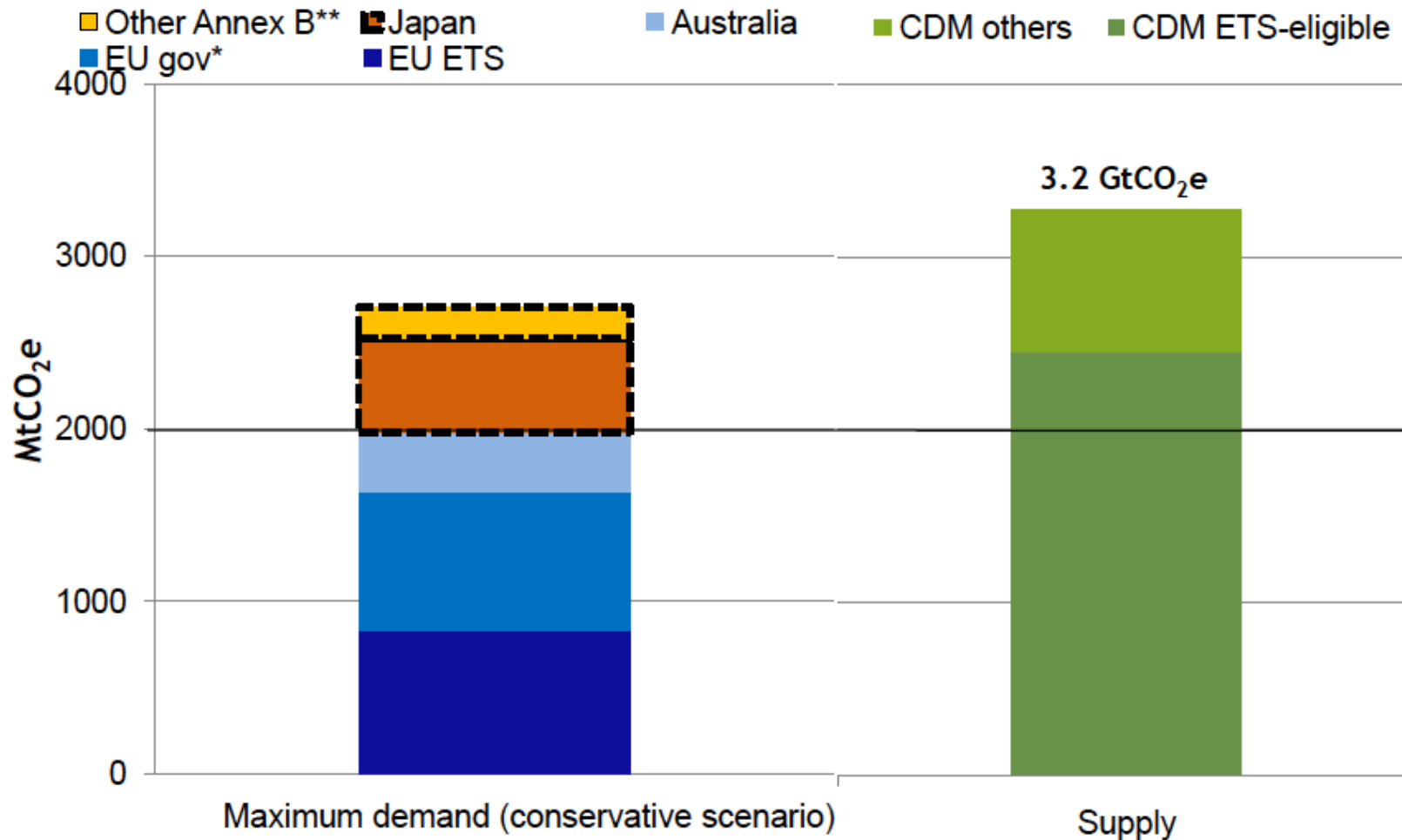
Prospect of carbon market Demand for 2008-12

Potential Demand from Industrialized Countries (MtCO ₂ e)		Potential Supplies (MtCO ₂ e)	
Country or entity	Kyoto assets demand	Official target*	
EU	1,065	Potential GIS	>1,500
<i>Government (EU-15)</i>	315	Ukraine	500–700
<i>Private sector (EU ETS)</i>	750	Russian Federation	200
		Czech Republic	120
		Other EU-10	600
Japan	300		
<i>Government of Japan</i>	100		
<i>Japanese private sector</i>	200		
Rest of Annex B	27	CDM & JI	1,366
<i>Government</i>	22	CDM	1,152
<i>Private sector</i>	5	JI	214
			range: 1,238–1,487
TOTAL	1,392		
<i>Government</i>	437		
<i>Private Sector</i>	955		

*: These numbers correspond to the amounts of AAUs governments intend to sell. They are much lower than the whole amount of excess AAUs, now estimated at more than 10 billion tCO₂e over the first commitment period, with Russia accounting for half, Ukraine one-quarter, and Poland one-fifth.

Source: Carbon Finance at the World Bank, 2011

Market projections indicate constrained demand over 2013-2020



*Including Iceland, Liechtenstein, and Norway

** Including New Zealand, North America, and Switzerland

Source: State and Trends of Carbon Market, 2012

Impact on adaptation fund

Revenue	254.90 (Million US dollar)
CER	167.92
Contribution by Parties and others	85.82
Revenue from investment	1.15
Expenditure	25.61 (Million US dollar)
Expenditure for adaptation projects	12.40
Administrative cost	13.21

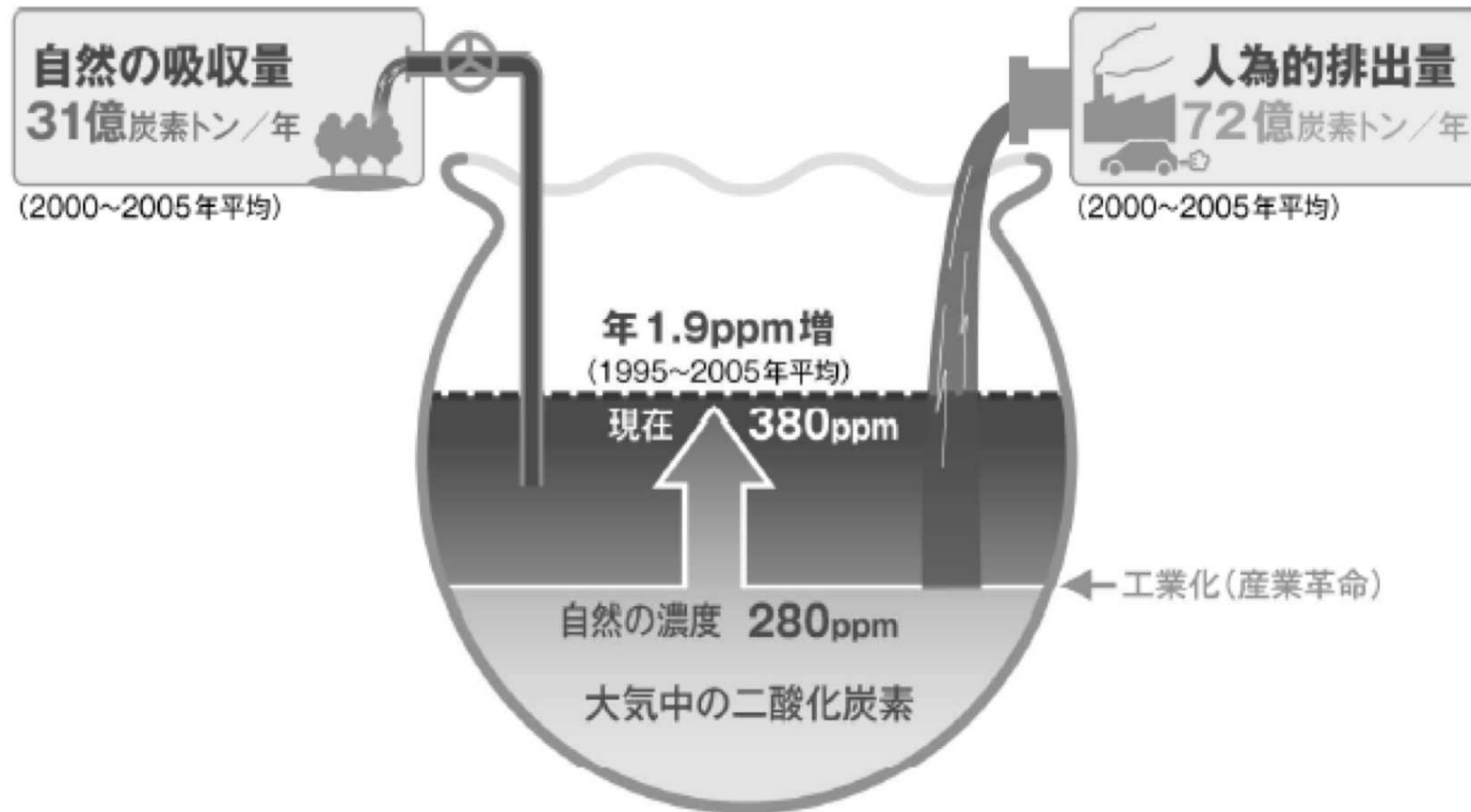
As of 31 September 2011

Source: Adaptation Fund, 2011 ²¹

Article 2 of UNFCCC

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温室効果ガス濃度安定化のためには、排出量を、今後自然吸収量と同等まで減らすことが必要。



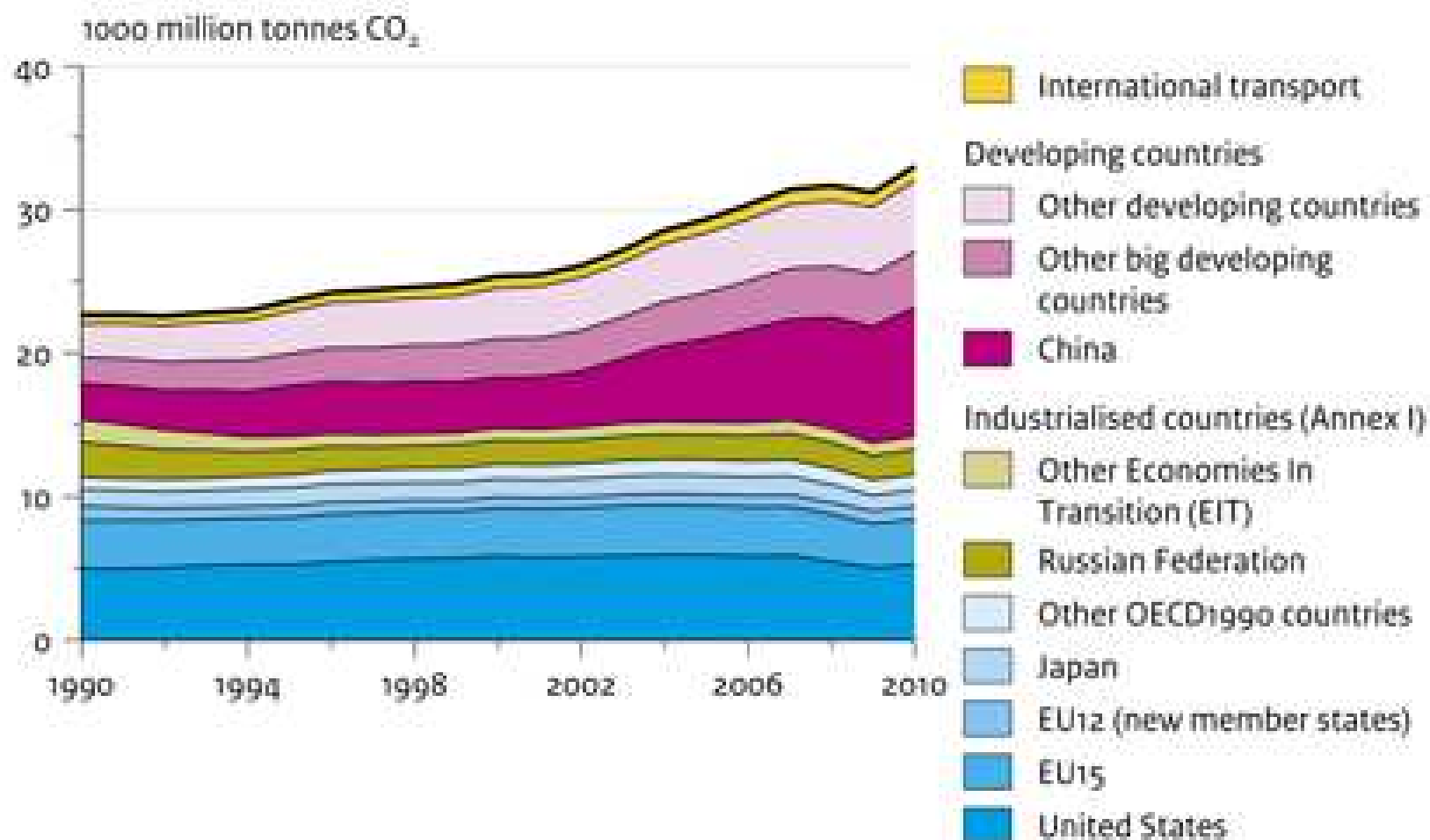
(IPCC第4次評価報告書(2007)より 国立環境研究所・環境省作成)

Stabilization requires emission reduction by more than 50% compared to current emission level.

Emerging long term goal

- Basically, countries agree on drastic cut of global emissions by the middle of this century.
- In Toyako Summit (2008), G8 countries endorsed “the goal of achieving **at least 50% reduction of global emissions by 2050**” as the goal that G8 countries want to “share with all Parties to the UNFCCC and together with them to consider and adopt in the UNFCCC negotiations”. L’ Aquila Summit (2009) confirmed it.
- **Cancun Agreements (2011): long term target = limit temperature rise below 2 degree from pre-industrialized level**

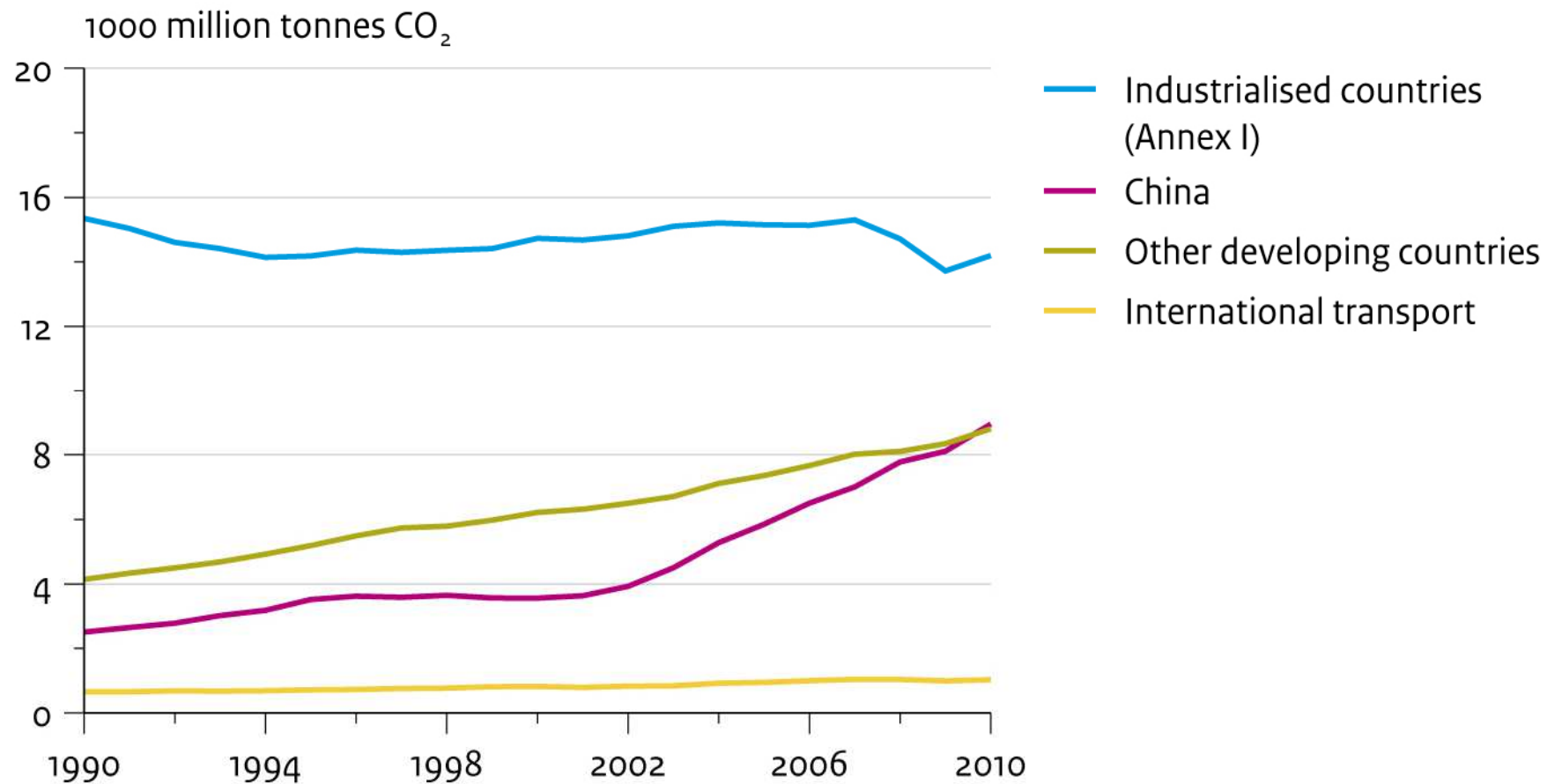
Global CO₂ emissions from fossil fuel use and cement production per region



Source: EDGAR 4.2 (1970-2008); IEA, 2010; BP, 2011; USGS, 2011; WSA, 2011; NOAA, 2011.

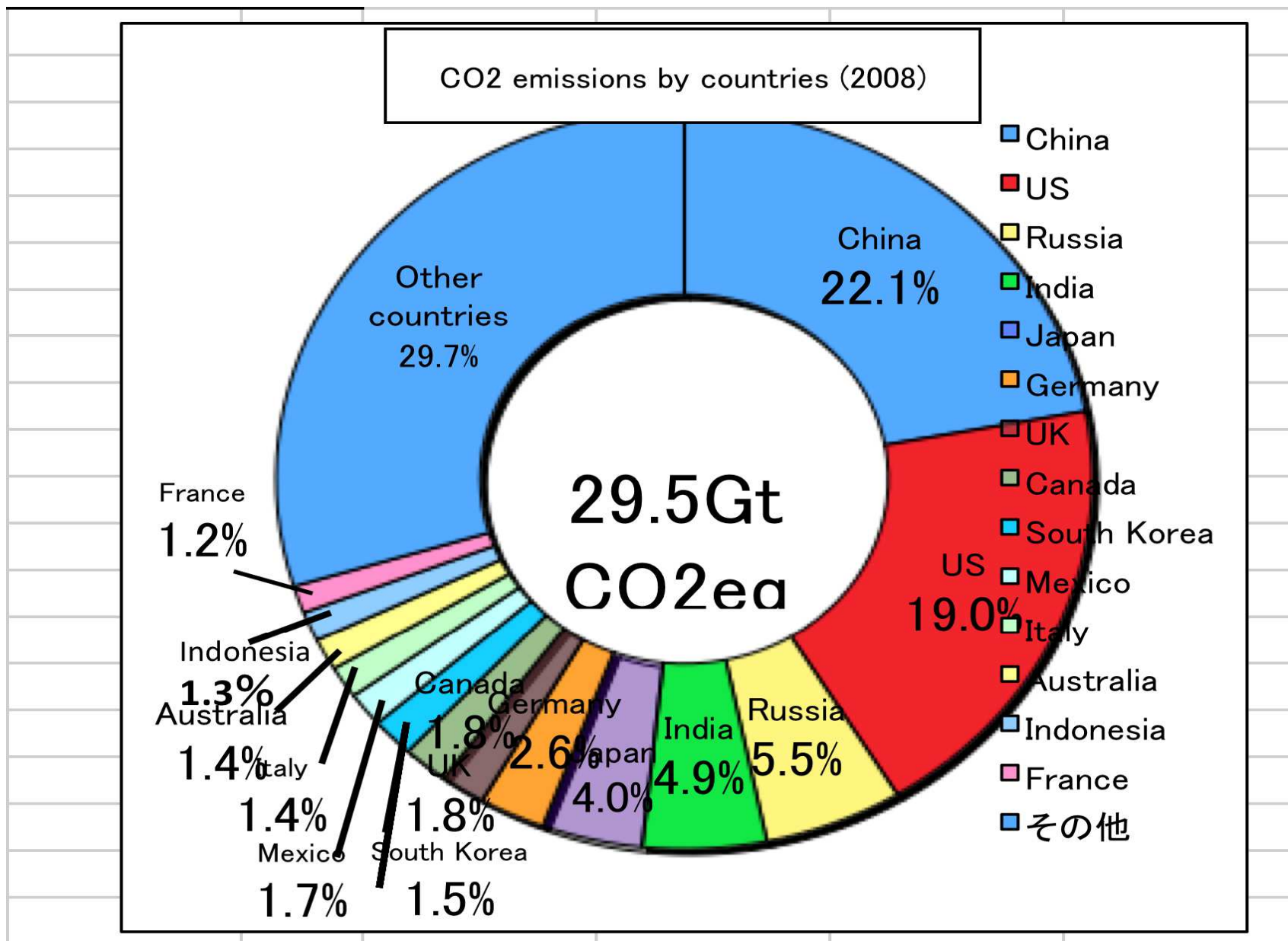
www.pbl.nl

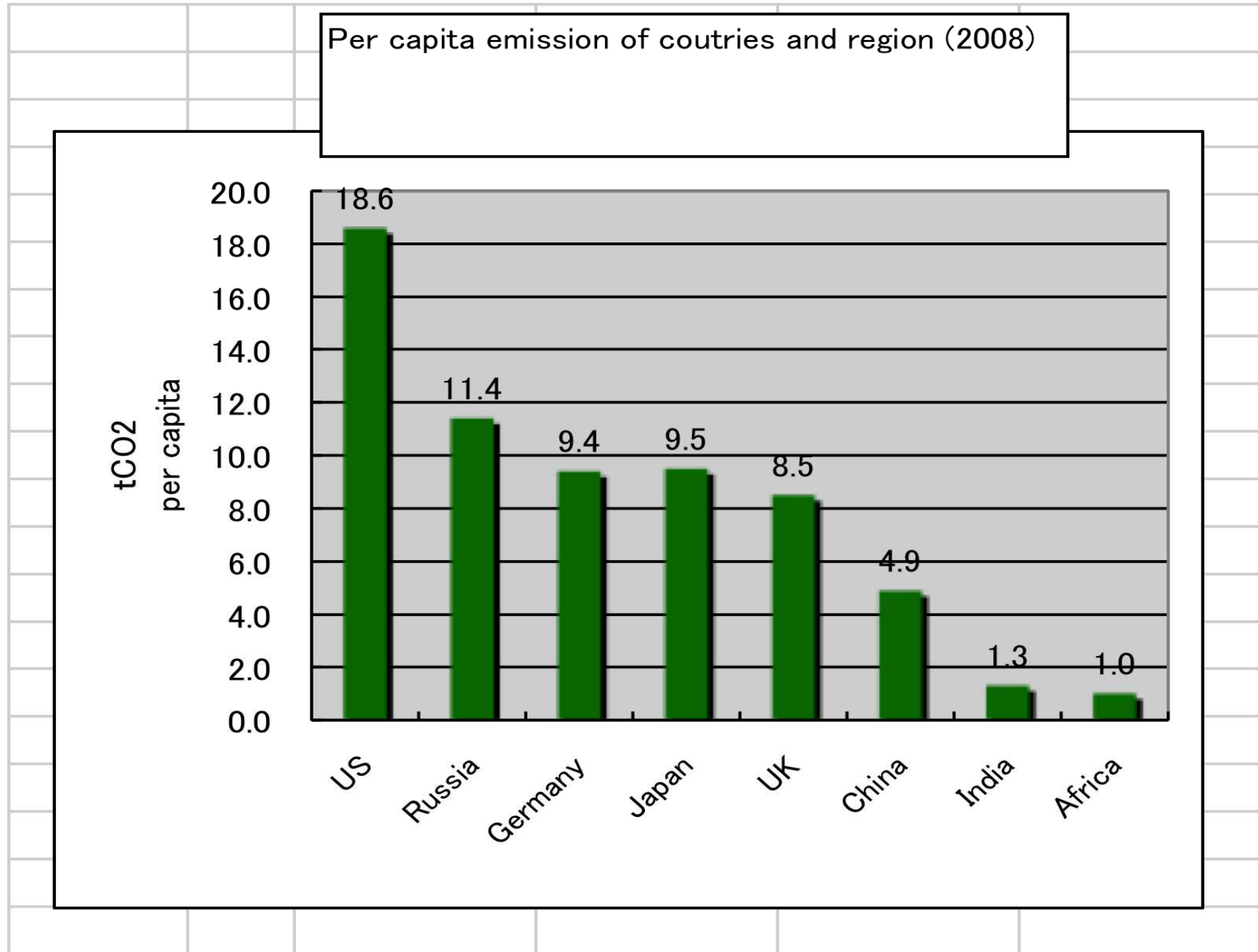
CO₂ emissions from fossil fuel use and cement production per region



Source: EDGAR 4.2; Olivier et al., 2011.

www.pbl.nl





Source: Takamura based on IEEJ, Handbook on Energy & Economic Statistics in Japan 2011

People without access to electricity by region

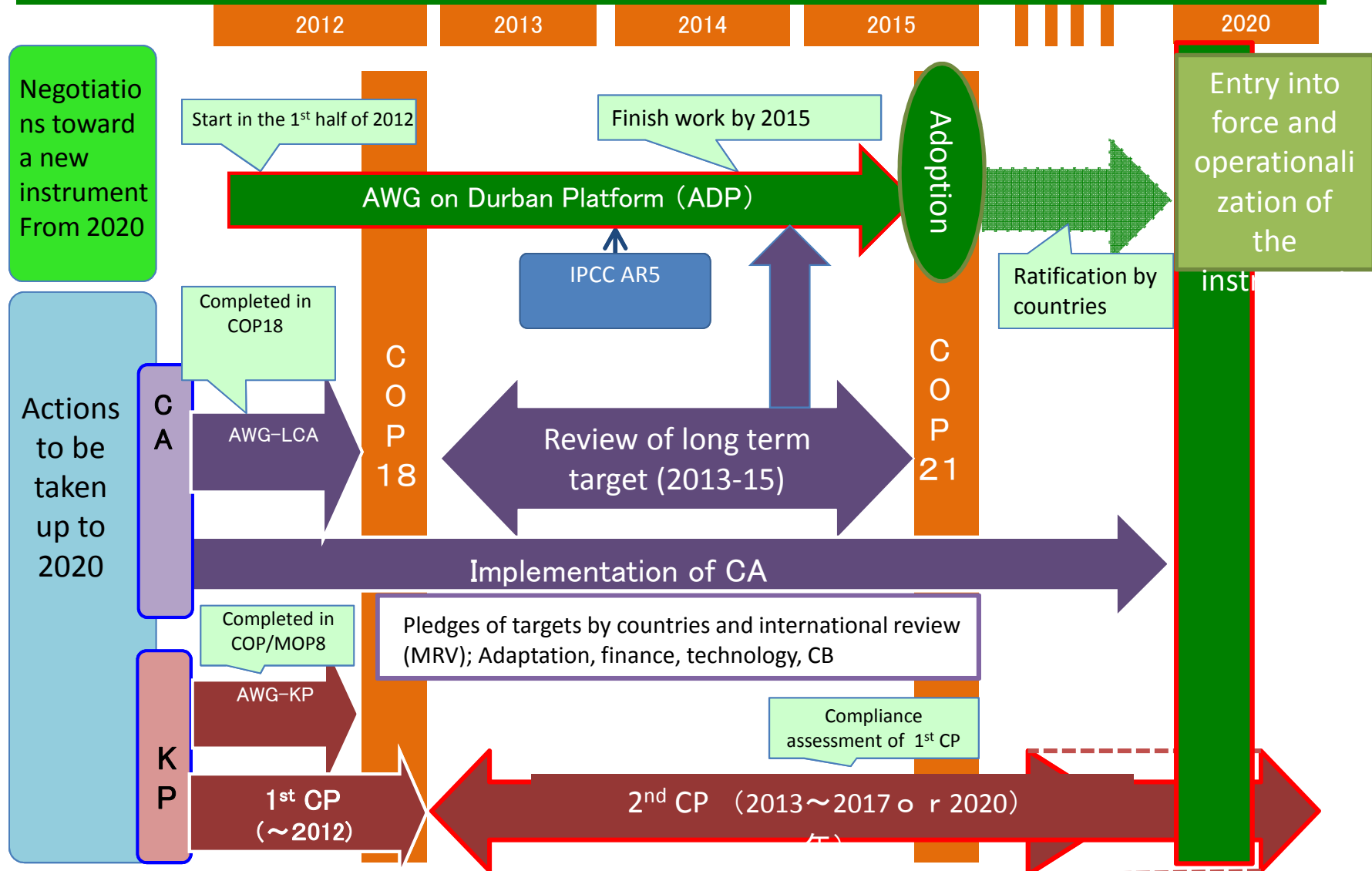
	2009			2030		
	Rural	Urban	Share of population	Rural	Urban	Share of population
Africa	466	121	58%	539	107	42%
Sub-Saharan Africa	465	121	69%	538	107	49%
Developing Asia	595	81	19%	327	49	9%
China	8	0	1%	0	0	0%
India	268	21	25%	145	9	10%
Rest of developing Asia	319	60	36%	181	40	16%
Latin America	26	4	7%	8	2	2%
Middle East	19	2	11%	5	0	2%
Developing countries	1 106	208	25%	879	157	16%
World*	1 109	208	19%	879	157	12%

*Includes countries in the OECD and Eastern Europe/Eurasia.

Investment and financial flows are key

- Returning global emissions to current levels in 2030 requires **additional investment and financial flows about 200 billion US dollar in 2030** (UNFCCC Secretariat 2007). Updates in 2008 show that they will be **170% higher**.
- **Over half would be needed in DCs** (UNFCCC Secretariat 2008).
- **Private funds** will play a crucial role.
 - will constitute the largest share of investment and financial flows (86 %) (UNFCCC Secretariat 2007).

Outcome of COP17 : Itinerary toward a new legal instrument, to start from 2020



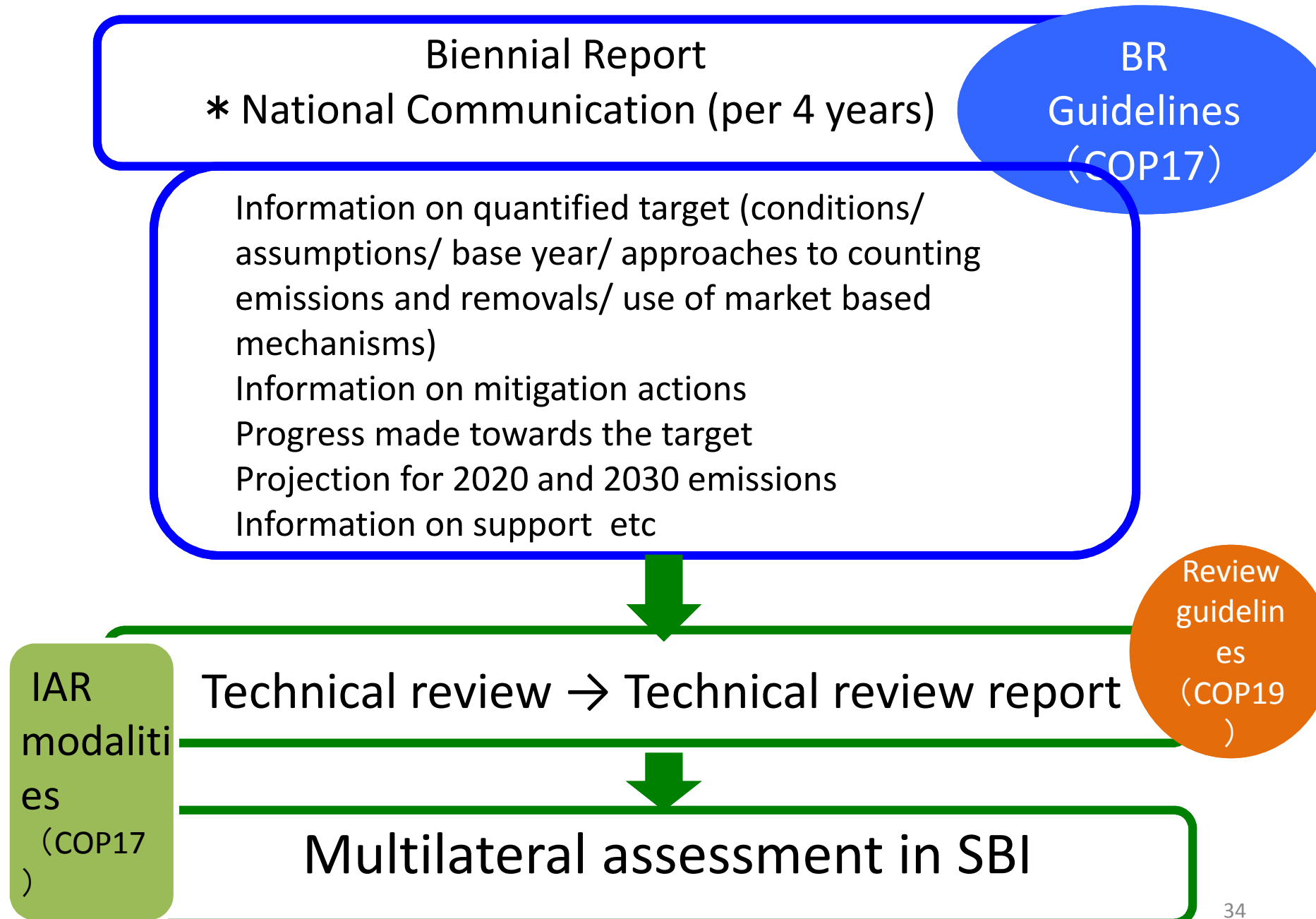
Implementing rules by 2020(2)

- Mitigation by developed countries (1)
 - Annex I Parties commit to implement individually or jointly the quantified economy-wide emissions targets for 2020.... (Copenhagen Accord, 2009)
 - Urges developed country Parties to increase the ambition of their economy-wide emission reduction targets.
 - Should develop low-carbon development strategies or plans

Implementing rules by 2020(2)

- **Mitigation by developed countries (2)**
 - Submit **annual greenhouse gas inventories** and **biennial reports** on their progress in achieving emission reductions
 - Information on emission reduction target; coverage of sector; LULUCF; use of market mechanisms
 - Progress in achieving target and predicted change in 2020 and 2030 emissions
 - Support for developing countries etc.
 - Establish a process for international assessment of emissions and removals and review national communication (**International Assessment and Review: IAR**)

MRV for mitigation by developed countries

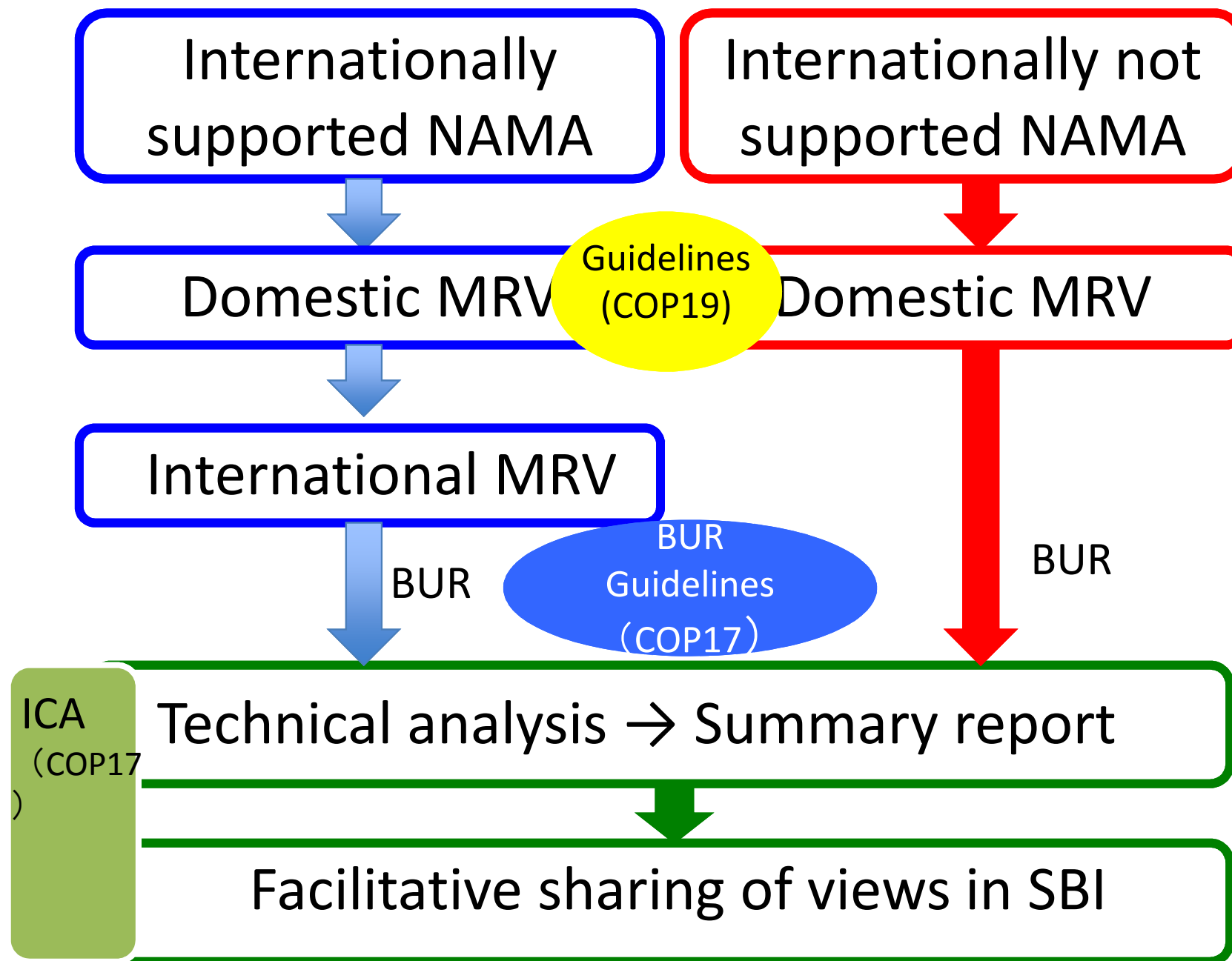


	1 st CP of the KP (2008-12) 2 nd CP of the KP	Implementation by 2020 under the COP
Legally bindingness of target	▪ Legally binding target	▪ politically commit to implementing its target
How to establish the level of reduction	▪ Decided through negotiation among countries	▪ Pledged voluntarily by each country. Need to explain the details of target.
Accounting rules	▪ Internationally establish common accounting rules.	▪ Ambiguity about accounting rules
Approaches to MRV and compliance assessment	▪ Report inventories to be submitted for review annually. Assess compliance after the period by comparing emissions and credits the country holds in its registry.	▪ Report inventories to be submitted for review annually. Report mitigation actions, their effect etc biennially to be submitted for review.
Measures against non compliance	▪ Compliance committee decides measures against non compliance.	▪ No measures decided so far.

Implementing rules by 2020(3)

- Nationally Appropriate Mitigation Actions (NAMA) by developing countries (DCs)
 - Key tool for enhancing and assisting mitigation actions by DCs
 - NAMA is **totally a voluntary pledge** by DCs.
 - Once submitted to the UNFCCC, they will be registered at the **registry**, which will enhance **matching of NAMA with international support for it**.
- Submit **national communication every 4 years** and **biennial update reports** in principle.
- Encourages developing countries to develop **low-carbon development strategies or plans** in the context of sustainable development.

MRV for mitigation by developing countries



Implementing rules by 2020(4)

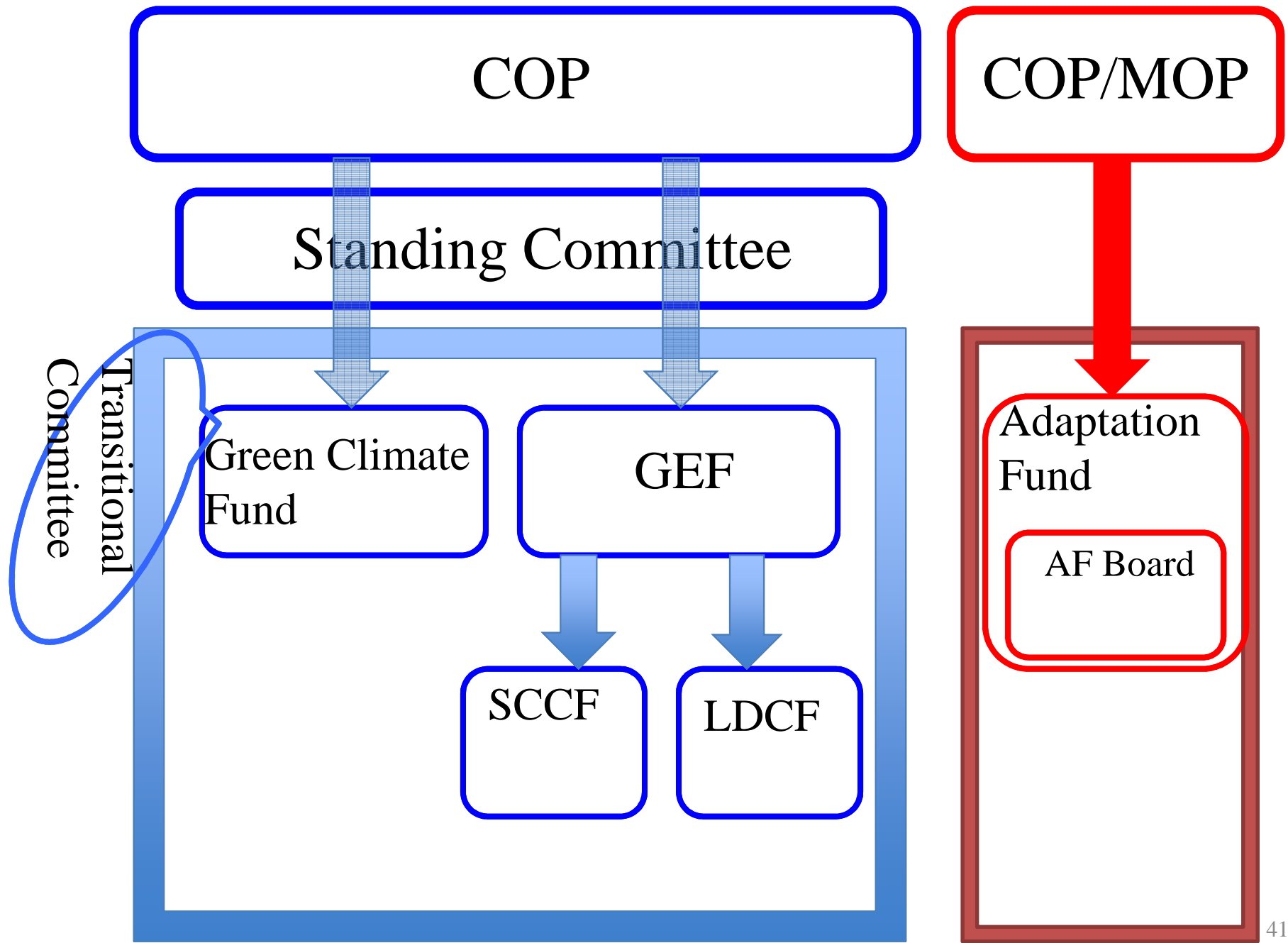
- **Reducing emissions from deforestation in DCs (REDD+)**
 - Agreed technical modalities at COP19 (national forest monitoring system, reference emission level, safeguards...)
 - Agreed to start a results-based finance at COP19
- **New market mechanisms under the UNFCCC (not under the KP).**
 - SBSTA requested to conduct a work programme to elaborate a framework for various approaches (Doha, para. 44 et s.)
 - SBSTA requested to conduct a work programme to elaborate modalities and procedures for the new market mechanism (Doha, para. 50 et s.)
 - No significant progress.

Implementing rules by 2020(5)

- Adaptation
 - Decide to establish “Cancun Adaptation Framework” and Adaptation Committee to enhance action on adaptation (CA).
 - Decides to establish Warsaw international mechanism to address loss and damage associated with the impacts of climate change in developing countries (COP19 decision)

Implementing rules by 2020 (6)

- Takes note of the collective commitment by developed countries to provide new and additional resources approaching **USD 30 billion for the period 2010-2012**.
- Recognizes that developed country Parties commit, in the context of meaningful mitigation actions and transparency on implementation, to a **goal of mobilizing jointly USD 100 billion per year by 2020** to address the needs of DCs.
- Biannual reporting by developed countries, continuation of consideration on long term finance by 2020, biannual high level ministerial dialogue (COP19 decision)



Implementing rules by 2020(7)

- Decides to establish a **Technology Mechanism**
 - (a) A **Technology Executive Committee**
 - (b) A **Climate Technology Centre and Network**, which facilitate a Network of national, regional, sectoral and international technology networks, organizations and initiatives

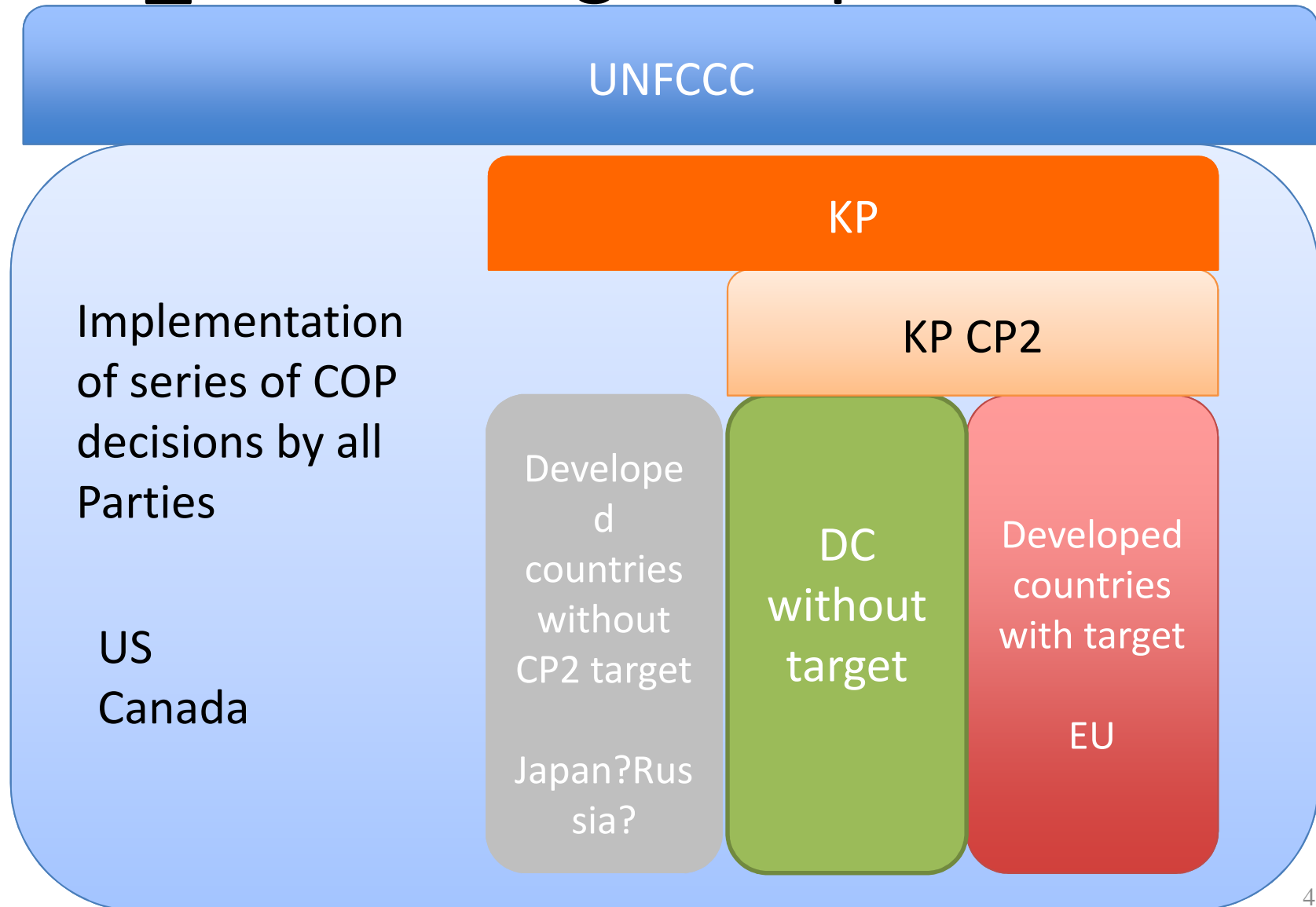
KP 2nd commitment period (1)

- Amendment containing 2nd CP reduction targets for Annex I countries adopted in COP18.
- 2nd CP shall **begin on 1 January 2013** and **end 31 December 2020 (8 years)**.
- **Implementing rules** relating to LULUCF, Kyoto mechanisms and coverage of gases.
 - **No significant change in the Kyoto mechanisms rules.**
 - For **LULUCF**, credits are to be issued for surplus removals from the reference level determined by each Annex I country. **The way of setting the baseline is country-specific**, which is different from the one in the 1st CP.

KP 2nd commitment period (2)

- Limited carry over of surplus AAUs
- Limited access to the Kyoto mechanisms for countries not participating in the 2nd CP
- Limited participation and effectiveness
 - US is not party from the beginning; Canada withdrew; Japan and Russia declared that they have no intention to take the target under the 2nd CP.
 - Only EU and other European countries and Australia will go along with 2nd CP. Share of emission covered by the KP 2nd CP is about 15% of global emissions.

_Climate regime up to 2020



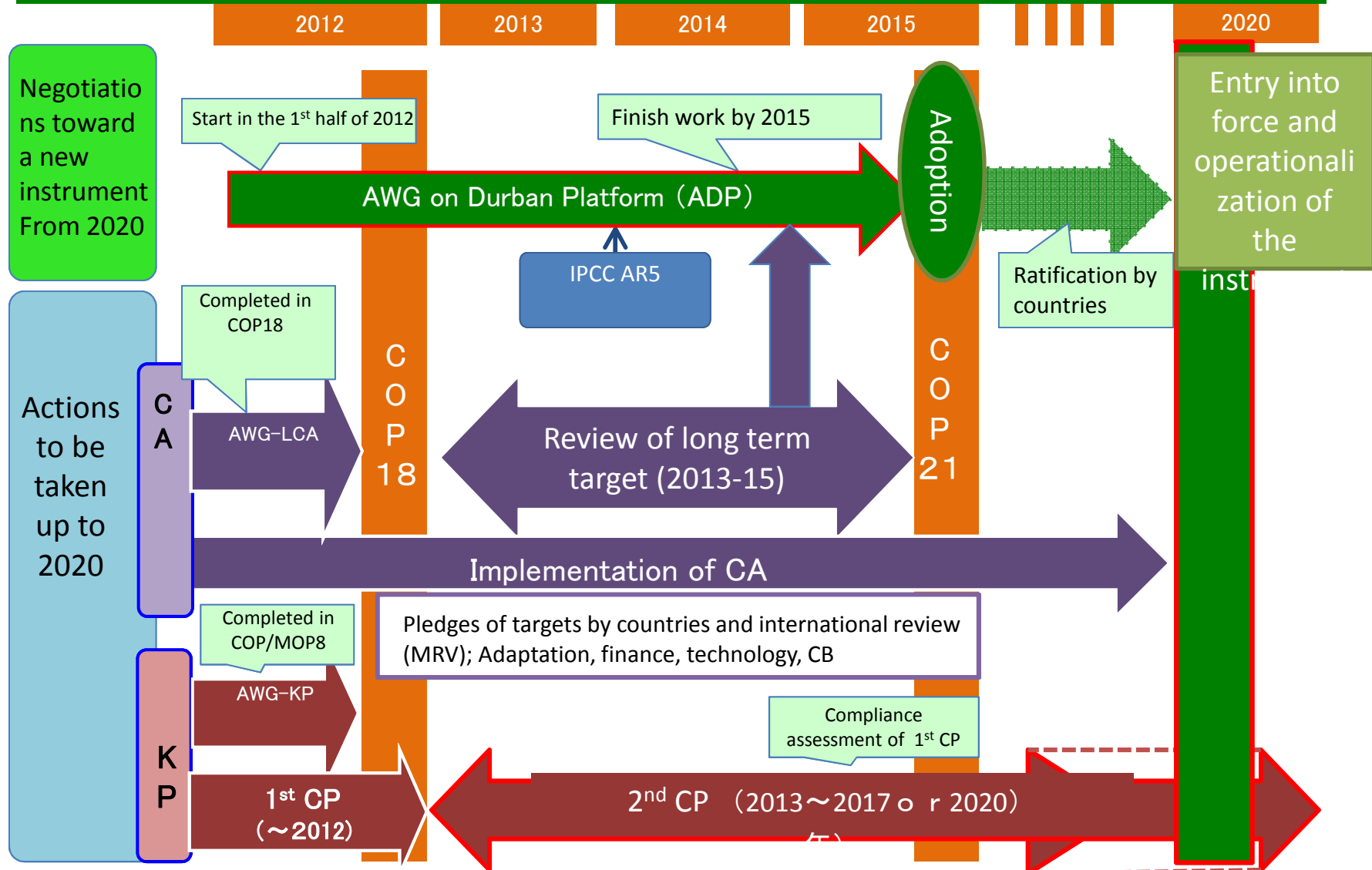
Emerging posture of regime

- Both developed countries and developing countries do mitigation efforts with some **differentiation** based on equity and in accordance with CBDR and respective capabilities.
- Seek to ensure that implementation (mitigation) will be **more transparent and accountable**.
- Institutional arrangements to enhance support.

“Gap” between pledges and target

- Mitigation commitments by developed countries: **return to “pledge and review”?**
 - Might be the only way the US could agree on.
 - Two concerns
 - Is is the way of ensuring achieving the emerging long term target?
 - Gap between current level of pledges and level required by science exists. Current level of accumulated pledges would lead **to increase in temperature by about 3.5 degree (about 700ppmv) by 2100** (Höhne et al. 2009).
 - How to ensure the **comparability of efforts** between developed countries?
 - Increased possibility of **unilateral measures.**

Outcome of COP17 : Itinerary toward a new legal instrument, to start from 2020

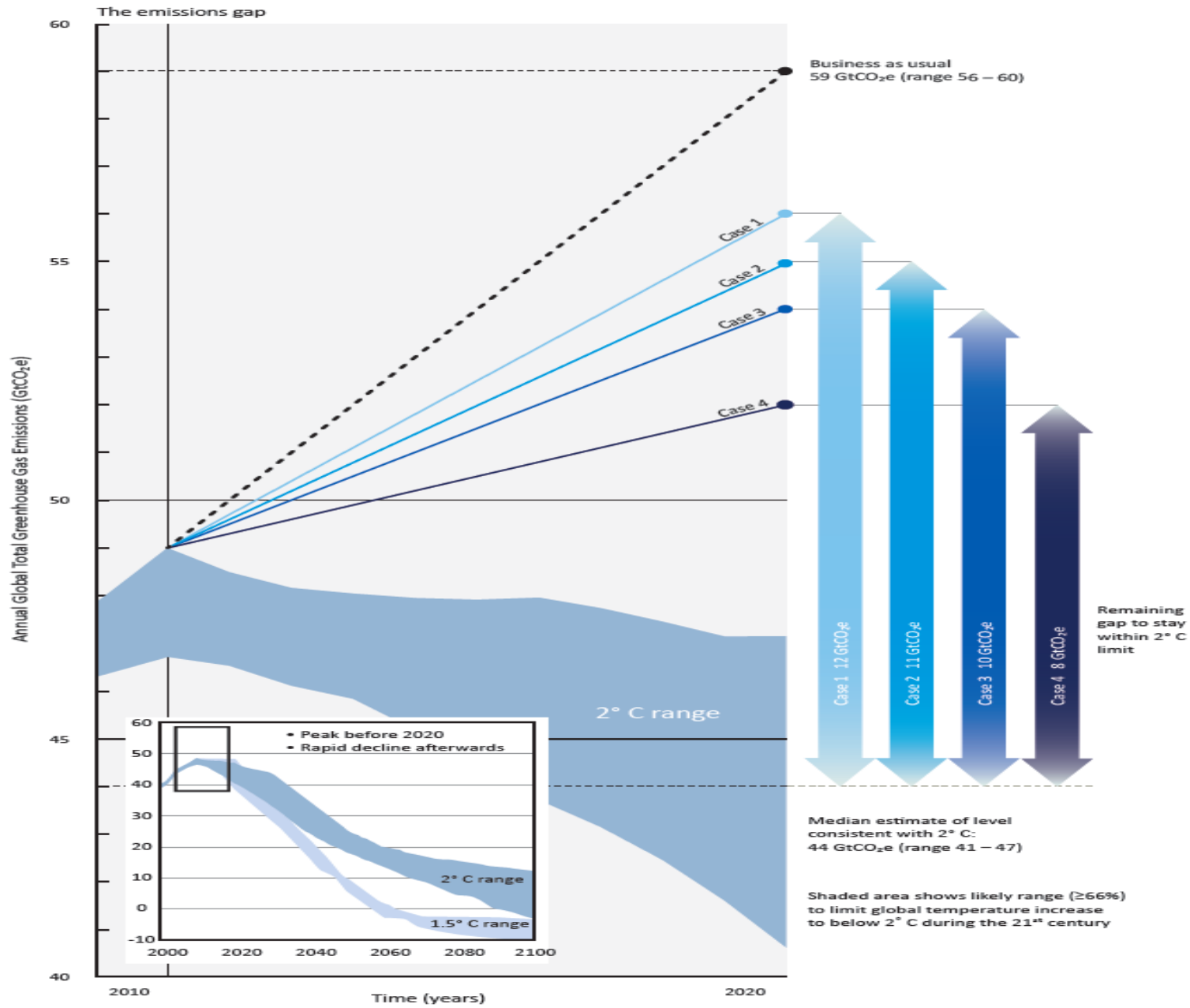


Negotiation toward a 2015 agreement(1)

- “Launch a process to develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties”
 - “a protocol”
 - “another legal instrument”
 - “an agreed outcome with legal force”
- Legal bindingness of the instrument might remain controversial while majority of countries prefer legally binding one.

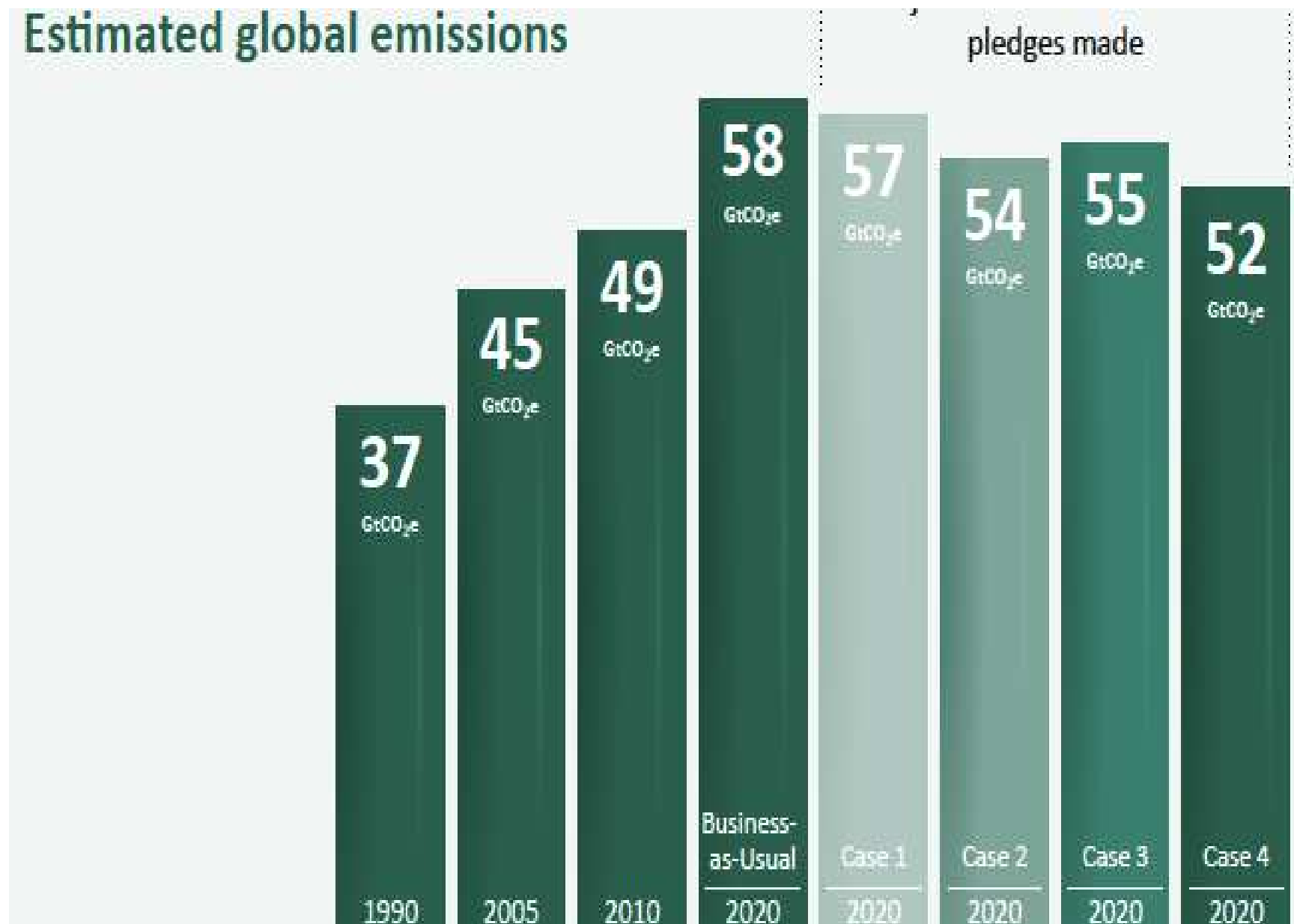
Negotiation toward a 2015 agreement(2)

- Establishment of an **Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP)**
 - ADP shall **complete its work** as early as possible but **no later than 2015** in order to adopt this protocol ... at COP21 (2015) and **for it to come into effect and be implemented from 2020.**
- The process shall **raise the level of ambition.**
- Decides to **launch a workplan on enhancing mitigation ambition** to identify and to explore options for a range of actions that can close the **ambition gap.**



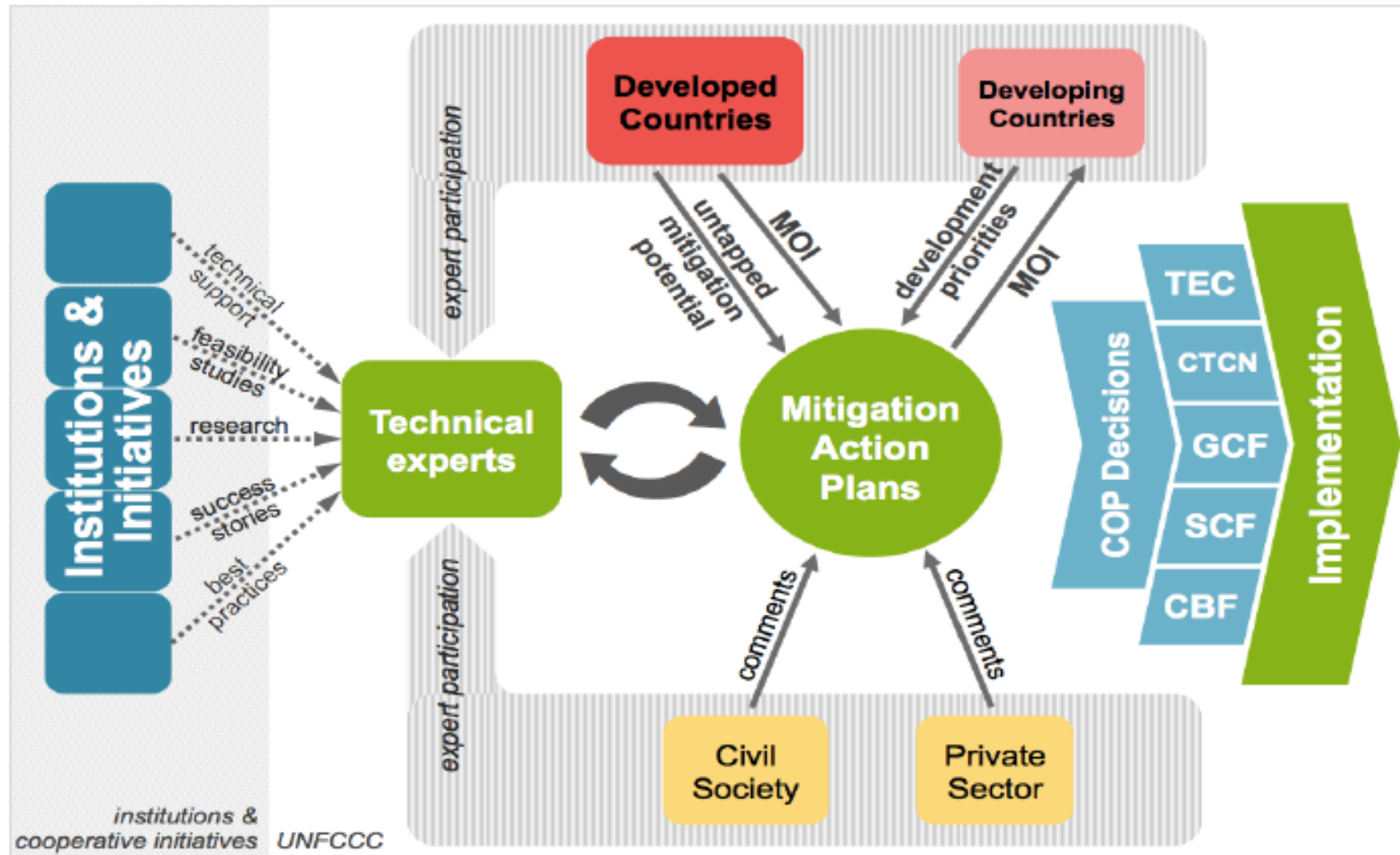
Source : UNEP
(2012)

Estimated global emissions

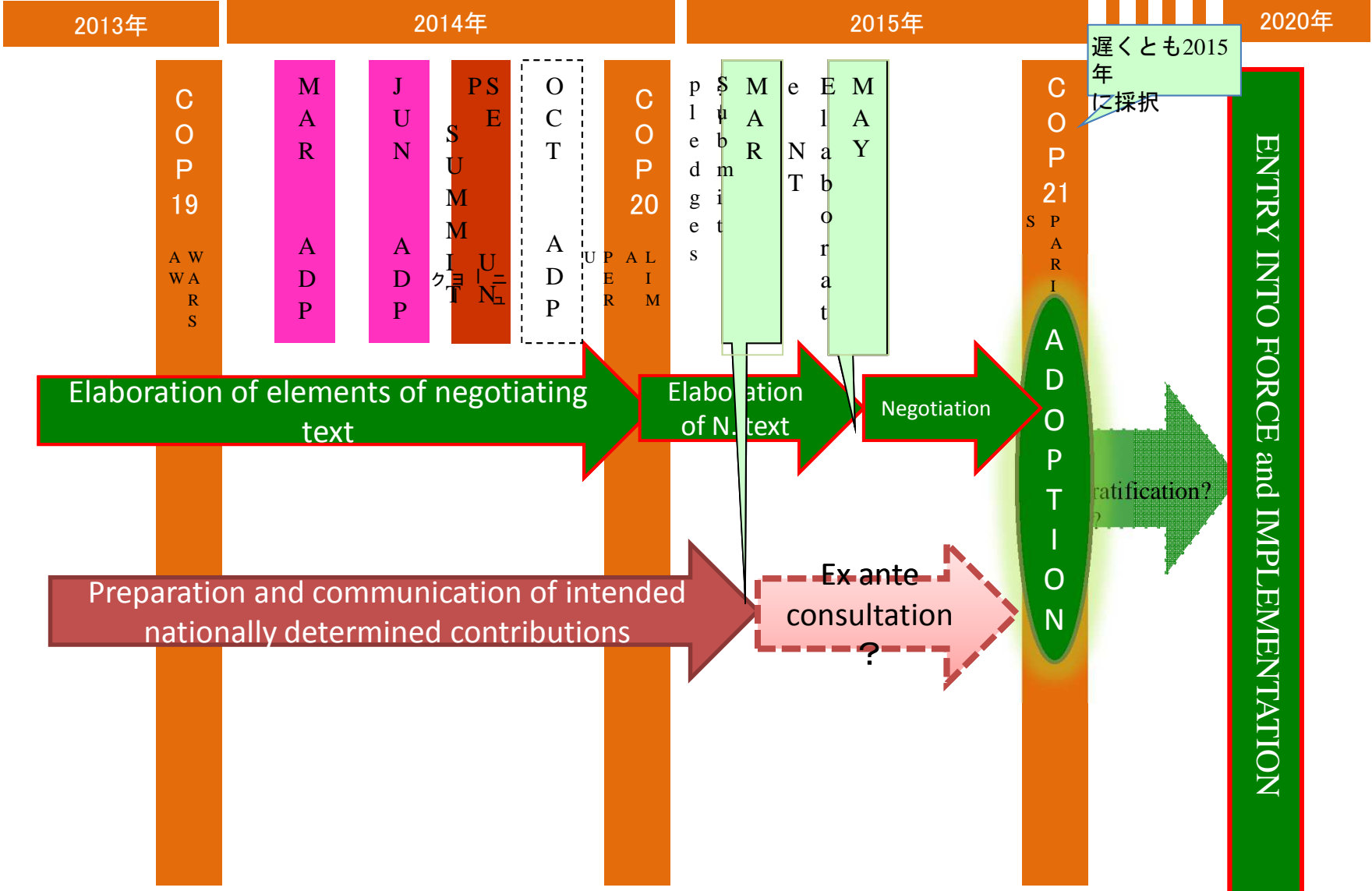


Source : UNEP
(2012)

AOSIS Proposal



Negotiation up to 2015 (COP21)



Challenges for climate regime (1)

- The agreed long-term target requires us to reduce emission more drastically and rapidly and to move as quickly as possible towards a low carbon society.
- Future climate regime should deliver significant reduction (**Effectiveness**).
 - **Effectiveness: ambition × participation × compliance** (Bodansky, 2012)
 - How to raise the level of ambition?
 - How to increase/ maintain participation of countries, especially major emitting countries?
 - How to ensure implementation of/ compliance with target?

Challenges for climate regime (2)

- Type of commitments and categorization of countries.
 - Currently, **quantified targets for developed countries + NAMAs for DCs under the UNFCCC**.
 - Keeps categories of countries and distinct type of commitments according to categories of countries? Or “**spectrum of commitments**”?
- How to determine the level of commitment?
 - **Top-down (Kyoto Protocol type) approach** or **Bottom-up (Cancun Agreement type) approach**?
 - Top-down approach: more equitable but less participation.
 - Bottom-up approach: less equitable but more participation.
 - Inequitable effort sharing would lead less participation.
 - Seeking **Bottom-up plus/ Hybrid approach**
 - US proposal
 - Countries submit targets, **subject to ex ante consultation** among countries for incentivizing countries to raise the ambition and for ensuring **ex ante clarity and comparability**

Challenges for climate regime (3)

- Ensuring **comparability of efforts**.
 - To what extent international rules are necessary (**common accounting rules**)?
 - Less controversial about domestic reduction efforts.
 - **More divergence of view about LULUCF and use of market based mechanisms.**
 - LULUCF
 - Market based mechanisms: centralized ones like CDM or decentralized ones like Bilateral Offsetting Crediting Mechanism (BOCM; JCM)

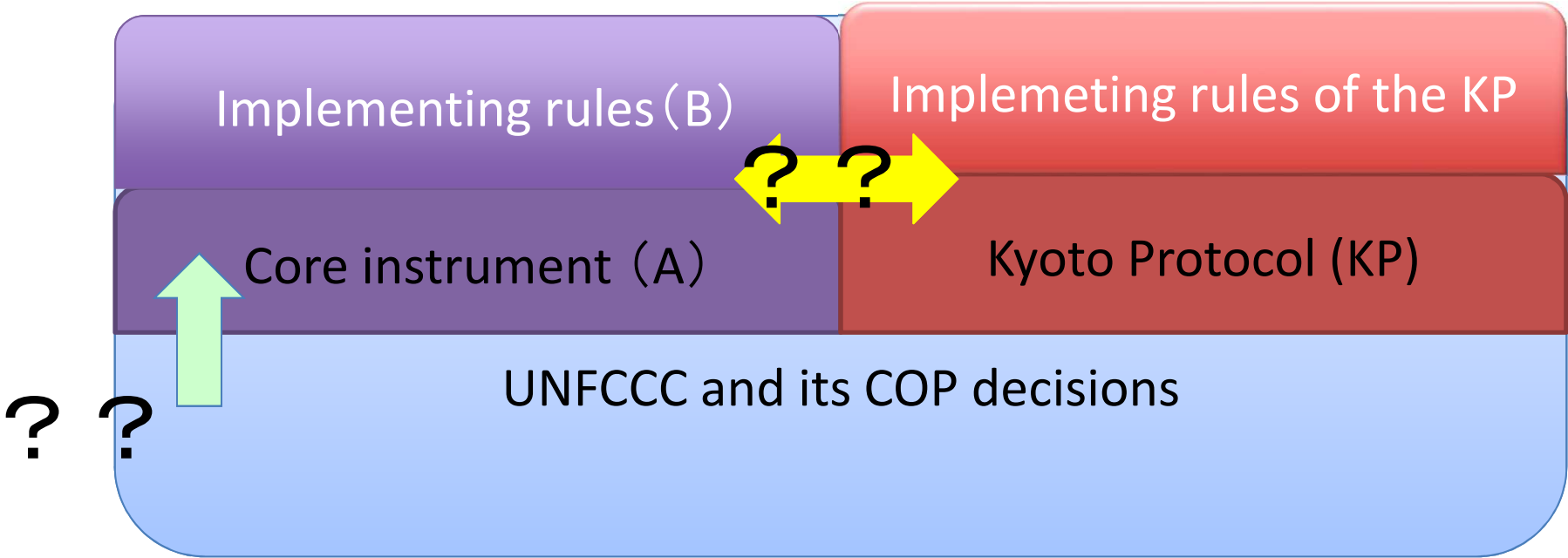
Challenges for climate regime (4)

- Form of 2015 agreement
 - Legal binding agreement?
 - Probably **multi-layered structured regime** based on core agreement
- Collaboration and coordination with regimes outside the UNFCCC

Pros and cons of legal form

- Legally binding (protocol) or non legally binding (COP decision)?
- LB instrument is in theory **more effective to ensure compliance**.
 - in case of non compliance, countries would be legally responsible and take consequences of it.
 - Countries would be more blamed for and receive stronger social pressures about their non compliance.
- COP decision become **operational immediately** while protocol takes time to be ratified and to be in force.

Relationship with UNFCCC and KP

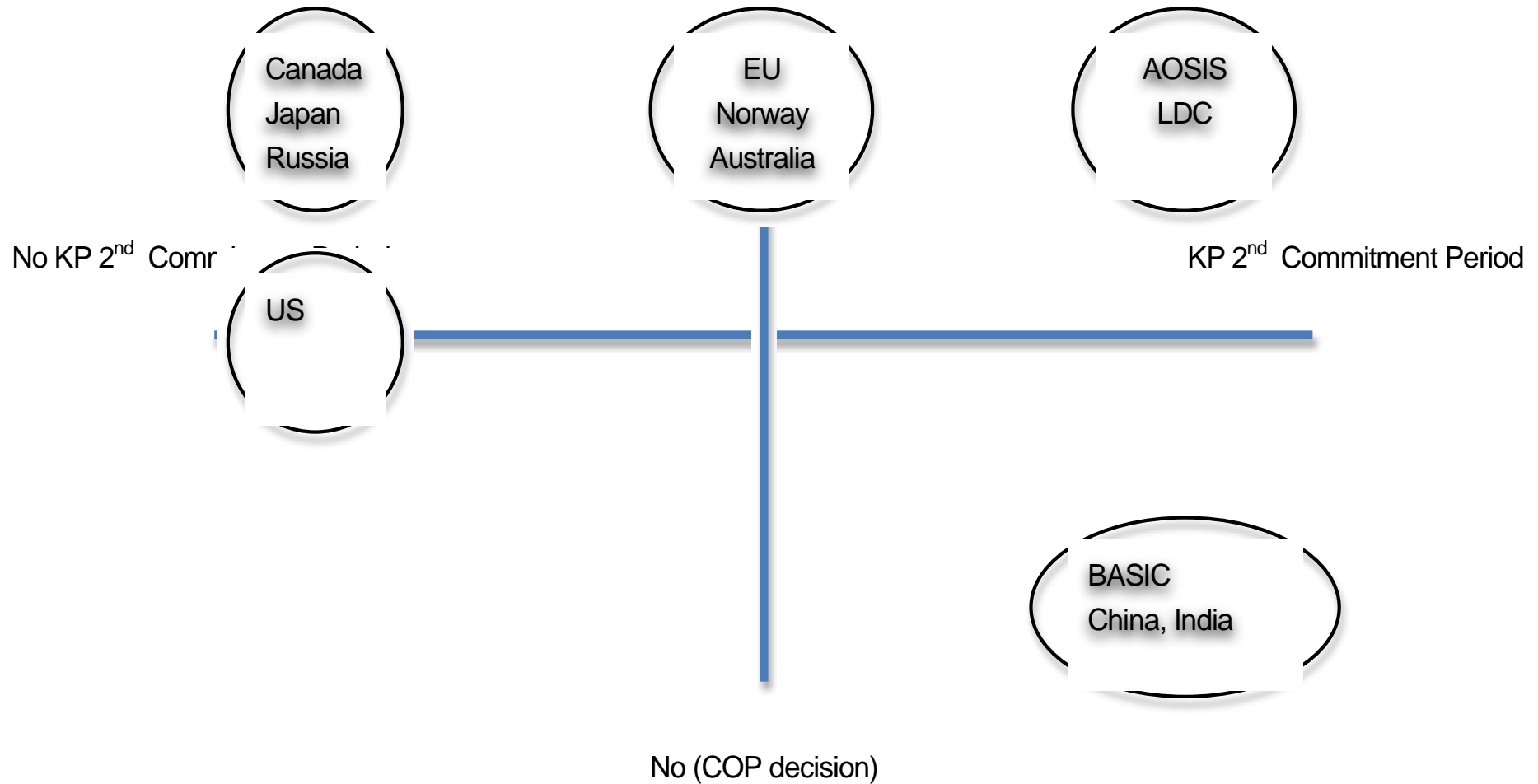


Change of geopolitical power balance in international society

- Increase in influence of emerging countries, especially China, in the international decision making.
- **Disparity of views and confrontation among developing countries, leading to an increase in actors in negotiation**
 - Various issues.
 - “While they develop, we die in the process.” (Grenada)

Challenges for COP17

Legally binding outcome under AWG-LCA



Change in rules of game? (1)

- Rules determining how to allocate reduction commitment among countries
 - Countries have responsibility to take actions over emission sources within their national jurisdiction.
 - 「Common But Differentiated Responsibilities (CBDR)」
 - Allocation of responsibilities according to **contribution to the problem** and **capabilities to tackle the problem**
 - Accordingly, developed countries should take the lead to protect climate system.

Change in rules of game? (2)

- Developed countries question the CBDR, based on economic development of and increase in emissions in emerging economies.
 - 「Modernization of CBDR」 「Dynamic interpretation of CBDR」
 - Counter arguments from developing countries: Allocation of responsibilities according to 「Historical emissions」 (ex. Brazil) 、 「Per capita historical emissions」 (ex. China)

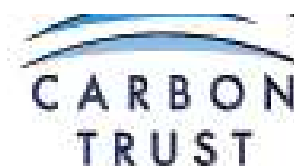
Embedded carbon (1)

- Some part of increase in emissions in emerging economies has occurred due to production of goods consumed in developed countries.
 - If these emissions are accounted as emissions of consuming countries, US and Japanese emissions would increase by about 10-20%; Chinese emissions would decrease by 20%.
 - About 21% of emissions from developing countries are to be attributed to consumption in developed countries.

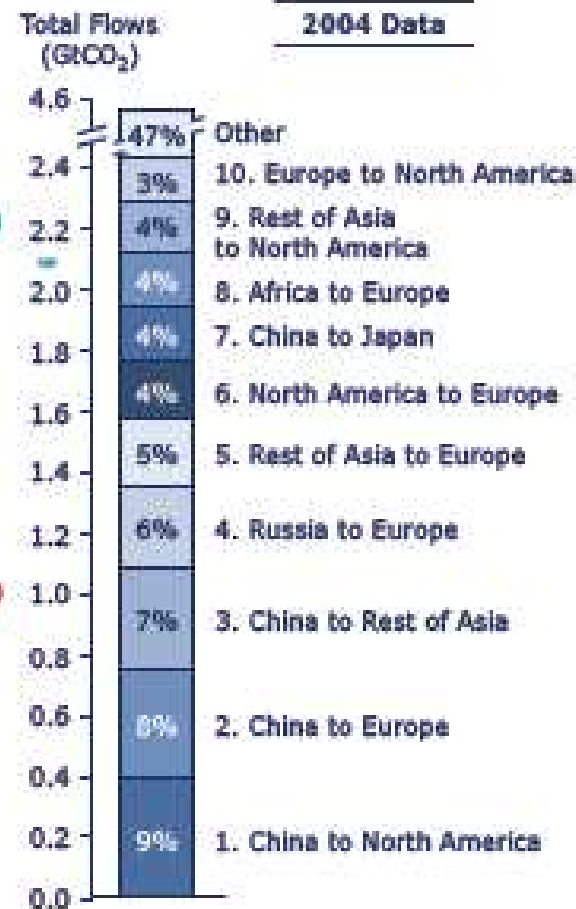
Embedded carbon (2)

- How to evaluate embedded carbon issues
 - Difficulties in allocating reduction responsibilities among countries due to globalization of economy
 - Carbon leakage
 - Possibility of impacting emissions from developing countries through policies and measures relating to goods by developed countries
 - “Policy diffusion” “Regulatory diffusion”
 - Unilateral trade measures and trade regime

Top 10 regional flows of CO₂ embedded in goods and commodities



2004 Data

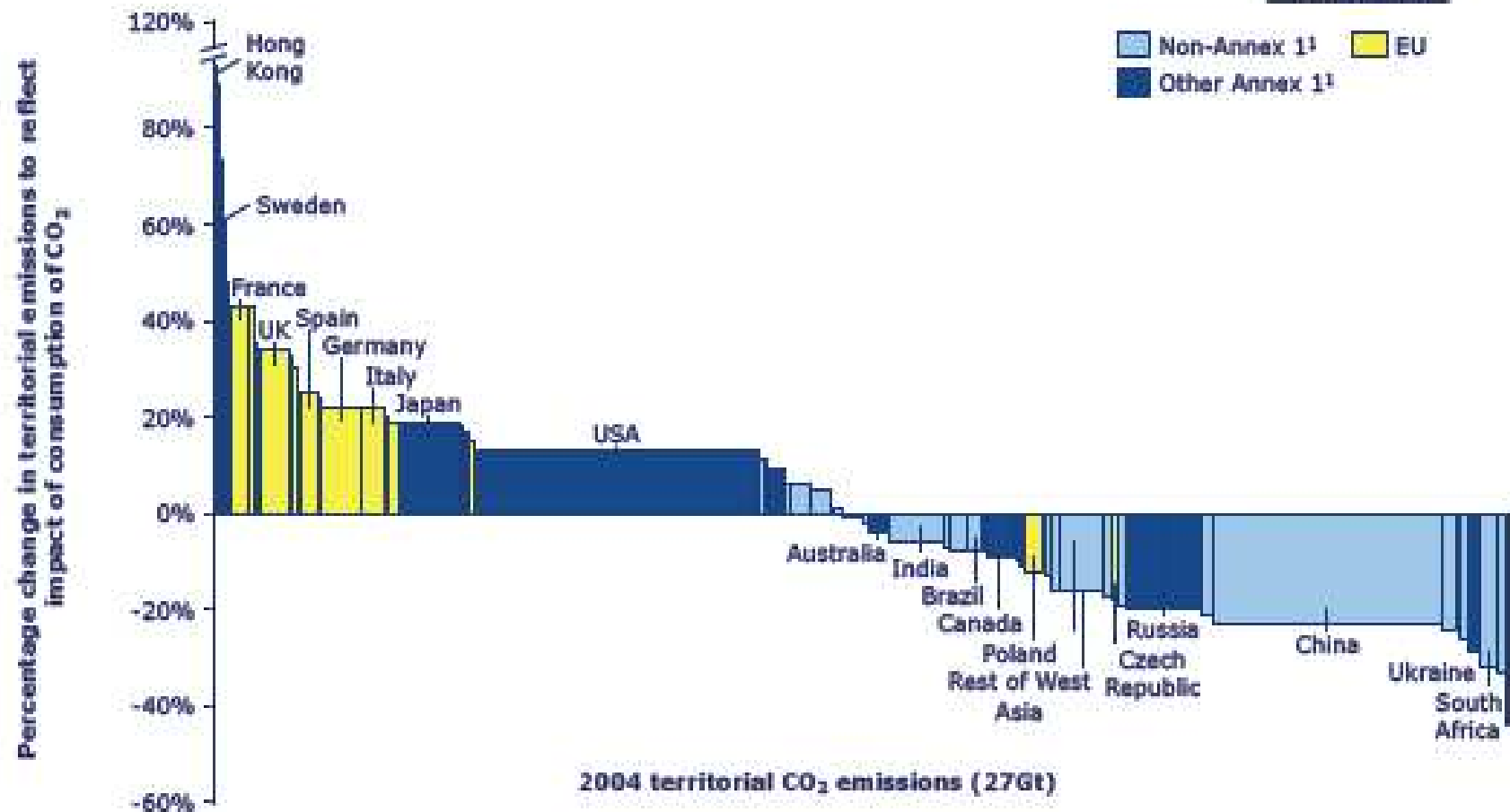


Note: Rest of Asia excludes China, Japan and India

Data includes flow of Scope 1-3 (direct, indirect and upstream) emissions arising in region of export that are embodied in trade flows to the region of import

Source: Carbon Trust Analysis; CICERO / SEI / CMU GTAP7 EEBT Model

A consumption perspective materially alters the distribution of emissions



1. Annex 1 to UNFCCC

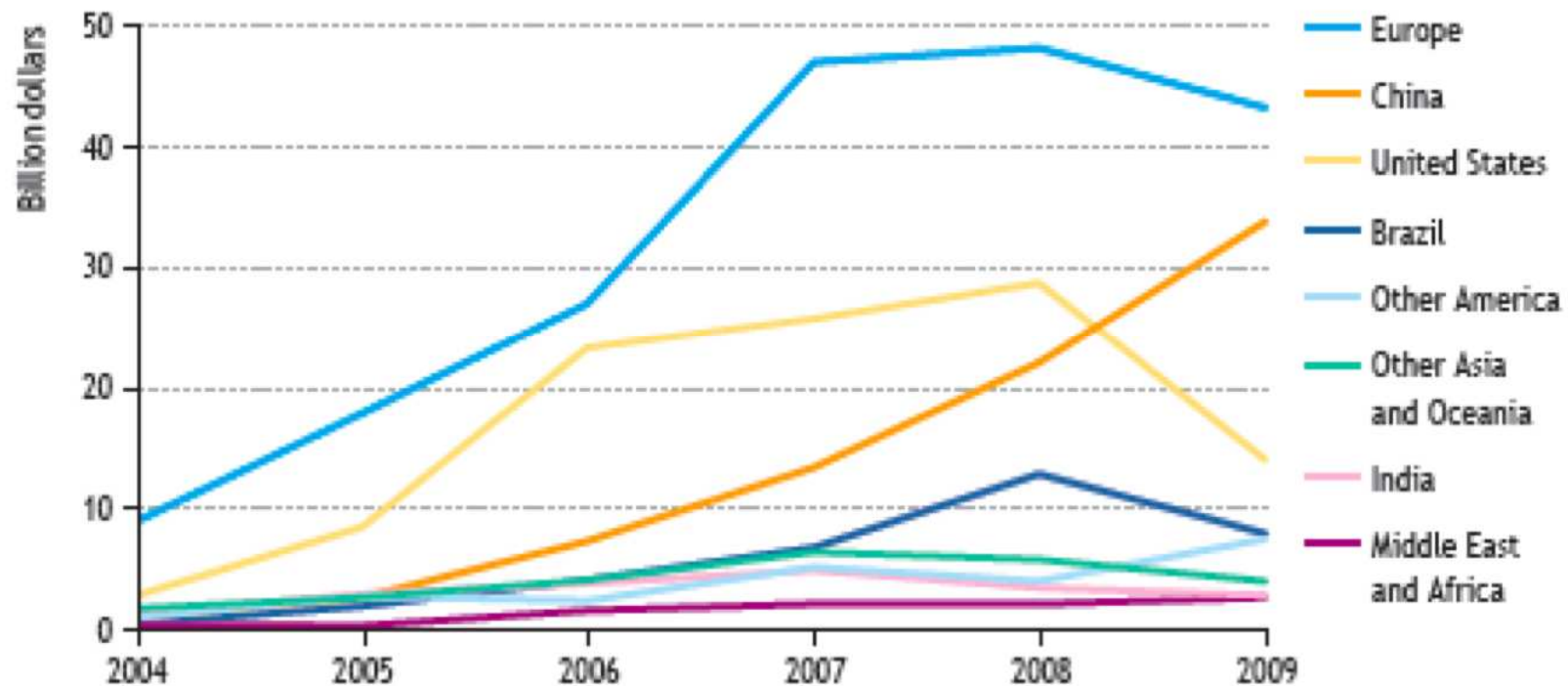
Note 1: Includes CO₂ emissions from production, process, transport and household sources only (27Gt in 2004); excludes non-CO₂ emissions, and emissions due to land-use-change

Note 2: Based on an MRIO (multi region input/output) model allocating emissions to regions of consumption

Source: Carbon Trust Analysis; CICERO / SEI / CMU-GTAP7 MRIO Model (2004)

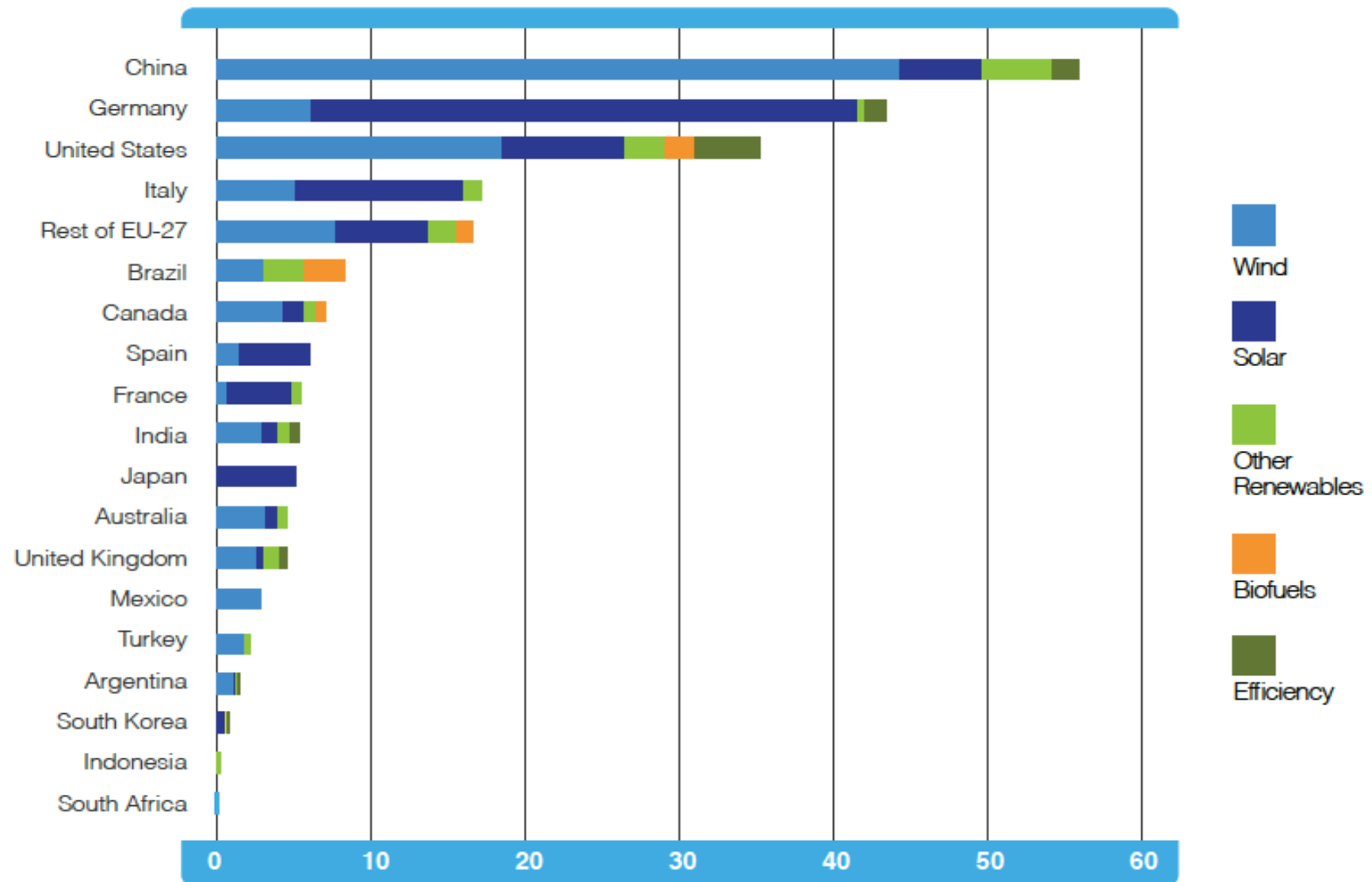
Investment in renewables

Figure 9.6 • Annual investment in renewable energy assets by region



Source: Bloomberg New Energy Finance databases.

Investment in renewables by country, 2010



Cases related to renewables before WTO

- Reflecting expanding market of renewables, increasing number of requests for consultation relating to renewable energy related measures have been brought before the WTO dispute settlement body.
 - Canada – Renewable Energy case, brought by Japan (2010) and EU (2011): Ontario FIT case
 - China – Measures concerning wind power equipment, brought by the US (2011)
 - EU and certain member states - Certain Measures Affecting the Renewable Energy Generation Sector, brought by China (2012)
 - India – Certain Measures Relating to Solar Cells and Solar Modules (2013)

Thank you for your attention!

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