

MEKANISME PERDAGANGAN KARBON: PELUANG DAN TANTANGAN INDONESIA

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Jakarta, 6 Oktober 2013

ISI PRESENTASI

- * Perubahan iklim
- * Protokol Kyoto
- * CDM dan perdagangan karbon
- * Indonesia dan perdagangan karbon
- * REDD+
- * Tantangan dan peluang

Planets and atmospheres

Mars

Thin atmosphere

(Almost all CO₂ in ground)

Average temperature : - 50°C



Earth

0,03% of CO₂ in the atmosphere

Average temperature : + 15°C



Venus

Thick atmosphere

containing 96% of CO₂

Average temperature : + 420°C



The Greenhouse effect



A T M O S P H E R E

Some solar radiation is reflected by the atmosphere and earth's surface

Outgoing solar radiation:

103 Watt per m²

Net incoming solar radiation:
240 Watt per m²

Some of the infrared radiation passes through the atmosphere and is lost in space

Net outgoing infrared radiation:
240 Watt per m²

G R E E N H O U S E G A S E S

Solar radiation passes through the clear atmosphere.

Incoming solar radiation:

343 Watt per m²

Some of the infrared radiation is absorbed and re-emitted by the greenhouse gas molecules. The direct effect is the warming of the earth's surface and the troposphere.

Surface gains more heat and infrared radiation is emitted again

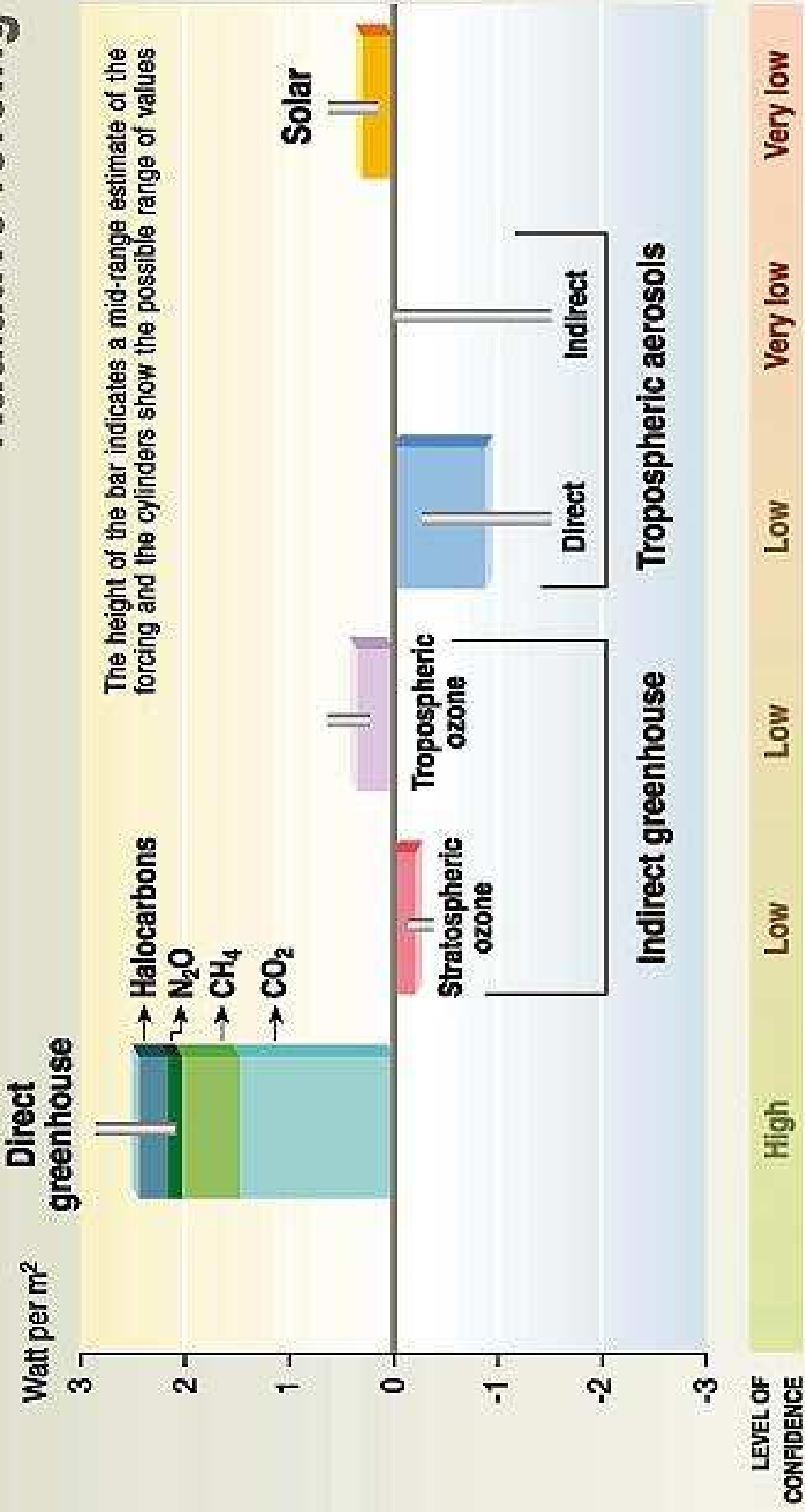
Solar energy is absorbed by the earth's surface and warms it...

168 Watt per m²

... and is converted into heat causing the emission of longwave (infrared) radiation back to the atmosphere

E A R T H

Radiative forcing



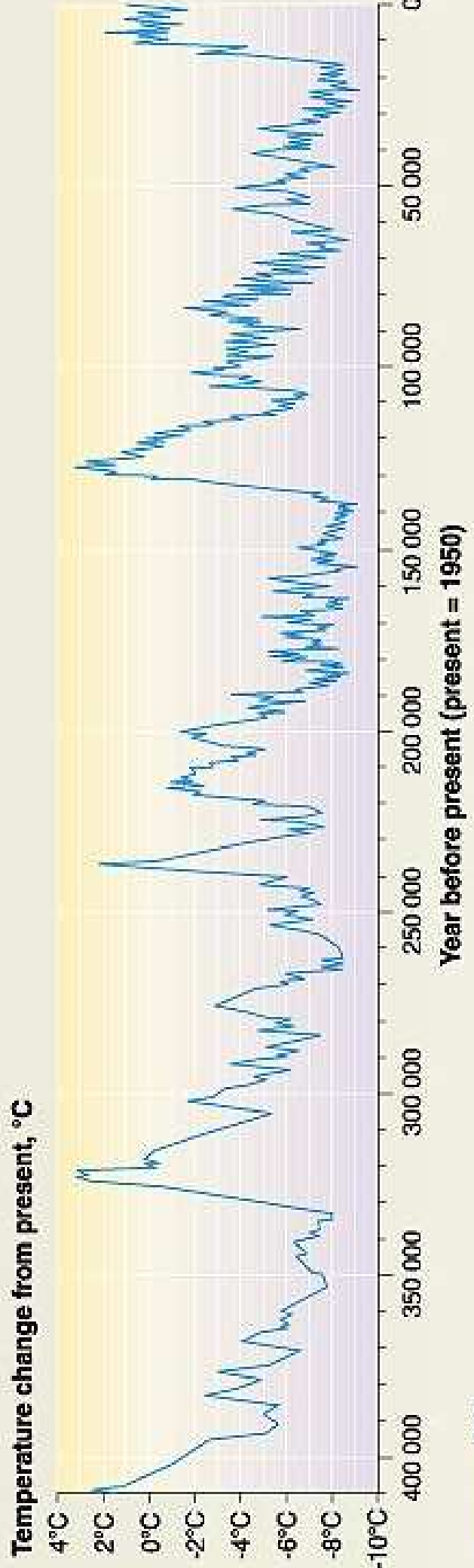
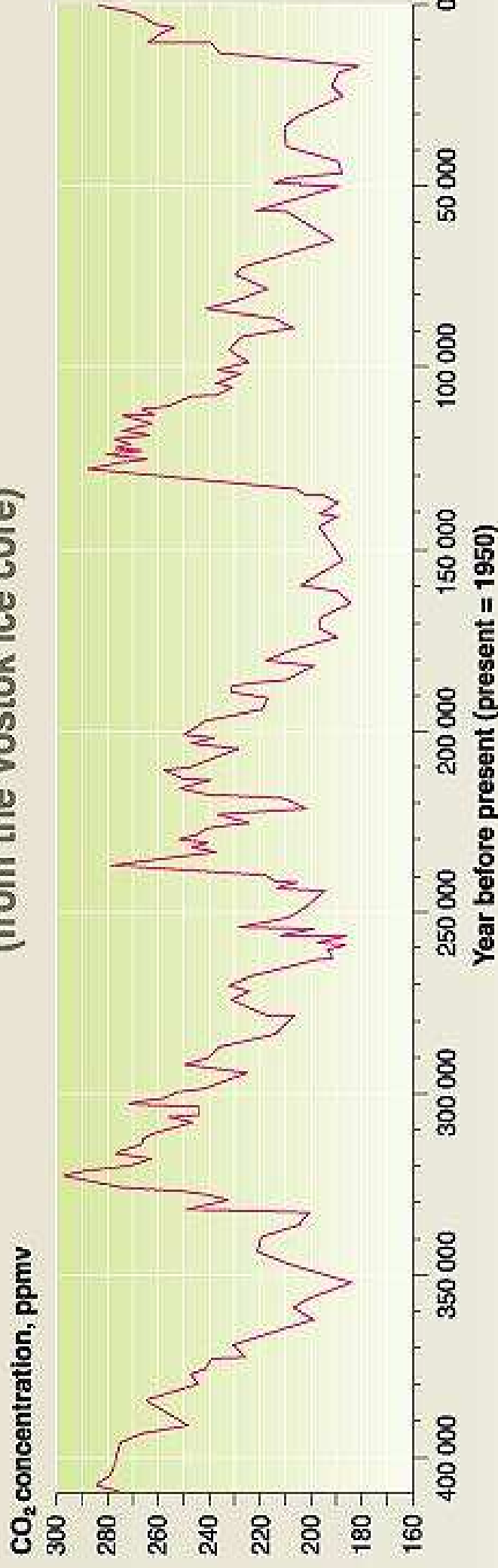
The main greenhouse gases

| Greenhouse gases | Chemical formula | Pre-industrial concentration | Concentration in 1994 | Atmospheric lifetime (years) ^{***} | Anthropogenic sources | Global warming potential (GWP) [*] |
|-----------------------|---------------------------------|------------------------------|-----------------------|---|--|---|
| Carbon-dioxide | CO ₂ | 278 000 ppbv | 358 000 ppbv | Variable | Fossil fuel combustion Land use conversion Cement production | 1 |
| Methane | CH ₄ | 700 ppbv | 1721 ppbv | 12,2 +/- 3 | Fossil fuels Rice paddies Waste dumps Livestock | 21 ^{**} |
| Nitrous oxide | N ₂ O | 275 ppbv | 311 ppbv | 120 | Fertilizer Industrial processes combustion | 310 |
| CFC-12 | CCl ₂ F ₂ | 0 | 0,503 ppbv | 102 | Liquid coolants Foams | 6200-7100 ^{****} |
| HCFC-22 | CHClF ₂ | 0 | 0,105 ppbv | 12,1 | Liquid coolants | 1300-1400 ^{****} |
| Perfluoromethane | CF ₄ | 0 | 0,070 ppbv | 50 000 | Production of aluminium | 6 500 |
| Sulphur hexa-fluoride | SF ₆ | 0 | 0,032 ppbv | 3 200 | Dielectric fluid | 23 900 |

Note : pptv= 1 part per trillion by volume; ppbv= 1 part per billion by volume, ppmv= 1 part per million by volume

* GWP for 100 year time horizon. ** Includes indirect effects of tropospheric ozone production and stratospheric water vapour production. *** On page 15 of the IPCC SAR. No single lifetime for CO₂ can be defined because of the different rates of uptake by different sink processes. **** Net global warming potential (i.e., including the indirect effect due to ozone depletion).

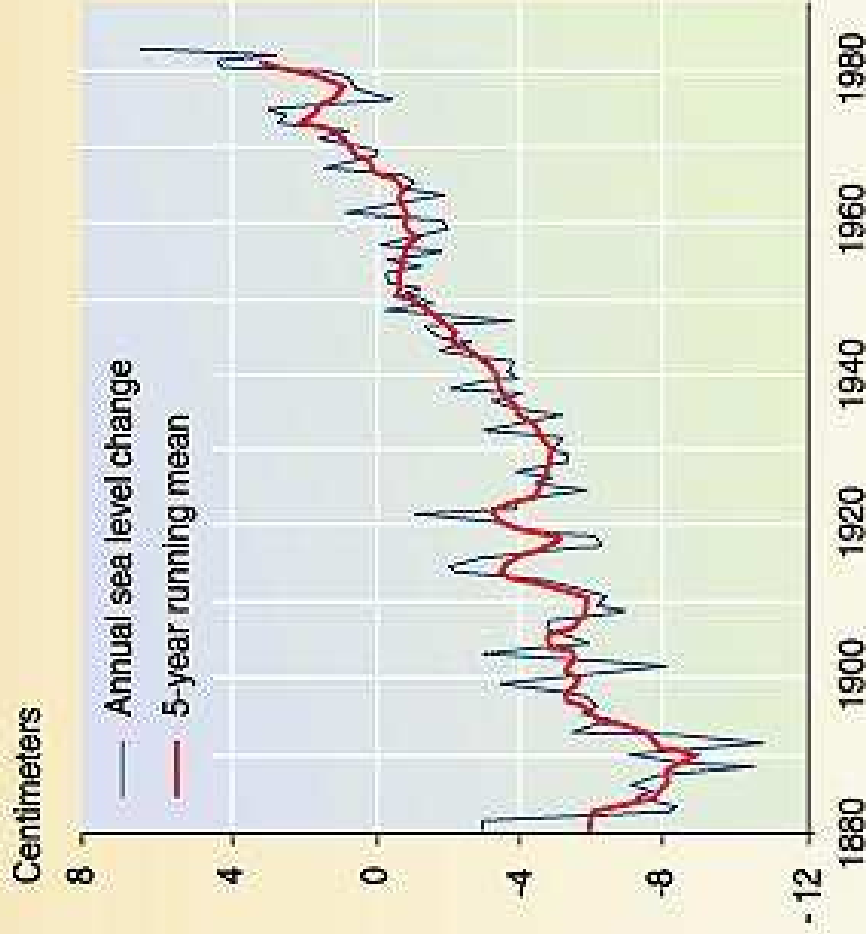
Temperature and CO₂ concentration in the atmosphere over the past 400 000 years (from the Vostok ice core)



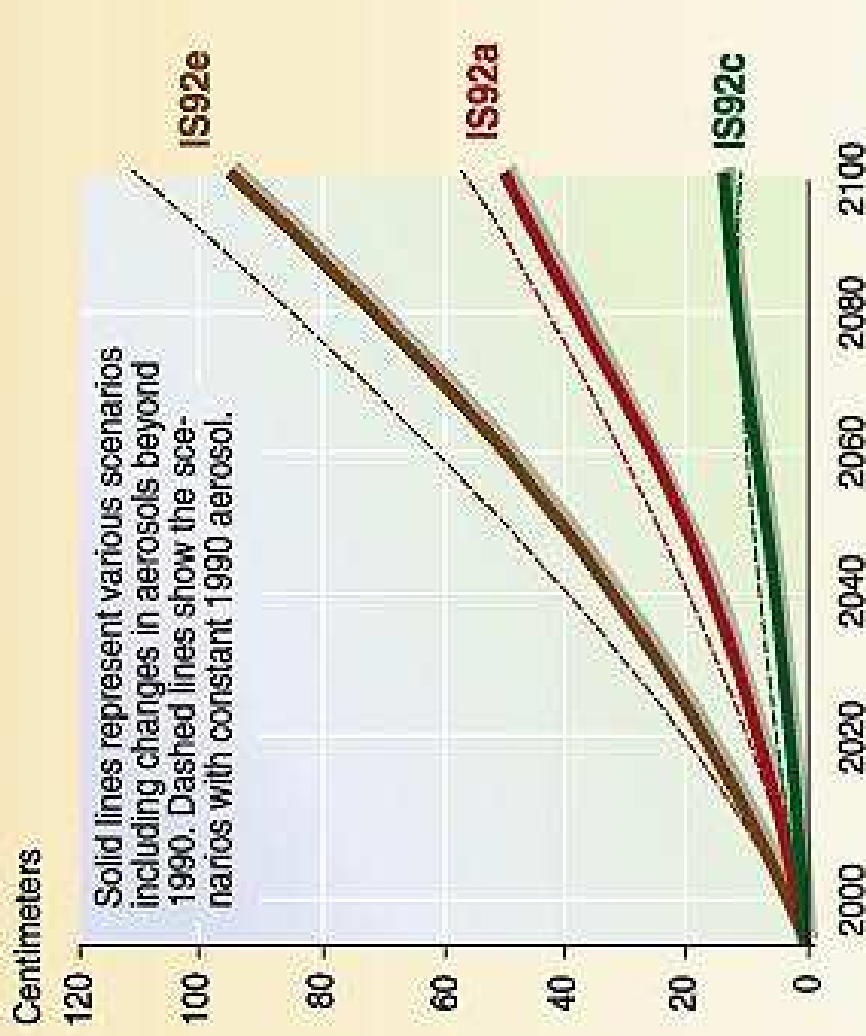
Source: J.R. Petit, J. Jouzel, et al. Climate and atmospheric history of the past 420 000 years from the Vostok ice core in Antarctica, *Nature* 399 (3&4 June), pp 429-436, 1998.

Sea level rise due to global warming

Sea level rise over the last century



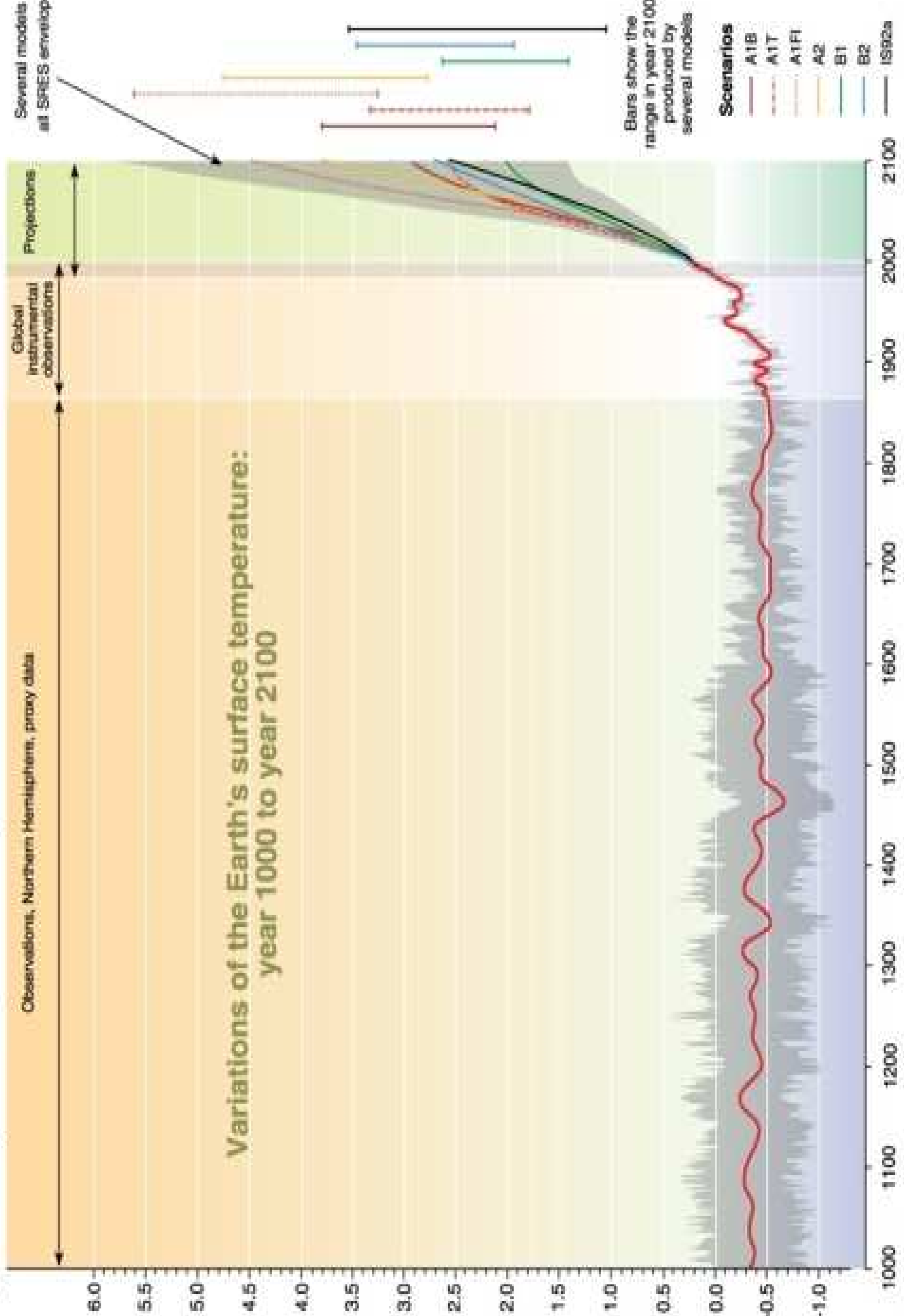
Sea level rise scenarios for 2100



GRID
Arendal
UNEP
GRAPHIC DESIGN: PHILIPPE REMACHEWICZ

Source: Climate change, 1995, The science of climate change, contribution of working group 1 to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge University press, 1995; Sea level rise over the last century, adapted from Gornitz and Lebedeff, 1987.

Departures in temperature in °C (from the 1990 value)



Middle Circle

Tropic of Cancer

Equator

Tropic of Capricorn

Antarctic Circle

Temperature Trends, 2000 to 2100

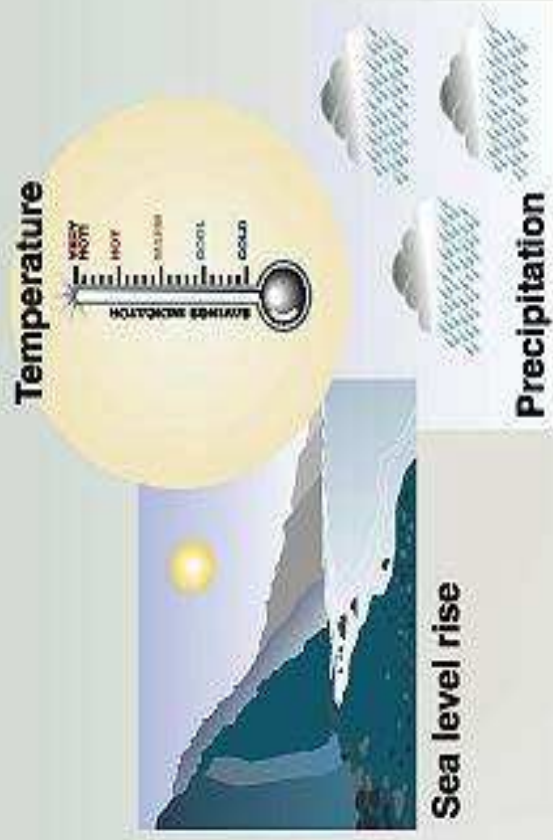
Temperature change (in°C)

-0.2 0 +0.4 +0.8 +1.2 +1.6 +2.0 +2.4

Average temperatures change according to the GFDL model (doubling of CO₂ and temperature increase by 3.7°C from 2000 to 2100.)

Source: Geophysical Fluid Dynamics Laboratory, GFDL, Princeton University

Potential climate changes impact



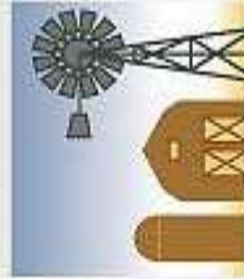
Impacts on...

Health



Weather-related mortality
Infectious diseases
Air-quality respiratory illnesses

Agriculture



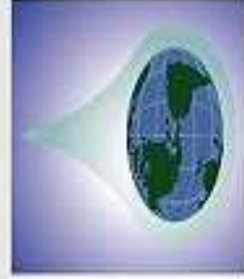
Crop yields
Irrigation demands

Forest



Forest composition
Geographic range of forest
Forest health and productivity

Water resources



Water supply
Water quality
Competition for water

coastal areas

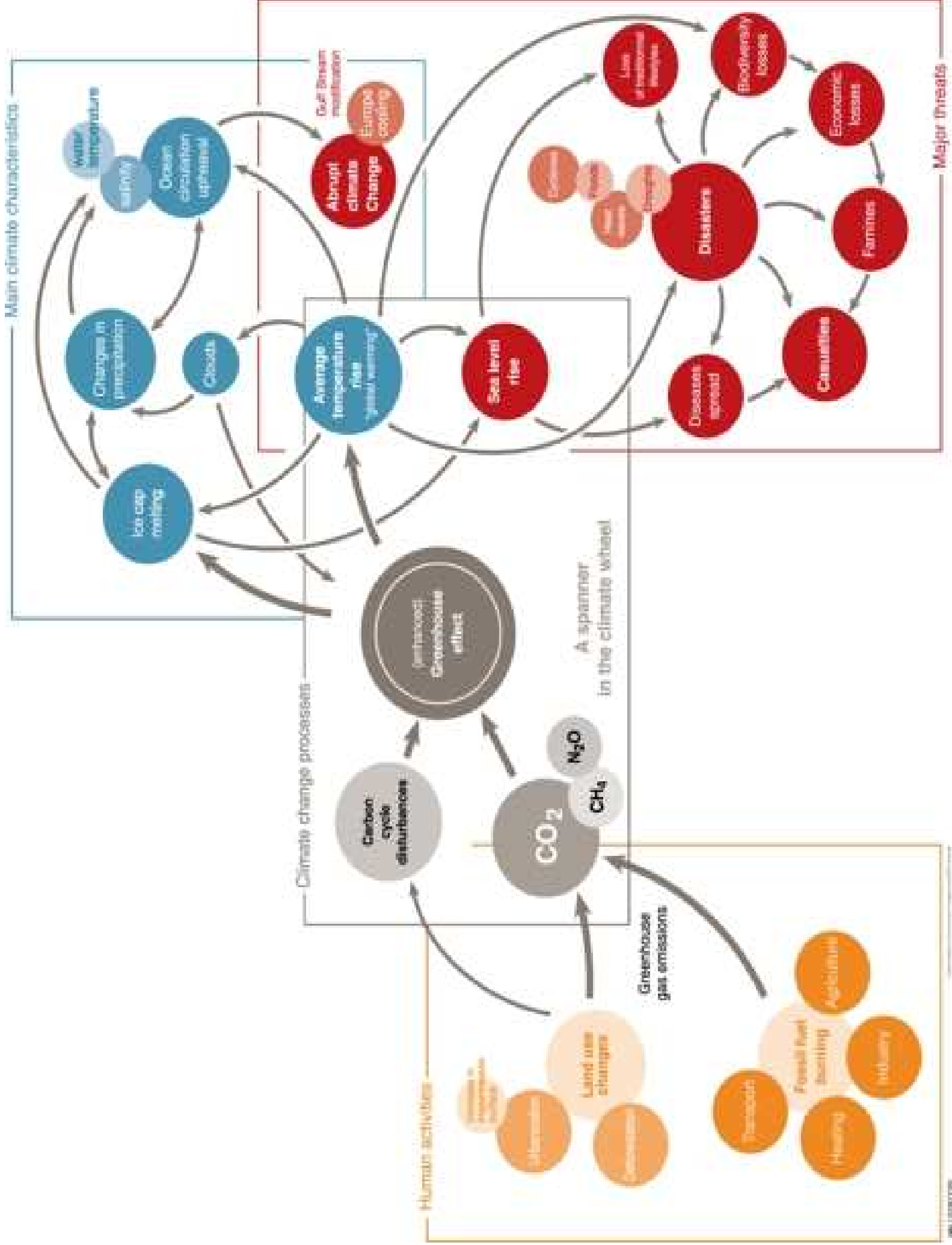


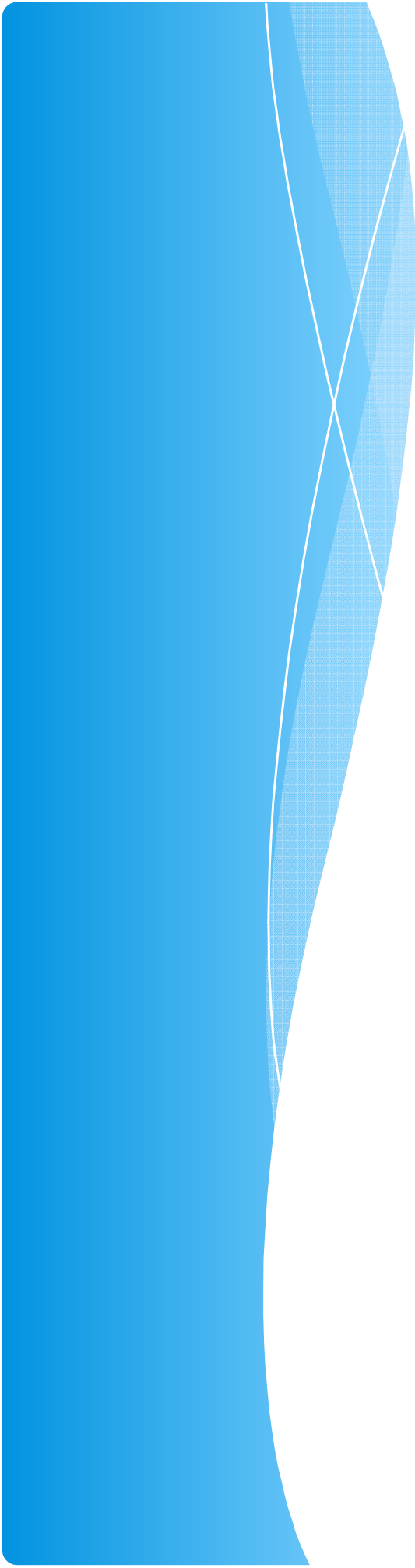
Erosion of beaches
Inundation of coastal lands
additional costs to protect coastal communities

Species and natural areas



Loss of habitat and species
Cryosphere: diminishing glaciers





Back in time:

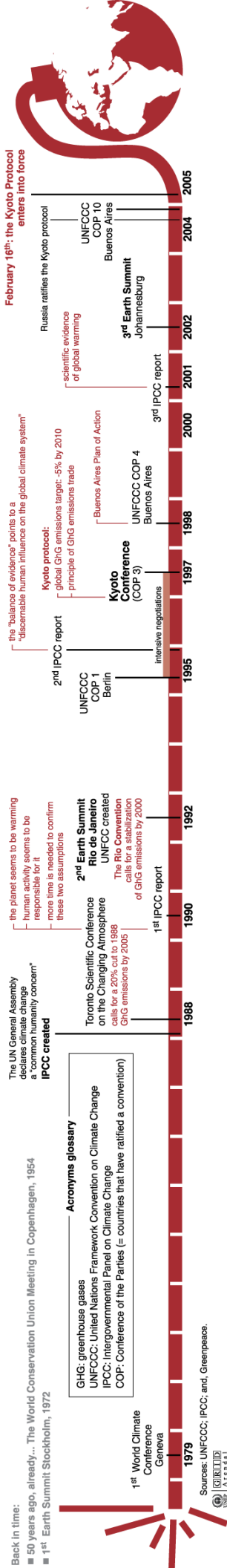
- 50 years ago, already... The World Conservation Union Meeting in Copenhagen, 1954
- 1st Earth Summit Stockholm, 1972

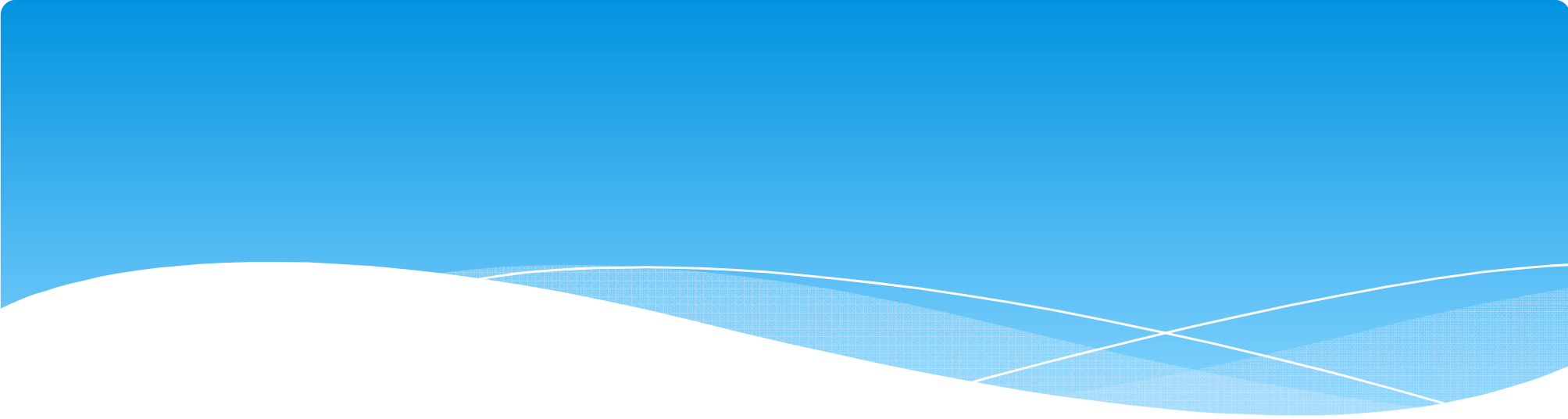
GHG: greenhouse gases
 UNFCCC: United Nations Framework Convention on Climate Change
 IPCC: Intergovernmental Panel on Climate Change
 COP: Conference of the Parties (= countries that have ratified a convention)

Acronyms glossary

1st World Climate Conference
 Geneva
 1979

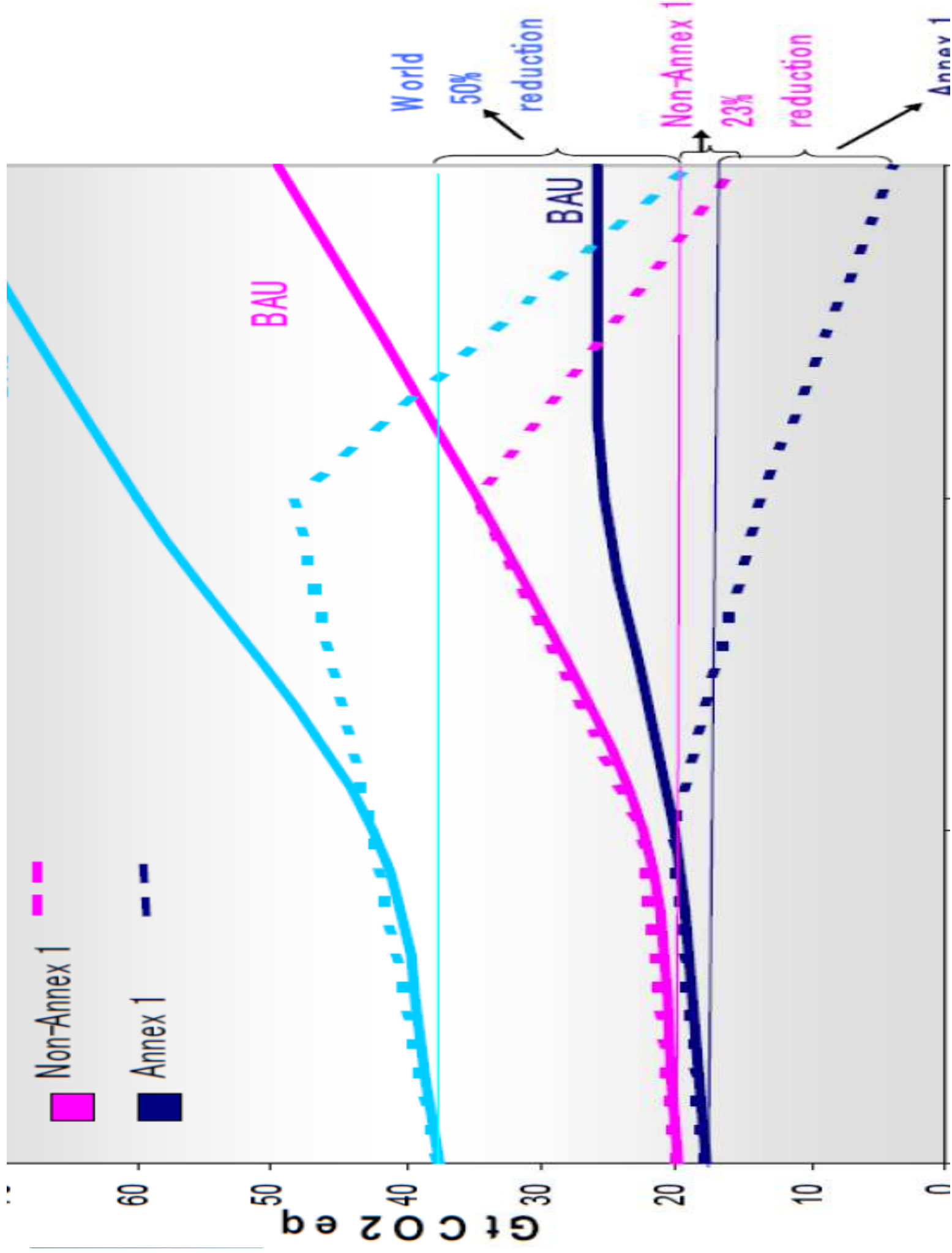
Sources: UNFCCC; IPCC; and, Greenpeace.



- 
- * Protokol Kyoto adalah perjanjian di bawah UNFCCC
 - * Set target 5,2% - 7% emisi GRK (level tahun 1990) selama periode 2008-2012
 - * Mekanisme melalui perdagangan emisi; clean development mechanism (CDM); dan Joint Implementation (JI)
 - * Carbon credit CDM → Certified Emission Reduction (CER)
 - * JI → Emission Reduction Unit (ERU)
 - * Skema sukarela → Voluntary Emission Reductions (VER)

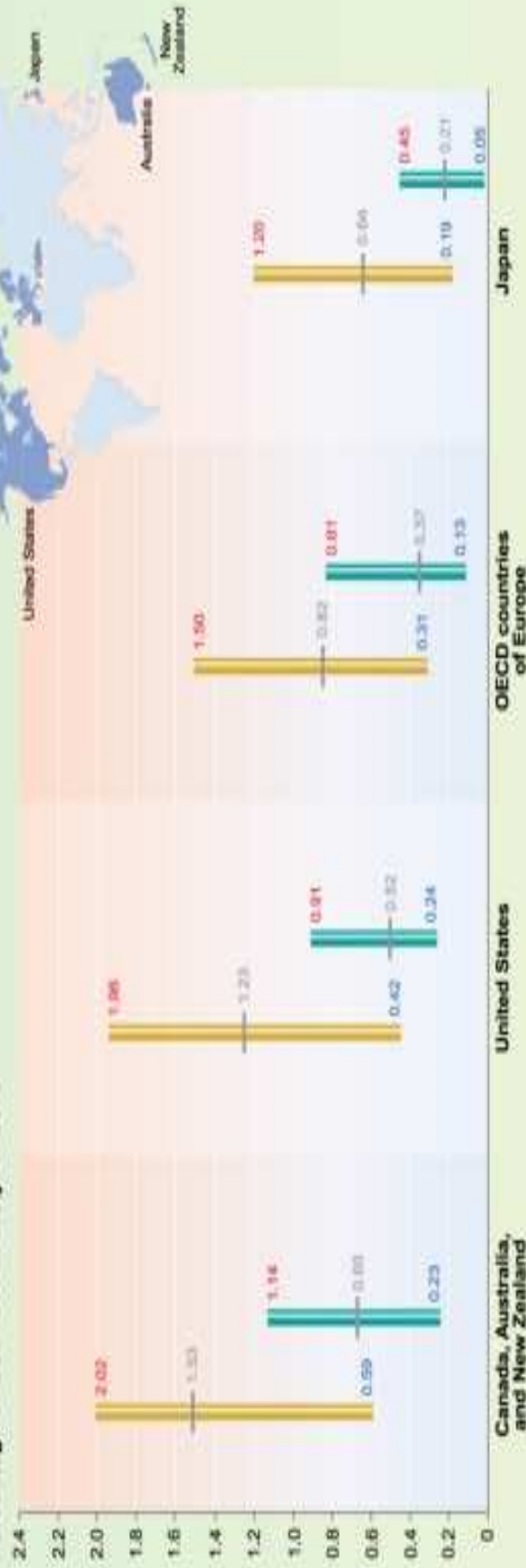
Pentingnya Perdagangan Karbon

- * Kenaikan konsentrasi GRK semakin bertambah dalam 50 tahun terakhir. Per bulan Mei 2012, konsentrasi CO₂ di atmosfer **mencapai 400 ppm**
- * Dibutuhkannya mekanisme pendanaan mitigasi yang terukur, transparan, dan berkesinambungan, sehingga **memenuhi kriteria sosial, lingkungan dan ekonomi.**
- * Perdagangan karbon lahir sebagai **konsekuensi logis dari kewajiban penurunan emisi** pada instalasi penyumbang emisi serta adanya kewajiban negara maju untuk menurunkan emisi, sedang negara berkembang belum diwajibkan.

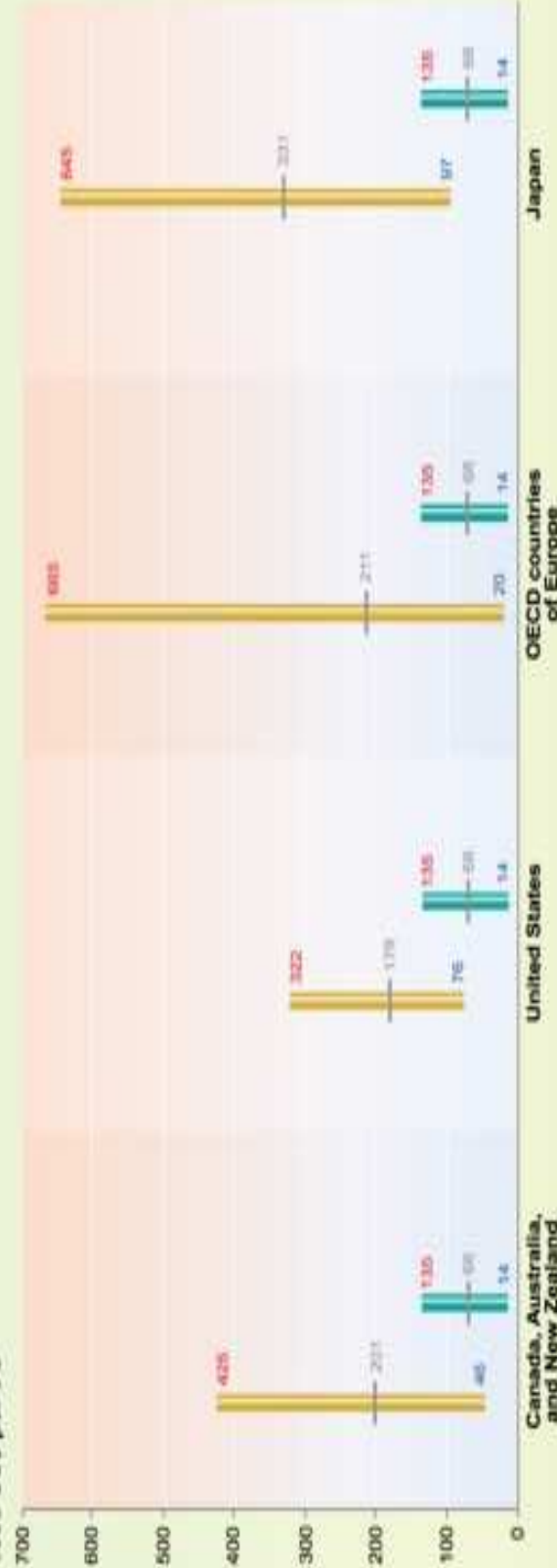


Projections of GDP losses and marginal cost in Annex II countries in the year 2010 from global models

(a) GDP losses
Percentage of GDP loss in the year 2010



(b) Marginal cost
1990 US\$ per t C

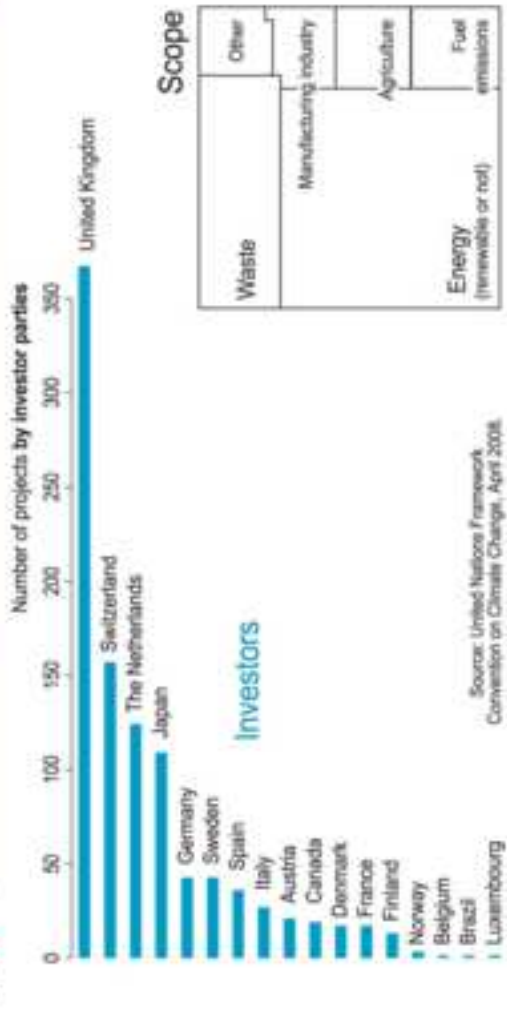
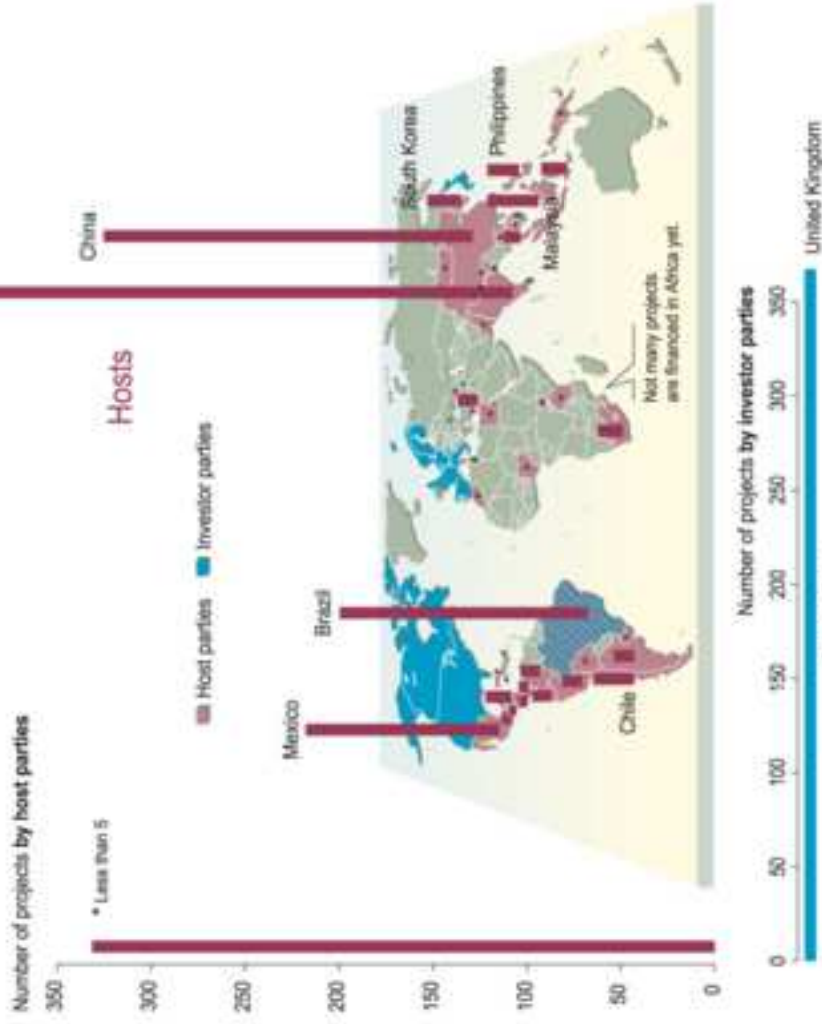


Range of outcomes for two scenarios
Absence of international trade in carbon emissions rights: each region must take the prescribed reduction

Full Annex B trading of carbon emissions rights permitted

The three numbers on each bar represent the highest, median, and lowest projections from the set of models.

Registered projects implemented under Kyoto's "Clean Development Mechanism"



Scope

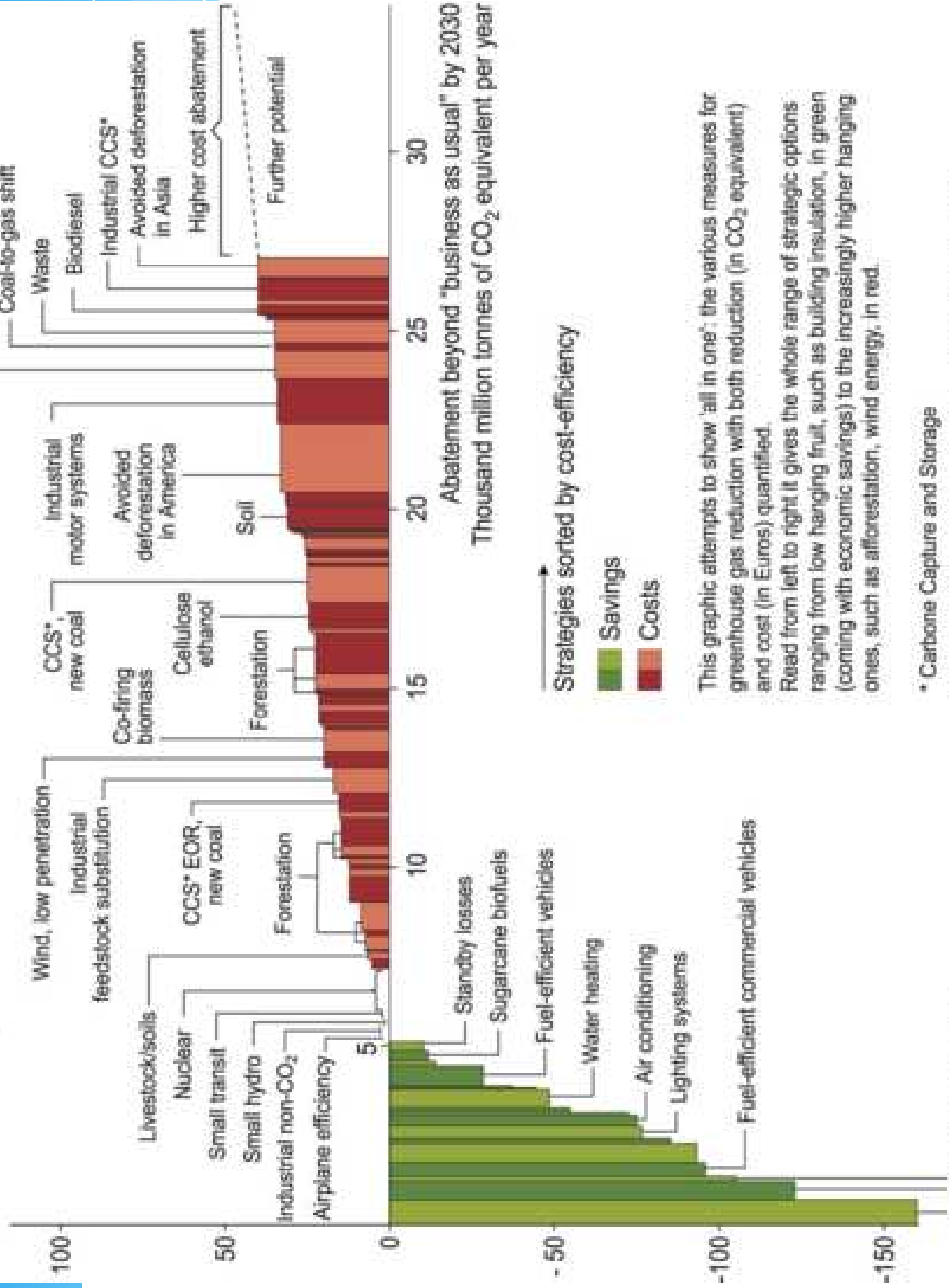
| | |
|---------------------------|----------------|
| Waste | Other |
| | |
| Energy (renewable or not) | Agriculture |
| | Fuel emissions |

Source: United Nations Framework Convention on Climate Change, April 2008.

Strategic options for climate change mitigation

Global cost curve for greenhouse gas abatement measures

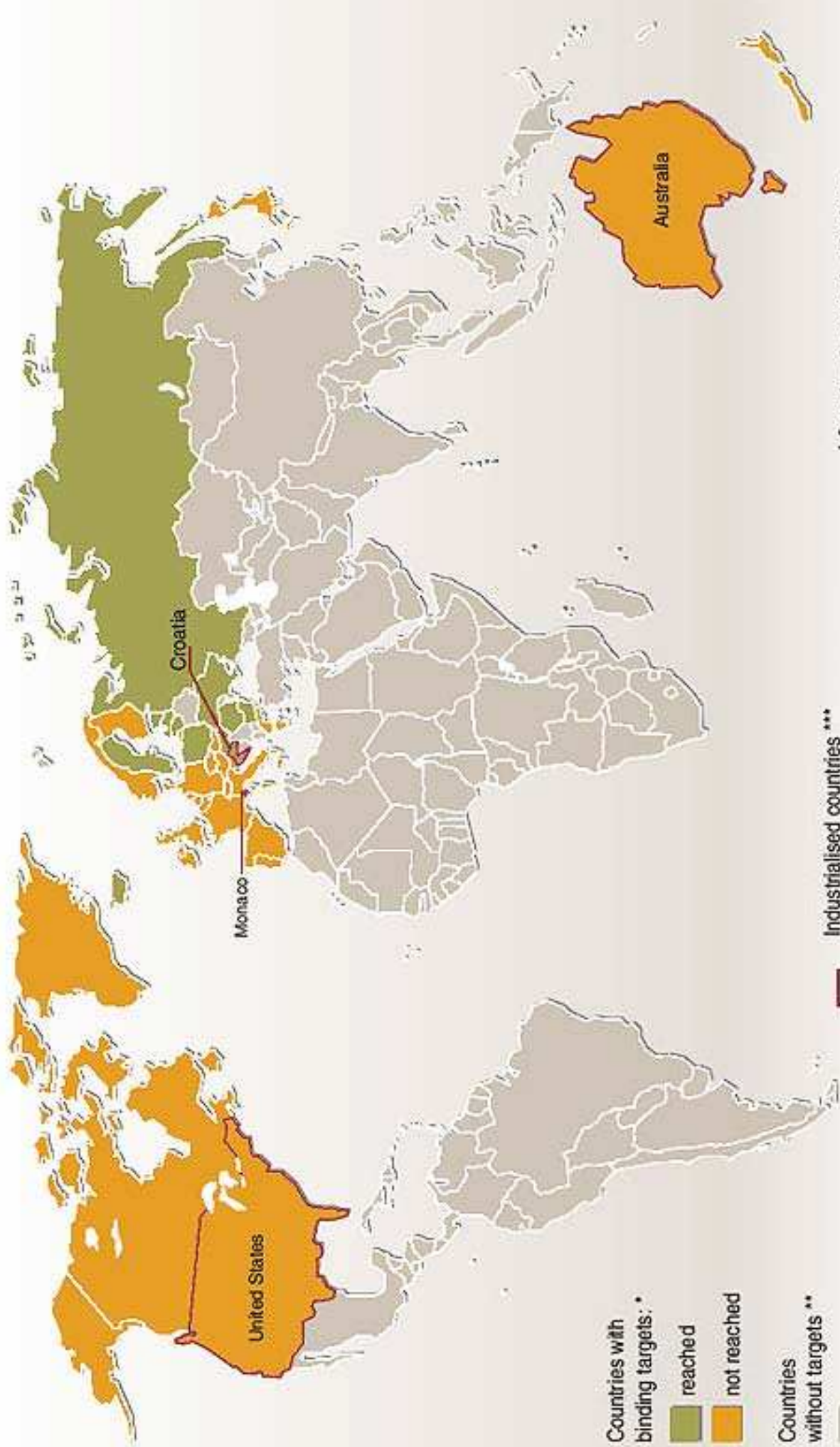
Cost of reducing greenhouse gas emissions by 2030
Euros per tonne of CO₂ equivalent avoided per year



This graphic attempts to show 'all in one': the various measures for greenhouse gas reduction with both reduction (in CO₂ equivalent) and cost (in Euros) quantified. Read from left to right it gives the whole range of strategic options ranging from low hanging fruit, such as building insulation, in green (coming with economic savings) to the increasingly higher hanging ones, such as afforestation, wind energy, in red.

* Carbon Capture and Storage

Source: McKinsey Climate Change Special Initiative, 2007.



Countries with binding targets: *

reached

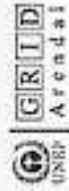
not reached

Countries without targets **



Industrialised countries *** that have not ratified the Kyoto Protocol

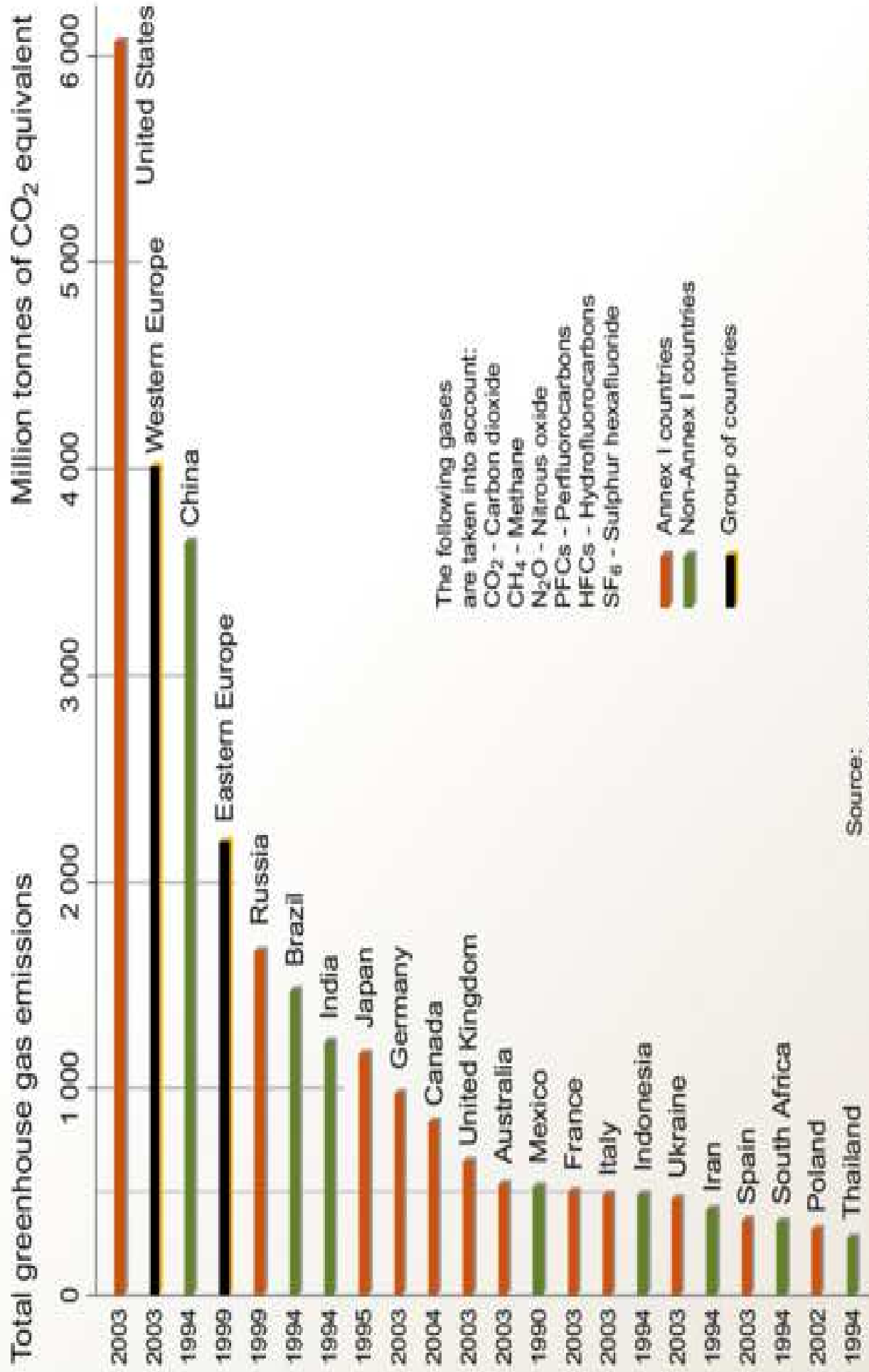
Kyoto target status



Source: UNFCCC, December 16 2004.

* "Annex B countries" of the Protocol, ** "Non-Annex I countries" of the Convention, *** "Annex I countries" of the Convention.

Top 20 greenhouse gas emitters (including land use change and forestry)

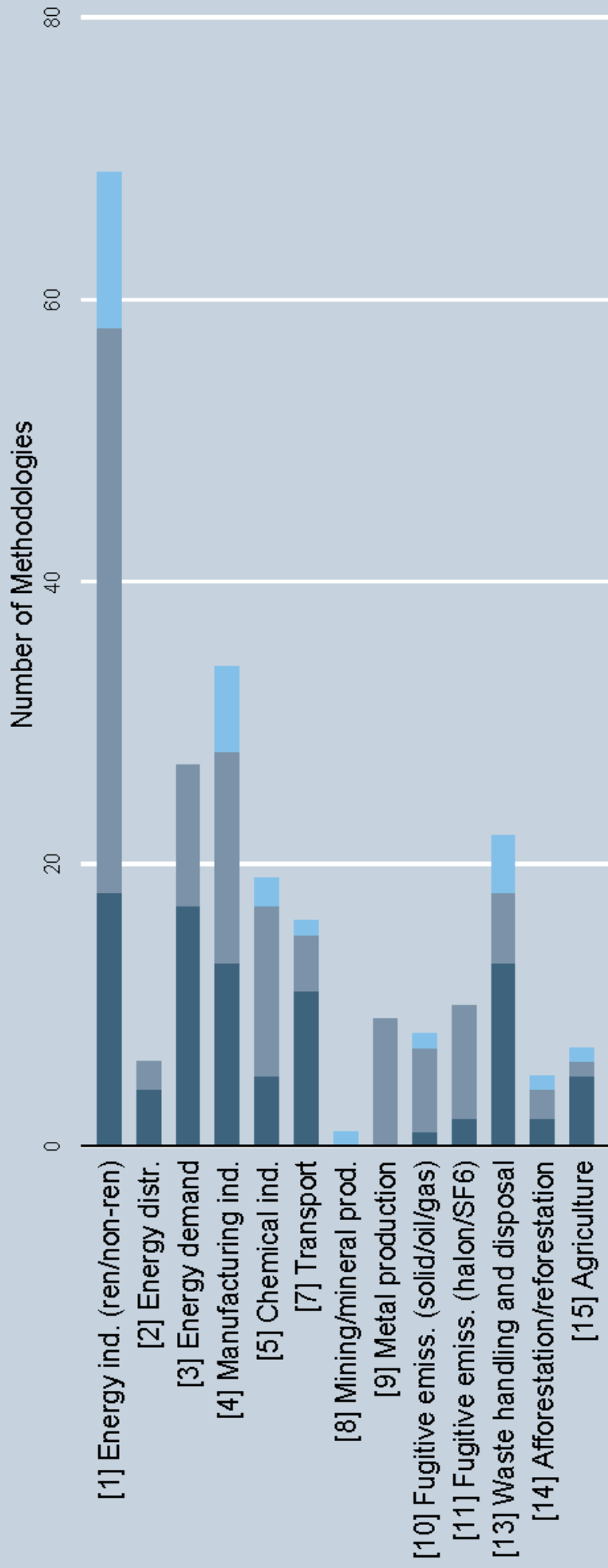


Source:
 United Nations Framework Convention on Climate Change,
 Greenhouse Gas Inventory Submission, 2006. Data compilation
 available on UNEP's GEO Data Portal (geodata.grid.unep.ch).

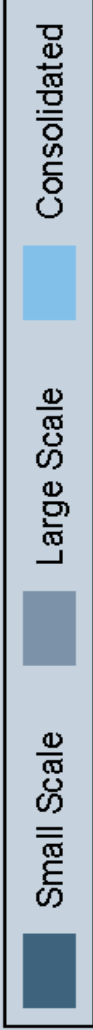
↑
 Most recent available year

Approved methodologies by Scope

Total number of unique methodologies = 200

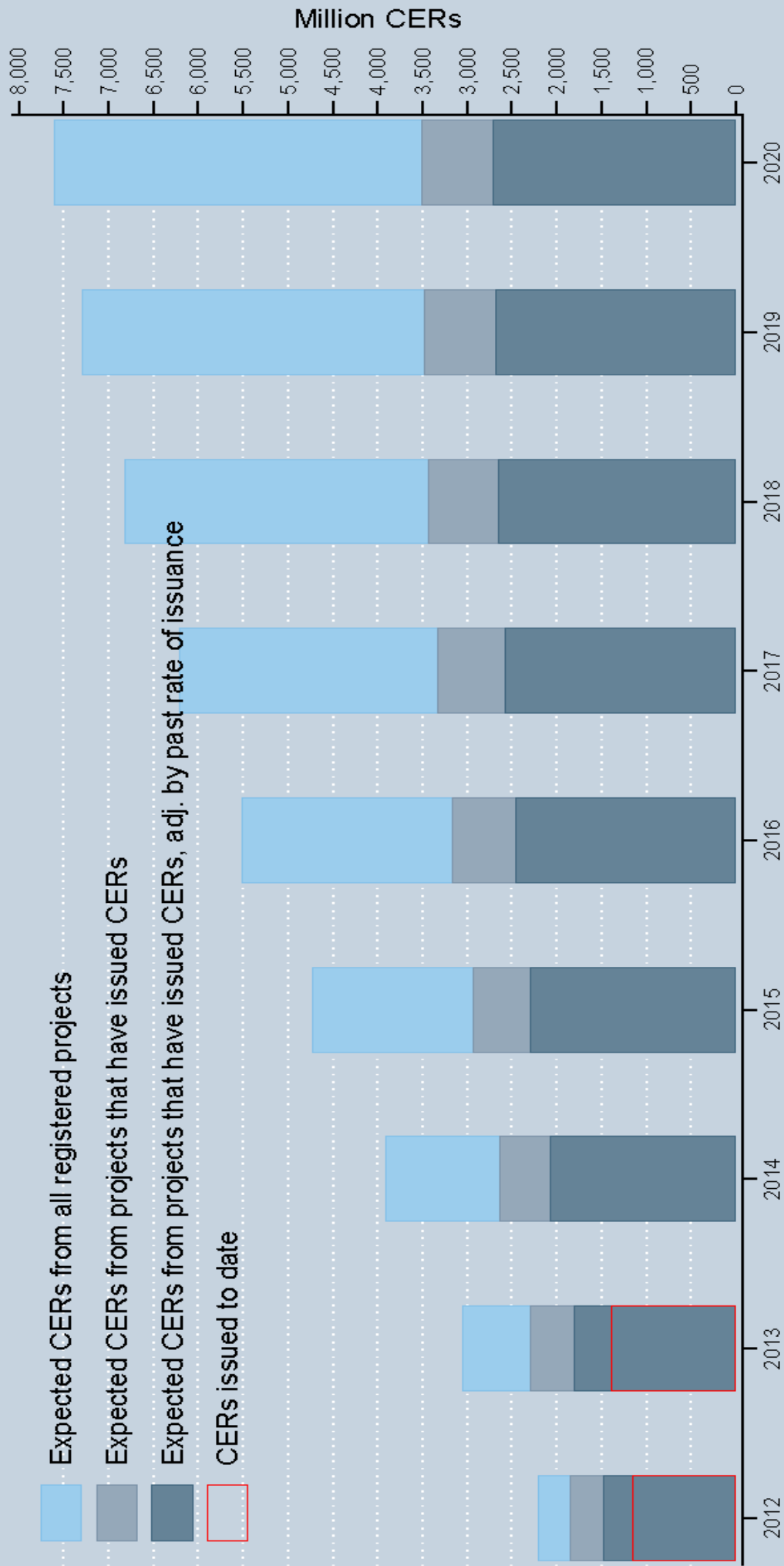


Data as of 30 Sep 2013
Source: UNFCCC



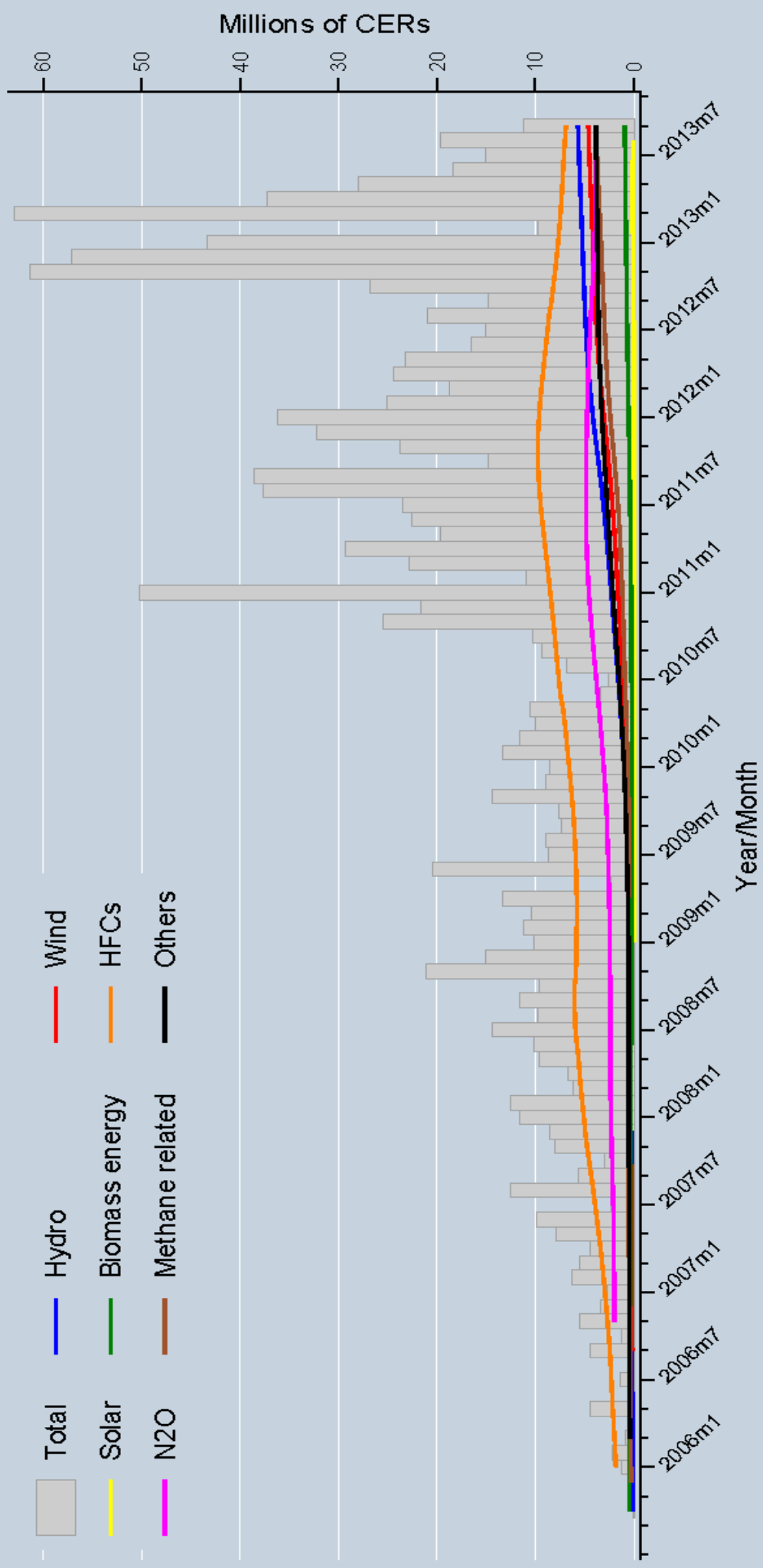
Note that a methodology can be linked to more than one sectoral scope.

Total potential supply of CERs from end KP 1st CP to 2020



Data as of 30 Sep 2013
Source: UNFCCC

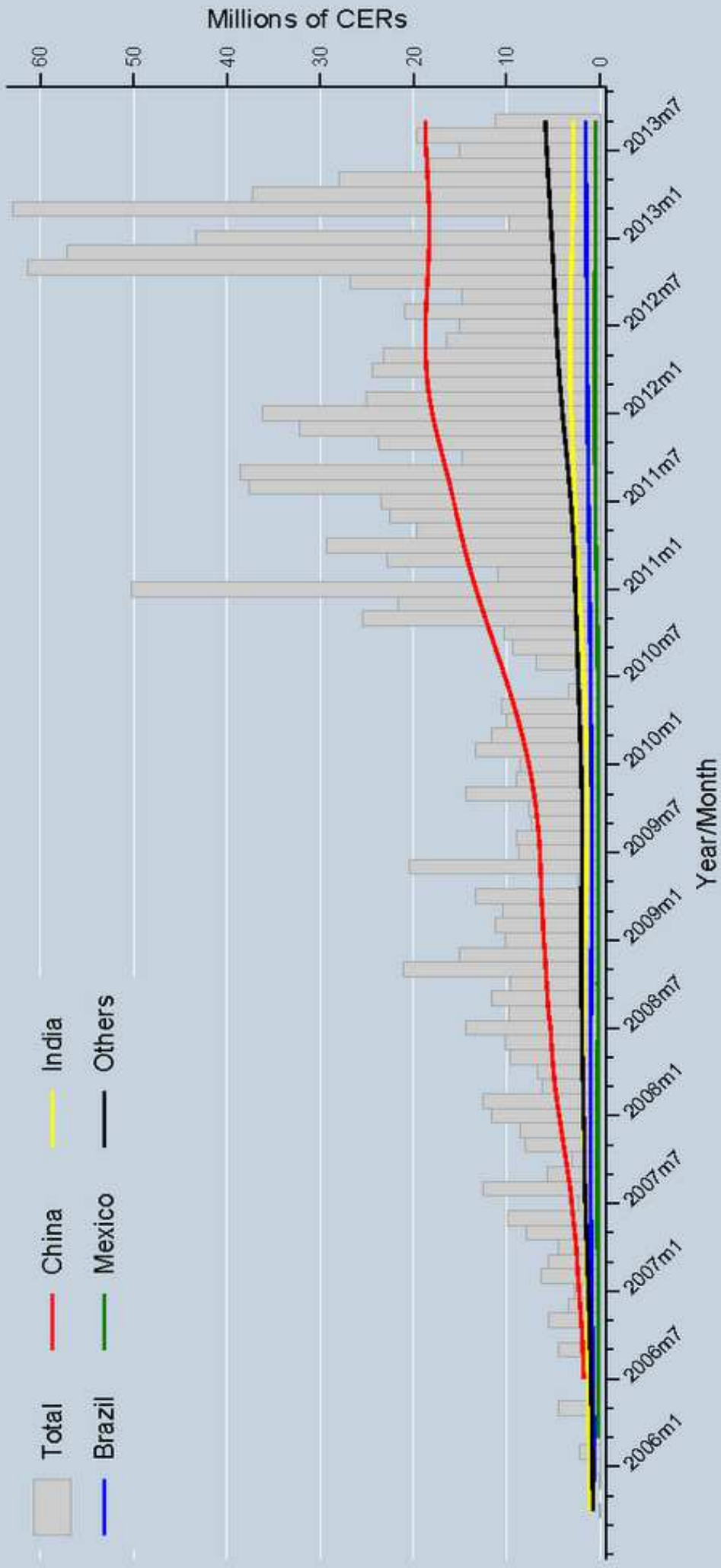
Trend of types of CERs issued and issuing



Data as of 30 Sep 2013
Source: UNFCCC & UNEP Risoe

Notes: Trends are locally weighted regressions at a bandwidth of 0.50

Trend of CERs issued and issuing by Host Party

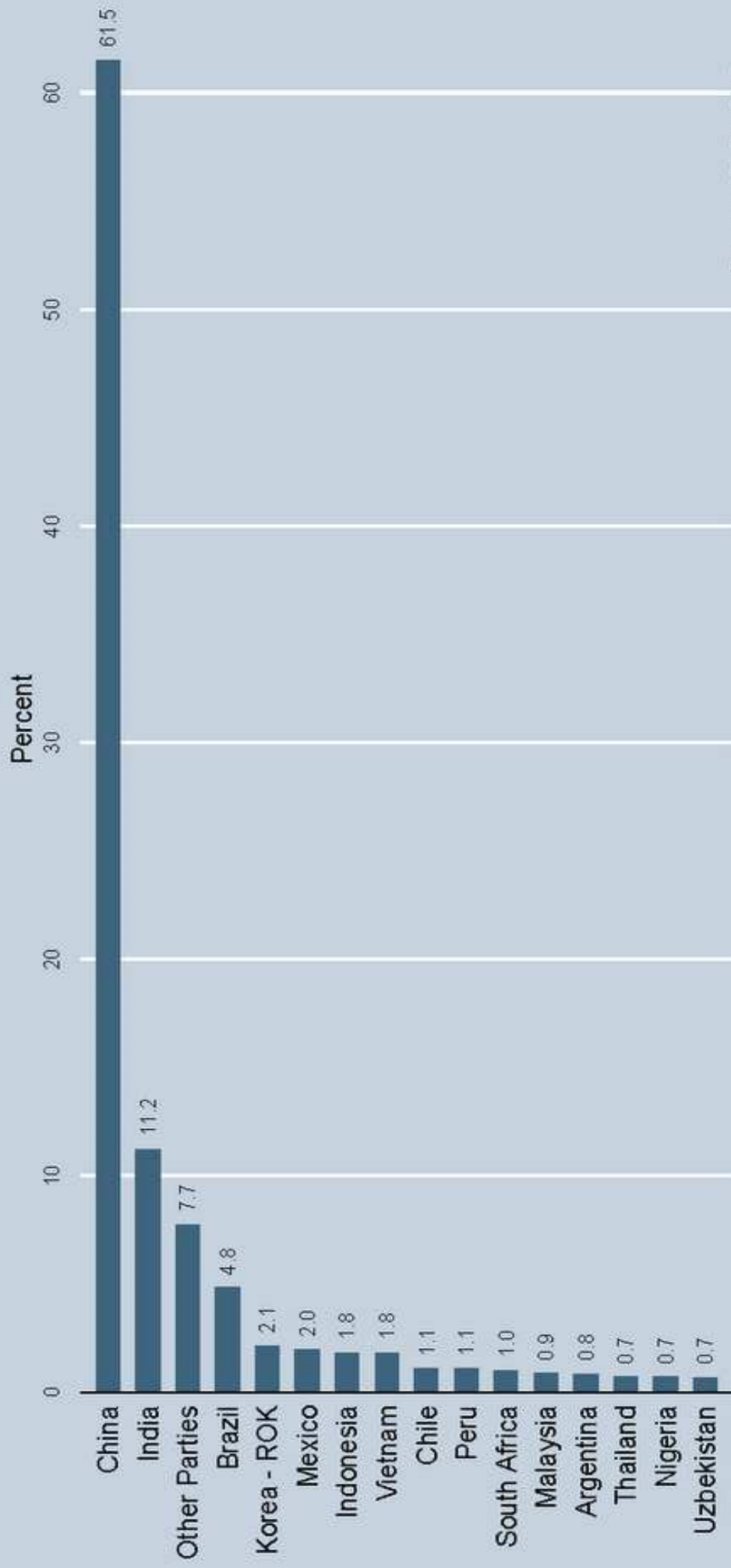


Data as of 30 Sep 2013
Source: UNFCCC

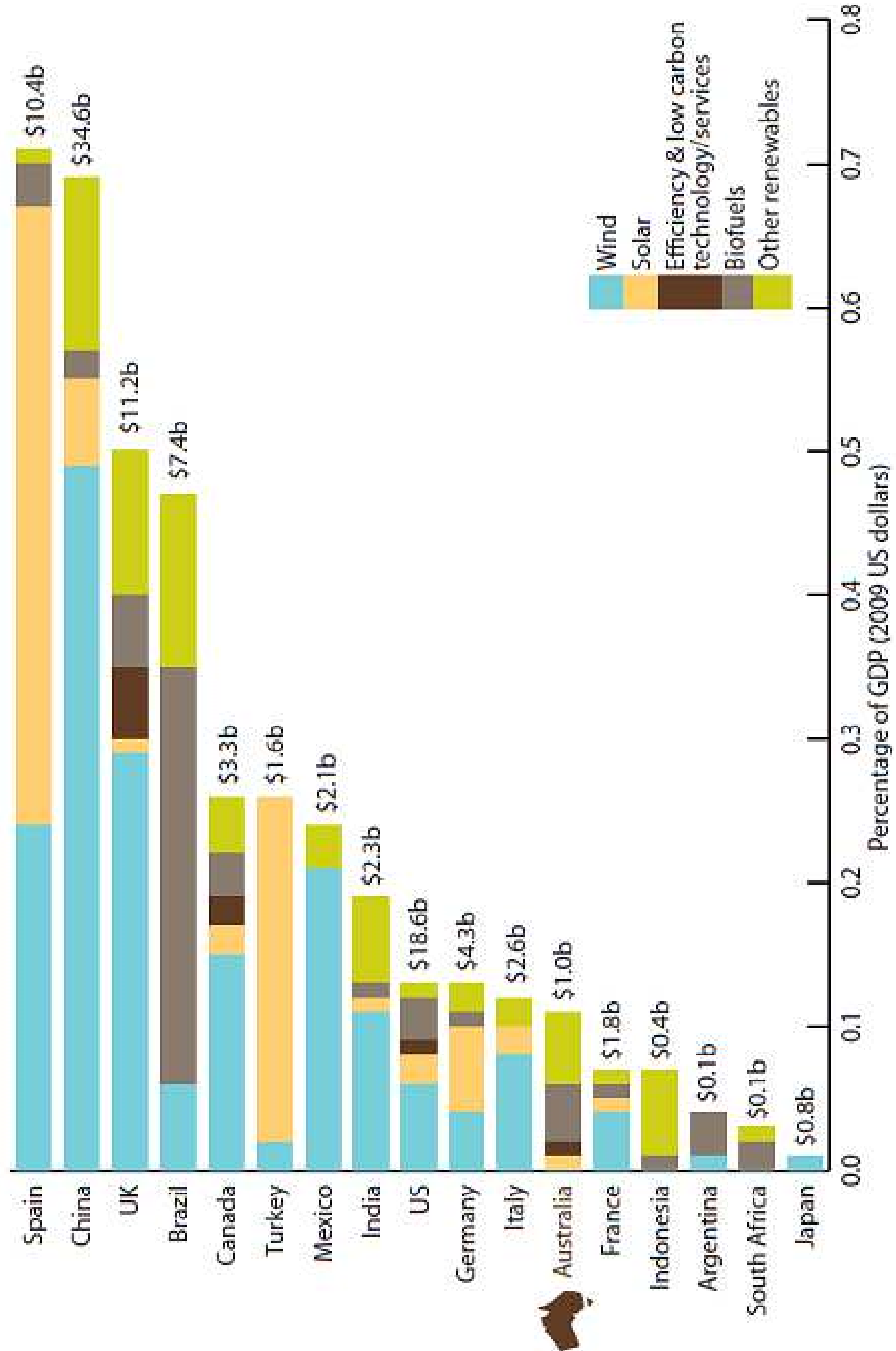
Notes: Trends are locally weighted regressions at a bandwidth of 0.50

Distribution of expected CERs from registered projects by Host Party

Total expected CERs is the sum of each projects average annual reductions: 955,797,218 t CO₂e

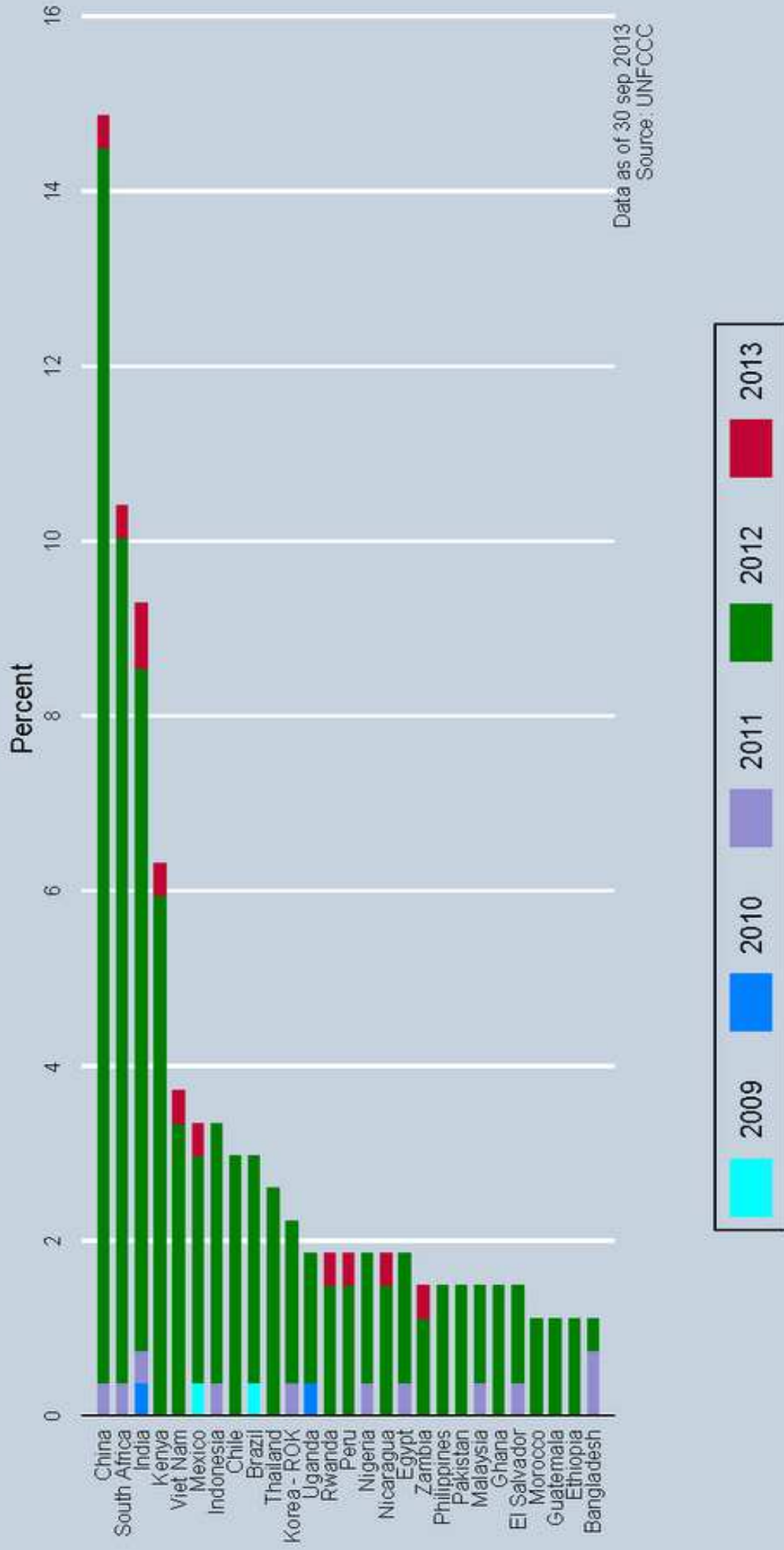


Data as of 30 Sep 2013
Source: UNFCCC



Distribution of registered PoAs by Host Party

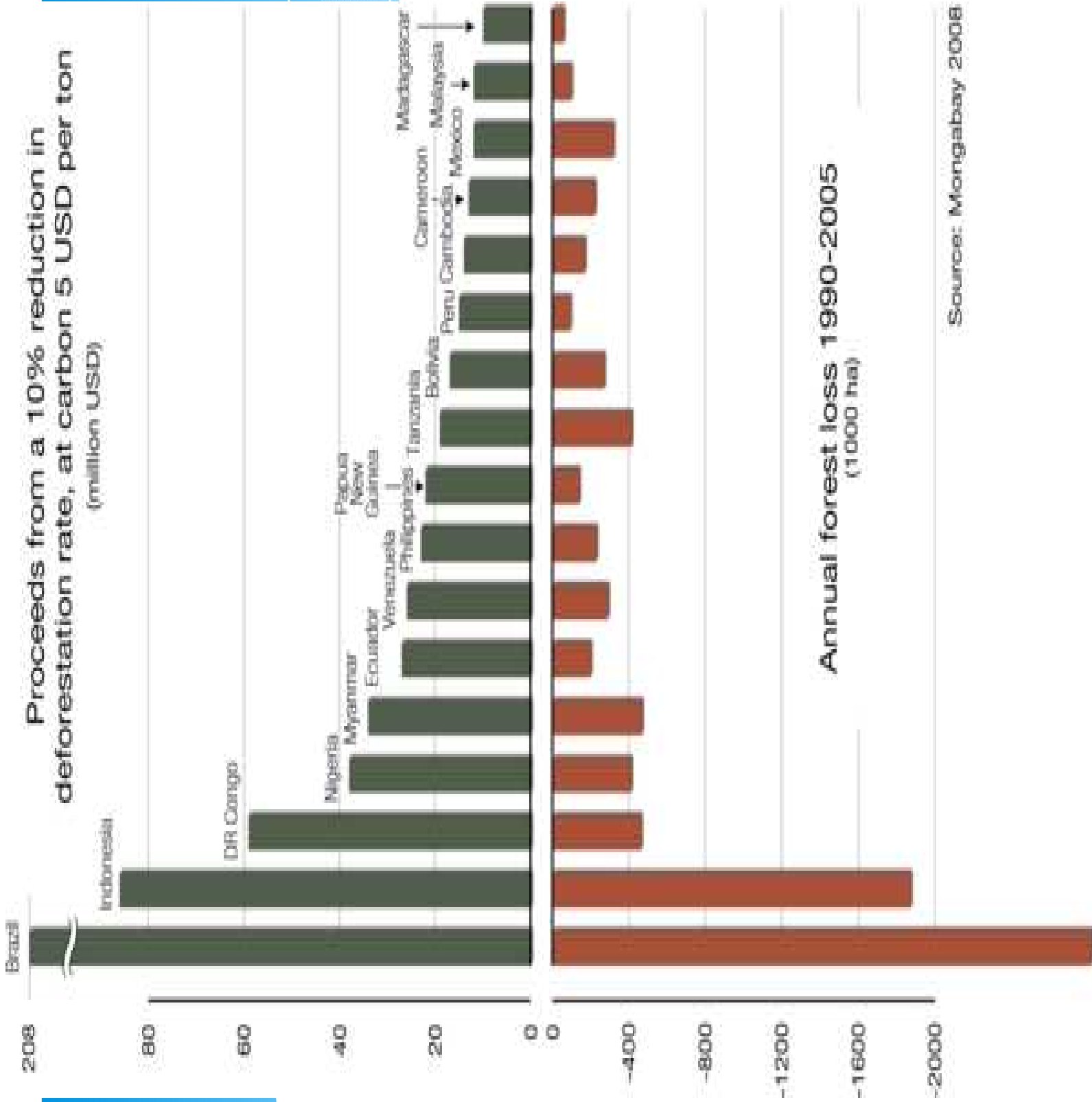
Total registered PoA activities: 222



Data as of 30 sep. 2013
Source: UNFCCC

Note: A PoA can have more than one Host Party involved.

Proceeds from a 10% reduction in deforestation rate, at carbon 5 USD per ton (million USD)



Annual forest loss 1990-2005 (1000 ha)

Source: Mongabay 2008

Perkembangan Perdagangan Karbon Global

- * **EU ETS**, diikuti oleh 29 negara, terbesar dan yang paling kuat. EU ETS juga memperdagangkan CER dari proyek CDM.
- * **Regional Greenhouse Gas Initiative (RGGI)**, adalah pasar karbon yang pesertanya pembangkit listrik di atas 25 MW di beberapa negara bagian US.
- * **New Zealand (NZ-ETS)**, adalah satu-satunya pasar karbon yang memperdagangkan kredit dari land use. Di NZ-ETS tidak dikenal adanya CAP.
- * **California**, diikuti oleh beberapa negara bagian di US.
- * **Australia**, akan mengoperasikan pasar karbon di tahun 2015 dengan harga karbon yang sudah disepakati.
- * **Jepang**, mempunyai beberapa pasar karbon yang bersifat voluntary (J-VET dan J-VER), serta mandatory (Tokyo Metropolitan).
- * **China**, mulai menerapkan pasar karbon dengan sistem cap and trade di 7 propinsi.
- * **Korea**, yang mengoperasikan pasar karbon sukarela K-VER dan akan mulai mengoperasikan yang cap and trade pada tahun 2015.

Pasar Karbon Sektor Kehutanan

- * Total \$237 juta proyek karbon hutan pada 2011
- * Secara nilai naik 33%, secara volume turun 22% dari catatan volume 2010 menjadi 26 MtCO₂e ditransaksikan pada 2011

REDD+ dan Pasar Karbon

- * Indonesia & komunitas global kini memiliki pilihan tidak hanya CDM
- * Beberapa mekanisme pasar baru dikenalkan sehingga lebih luas peluang untuk menggunakan mekanisme pasar
- * Beberapa sistem pasar domestik dikembangkan untuk mengurangi biaya mitigasi

REDD+ dan Pasar Karbon

- * **REDD+** membutuhkan pasar khusus untuk menjual “produk”nya tidak hanya karbon
- * Indonesia mengembangkan **Skema Karbon Nusantara** untuk memenuhi kebutuhan mekanisme berbasis pasar

Pendanaan REDD+

- * Input-based incentive
 - * Output-based incentive
 - * Performance-based incentive (market mechanism)
-
- * Melalui : Pasar karbon wajib (Mandatory market);
Pasar sukarela (Voluntary market)

Pertanyaan Konseptual Pasar Karbon dalam Konteks REDD

- * Sisi penawaran: Bagaimana mengurangi emisi karbon hutan dengan mempertimbangkan aspek conditionality, additionality, leakage dan performance?
- * Permintaan: Apakah *Voluntary Carbon Standard* yang saat ini dijadikan acuan sudah cukup tepat? Dan bagaimana *Willingness to pay* pembeli potensial untuk ikut serta dalam mekanisme pasar sukarela dalam REDD+?

Potensi Penawaran

Restorasi ekosistem, pengelolaan taman nasional, dan pembangunan KPH merupakan kegiatan-kegiatan yang berpotensi untuk membangun sisi penawaran pasar karbon hutan:

- * Conditionality adalah kejelasan kawasan
- * Additionality adalah kegiatan restorasi dan konservasi
- * Permanence adalah jangka waktu konsesi kawasan sekitar 60 tahun
- * Leakage adalah peningkatan kesadaran dan pembangunan kapasitas

Potensi Permintaan

- * Skema Karbon Nusantara. Dimaksudkan untuk menyertifikasi kredit karbon melalui Unit Karbon Nusantara. Skema Karbon Nusantara dapat dijadikan alternatif untuk VCS di pasar domestik
- * Pembeli kredit karbon dapat berupa pemerintah negara lain (bilateral/multilateral), perusahaan nasional dan multinasional (e.g. Chevron)
- * Alternatif permintaan adalah dari Corporate Social Responsibility (CSR)

Tantangan

- * Ketidakjelasan pembeli kredit karbon di tingkat internasional. Walaupun prospek REDD+ diyakini masih bagus terutama dalam membantu konservasi sumberdaya hutan
- * Masalah hak atas karbon yang melakukan offset (pembeli) adalah perusahaan/lembaga di luar negeri --> sovereignty
- * Bagaimana menjernihkan kesimpangsiuran antara pasar karbon dengan pendanaan persiapan
- * Bagaimana formula insentif yang tepat untuk melibatkan perusahaan dalam negeri yang berpotensi menjadi pembeli dalam pasar karbon dari REDD+ (e.g melalui CSR)?

Kebijakan Strategis

- * Membangun sistem registrasi nasional untuk mengkoordinasikan inisiatif - inisiatif lokal saat ini dan mengarahkannya ke compliance market jika telah ada kesepakatan internasional
- * Mengingat masih belum banyak pembeli serius di pasar internasional, maka yang bisa dilakukan adalah bagaimana membangun joint credit mechanism seperti dengan Pemerintah Jepang yang serius untuk memindahkan dananya dari CDM ke REDD+
- * Karena performance-based incentive tidak hanya berupa pasar karbon, maka perlu dilakukan diversifikasi kegiatan



TERIMA KASIH