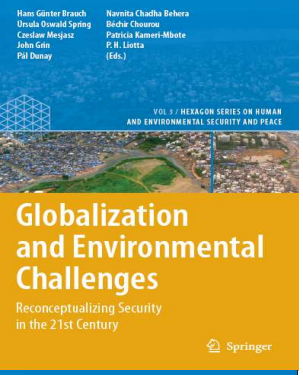

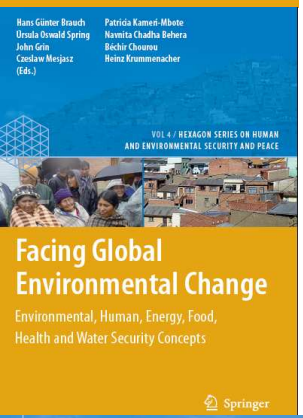

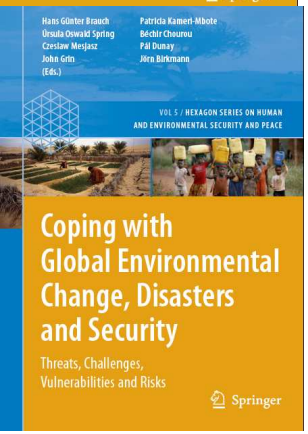

5 December 2012, 8.30 am - 11.30 pm (3 hours)
Graduates Seminar 4, Lecture Hall: 3F-201-
Politics and International Relations Students

Climate Paradox:
Climate Policy of the G8 and & 20 Countries

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Editor, Hexagon Series on Human, Environmental Security & Peace
Editor, Springer Briefs in Environment, Security, Development & Peace, vol. 1-2
Editor, SpringerBriefs on Pioneers in Science & Practice,

Reading Texts

- Text 7: Brauch, Hans Günter, 2009a: “Securitzing Global Environmental Change”, in: Brauch, Hans Günter; Oswald Spring, Úrsula et al. (Eds.), 2009: Facing Global Environ-mental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts (Berlin – Heidelberg – New York: Springer-Verlag): 65-102.
- Text 8: Brauch, Hans Günter, 2012: Brauch, “Climate Paradox of the G8 - Legal Obligations, Policy Declarations and Implementation Gap”, in: Viola, Eduardo; Lessa, Antônio Carlos (Eds.): Revista Brasileira de Política Internacional - Brazilian Journal of International Politics, Special English issue: Global Climate Governance and Transition to a Low Carbon Economy (Brasilia: November 2012).

Contents

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7. Overcoming the Climate Paradox: Business as Usual vs. sustainability Revolution

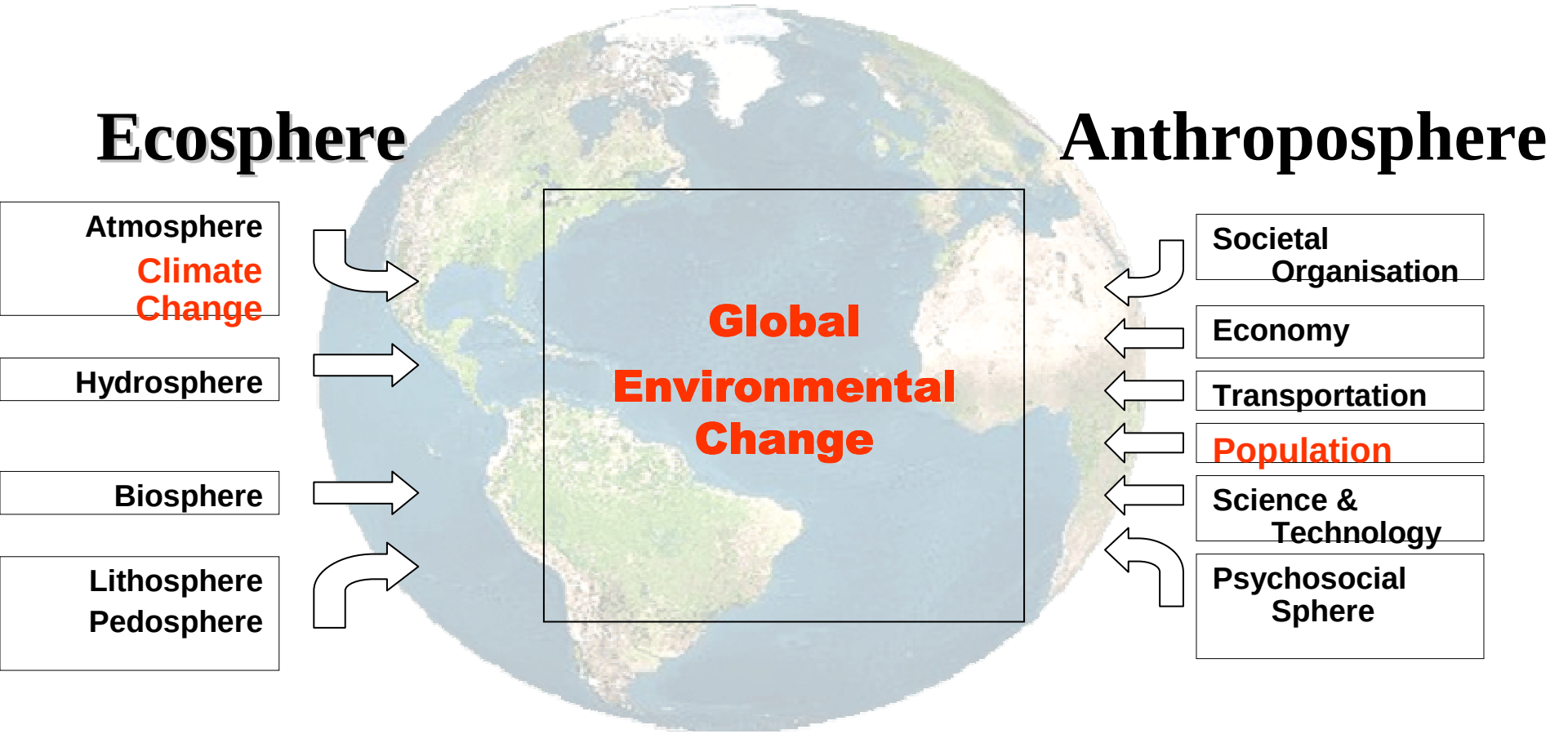
1. Major Achievements: 1972-2012

- **UNCED or first Earth Summit in Rio in June 1992**
  - 1972: Stockholm put environment on UN agenda, UNEP
  - 1987: Brundtland Commission: sustainable development
  - 1992: UNCED launched global environment governance with three major global environment regimes
- **UNFCCC (1992): Process of Conference of Parties**
  - COP 1 (1995): Berlin Mandate for a Protocol
  - **COP 3 (1997): Kyoto Protocol**, with QELROs for Annex B countries (OECD and former Comecon countries of -5% by 2012)
  - **COP 15 (2009): Copenhagen failure to agree on Post KP-Regime**
  - COP 16 (2010): Cancun Accords: voluntary commitments
  - **COP 17 (2011): Durban: nonbinding goal for new regime by 2020**
  - **COP 18 (2012): Doha under way: outcome uncdertain!**
- **UNCBD**
  - **Cartagena Protocol on Biosafety (2000, entered into force 2003)**
  - **Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (2010, not yet in force)**
- **UNCCD: no legally binding protocol so far.**

1.1. Major Policy Failures: USA

- **Growing domestic opposition in the USA**
  - **UNCBD: signed 4 June 1993, never ratified it**
    - **Cartagena Protocol: never signed & ratified**
    - **Nagoya Protocol: never signed & ratified**
  - **UNFCC: signed 12.6.1992 & ratified 15.10.1992**
    - **Kyoto Protocol: US reduction goal: -7% (Clinton Administration signed KP in 12.11.1998)**
    - **Failed to ratify KP due to Republican opposition in the US congress (Senate)**
- **USA became an environmental laggard since 1993 (UNCBD) & 1998 (KP,UNFCCC)**

2. Global Environmental Change (GEC)



GEC poses a threat, challenge, vulnerabilities and risks for human security and survival.

2.1 Global Environmental & Climate Change

- Global Environmental Change (GEC) & global climate change (GCC) have become
  - scientific issues since the 1970s,
  - political problems since the late 1980s & they have been discussed as
  - security-related threats, challenges and risks since early 21st century.
- The symbolic political takeoff occurred at the United Nations Conference on Environment and Development (UNCED) or at the first ‘earth summit’ in June 1992 at Rio de Janeiro when the
  - United Nations Framework Convention on Climate Change **(UNFCCC)**
  - United Nations Convention on Biological Diversity **(UNCBD)** signed
  - Policy documents were approved, e.g. **Agenda 21**,
  - **Rio Declaration on Environment and Development,**
  - **Statement of Forest Principles**
- In contrast, two decades later at the second Rio ‘earth summit’ (Rio+20) no legally binding document was signed and only a non-binding policy document was approved on the “Future we Want” with lowest common denominator of the governments.

2.2 Scientization, Politicization & Securitization of Climate Change

- Since 1970/80s: '*global environmental change*' (GEC) a new topic in natural & social sciences
- Since late 1980s and 1990s policy efforts on:
  - Climate Change: 1988: issue of G7; 1990: UN GA mandate; 1992: Rio summit: UNFCC (1992) and Kyoto Protocol (1997)
  - Desertification: UNCCD (1994)
- Since 2000: both are seen as security issues
  - Climate change & international security (UN, EU)
  - Climate change & national security (primarily min USA)
  - Climate change & human security (HSN,GECHS, IPCC)

3. From Rio 1 (1992) to Rio 2 (2012): Performance Gap

- After end of Cold War, first ‘earth summit’ in Rio de Janeiro indicated a significant shift in global political priorities from military security to the new emerging global environmental challenges that required new multilateral cooperation.
- As only remaining superpower, US demonstrated at Rio 1992 its political will to demonstrate its leadership also on global environmental policies.
- This position came under attack during Clinton Administration when Republican controlled US Congress successfully blocked international commitments with the support of interest groups.
- With terrorist attack of 11 September 2001, George W. Bush re-established the dominance of the military agenda downgrading the urgency of GEC issues and climate change.

3.1. Legal Obligations: UNFCCC & KP

There is a weak not very specific legal commitment

- **UNFCCC (1992): Art. 2, Objective:**

  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.

- **Kyoto Protocol (1997): Art. 3,1:**

1. The Parties included in Annex I shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of this Article, with a view to reducing their overall emissions of such gases by **at least 5 % below 1990 levels in the commitment period 2008 to 2012.**
   - **USA: - 7% under KP (signed but never ratified)**
   - **Canada: -6% under KP (signed, ratified and withdrew on 31 December 2011**
   - **Mexico: no legal obligations but voluntary commitments: -50% (by 2050) base year 2000**

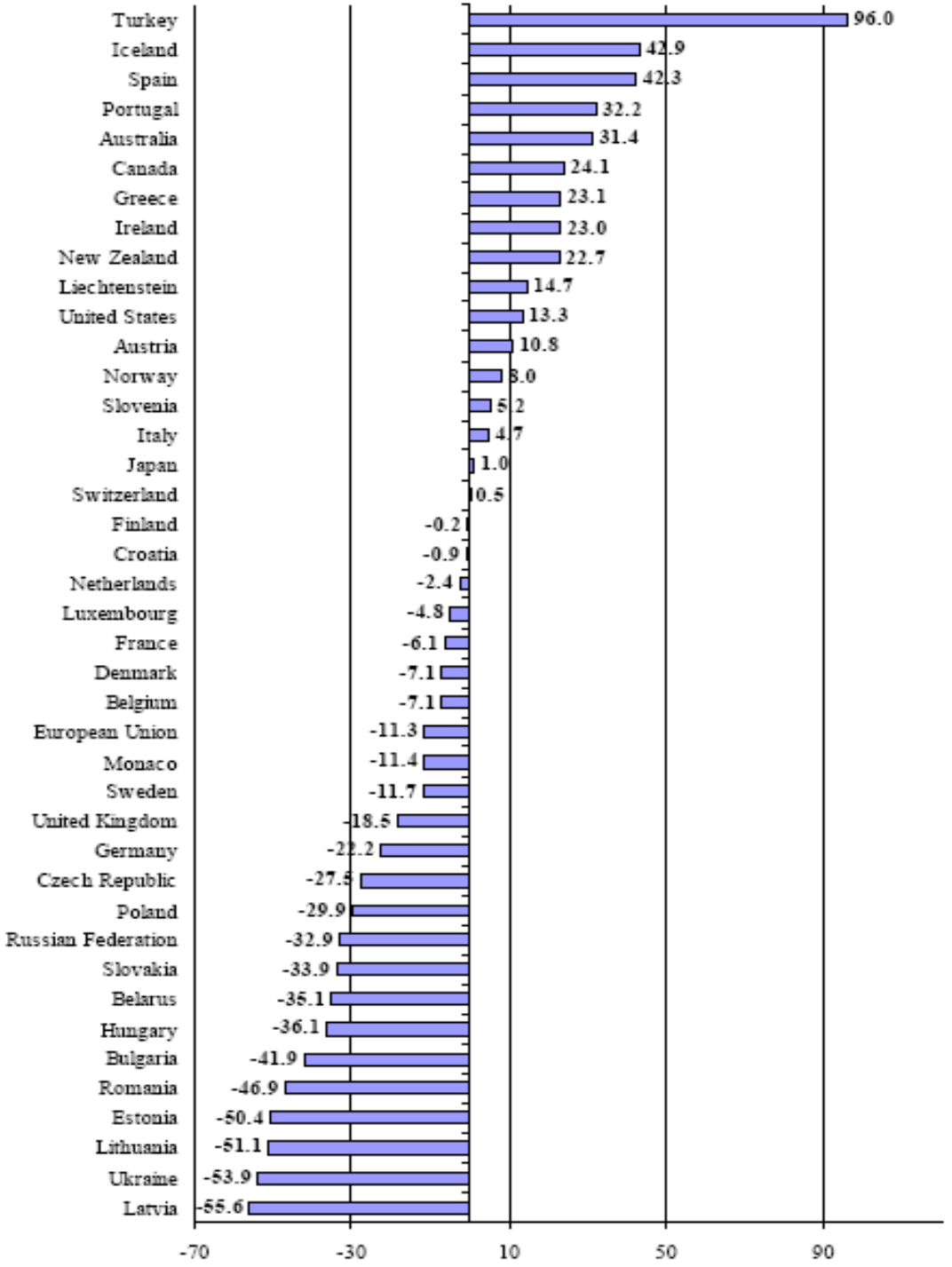
3.2. GHG Reduction Implementation Gap

QELRO, Kyoto Protocol

- EU countries: -8%
- Canada: -6%
- USA: - 7% (no party KP)
- Japan: -6%
- Australia: +8%

Changes in GHG Emissions: Annex I Part., 1990–2008 (exc. [incl.] LULUCF (%).

- EU countries:-11.3 [-11.3]
- Canada: + 24.1 [+33.6]
- USA: +13.3 [+15.3]
- Japan: +1% [-0.2]
- Australia: +31.4 [+33.1]
- Turkey: +96.0 [101.1]



3.3. Performance Assessment: UNEP GEO-5 (June 2012) & UNFCCC

- **Global Environmental Outlook** (GEO-5) of UNEP of 2012: only 3 of 90 indicators showed significant improvement.
- On achieving the approved goals on the “stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system” (UNFCCC, 1992) and of the political goal “to limit the increase in global average temperature to less than 2℃ above pre-industrial levels” (UNFCCC COP 15-COP 17),
- **GEO-5 noted “very little to no progress”** due to “rising CO2 & other greenhouse gas emissions, increasing concentrations.
- According to the Millennium Development indicators, the global development indicators noted some improvements but one of 7 billion people are still poor and hungry (UNMDG 2012).
- **At Rio+20 (2012) the outcome document called for developing “Sustainable Development Goals” that integrate environmental and development indicators but did not agree on specific targets.**

3.4. UNCBD & Cartagena Protocol

- October 2012, UNCBD had 193 State Parties (192 States, EU). The United States has signed the UNCBD on 4 June 1993 but never ratified it. Besides USA, Andorra, Vatican, South Sudan are no parties to the UNCBD.
- Cartagena Protocol on Biosafety governs movements of living modified organisms (LMOs) resulting from modern biotechnology counted 163 Parties in October 2012. It was adopted on 29 January 2000 and entered into force on 11 September 2003.
- Cartagena Protocol has so far not been ratified by Argentina, Australia, Canada, Chile, the Russian Federation, the USA, Israel, several Arab (Iraq, Kuwait, Lebanon, South Sudan, UAE) and Pacific Small island States.
- **Nagoya – Kuala Lumpur Supplementary Protocol** on Liability & Redress was adopted on 16 October 2010 and signed until September 2012 by 51 signatories but ratified so far by no country. It will enter into force 90 days after being ratified by at least 40 Parties to the Cartagena Protocol on Biosafety.

4. Climate Paradox: Policies without Implementation

- Most governments agree that climate change is due to human interventions into the earth system and supported the goal to stabilize global average temperature at 2℃ above the pre-industrial level b y. Since 2007, G8 countries supported the goal, most recently in May 2011 in Deauville (France):
  - of developed countries reducing emissions of greenhouse gases in aggregate by 80% or more by 2050, compared to 1990 or more recent years.
  - Consistent with this ambitious long-term objective, we will undertake robust aggregate and individual mid-term reductions. Similarly, major emerging economies need to undertake quantifiable actions to reduce emissions significantly below business-as-usual by a specified year.

5. Performance of G-8: Mixed Performance: GHG Emissions

Country	UNFCCC (1992)		Kyoto Protocol (1997)		Re-duc-tion goal (%)	EU-15 Reduc-tion goal (%)	Performance (1990-2009) GHG reductions in % 1990 (base year)		
G8 countries	An-nex 1	An-nex 2	Annex B	In tran-sition		Burden-sharing agree-ment (1998)	EU Eurostat (2011) IEA [2011]	UNFCC (2009) Landuse change and forestry (LULUCF) Excl.	Incl.
1) USA	X		X		-7		+6.7	+7.2	+5.6
2) Canada	X		X		-6		+20.4	+17.0	+29.8
3) Japan	X		X		-6		+2.7	-4.5	-5.0
4) Germany	X		X		-8	-21	-25.4[-21.9]	-26.3	-23.0
5) UK	X		X		-8	-12.5	-27.1[-15.2]	-26.9	-27.7
6) France	X		X		-8	0	-8.3[+0.6]	-7.7	-12.9
7) Italy	X		X		-8	-6.5	-5.0[-2.0]	-5.4	-13.3
8) Russia		X		X	0		-29.7	-36.9	-57.2

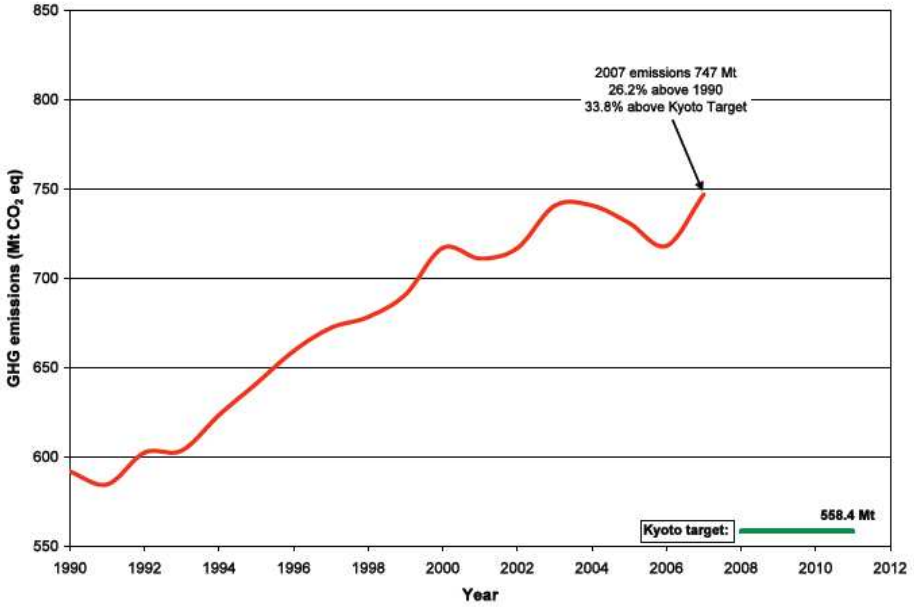
5.1. US Climate Performance

- In 2008, the USA had contributed about 18.11% to global total of CO2 emissions, 2nd rank between China and the European Union (E-27).
- Its per capita emissions amounted to 17.3 tons CO2 and the average annual % growth from 1970 to 2008 was -0.6%.
- According to IEA's statistics from 1990 to 2009, the total CO2 emissions of the USA increased by 6.7% and were thus 13.7% above its targets under Annex B of the KP.

5.2. Climate Policies of NAFTA Countries: Performance of Canada

- In 2008, Canada had contributed 1.8% to global total and took the 7th rank between Germany and Iran.
- Canada's per capita emissions in 2008 amounted to 16.4 tons of CO2 and average annual % growth from 1970 to 2008 amounted to +0.1%.
- According to IEA's statistics from 1990 to 2009, Canada's CO2 emissions increased by 20.4% and were thus 27.4% above its targets under Annex B of the KP.
- In its 5th NC to the UNFCCC of 12 February 2010 the Government of Canada described its performance as follows:

5.3. Climate Policies of NAFTA Countries: Performance of Canada



In its 5th NC the government admitted that in 2007 Canada's GHG emissions were 33.8% above its Kyoto target.

- 1990-2007, Canada's GHG emissions increased faster than its population, only the GHG per capita and per energy use and the GHG intensity declined. Emissions increased in all sectors, except for land-use change and forestry.
- **On 11 December 2011, Canada unilaterally withdrew from the KP. Canada would join a new global commitment with China and the US.**
- Canada's Prime Minister Harper claimed that the **KP hurt the competitiveness of its economy**.
- The huge performance & implementation gap and the increasing pressure of the energy industry to **exploit Canada's huge potential of oil sands** persuaded Canada's Cons. Harper government as first country to opt out of the KP (1997) to give preference to domestic economic interests over global commitments.

5.4. From Leaders to Laggards: Canada and USA

- **USA was a leader of global climate policy from 1988-1992/1997:**
  - Reagan tabled climate change on G-7 agenda
  - Supported start of UNFCC negotiations & IPCC etsablishment in December 1988
  - George Bush signed & ratified UNFCC in 1992
- **Since 1998 US climate policy was blocked in US Congress by Republican majority:**
  - In 1998 US could sign but not ratify KP due to a lacking 2/3 majority in US Senate.

5.5. Japan: Impact of Fukushima

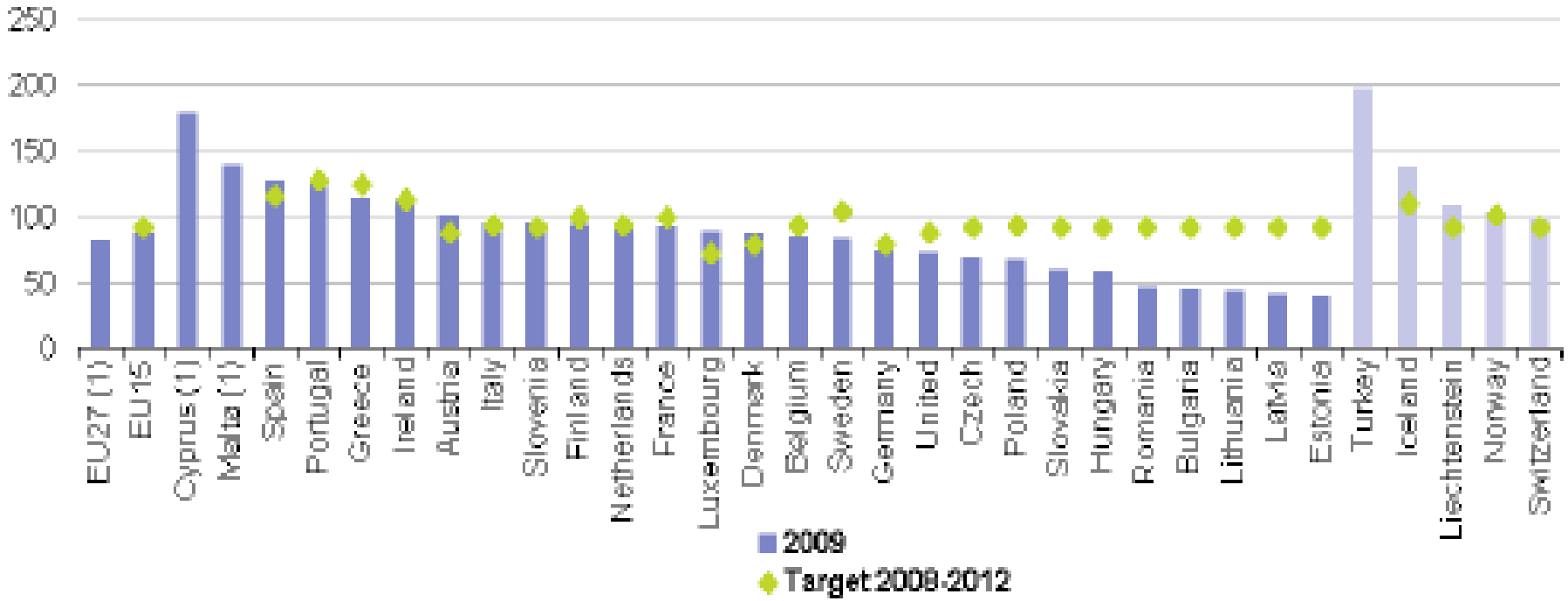
- **2008, Japan 6th rank between India & Germany. Japan's per capita emis-sions in 2008 amounted to 9.5 tons CO2 & average ann. growth 1970- 2008 +0.7%. According to IEA's statistics (1990-20099, Japan's CO2 emissions were 8.7% above its targets under the KP.**
- **Since 1960s Japan held a technological lead in energy-efficient technolo-gies. Ohta (2011) argued that "a lack of strong and stable political leadership on climate change… has also allowed well-organized economic interests and the economy ministry to solidify an industry-oriented policy coalition".**
- **With the Fukushima nuclear catastrophe in March 2011 the vulnerability of Japan's energy policy relying heavily on nuclear energy became obvious.**
- **Japan's policies to achieve its more ambitious long-term emissions reduction targets (25 per cent by 2020, and 80 per cent by 2050) depended heavily upon expanded use of nuclear power. … But in the aftermath of the Fukushima Daiichi nuclear crisis, these plans have been abandoned, leading many observers to express severe doubts that Japan will meet its long-term emissions targets.**
- **Whether Japan will be able to meet its GHG reduction goals by 2020 and 2050 depends on fundamental decisions on its future energy policy and on an efficient political strategy for a transition towards a sustainable development path in the first half of the 21st century.**

5.6. Russia: Economic Transition

- 2009, Russia s 4th largest CO2 emitter aftere China, USA & India, for all GHG emissions, including defore-station, Russia 5th place behind China, US, Brazil & Indonesia.
- In cumulative emissions for 1850-2007 with 8% Russia was the third largest emitter.
- According to UNFCCC's (2009) with land-use change Russia reduced its GHG emissions since 1990 by -57.2%, without land-use change and forestry by -36.9% and according IEA's (2011) analysis by -29.7% .
- Russia's major decline in GHG emissions since 1990 coincided with dissolution of Soviet Union & transition of Russia from a socialist to a market economy. Prior to COP 15 (2009) in Co-penhagen, Russia considered reducing its GHG by 25 % until 2020.

5.7. Implementing Legal Obligations & Policy declarations: EU (Germany, UK, France, Italy

Greenhouse gas emissions and targets per country (Index Kyoto base year = 100):
Source: Eurostat: Climate change statistics (June 2011); at: <



(1) No target under the Kyoto Protocol (1990=100).

Source: Eurostat (tsien010), European Environment Agency, European Topic Center on Air and Climate Change

5.8. Leaders & Laggards of EU-27

- **Among EU-27, Germany, UK, France, Italy) were responsible for 54.9% of the GHG** weighted emissions in CO2 equivalents. Of these by 2009 Germany had reduced its emissions by -21.1%, Sweden by -20.9, UK by -15.2%, Denmark by -7.2%, Belgium by -7% since 1990. For EU-15's 'burden-sharing' targets, Sweden had reduced its emissions by -20.9%, the UK by -14.6%, France by -8.3%, Finland by -6.6% and Germany by -4.5%.
- However, there were also several laggards that missed both their reduction targets under Annex B of KP and under the EU-15's 'burden-sharing' approach, led by Spain (+37.7/+11.8%), Portugal (+35.3/-3.0%), Ireland (+32.4/-0.8%) and Greece (28.6/-10.5%), **whose combined share of the EU-27 was only 13.7% in 2009.**

5.9. EU GHG Reduction Goals 2020

The EU also adopted in 2008 a decision to aim by 2020 at a 20/20/20 target:

- A reduction in EU greenhouse gas emissions of at least 20% below 1990 levels
- 20% of EU energy consumption to come from renewable resources
- A 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency.

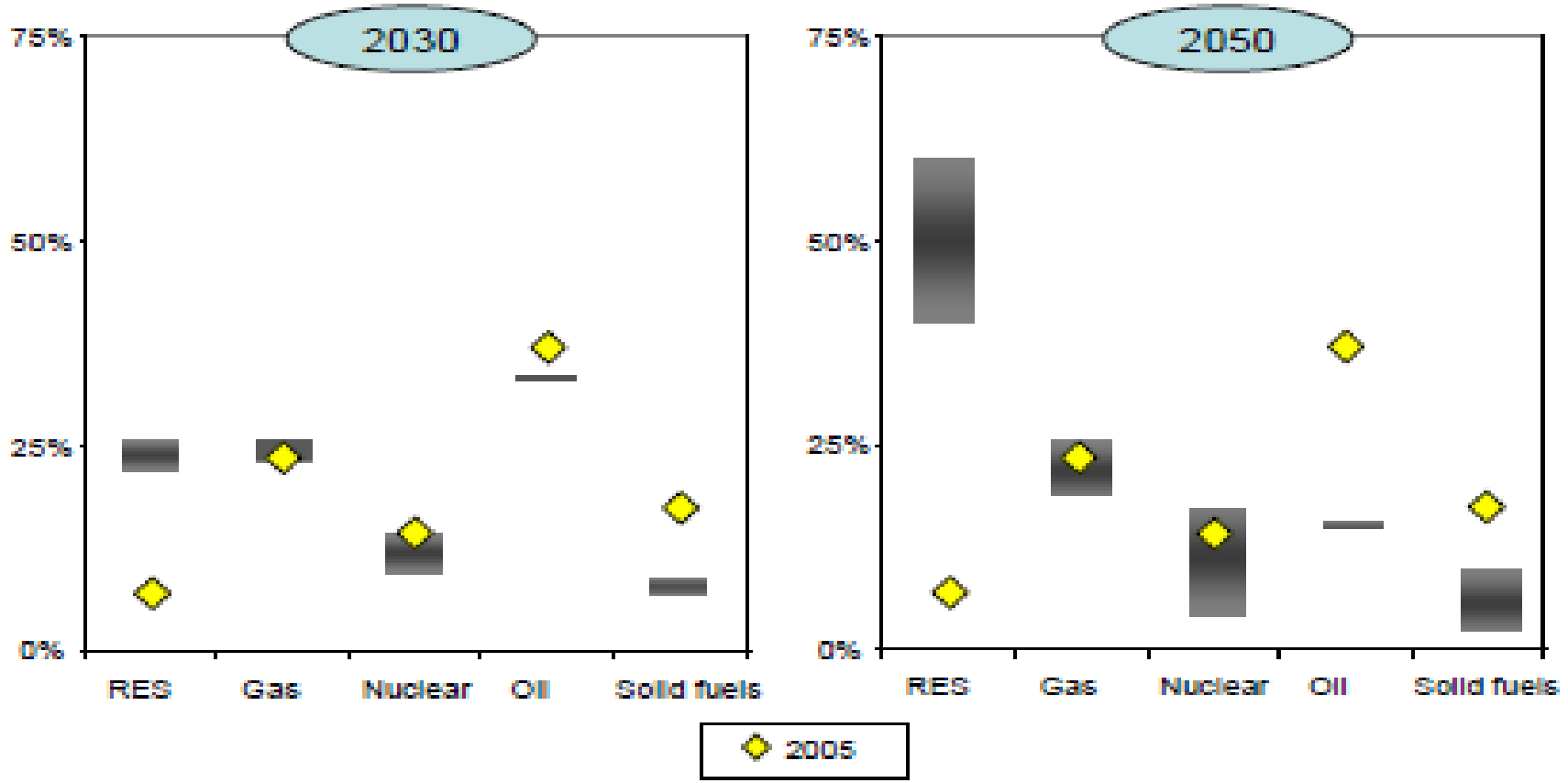
10–11 December 2009, before COP 15 in Copenhagen European Council offered to increase its emissions reduction to 30% if other major emitting countries would commit to significant reductions under a global climate agreement.

5.10. EU-27 Reduction Goal for 2050

- On 15 December 2011 the European Commission (2011) released its ***Energy Roadmap 2050***, according to which:
- The EU is committed to reducing greenhouse gas emissions to **80-95% below 1990 levels by 2050 in the context of necessary reductions by developed countries as a group.** The Commission analysed the implications of this in its **'Roadmap for moving to a competitive low-carbon economy in 2050'.**
- **The 'Roadmap to a Single European Transport Area' focused on solutions for the trans-port sector and on creating a Single European Transport Area**.
- In this Energy Roadmap 2050 the Commission explores the challenges posed by delivering the EU's decarbonization objective while at the same time ensuring security of energy supply and competitiveness. It responds to a request from the European Council.
- **This requires a sustainable transition in the energy sector.**

5.11. EU Decarbonization scenarios - 2030 and 2050 (comp. with 2005 in %)

Graph 1: EU Decarbonisation scenarios – 2030 and 2050 range of fuel shares in primary energy consumption compared with 2005 outcome (in %)



5.12. Outcome of COP 19 in Doha

- Visit outcome (documents) on 7 Dec. 2012 at

6.Performance of G-20: No Commitment

- Between 1950 and 2010 the population of the G20 increased significantly what coincided with a major increase in CO2 emissions since 1971 to 2009.
- With regard to the population projections until 2050 and 2100, population of 4 G8 is projected to continue to grow from 2010- 2100 (USA,France, Canada,UK), while it will decline for Japan, Russia, Germany, Italy.
- During past 60 years the population of India & China together has grown by 1 643 million people but the projections until 2100 for China and India differ significantly with a projected increase of 326 million for India and a projected decline of 400 million people for China by 2100 compared with 2010.

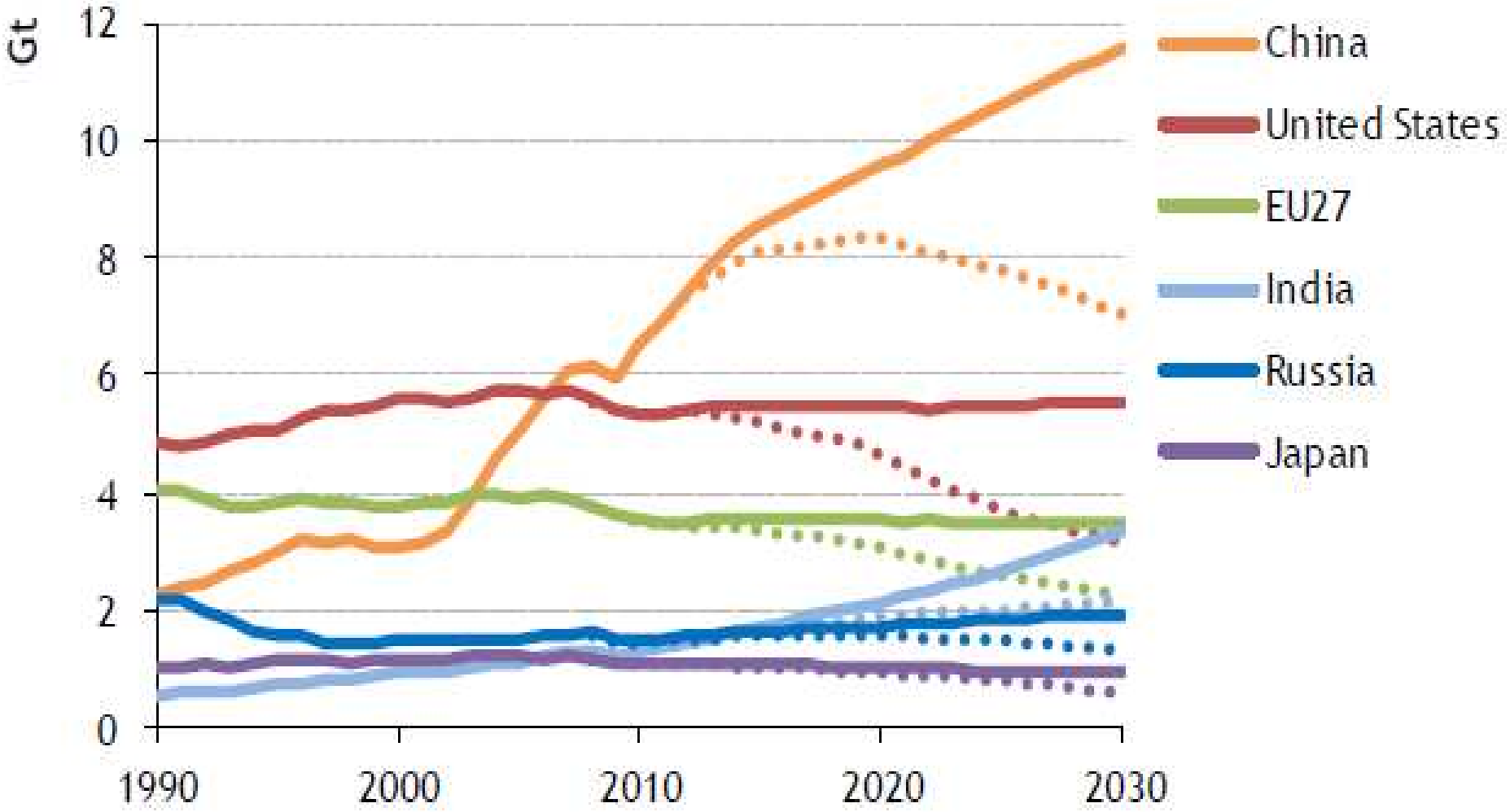
6.1 Population change & projections for the G20 from 1950 until 2100.

	Population change (in 1 000)				Population projection (in 1 000)				Population increase	
	1950	1970	1990	2010	2030	2050	2075	2100	1950-2010	2010 2100
G-8	**With GHG reduction obligations under the Kyoto Protocol**									
1) USA	157 813	209 464	253 339	310 384	361 680	403 101	446 428	478 026	+152 571	+167 642
2) Canada	13 737	21 717	27 701	34 017	39 850	43 642	46 767	48 290	+20 280	+14 273
3) Japan	82 199	103 710	122 251	126 536	120 218	108 549	95 984	91 330	+44 337	-35 206
4) Germany	68 376	78 169	79 098	82 302	79 469	74 781	70 482	70 392	+13 926	-12 910
5) UK	50 616	55 645	57 214	62 036	69 314	72 817	74 371	75 676	+11 420	+13 640
6) France	41 832	50 763	56 708	62 787	68 467	72 442	76 420	80 288	+20 955	+17 501
7) Italy	46 367	53 325	56 832	60 551	60 851	59 158	55 330	55 619	+14 184	-4 932
8) Russia	102 702	130 392	148 244	142 958	136 429	126 188	114 585	111 057	+40 256	-31 901
G-20	**With GHG reduction obligations under the Kyoto Protocol**									
9) EU-15/27										
10)Australia	8 177	12 728	17 096	22 268	27 771	31 385	34 114	35 908	+14 091	+13 640
	Without GHG reduction obligations under the Kyoto Protocol									
11) Turkey	21 238	35 464	54 130	72 752	86 665	91 617	86 998	79 200	+51 514	+6 448
12) South Korea	19 211	31 443	42 980	48 184	50 335	47 050	40 467	37 221	+28 973	-10 963
13) Mexico	27 866	51 868	84 307	113 423	135 398	143 925	138 407	127 081	+85 557	+13 658
14) China	550 771	814 623	1 145 195	1 341 335	1 393 076	1 295 604	1 085 948	941 042	+790 564	-400 293
15) India	371 857	553 874	873 785	1 224 614	1 523 482	1 692 008	1 692 208	1 550 899	+852 757	+326 285
16) Brazil	53 975	96 078	149 650	194 946	220 492	222 843	202 651	177 349	+140 971	-17 597
17)South Africa	13 683	22 502	36 794	50 133	54 711	56 757	56 863	54 477	+36 450	+4 344
18) Argentina	17 150	23 983	32 642	40 412	46 761	50 560	51 079	49 201	+ 23 262	+8 789
19) Indonesia	74 837	118 362	184 346	239 871	279 659	293 456	278 207	254 178	+165 034	+14 307
20)Saudi Arabia	3 121	5 772	16 139	27 448	38 481	44 938	45 818	42 427	+24 327	+14 979

6.2 Change of CO2 Emissions (1971-2009) and projections up to 2030

Countries	CO_2 emissions: Sectoral Approach in mill, tonnes (IEA 2011)					% change 1990-2009	CO_2 emission per cap. (UNDP 2011)		CO_2 emissions projections (IEA)			
									% of global total			
	1971	1980	1990	2000	2009		Tonnes (2008)	Average annual growth % 1970/2008	2007	2020	2020	2030
G-8	**With GHG reduction obligations under the Kyoto Protocol**											
1) USA	4 291.3	4 661.6	4 868.7	5 698.1	5 195.0	6.7%	17.3	-0.6	20	16		
2) Canada	339.4	426.9	432.3	532.8	520.7	20.4%	16.4	0.1				
3) Japan	758.8	880.7	1 064.4	1 184.0	1 092.9	2.7%	9.5	0.7				
4) Germany	978.6	1 055.6	950.4	827.1	750.2	-21.1%	9.6					
5) UK	623.5	571.1	549.3	523.8	465.8	-15.2%	8.5	-0.8				
6) France	431.9	461.4	352.3	376.9	354.3	0.6%	6.1	-0.9				
7) Italy	292.9	359.8	397.4	426.0	389.3	-2.0%	7.5	0.8				
8) Russia			2 178.8	1 505.5	1 532.6	-29.7%	12.1		6	5		
G-20	**With GHG reduction obligations under the Kyoto Protocol**											
9) EU-27			4 051.9	3 831.2	3 576.8	-11.7%			14	11		
10)Australia	144.1	208.0	260.1	338.8	394.9	51.8%	19.0	1.3				
G-20	**Without GHG reduction obligations under the Kyoto Protocol**											
11) Turkey	41.4	70.9	126.9	200.6	256.3	102.0%	3.9	3.2				
12) South Korea	52.1	124.4	229.3	437.7	515.5	124.8%	10.6	5.0				
13) Mexíco	97.1	212.1	264.9	296.6	399.7	50.9%	4.4	1.8				
14) China	809.6	1 419.8	2 244.1	3 077.2	6 877.2	206.5%	5.2	4.6	21	27		
15) India	200.2	283.3	582.3	972.5	1 585.8	172.3%	1.5	3.8	4	6		
16) Brazil	91.1	180.3	194.3	302.8	337.8	73.9%	2.1	2.0				
17) South Africa	173.8	214.5	254.7	298.2	369.4	45.0%	8.8	0.7				
18) Argentina	83.1	95.9	100.4	139.0	166.6	66.0%	4.8	0.9				
19) Indonesia	25.1	68.8	142.2	264.0	376.3	164.7%	1.8	4.8				
20) Saudi Arabia	12.7	99.1	158.9	252.4	410.5	158.4%	17.2	2.1				
									65	65		

6.3 Energy-related CO2 Emissions for EU27, US, Japan, Russia, China & India (1990-2030)

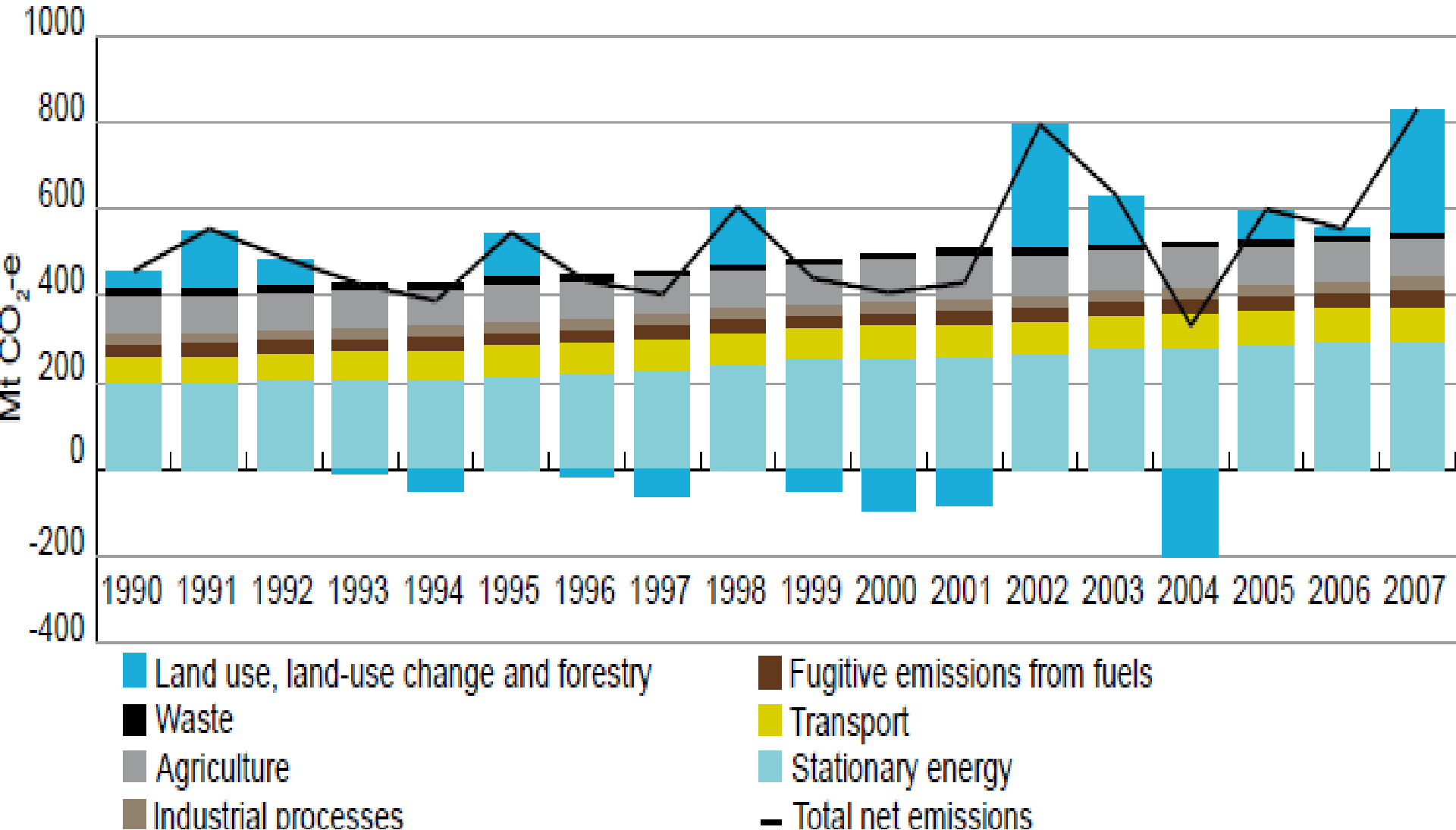


6.4. Australia: Annex 1 (UNFCCC) and Annex B Country (KP)

- In 2008, Australia had contributed about 4.01% to the global CO2 and took 16th rank between Indonesia & Brazil. Australia's per capita emissions in 2008 19 tonnes CO2 and average annual % growth 1970 -2008 +1.3%. According to IEA's statistics 1990-2009, Australia's CO2 emis-sions increased by 51.8% and were thus +41.8% above its targets under Annex B of the KP.
- Australia's emission reduction targets of 2010 aimed to reduce its emissions below the level of 2000 by 2020 by 25% "if the world agrees at a stabilization goal of or below 450 ppm", by 15% if major developing countries substan-tially constrain their emissions and developed countries accept similar obligations and by 5% irrespective of the actions of other states. Australia's climate change strategy is based on three pillars: a) to reduce emissions, b) adapt to unavoidable climate change, and c) help to shape a global solution.
- Australia's 80% reliance on coal & 15% on gas for electricity generation in 2007-2008 and as a major exporter of coal made carbon industry a major employer and a powerful political voice.
- In 2007-2008, the reliance on hydropower was only 1.7%, on wind and solar energy 0.8% and on other renewables 0.8%. Therefore the goal "to achieve by 2020 a 20% contribution of renewables to the generation of its electricity" remains politically ambitious.

Trends in CO2 emissions and removals by sectors in Australia (1990-2007).

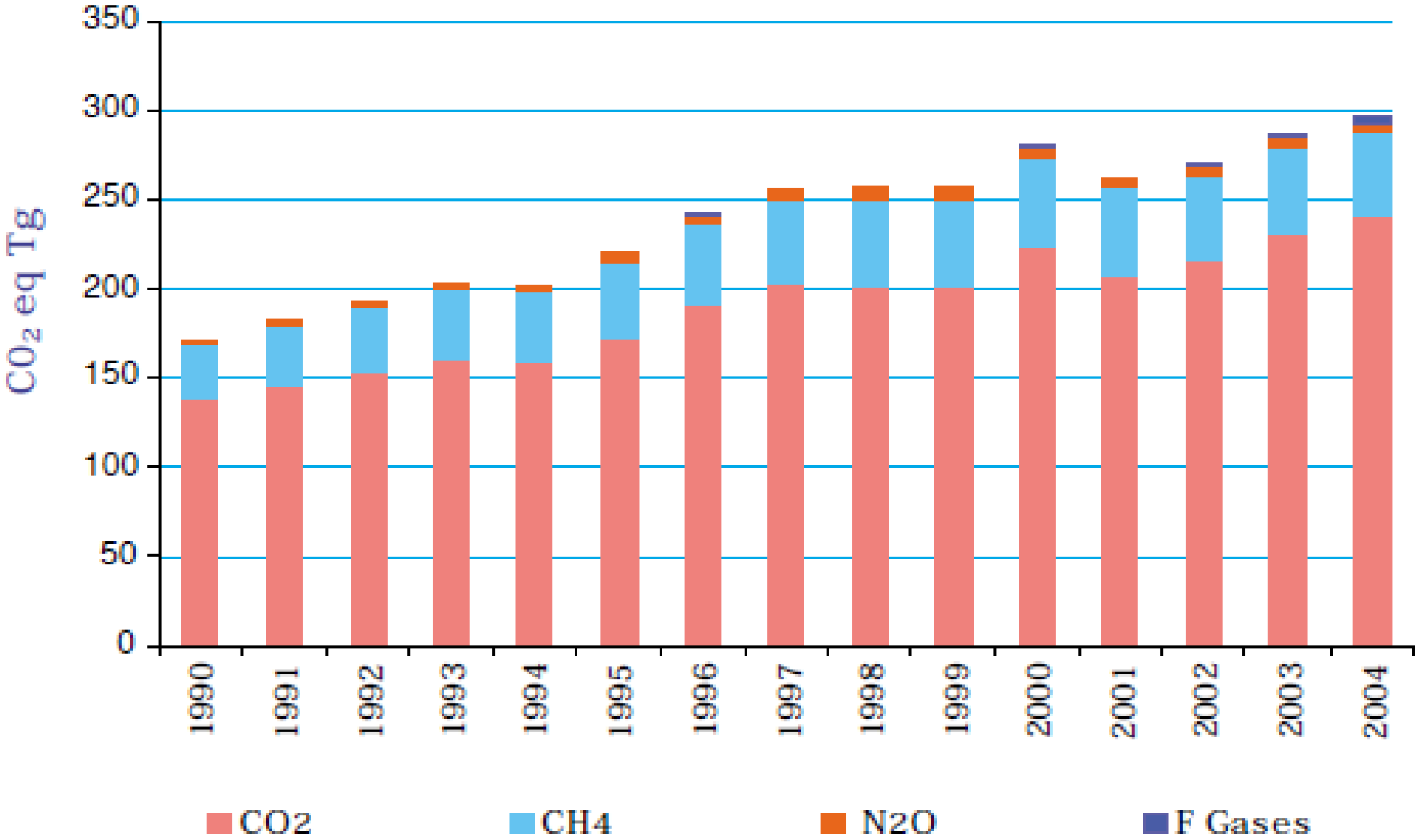
Source: Australia's 5th NC (2010: 6)



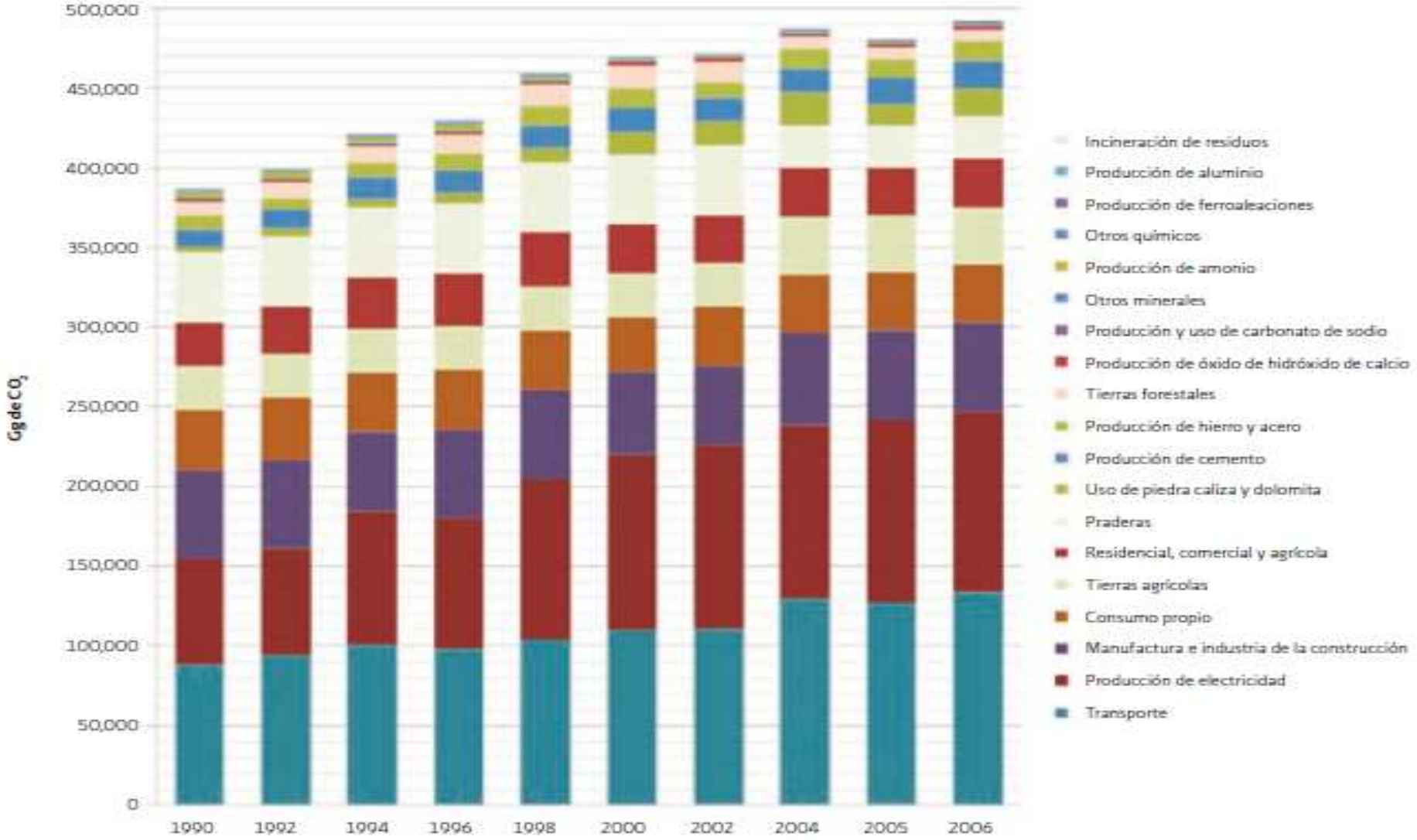
6.5. Threshold OECD countries: Turkey, South Korea and Mexico

- Three OECD & economic threshold countries have no GHG reduction obligations under KP.
- While **Turkey** has been an Annex-1 country of UNFCCC, it **did not join Annex B of the KP**.
- In 1997, **South Korea** objected to become an Annex-1 country,
- **Mexico** was then not yet an OECD member.
- **CO2 emission increases since 1990-2009**:
  - South Korea had the highest (124.8%),
  - followed by Turkey (102%) and
  - Mexico (50.9%).

Total GHG emissions per gas in Turkey (1990-2004). Source: Turkey, 1st NC (2007: 63)



Mexico's CO_2 Emissions by Sector (1990-2006). **Source:** Mexico's 4th NC (2009)



6.6. BASIC countries: Brazil, South Africa, India & China

- The population of the four BASIC countries (Brazil, South Africa, India, China) increased between 1950 and 2010 by 1,820,742,000 and they represented in 2010 about 2.811 billion of a global population of 7 billion people or about 40% of the global populations.
- Their combined CO2 emissions amounted in 2008 to about 31.86% of the global emissions.
- Given the projected emissions growth rates until 2030 & the still growing population in all BASIC countries, the economic growth and the increase in energy consumption and emissions most particularly in China and India will have global ramifications.
- Strategies for moving to a low carbon economy in China & India with a higher degree of energy efficiency & an increasing share of renewable energy sources for electricity generation & transportation will have a global impact in reducing GHG emissions.

6.7. Remaining G20 countries: Indonesia, Saudi Arabia, Argentina

- **Indonesia (2008**) contributed 1.35% of CO2 emissions to the global total, its per cap. em. in 2008 ca. 1.8 tonnes of CO2 & average annual growth (1970-2008); 4.8%. from 1990 to 2009, Indonesia's CO2 emissions increased by +164.7%.
- **Saudi Arabia (2008)** contributed 1.44% of global CO2, 14th rank between South Africa and Indonesia. Its per capita emissions in 2008 amounted to 17.2 tonnes of CO2, its average ann. growth (1970-2008): 2.1%. From 1990 to 2009, Saudi Arabia's CO2 emissions increased by +158.4%.
- In 2008, **Argentina** had contributed with 192,378 thousand metric tones of CO2 emissions and about 0.64% to the global total and took the 28th rank between **Malaysia and The Netherlands**. Argentina's per capita emissions in 2008 amounted to 4.8 tonnes of CO2 and the average annual growth from 1970 to 2008 amounted to 0.9%. According to IEA's statistics from 1990 to 2009, Argentina's CO2 emissions increased by +66%.

6.8. GHG Emissions Reduction Pledges of the Non-Annex I G20 countries

GHG emissions (Gt CO_2 eq)	1990	2005	Business-as usual 2020	Unconditional pledge	Conditional pledge
Turkey	187	330	503	503	503
South Korea	308	569	678	569	569
Mexico	581	774	784	784	617
China	3,594	7,233	13,450	12,964	12,894
India	1,106	1,859	3,121	3,537	3,537
Brazil	1,854	2,279	2,497	2,068	1,977
South Africa	334	422	608	608	491
Argentina					
Indonesia	913	1,195	1,487	1,604	1,280
Saudi Arabia					
Other non-Annex I	4,569	6,587	9,303	9,303	9,303
Non-Annex I total (incl. land-use CO_2)	**18,036**	**24,595**	**35,051**	**34,599**	**33,494**
Annex I (excluding Turkey)	19,019	18,034	18,646	17,868	15,368
World strict rules	37,856	44,063	55,746	54,517	50,912
World lenient rules	**37,856**	**44,063**	**55,746**	**55,374**	**54,269**

7. Overcoming the Climate Paradox

- **Many OECD states – among them three G8 countries – failed to implement their legal obligations and to adopt a Post-Kyoto regime.** The Durban outcome "included a decision by Parties to adopt a universal legal agreement on climate change as soon as possible, and no later than 2015". This refers to a 'business-as-usual' mentality among government representatives to postpone legally-binding commitments to their successors.
- **Democratic governance did not determine the different climate performance of the G-8. Rather, there is a significant implementation gap among democracies between a majority of EU countries (leaders) and large OECD countries in North America and in the Asia-Pacific (laggards).** Among the G-8 countries different strategies of 'business first' and reformist approaches towards a 'long-term transformative change to sustainability' could be observed.
- **All 11 non Annex-1 G-20 countries have also significantly increased their GHG from 1990 to 2009 and most have so far rejected to adopt any legally binding quantitative reduction commitments**. If the two versions of the business-as-usual strategies and policies as business-first (in the North) as development-first (in the South) prevail, the probability may increase that global environmental change and global climate change pose multiple security threats, challenges vulnerabilities and risks for international, national and human security during this century., which also reduce the policy prospects for policies aiming at a positive and sustainable peace with a higher degree of social justice.

7.1. Overcoming the Climate Paradox

Business as Usual vs. Sustainability Revolution

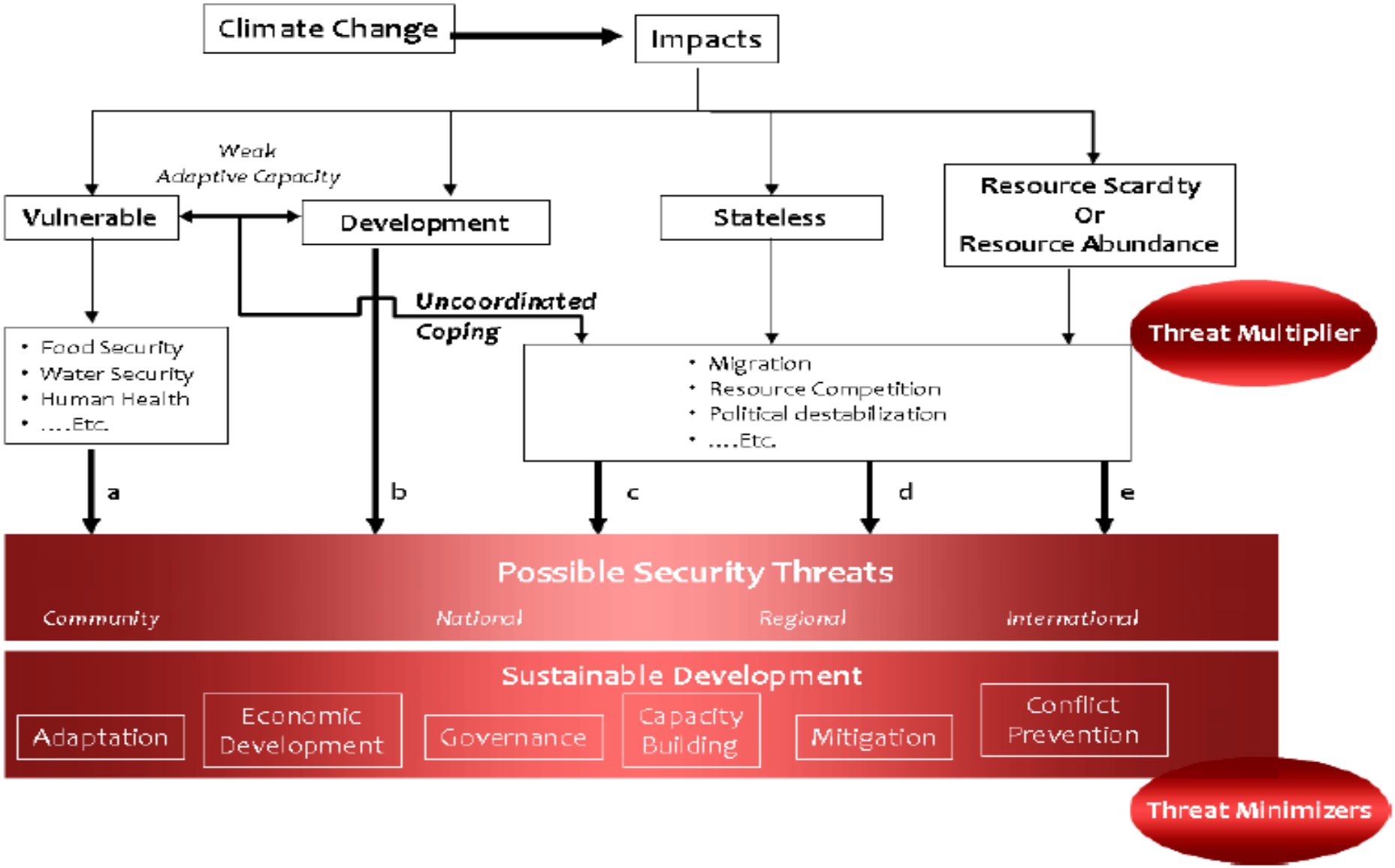
- 'Climate paradox' resulted between COP 15 &COP 17 in a strategy of postponement of legally binding GHG reduction goals to the next government and to due to policies humankind may face dangerous climate change in a 4℃ wo rld or even a catastrophic climate change in a 6℃ world.
- To avoid both alternative developments until the end of this century a fundamental paradigm shift is needed with a "transformation of global cultural, environmental, economic … and political … relations" by aiming at a "sustainability revolution and sustainable peace". Both visions refer to different coping strategies with GEC:
  - In the first vision of business-as-usual cornucopian perspectives prevail that suggest primarily technical fixes …, defense of economic, strategic and national interests with adaptation strategies that are in the interest of the 'top billion' of OECD countries
  - In the alternative vision of a comprehensive transformation a sustainable perspective has to be developed and implemented into effective new strategies and policies with different goals and means based on global equity and social justice.
- Both opposite scientific visions imply different policy consequences:
  - The vision of business-as-usual with minimal reactive adaptation and mitigation strategies will most likely increase the probability of a 'dangerous climate change' … or catastrophic GEC with both linear and chaotic changes in the climate system and their socio-political consequences that represent a high-risk approach.
  - To avoid these consequences the alternative vision and sustainability perspective requires a change in culture …, worldviews …, mindsets … and new forms of national and global governance (

Contents

1. Introduction: Two Alternative Discourses

- **Reactive policies and scientific discourse:** Continuation of present trends of anthropogenic Climate Change: may lead to severe security implications for international, national & human security, espec. to climate-induced migration, crises, conflicts or: climate change as a threat mulitplier!
- **Proactive policies & scientific discourse:** Strategies of long-term transformative change towards sustainabile development (sustainability transition), especially in those sectors (energy, transportation, housing etc.) or: climate change as a threat minimizer!

1.1. Report of UN-Sec-General (11.9.2009)



2. First Discourse: Securitization of Climate Change
Three security policy debates

Climate change & internat. security discourse

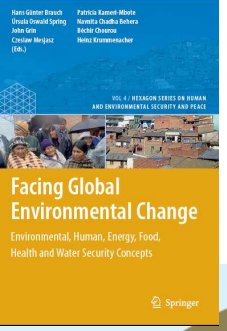
- **UN (17 April 2007):** FM M. Beckett, UK presidency
- **EU (2008):** EC & Council Study & roadmap process
- UN GA (June 2009) Res., Report by Sec. General

Climate change & national security discourse:

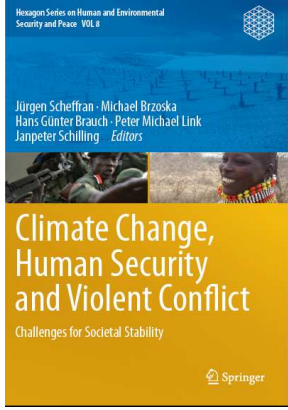
- **US studies:** CNA, CSIS, NIC (CIA), NSS 2010

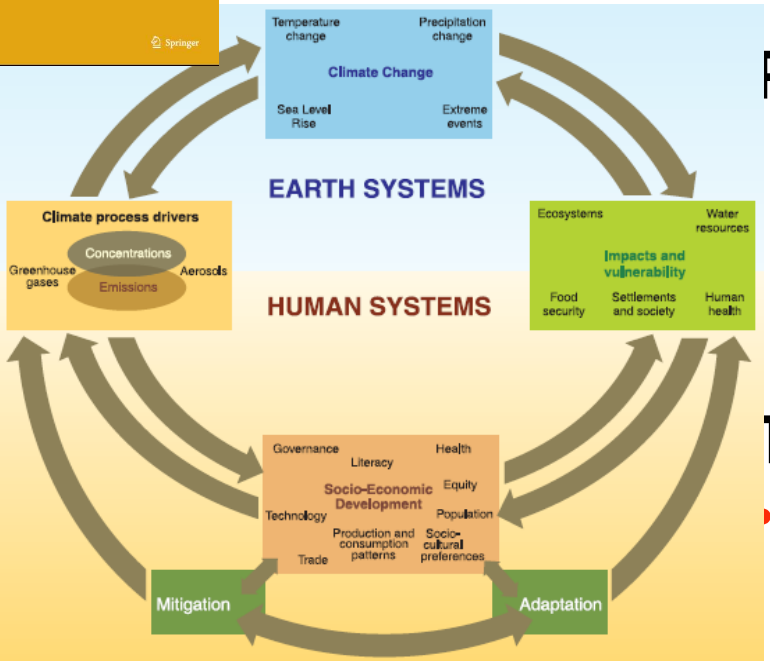
Climate change & human security discourse

- IHDP (GECHS): Lonergan & Brklacich (chairnen)
  - 2005: conference in Norway on Cliamte change and human security
- HSN (Canada was a co-founder & a major sponsor)
- 2007/2008: Greek HSN presidency
- **2011-2014: IPCC, WG II, chapter on human security**



3. Climate Change & Security Nexus in Social Sciences





Objects of Security Analysis (Securitization)

- Physical Effects: e.g. temp, rise
- Impacts: Sectors & Regions
- Societal Effects (migration, crises, conflicts

Whether they pose:

- **Objective Security Dangers**
- **Subjective Security Concerns**

Four Schools

- Dramatizers: Climate wars
- Sceptics: lack of research (PRIO)
- **Empiricists: PEISOR Model**
- Trend & future scenarios

Two Approaches

- **Policy & Scenario analysis Causal analysis**
  - Natural phenomena -> migration, crises, conflicts (violence)
    - 2nd phase: Homer-Dixon, Bächler
    - 4th phase: Oswald – Brauch - Dalby
- **Discourse analysis:** climate change
  - International security
  - National security
  - Environmental security
  - Human security

4. Alternative Discourse: Proactive Policies to a Fourth Sustainability Revolution & for a Sustainable Peace

- M**indset of 'business-as usual'** and the **cornucopian vision** are mental obstacles that restrained political willingness toward long-term transformation of economic, social & political system.
- Radical climate skeptics portrayed climate change as a major threat to the American way of life and jobs. Ultra conservative climate skeptical movements to attack & delegitimize the IPCC contradict the American optimism in scientific progress.
- The necessary long-term transformation and the sustainability transition (Grin/Rotmanns/Schot 2010) require in the USA and Canada a fundamental change of their dominant worldview, consumerist culture, values, belief systems, and of the attitudes & behavior of the people and fundamental transformation of the energy system aiming at a progressive decarbonization.
- This challenges powerful sectors of the economy, the interests of business groups and also of the trade unions representing these old economic sectors.

4.1. Coping Strategies: Business-as-Usual

- **Instant Response: Discredit the message & attack the messenger: 2009: Attack on IPCC**
- **Coping with Climate Change Impacts:**
  - **Market will provide means** for coping with physical climate change effects: **Washington neoliberal consens.**
  - **Military Protection:** Adjust military strategies, missions and tools to be able to operate under conditions of dangerous climate change („militarization“): **Hobbesian**
  - **Develop the technologies:** Geo-engineering schemes, strategy of energy independence: **Cornucopian**
- **No Need for a Sustainability Revolution**

4.2. Business-as-Usual: Hobbesian World

- *Business-as-usual* in a **Hobbesian world** where economic and strategic interests and behaviour prevail leading to a major crisis of humankind, in inter-state relations and destroying the Earth as the habitat for humans and ecosystems putting the survival of the vulnerable at risk.
- In this vision of ***cornucopian perspectives*** prevail that suggest primarily technical fixes (geo-engineering, increase in energy efficiency or renewables), defence of economic, strategic and national interests with adaptation strategies that are in the interest of and affordable for the 'top billion' of OECD countries in a new geopolitical framework, possibly based on a condominium of a few major countries.
- This vision with minimal reactive adaptation and mitigation strategies will increase the probability of a '**dangerous climate change' or catastrophic GEC** with both linear and chaotic changes in the climate system and their socio-political consequences that represent a high-risk approach.

4.3. Fourth Sustainability Revolution

- 2nd vision for a *transformation* of global cultural, environmental, economic (productive and consumptive patterns) and political (with regard to human & interstate) relations
- In the alternative vision of a comprehensive transformation a *sustainable perspective* has to be developed and implemented into effective new strategies and policies with different goals and means based on global equity and social justice.

4.4. Alternative Vision

- The alternative sustainability perspective requires a change in *culture* (thinking on the human-nature interface), ***worldviews*** (thinking on the systems of rule, e.g. democracy vs. autocracy and on domestic priorities and policies, interstate relations), ***mindsets*** (strategic perspectives of policy-makers) and new forms of national and global *governance*.
- This alternative vision refers to the need for a "**new paradigm for global sustainability**" (Clark/Crutzen/Schellnhuber 2004), for a "transition to [a] much more sustainable global society", aimed at peace, freedom, material well-being and environmental health. Changes in technology and management systems alone will not be sufficient, but "significant changes in governance, institutions and value systems" are needed, resulting in a fourth major transformation after "the stone age, early civilization and the modern era". These alternative strategies should be "more integrated, more long-term in outlook, more attuned to the natural dynamics of the Earth System and more visionary"

4.5. Policy Response – Four Actors: State, Society, Economic Sector, Knowledge

- Key actors for development and implementation are:
  - **States:** initiate, fund &implement strategies, policies & measures for a fourth sustainability revolution
  - **Society** (parties, interest & pressure groups, NGOs, lobbyists): public awareness, discourse, social movements for sustainability transformation
  - **Economic sector & business community:** develops and offers technical and economic solutions
  - **Knowledge** (generation & education): source for innovation

4.6. Role of Knowledge

- The fourth sustainability revolution must be knowledge-based!
- The great transformation of the industrial revolution relied on new innovative scientific and technological knowledge that is either the result of inventions or resulted in new innovations.
- Despite its already widely accepted objectives and the many viable low-carbon technologies already available to us, the transformation is a joint quest.
- Research and education are tasked with developing sustainable visions, in co-operation with policy-makers and citizens; identifying suitable development pathways, and realising low-carbon and sustainable innovations.
- The WBGU recommends intensified refocusing of national and international research towards the Great Transformation, and the provision of the requisite funds. The relevant scientific findings must also be made accessible and understandable to allow people to accept the change and to participate democratically in the transformation.

4.7. Four Knowledge-based Concepts of for Alternative Vision

- Key concepts of the alternative vision of a new fourth ‘sustainable revolution’ are a radical change in *culture*, *worldview*, *mindset* and *participative governance* in the thinking and action on sustainability laying out an alternative development path with a total transformation of productive and consumptive processes aiming at equity, social justice, and solidarity with the most vulnerable and marginal people and the poorest countries.
- This lays out an alternative development path with a **total transformation of productive and consumptive processes** aiming at equity, social justice, and solidarity with the most vulnerable and marginal people and the poorest countries.

4.8. Worldview of Scientists

- *Worldview* concept evolved from ‘Weltanschauung’ that refers to a wide world perception and to a **framework of ideas and beliefs through which individuals interpret the world &** interact with it.
- A comprehensive worldview includes the **fundamental cognitive orientation of a society, its values, emotions, and ethics** through which a society or a group interprets the world in which it interacts.
- Worldview is the **fundamental cognitive, affective, & evaluative presupposition a group of people makes about the nature of things**, & which they use to order their lives.
- The **‘construction of integrating worldviews’** begins from fragments of worldviews offered to us by different scientific disciplines and various systems of knowledge to which different perspectives contribute in the world’s cultures.
- **Gert Krell** used this concept for distinguishing among several macro-theoretical approaches in international relations.

4.9. Mindset of Policymakers

- The concept of *mindset* includes a fixed mental attitude or disposition that predetermines a person's responses to and interpretations of situations by referring to different patterns of perceiving and reasoning.
- Fisher used it as 'cultural lenses' that filter our view of and reaction to the world. With regard to the 'Fourth Sustainable Revolution' this concept refers to a discussion of a post-carbon society, where solidarity, equity, and social justice are the key drivers instead of the maximization of profits and the destruction of the Earth without thinking of the next generations or of the collapse of ecosystems.
- **Ken Booth** mindsets "freeze international relations into crude images, portray its processes as mechanistic responses of power and characterize other nations as stereotypes". Many mindsets have survived the fundamental global contextual change of 1989/1990, as the Cold War "exists as our living past, and it exerts a powerful presence by being both remembered and forgotten in complex ways".

5. Emergence of Alternative Discourse

- **Research & Dialogue Project: Sustainability Transition and Sustainable Peace (STSP)**
- *Second debate* is partly policy driven, by debate on a **green economy** that has been launched by **UNEP, OECD and by different DGs of the European Commission.**
- ***Scientific discourse*** on sustainability transition evolved
  - after conference in Amsterdam (2009); Lund (2011), Copenhagen (2012)
  - *Sustainability Transitions Research Network* (STRN)
  - journal on *Environmental Innovation and Sustainability Transition* (EIST)
  - *Routledge Book Series in Sustainability Transitions* (since 2010).
- **This new project tries to link this emerging debate with the experience of international relations and *environment, security, development and peace* (ESDP) studies by addressing possible impacts of both alternative policy trends for international peace and security.**

5.1. Past Transitions & War/Peace

- **All three technical revolutions (longterm transformations):**
  - the first **agricultural revolution** (10.000 to 6.000 years ago),
  - the second **industrial revolution** (1750-1890/1914), and
  - the third revolution of **communication, transportation and information (CTI) technologies** (since 1890 or 1920) ('second industrial revolution') have resulted in a higher and more violent level of warfare and have thus impacted negatively on international peace and security.

This experience raises several new key research questions:

- Will the suggested fourth sustainability revolution lead to new multiple and potentially violent conflicts within and among countries?
  May the suggested sustainability transition in the energy sector reduce the potential of resource-related violent conflicts and wars?
- From a scientific and conceptual perspective, which strategies, policies and measures may be needed to combine the proposed process of a long-term transition of the scientific institutions and their new knowledge, of societies and the business community and economic sectors as well as new forms of governance with the goal of a sustainable peace?

5.2. Political Urgency and Research Agenda: Towards a Fourth Sustainability Revolution

Glooming Prospects for Post-Kyoto Regime: Paralysis

- Prospects for Post-Kyoto climate regime at COP 17 in Durban are low
- At present it becomes increasingly unlikely to realize the 2°C world
- Probability of 'dangerous climate change' increases dramatically
- This increases the probability that thresholds in the climate system may be crossed, that tipping points may be unleashed, triggering cascading processes as: 'Arabellion' and 'Fukushima nuclear disaster'

Business-as-usual paradigm prevails in politics & media

- In light of global financial crisis, the sense of urgency for proactive climate action has declined since 2009 prior to Copenhagen (COP 15)
- The US government is paralyzed due to ideological confrontation within the US Congress and between the Senate & the House
- Lack of urgency among BASIC countries to accept commitments.

5.4. Implications for the Social Sciences

- The challenge of research on the societal impacts of global environmental change in the Anthropocene requires an understanding of the **observed and projected changes** within the **earth system** and its **physical and societal impacts for the human systems, i.a. an analysis of earth systems sciences.**
- This requires increased funding for multi-, inter- and transdisciplinary research to address the '**consilience**' of the sustainability paradigm.
- Research on sustainability transition may not be limited to a research agenda of the priorities, pathways & strategies towards sustainability
- For **sociology and political science** it requires to address 'cascading processes' in the 'world risk society' stimulated by the ‚principle of *precaution through prevention*' (Ulrich Beck, 2011).
- For international relations, security and peace research this requires conceptual research on the conditions and possibilities of a sustainable peace as a global political framework for a sustainable transition.

5.5. Goals, Objectives, Thesis & Structure

‘**Sustainability transition’ research has evolved since 2004:**

- Clark, Crutzen, Schellnhuber: ‘Science for Global Sustainability’ (2004).
- Dutch *Knowledge Network on Systems Innovation &Transition*
  - complex systems analysis,
  - socio-technological and a governance perspective”.
- Relies on research that has evolved since the 1990s when “innovation & technology scholars … started to address environmental innovation and sustainability transitions more explicitly:
  - *technological innovation systems approach* (TIS) and
  - *multi - level perspective* (MLP) approaches has contributed.
- ‘*Sustainability Transitions Research Network*’ (STRN, 2009/2010),
- ‘Routledge Studies in Sustainability Transitions’ (2010),
- Journal ‘*Environmental Innovation and Sustainability Transitions*’ (2011)
- WBGU Report on a ‘Social Contract for Sustainability’ (2011)

5.6. WBG (2011): New Social Contract for a „Global Transformation“

- **WBGU explains reasons for a ‚post fossil-nuclear metabolism‘ concluding that the transition to sustainability is achievable.**

A New Social Contract

- **Transformation into a sustainable society requires a modern framework for nine billion people for living with each other, and with nature: a new Contrat Social.**
- **This virtual social contract relies on each individual’s self-concept as a responsible global citizen. This contract is also a contract between generations.**
- **Science plays an essential role here, as for the first time in history, a profound transition is not caused by imminent necessity, but by precaution and well-founded insight. In this respect, the social contract also represents a special agreement between science and society.**
- **A new culture of democratic participation through the appointment of ombudsmen … to ensure the protection of future-oriented interests. Sustainability-oriented approach can be given a secure, firm footing through the inclusion of ‘climate protection’ in the constitution as a national objective, and through establishing a climate protection law.**
- **A low-carbon transformation can only be successful if it is a common goal, pursued simultaneously in many of the world’s regions.**
- **Therefore, the social contract also encompasses new ways of shaping global political decision-making and cooperation beyond the nation state.**

5.7. Two Parallel Discourses on ST

- The parallel discourse on ‘sustainability transition’ addresses both the causes and impacts of GEC and GCC by facing & coping with both and avoiding the projected societal consequences of dangerous or catastrophic climate change and of possible tipping points in the climate system.
- From this perspective the goal of ‘sustainable development’ and the perspective on **‘sustainability transition’ refer to a much wider research agenda than the relatively narrow focus on environmental and technological innovations that is a primary focus of many researchers in the STRN.**
- The process of ‘transition’ refers to multiple long-term evolutionary and revolutionary transformative changes that point to five different historical times, with different transformative results
- These must be distinguished since they have different transformative results. We may address them with four hypotheses:

5.8. Four Hypotheses

- We are in the midst of a **global transition in earth history** from the '**Holocene', to the 'Anthropocene'** that began with human interventions into the **earth system** and that has resulted in a rapid increase in GHG emissions in the atmosphere.
- The **impacts of the grand transformations** of the first and second industrial revolution have resulted in a complex global environmental change and in anthropogenically-induced climate change, besides as well as the increasing destruction of the biodiversity. natural climatic variations. This has resulted in an exponentially growing accumulation of GHG in the atmosphere this has also affected almost all environmental services.
- The **societal impacts** of four physical effects of 'anthropogenic global climate change' and of biodiversity loss may result in **major international, national, and human security dangers**.
- **Since 2005 an alternative discourse on 'sustainability transi-tions' or on 'transitions to sustainable and resilient development' has begun to evolve**. It addresses new directions in the 'study of long-term transformative change' that also needs to focus on resilient societies.

5.9. Climate Change & Sustainability Transition

- The emerging scientific debate on ‘sustainability transition’ addresses the many scientific, societal, economic, political, and cultural needs to reduce GHG emissions.
- These cannot be achieved simply by legally binding *quantitative emission limitation and reduction obligations* (QELROs), as in the framework of the Kyoto Protocol (1997).
- These have so far failed to achieve their proclaimed stated aims during the past two decades because of a lack of political will and capability to implement these legal obligations and policy declarations.
- A continuation of the prevailing world view and ‘business-as-usual’ mindset may lead to ‘dangerous’ (+4□℃ world) or even ‘catastrophic’ (4-6°world) climate changes and major huma n catastrophes during this century if the global temperature should rises by 4-6□℃ above the pre-industrial average by end of the 21st century.

6. Seven Dimensions of Debate on Sustainability Transition

In a talk at the first sustainability transition and sustainable peace (STSP) workshop I distinguished among 7 dimensions of ST

<http://www.afes-press-books.de/html/sustainability_workshop_overview.htm>

1. **Temporal Dimension of Sustainability Transition**
2. **Spatial Dimension of Sustainability Transition**
3. **Scientific Dimension of Sustainability Transition**
4. **Societal Dimension of Sustainability Transition**
5. **Economic Dimension of ST**
6. **Political Dimension of ST**
7. **Cultural Dimension of ST**

7. Goal of the STSP Project

- **Sustainability Transition and Sustainable Peace Project (STSP)** was launched after the project on the **Reconceptualization of Security** (2004-11): 270 peer reviewed book chapters in vol. 3, 4 , 5 in the Hexagon Book Series on Human, Environmental Security & Peace (HESP) as **Global Human and Environmental Security Handbook for the Anthropocene**.
- This new international research and dialogue project on Sustainability Transition and Sustain-able Peace Project (STSP) **addresses key scientific and political challenges of the 21st century:**
- **Relative failure of international efforts to address, face & cope with impacts of global environmental change & global climate change** that have resulted in a
- **'climate paradox' that major industrialized and democratic countries were unable or unwilling to comply with their global legally binding and declaratory commitments they adopted during the first Earth Summit in Rio de Janeiro in June 1992 in the aftermath of the end of the Cold War**:
  - United Nations Framework Convention on Climate Change (UNFCCC)
  - United Nations Convention on Biodiversity (UNCBD)
  - Rio-Declaration on Environment and Development
  - Agenda 21

7.1 Scientific Response to Policy Failures

This failure is reflected in

- the inability of the international community represented by the world of states to agree on a legally binding follow-up to Kyoto Protocol by the end if 2012;
- in the relative failure of the Conference of Parties (COP) to the UNFCCC at
  - COP 15 in Copenhagen, Denmark (2009);
  - COP 16 in Cancun, Mexico (2010);
  - COP 17 in Durban, South Africa (2011);
- in the failure of most G8 countries to initiate measures to implement their announced goal (2007-2011) to reduce their GHG emissions by 80% by 2050 that decided on 18-19 May 2012 at their summit in the USA not to repeat in their Camp David Declaration previous commitments;
- in the failure of the G20 meeting in Los Cabos (Mexico) on 18-19 June 2012 to adopt any legally binding agreement on financing climate change activities in developing countries in their G20 Leaders Declaration
- in the failure of the United Nations Conference on Sustainable Development (Rio+20) in Rio de Janeiro on 20-22 June 2012 to adopt any new and legally binding decisions at besides the declaratory statement: Outcome of the Conference: The future we want

7.2. Two Alternative Visions & Strategies

- This sceptical diagnosis refers to 2 different approaches on international security & environmental policy:
  - a business-as usual policy that the market, economic initiatives and military power will be able to cope with its consequences;
  - a willingness to move towards a fourth sustainability revolution that requires multiple efforts to move towards a long-term transition towards sustainability.
- This project tries to link this emerging debate with the experience of international relations and environment, security, development and peace (ESDP) studies by addressing possible impacts of both alternative policy trends for international peace and security

8. Conclusions: G-20 Climate Performance

- Climate performance of G20 countries since 1990 has been unsatisfactory. Only Russia and EU27 countries met their GHG reduction obligations (KP)
- Of Annex B countries Australia, Canada and the USA have been laggards.
- The USA never ratified the KP,
- Canada withdrew while Australia and Japan still adhere to these obligations.
- The G8 have repeatedly declared to reduce their GHG emissions by 80% without agreeing on the base year: 1990 for the EU27 and 2005 for the USA and Japan (?).
- EU launched its Energy Roadmap 2050: aims at 80-95% CO2 reduction,
- No similar commitments exist for Russia, Japan, Canada and USA.
- Some Non-Annex B G20 countries have made reduction pledges for 2020 under the Cancun Agreement,
- No BASIC countries pledged to stabilize their GHG emissions on the level of 1990 or 2050. The major change from 1990 to 2020 will occur between the Annex-1 and Non-Annex 1 countries: while the
- share of the global GHG emissions of the Annex-1 countries is projected to decline from above 50% to more than 1/3
- that of the Non-Annex 1 countries is projected to rise from just below 50% to nearly 2/3. This trend is reflected in the global population projections for the G-20 until 2030, 2050 and 2100.

8.1. Need for a Fundamental Change

- Changes in the global GHG emissions may not be achieved by relying on a business-as-usual approach in science, government, the business community and in society. Adhering to a such an approach may increase the prospects that a dangerous or catastrophic climate change may trigger multiple international, national and human security consequences. Rather, a major change in GHG emissions requires strategies, policies and measures that aim at a ‘sustainability transition’ towards a low-carbon or green economy with a major reduction of hydrocarbon energy sources (coal, oil, gas) and a significant increase of renewables linked with significant energy efficiency improvements in all energy (electricity, transportation, heating/cooling), production (industry, agriculture) and consumption sectors. Such a ‘sustainability transition’ requires a fourfold approach linking the:
  - **scientific dimension** (a new scientific revolution towards sustainability that requires a fundamental shift in the dominant scientific worldview);
  - **societal and cultural dimension** (changes in values, attitudes, culture, worldviews, mindsets, and behavior);
  - **economic dimension** (energy sector, production and consumption patterns) aiming at a progressively de-carbonized and partly dematerialized world, regional, national and local economy;
  - **political dimension** (changes in governance processes at the local, national, regional and international level and in the national and international policy goals to be oriented at a sustainable peace).

8.2. ‘Sustainability Transition’: Major Challenge for Humankind during the 21st Century

- **This process of a ‘sustainability transition’** is major challenge for humankind in 21st century in dealing with impacts of global environmental change (climate change, water, soil, biodiversity) during the Anthropocene eta of Earth history, humankind has entered with the first and second industrial revolutions.
- A ‘fourth sustainability revolution’ covering all four dimensions of a process of sustainability transition may avoid the prospects of major resource conflicts (on hydrocarbons after peak oil) and climate-induced conflicts and wars and the needed cooperation may increase the prospects for a sustainable peace.
- **First & second industrial revolutions caused first changes in science and technology** (new scientific knowledge, inventions, innovations)
  - that resulted in an **industrialization of warfare (World War I, World War II)** that required a total mobilizations of human and material resources.
  - The **‘great political transformation’ in the USA during the 1940s** from an isolationist and pacifist orientation towards a global and interventionist worldview and mind-set in international relations and politics implied a fundamental change in the value base of the only remaining world power that was not affected by the fundamental peaceful change in world order after the end of the Cold War.

8.3 Learning lessons from previous long-term transformative changes

All three technical revolutions:

- the first agricultural revolution (10.000 to 6.000 years ago),
- the second industrial revolution (1750-1890/1914),
- third revolution of communi¬cation, transportation and information (CTI) technologies (since 1890 or 1920) resulted in a more violent level of warfare and impacted negatively on international peace and security.

This experience raises several new key research questions:

- Will the suggested fourth sustainability revolution lead to new multiple and potentially violent conflicts within and among countries?
- May the suggested sustainability transition in the energy sector reduce the potential of resource-related violent conflicts and wars?
- From a scientific and conceptual perspective, which strategies, policies and measures are needed to combine the proposed process of a long-term transition of the scientific institutions and their new knowledge, of societies and the business community as well as new forms of governance with the goal of a sustainable peace?

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