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## First Sustainability Transition & Sustainable Peace Workshop

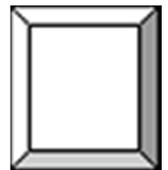
**Towards a Fourth Sustainability Revolution and Sustainable Peace:  
Visions and Strategies for Long Term Transformative Change to  
Sustainable Development in the 21st Century**

# Climate Paradox of the G8

**Legal Obligations, Policy Declarations & Implementation Gap**

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# Abstract & Keywords

- This article analyses the climate policy performance of the G-8 from 1992 to 2012 based on their legal commitments (Annex-1, Annex-B countries) under the UNFCCC (1992) and the Kyoto Protocol (1997) and their policy declarations on their GHG reduction goals until 2050. A 'climate paradox' has emerged due to a growing implementation gap in Canada, USA and Japan, while Russia, Germany, UK, France and Italy fulfilled their GHG reduction obligation.
- **Keywords:** climate paradox, G-8, policy implementation gap

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# **1. From the Earth Summit in Rio (1992) to Rio+20 (2012)**

- **UNCED or first Earth Summit in Rio in June 1992**
  - End of the Cold War (1989/1990)
  - New opportunity for multilateral diplomacy
  - Politicization of GEC, US leadership
  - Major participation of heads of states & governments
  - Major agreements:
    - UN Framework Convention on Climate Change (UNFCCC)
    - UN Convention on Biological Diversity (UNCBD)
    - Mandate for UNCCD (UN Convention to Combat Desertification)
    - Agenda 21,
    - Rio Declaration on Environment and Development,
    - Statement of Forest Principles
- **UNCSD, Rio+20 in Rio de Janeiro June 2012**

# 1.1. Key Questions & Achievements

- **2 decades later in 2012 key questions:**
  - Have these conventions and policy guidelines been fully implemented?
  - Which legal instruments have been adopted and have they been fully implemented?
  - If not, what have been the reasons or obstacles for the policy performance or implementation gap?
  - Why did the only remaining superpower turn from a leader to a laggard of international environmental governance?
  - Which countries did implement their legal obligations under UNFCCC, UNCBD and UNCCD?

# 1.2. Major achievements

- **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
- **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.**

## **1.3. 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**
  - **UNFCCC: 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. Legal Obligations of the G8: UNFCCC (1992) & KP (1997)

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**.

## 2.1. Policy consensus to stabilize temperature rise 2°C above preindustrial levels by 2100

### Copenhagen Accord agreed (COP 15, 2009)

„...we shall, recognizing the scientific view that the **increase in global temperature should be below 2 degrees Celsius**, on the basis of equity and in the context of sustainable development, enhance our long-term cooperative action to combat climate change.“

**But legally nonbinding reduction obligations**

### Cancun Agreements (COP 16, 12.12.2010):

- 10. *Realizes* that addressing climate change requires a **paradigm shift towards building a low-carbon society** that offers substantial opportunities and ensures continued high growth and sustainable development, based on innovative technologies and more sustainable production and consumption and lifestyles, while ensuring a just transition of the workforce that creates decent work and quality jobs;

### **3. G-8 Policy Declarations: Long-term Commitments (2007-2012)**

- G8: Group of 8 large industrialized countries
  - NAFTA: Canada & USA, Japan, Russia
  - EU: France, Germany, Italy, UK
- Obligations:
  - Only USA did not ratify KP & was not legally bound to implement its reduction target of -7% (base 1990)
  - Only Canada left KP after COP 17 (Durban) in December 2011
  - NAFTA: US: no obligations & Canada: no more obligations; Mexico: no Annex B country with QELROs

### **3.1. Policy Declaration: G-8 Countries G-8 agreed to reduce GHG emissions by 2050 for industrial countries by 80 %**

- G8 (Britain, Canada, France, Germany, Italy, Japan, Russia, US) agreed in 2007 (Germany):
  - **50% global reduction of GHG emissions by 2050**
- in 2008 (Italy), 2009 (Japan), 2010 (Canada)
  - **80% reduction of GHG by 2050 for G-8 countries**
  - US\$ 10 billion/year climate technology & research.
- They differed on year of reference 1990 or later
- But no agreement on legally binding targets
- Goal was not repeated in Camp David, May 2012

## 3.2. Policy Declaration: G-8 Countries from 2011 to 2012

**May 2011, Deauville (France), G8 supported the goal:**

- 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 & individual mid-term reductions. ... Similarly, major emerging economies need to undertake quanti-fiable actions to reduce emissions significantly below business-as-usual by a spec. year.

**G8 Camp David, 19 May 2012. US Presidency: goal dropped**

- 10. ... We also recognize the importance of pursuing and promoting sustainable energy and low carbon policies in order to tackle the global challenge of climate change. ...
- 12. We recognize that increasing energy efficiency and reliance on renewables and other clean energy technologies can contribute significantly to energy security and savings, while also addressing climate change and promoting sustainable economic growth and innovation. ...
- **13. We agree to continue our efforts to address climate change and recognize the need for increased mitigation ambition in the period to 2020, with a view to doing our part to limit effectively the increase in global temperature below 2°C above pre-industrial levels, consistent with science.**

## 4. Changes in GHG Emissions of G-8

- US no obligations: From leader to laggard
- Canada and Japan that missed QELRO targets
  - Canada: worst performance of all G-8
  - Japan was 2009 after economic crisis to meet target, after Fukushima (2011): shift from nuclear to coal as source of electricity generation: impossible
- Russia: due to economic transition and collapse of the socialist economy, major reductions,
- EU-4 (EU-27): implemented KP QELRO targets

# 4.1. Historical Emissions

**Table 1:** Top ten annual energy-related CO<sub>2</sub> emitters for the year 2009. **Source:** International Energy Agency, 2011: *CO<sub>2</sub> emissions from fuel combustion: highlights* (Paris: IEA).

Country	% of global total annual emissions	Tons of GHG per cap.
People's Republic of China	23.6	5.13
United States	17.9	16.9
India	5.5	1.37
Russian Fed.	5.3	10.8
Japan	3.8	8.6
Germany	2.6	9.2
Isl. Rep. Iran	1.8	7.3
Canada	1.8	15.4
South Korea	1.8	10.6
UK	1.6	7.5

**Table 2:** Top ten cumulative energy-related CO<sub>2</sub> emitters 1850–2008. **Source:** World Resources Institute, 2011: *Climate Analysis Indicators Tool: Indicators: GHG Emissions: Cumulative Emissions* (Washington DC: WRI).

Country	% of world total	Metric tonnes CO <sub>2</sub> per person
United States	28.5	1,132.7
People's Republic of China	9.36	85.4
Russian Fed.	7.95	677.2
Germany	6.78	998.9
UK	5.73	1,127.8
Japan	3.88	367
France	2.73	514.9
India	2.52	26.7
Canada	2.17	789.2
Ukraine	2.13	556.4

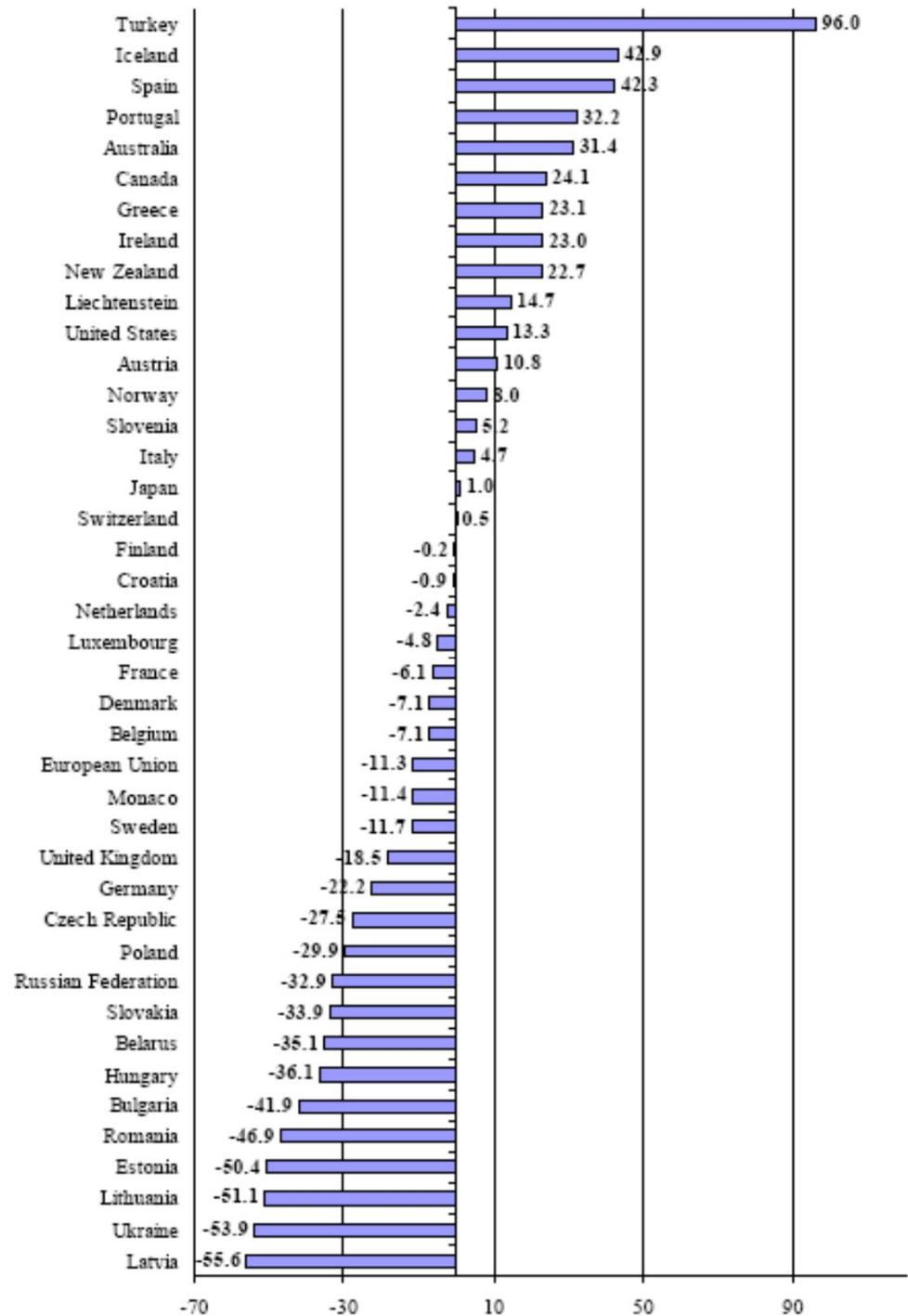
## 4.2. GHG Reduction Implementation Gap (2009)

### QELRO, Kyoto Prot.

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



## 4.3. GHG Emissions of G8

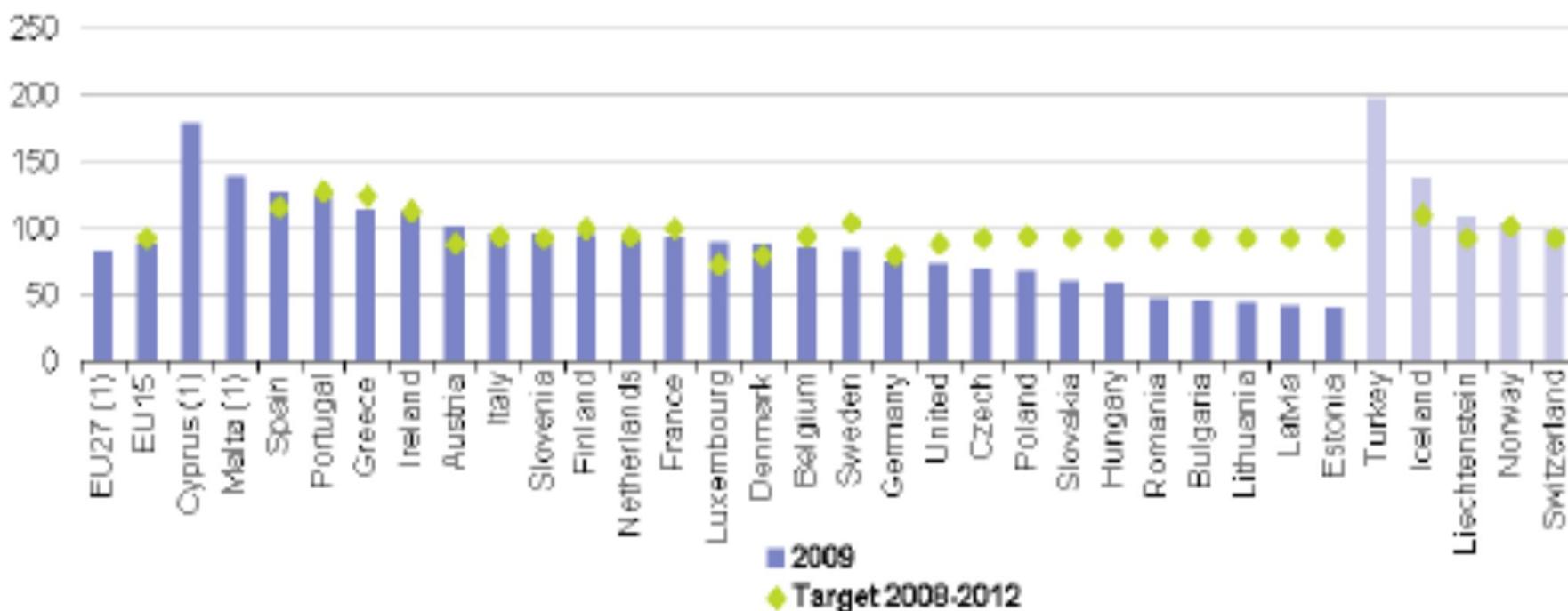
Country	UNFCCC (1992)		Kyoto Protocol (1997)		Reduction goal (%)	EU-15 Reduction goal (%)	Performance (1990-2009) GHG reductions in % 1990 (base year)		
	An-nex 1	An-nex 2	Annex B	In tran-sition			Burden-sharing agreement (1998)	EU Eurostat (2011) IEA [2011]	UNFCCC (2009) Landuse change and forestry (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. Implementing legal obligations & policy declarations: European Union EU-4: Germany, UK, France and Italy**

- In 2012, 25 (except Malta and Cyprus) of EU-27 are Annex B countries and all are parties to UNFCCC & KP. For 15 EU members: burden-sharing agreement (1998) adopting different targets.
- GHG emissions for most EU-27 declined from 1990 to 2009.
- With EU enlargements of 2004 (EU15+10) and 2007 (Bulgaria, Romania), 10 transition countries joined whose emissions had dropped with the collapse of socialist system in 1989.
- Among EU-27: Germany, UK, France & Italy were responsible for 54.9% of the GHG weighted emissions in CO2 equivalents.
- GHG emissions of EU-27 in 2009 GHG emissions had declined by 17.4% since 1990.

# 5.1. 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

## 5.2. 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.

## 5.3 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.

## **5.4. GHG Reduction Goals of Germany by 2020**

- The German Climate Agenda 2020 after G8 Meeting in Heiligendamm (2007) proposed eight measures to reduce 2020 levels of GHG emissions by 40%:
  - Modernising power stations
  - Doubling the number of CHP units
  - Increasing the share of renewables in electricity production to 27%
  - Cutting electricity consumption by 11%
  - Improving the energy efficiency of buildings
  - Using more renewables for heating
  - Increasing fuel efficiency and use more biofuels in transport
  - Reducing methane and the emission of F-gases
  - The plan excludes a revival of nuclear power.

# 5.5. GHG Reduction Goals of UK

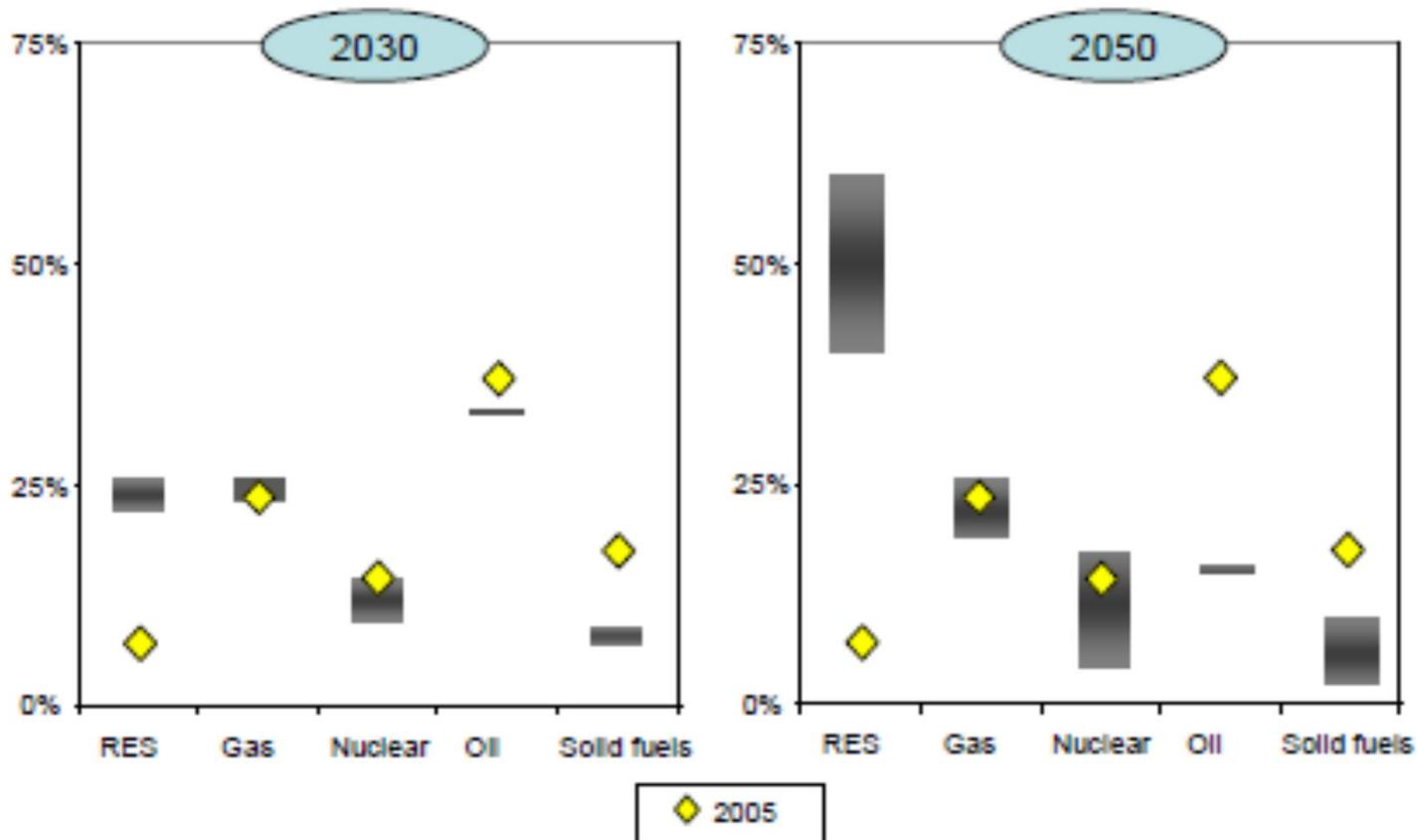
- The UK Climate Change Bill sets a target of
  - 26-32% reduction in GHG emissions by 2020.
  - UK proposes 60% reductions by 2050.
- The Bill is first climate change action plan that would be legally binding. A Committee on Climate Change will be created to provide independent expert advice and to hold the government accountable if targets are not reached.
- The principal measures used to reach the targets would be:
  - Improving energy efficiency
  - Stimulating consumers to become producers at home
  - Investing in the development of low carbon fuels and technology
  - The draft plan has already received severe criticism in the UK. Some claim that it is doomed to fail because it is based on forecasts that are far too optimistic, while others criticise the targets for not being ambitious enough.

## 5.6. 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 transport 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.**

# 5.7 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 %)



## **6. From Leaders to Laggards: Canada and USA**

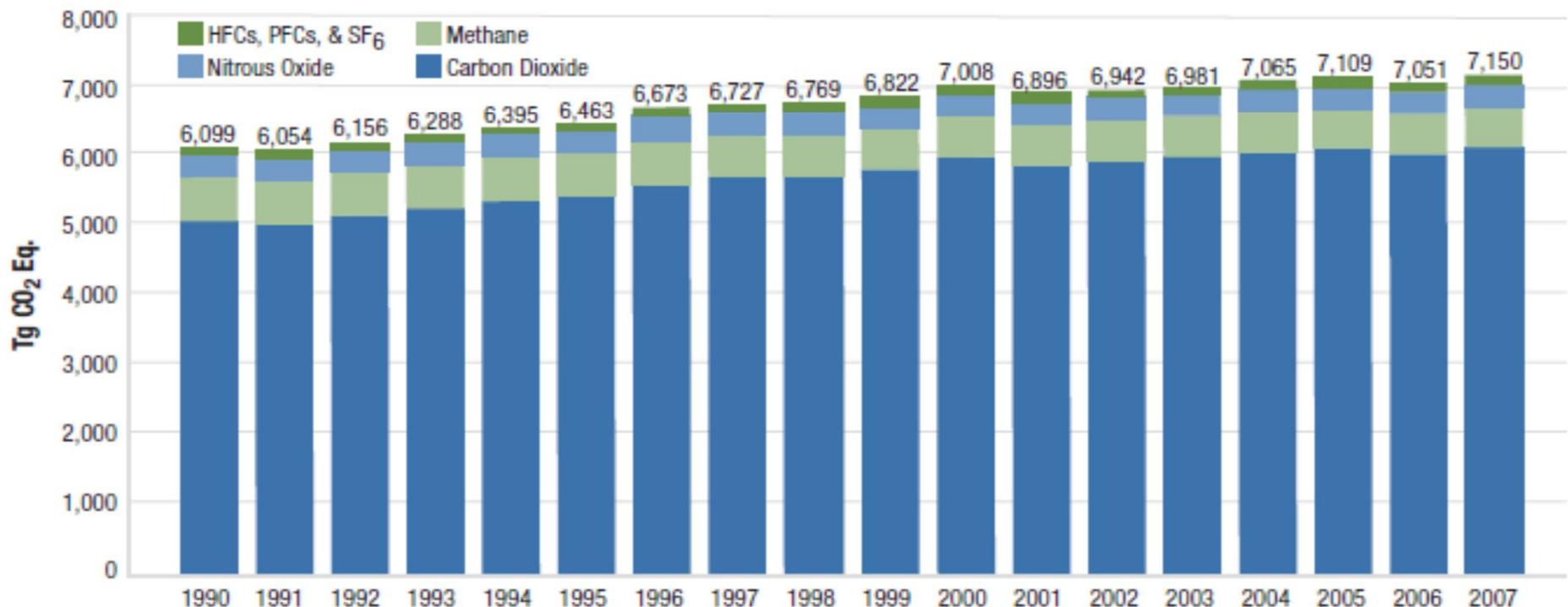
- **USA was a leader of global climate policy from 1988-1992/1997:**
  - Reagan tabled climate change on G-7 agenda
  - Supported start of UNFCCC negotiations & IPCC establishment in December 1988
  - George Bush signed & ratified UNFCCC in 1992
- **Since 1998 US climate policy was blocked in US Congress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

# 6.1. US Climate Performance

- **President Obama:** The threat from climate change is serious, it is urgent, and it is growing. Our generation's response to this challenge will be judged by history, for if we fail to meet it—boldly, swiftly, and together—we risk consigning future generations to an irreversible catastrophe (CAR 2010).

Figure 3-1 Growth in U.S. Greenhouse Gas Emissions by Gas: 1990–2007

In 2007, total U.S. greenhouse gas emissions rose to 7,150.1 Tg CO<sub>2</sub> Eq., which was 17 percent above 1990 emissions, and 0.6 percent above 2005 emissions.



## 6.2. US Climate Performance

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

## 6.3. Goals of Obama Administration (2009)

On the policies and measures the **5th US NC** (2010) noted by using the year 2005 as base year instead of 1990 agreed to in the UNFCCC and in the KP:

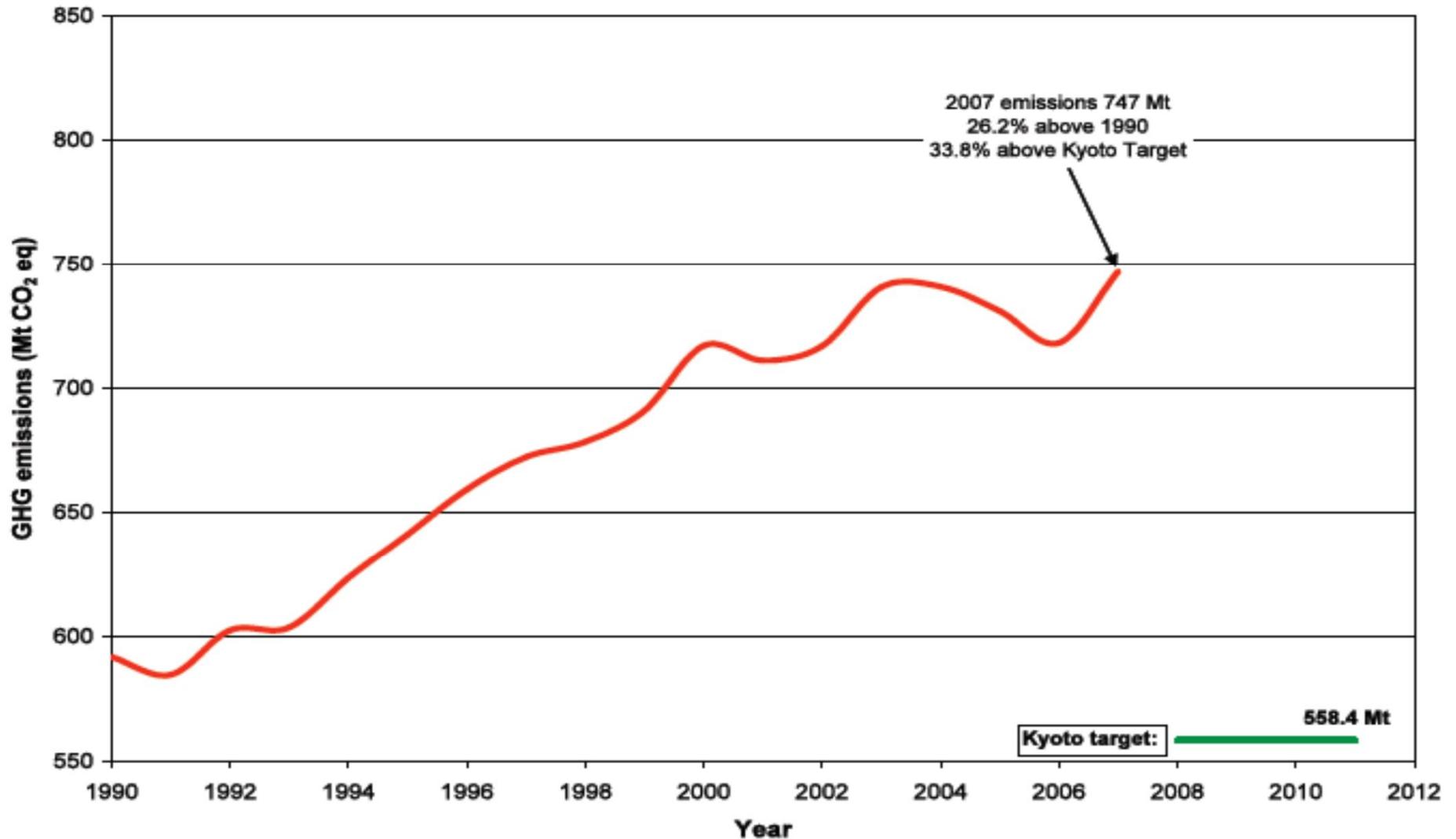
- In June 2009, U.S. House of Representatives passed the American Clean Energy and Security Act, which includes economy-wide GHG reduction goals of **3 percent below 2005 levels in 2012, 17 percent below 2005 levels in 2020, and 83 percent below 2005 levels in 2050**. ... With additional mitigation measures, ... the United States would have a GHG reduction goal of 17 percent by 2020. ...
- This act was never adopted by US Congress & never became a binding law. This failure paralyzed the Obama Administration (2011-2012).

## **6.4 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 CO<sub>2</sub> and average annual % growth from 1970 to 2008 amounted to +0.1%.
- According to IEA's statistics from 1990 to 2009, Canada's CO<sub>2</sub> 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:

# 6.5 Climate Policies of NAFTA Countries: Performance of Canada



## 6.6. Canada leaving the KP

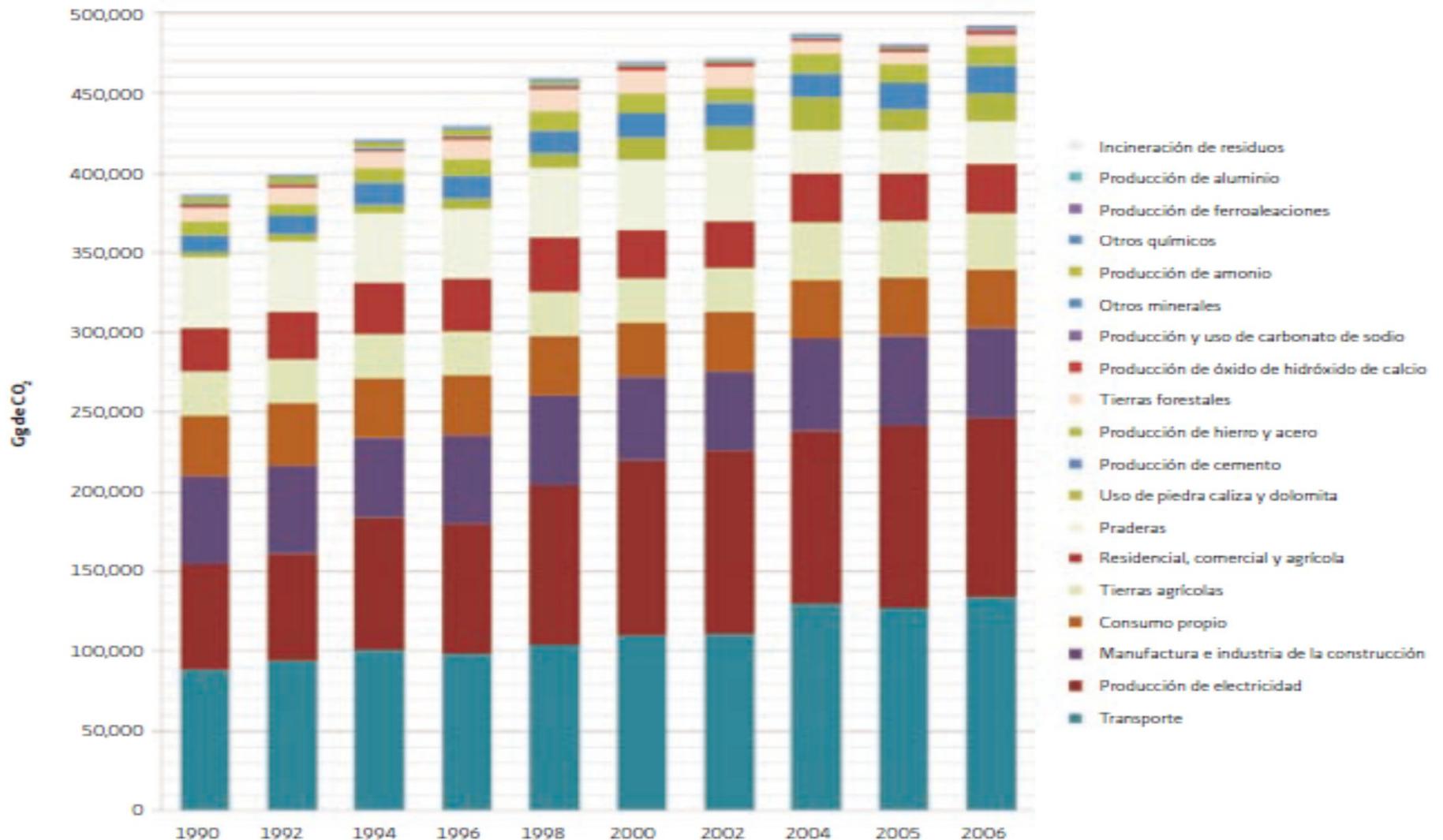
- In its 5th NC the government admitted that in 2007 Canada's GHG emissions were 33.8% above its Kyoto target.
- 1990-2007, Canada's GHG emissions increased faster than its population, only the GHG per capita and per energy use and the GHG intensity declined. Emissions increased in all sectors, except for land-use change and forestry.
- On 11 December 2011, Canada announced its unilateral withdrawal 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 and implementation gap and the increasing pressure of the energy industry to exploit Canada's huge potential of oil sands persuaded Canada's Conservative Harper government as the first country to opt out of the KP (1997) to give preference to domestic economic interests over global commitments.

## 6.7 Climate Performance of Mexico

- As one of three OECD countries, Mexico had no QELROs as a non-Annex B country of the KP (1997).
- According to Mexico's 4th NC (2009: 26), 1990-2006, Mexico's GHG emissions increased by "approximately 40%, [with] an average annual growth of 2.1%".
- **1990-2009, Mexico's GHG Emissions increased by 50.9%**
- In 2006, Mexico's National Development Plan (2007-2012) addressed actions for CC mitigation and adaptation.
- Environment and Natural Resources Sector Program (2007-2012) developed a National Strategy of Climate. A Special Program on CC (2009-2012) committed unilateral voluntary emissions reductions of 50% by 2050 compared to a baseline year of 2000; research results in the medium and long run.
- Since 2005, the Interministerial Commission on CC has coordinated the national policies for prevention and mitigation of GHG emissions, and for adaptation to CC impacts.
- In 2010, Mexico hosted COP-16 of the UNFCCC in Cancun which resulted in the Cancun Agreements.

# 6.8. Climate Policies of NAFTA Countries: Performance of Mexico

Figura II. 3 Emisiones por sector en Gg de CO<sub>2</sub>, 1990-2006



# 7. Achievements due to Economic Transition: Special Case of Russia

- In 2009, Russia was 4th largest CO<sub>2</sub> emitter behind China, the USA and India, and for all GHG emissions, including deforestation, Russia held the fifth place behind China, the US, Brazil and Indonesia.
- In cumulative emissions for 1850-2007 with 8% Russia was the third largest emitter.
- According to UNFCCC's (2009) assessment 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 the dissolution of Soviet Union & transition of Russia to a market economy. Prior to COP 15 (2009) in Copenhagen, Russia considered reducing its GHG by 25 percent until 2020.

# 8. Climate Paradox: Performance & Implementation Gap

- Regarding to KP targets, since 1990 the G-8 countries have shown a mixed performance.
  - As a ‘country in transition’ Russia had the highest GHG emissions reduction.
  - The EU-27 have clearly met their overall targets under the KP and most member countries have met their national targets under the EU’s ‘burden-sharing agreement’ (1998) based on the KP.
  - Only Canada and the US have clearly failed to stabilize their GHG emissions by the year 2000 to the level of 1990 and to achieve the GHG reduction targets to which they agreed when they signed the KP.

# 8.1. Does Democracy Matter?

- As EU-27 & NAFTA countries are liberal democracies, different performance is not due to 'system of rule'.
- To explain this fundamentally different performance and especially the fundamental change in public opinion in the US regarding climate change between 2007 and 2012 additional factors must be considered, such as the **different political culture** in North America and in EU, the **different role of economic interest groups**, of **powerful lobbies**, of the **conservative mass media** and of **powerful and inward looking** and **ideology-driven grassroots movement** focusing on the Republican Party that prevented the climate change implementation legislation in US Congress.

## 8.2. A Climate Paradox?

- The climate paradox hypothesis applies specifically to these two laggards in climate change performance. Canada and the USA share extremely high CO<sub>2</sub> emissions per capita and the same 'way of life', which is a part of the North American political culture and of the values, attitudes and behavior of most citizens.
- With the assumption of the world power role during the 1940s the prevailing thinking on the role of the US in world politics and especially of the role of its military tool has significantly changed, as have the dominant theories of international relations from Wilsonian idealism to Hobbesian realism.

## 8.3. Addressing the Climate Paradox

- Overcoming the 'Climate Paradox' in North America requires a deliberate climate leadership of EU countries & a sustained willingness to unilaterally implement their climate reduction goals and the different roadmaps for 2050.
- Overcoming the 'climate paradox' requires a gradual replacement of the thinking and action in terms of 'business as usual' towards multiple sustainability transitions in all sectors of society, economy and also in the political realm.
- To move to a 'Fourth Sustainability Revolution' (FSR) requires major changes in the dominant culture & way of life, in societal, economic & political worldview of citizens & mindset of leaders, but also in governance to curb the influence of political money on the behavior of the elected representatives of the people.

## 8.4 Overcoming the Dominant Worldview

- The proposed new scientific revolution (Clark/Crutzen/Schellnhuber 2012) and the need for a new paradigm shift towards sustainability necessitate to gradually overcome the dominant worldview of the people and mindset of the political leadership.
- In international relations, severe crises have often become a driving force for learning, innovation & change, as the response of Nixon & Kissinger to the Vietnam War, or Gorbachev's efforts to save the socialist model by initiating a new thinking and reforms from the top.
- Implementing a sustainability transition with increasing energy efficiency reduces energy costs and enhances the competitiveness of European products. It may also reduce the dependence on fossil imports and thus the involvement in resource conflicts over the control of fossil energy resources

## 8.5. Alternatives: Business-as-usual or Sustainability Transition?

- **Mindset 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.

## **8.6. 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**

## 8.7. 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.

## 8.8. Fourth Sustainability Revolution

- 2<sup>nd</sup> 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.

## 8.9. 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”

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

- Key actors for development and implementation are:
  - **States:** initiate, fund and 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

# 8.11. 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.

## 8.12. 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.

## 8.13. 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.

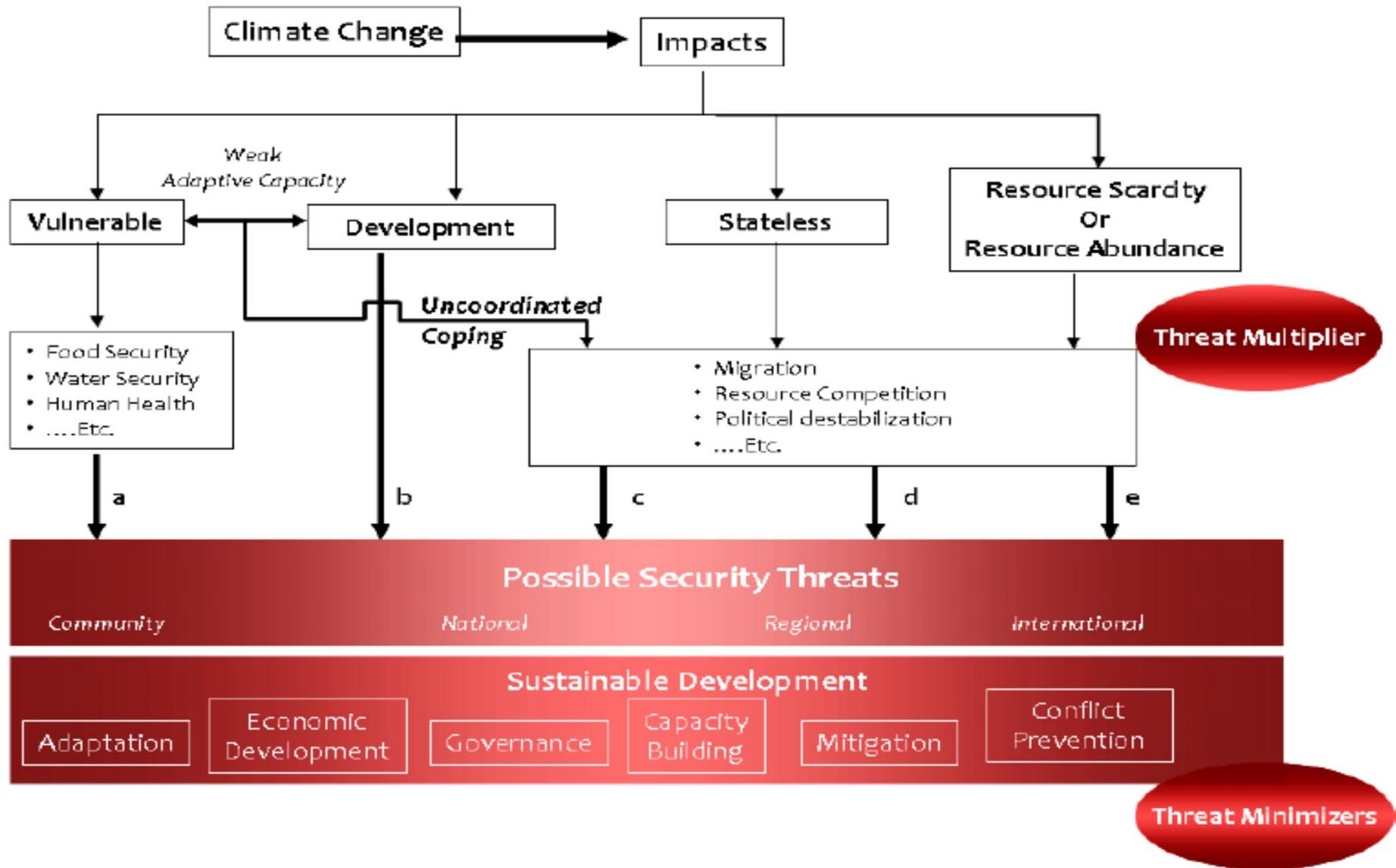
# 8.14. Mindset of Policymakers

- 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".

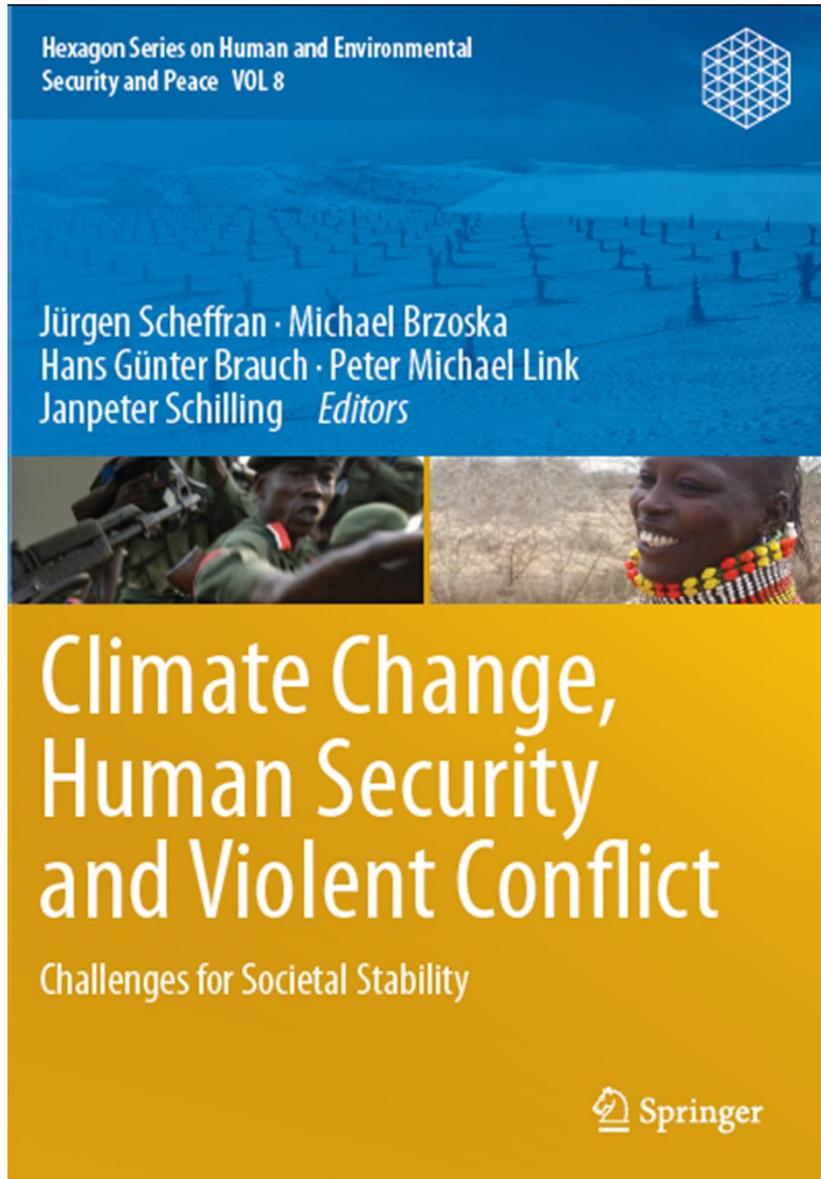
# 9. Parallel Debates & Discourses

- There are several parallel political debates & scientific discourses dealing with possible societal impacts of global environmental and climate change focusing on:
  - the securitization of climate change where climate change may act as a **threat maximizer** and trigger **multiple human, national and international security effects**;
  - strategies, policies and measures based on **business-as-usual scenarios** and on the a **Hobbesian mindset** may result in a militarization of climate change impacts
- In the alternative vision that aims at a longterm transformation aiming at sustainable development six political components of 1) adaptation, 2) economic development, 3) governance, 4) capacity building, 5) mitigation, and 6) conflict prevention may help to minimize potential security threats.

# 9.1. Report of the UN-SG (11.9.2009)



# 9.2. The Securitization Discourse



## Four Schools

- Dramatizers: Climate wars (Welzer)
- Skeptics: lack of research (PRIO)
- **Empiricists: PEISOR Model: focus on multiple complex linkages**
- Deniers

## Five Approaches

- **Policy Analyses**
- **Scenario analyses**
- **Discourse analysis: climate change (chapter 4 of this volume)**
- **Conceptual & model analyses**
- **Theoretical & empirical analyses**
  - **Causal analyses**
  - **Qualitative approaches (case studies)**
  - **Quantitative approaches (macro sociological approaches)**

## 9.3. Sustainability Transition 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.**

# 9.4. 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?

# **10. 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.

# 10.1 Emerging Research Agendas

## Strategy for Sustainable Transition Requires Changes in the Scientific System of Knowledge Production

- **Edward O. Wilson (1998)** noted a growing *consilience* (interlocking of causal explanations across disciplines) in which the “interfaces between disciplines become as important as the disciplines themselves” that would “touch the borders of the social sciences and humanities.”
- **Clark, Crutzen and Schellnhuber (2004)** called for a ‘second Copernican Revolution in earth systems science’ & a ‘new paradigm of sustainability’ and new ‘Contract for a Planetary Stewardship’
- **Grin, Rotmans and Schot (2010)** reviewed “Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change”
- **Huff (2011)** discussed past “Intellectual Curiosity and the Scientific Revolution” in Western and Non-western Cultures (Confucianism, Hinduism and Islam)
- **Brauch, Dalby and Oswald Spring (2011)** suggested a new ‘Political Geo-ecology for the Anthropocene” by bringing politics and security into Earth Systems Science and its key results into the social sciences
- **WBGU (2011)** proposed a new “Social Contract for a Global Transformation”

## 10.2. 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.

# 10.3. 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**.

# 10.4 Specific Goal of this Workshop

- **This workshop combines four scientific issue areas and scientific discourses:**
  1. **Research on consequences of policies on GEC and climate change** that resulted in a deficient implementation of agreements (KP of UNFCCC) and of non-binding policy declarations of the G8 & G20 what represents a 'Climate Paradox'.
    - This will increase the probability of a **dangerous and catastrophic climate change**.
    - To avoid its consequences in science, & societal, economic and political realms, major changes in science, society, the business community & politics are needed.
    - This has inspired several scientists to call for a new '**scientific revolution towards sustainability**',
    - a new '**Social Contract for Sustainability**' or a
    - '**fourth sustainability revolution**'.
  2. **Research that address the consequences of global environmental change and climate change on international peace and security, and the linkages between climate change and security**
  3. A third emergent research field in the social sciences deals with *theoretical and empirical approaches and strategies of a long-term transformative change towards a sustainable development (KSI)*
  4. In the context of these discourses a sustainable peace will also be addressed from the perspective *human security*.
- **Based on the discussion of these multiple complex issue linkages new research questions & research fields are to be developed for a multidisciplinary oriented & policy relevant international social sciences and also for peace research.**

# 10.5 Questions of this Session

- **Which conceptual linkages** exist between the discussion on sustainable development and a sustainable peace?
- **Which possible consequences of non-action and of a postpone-ment of decisions** can be foreseen in the area of global environ-mental change (water, soil, climate change, biodiversity) on the area of international peace & security – from the perspective of states & international organizations & of human security?
- **May policies of ecological non-action & of postponement of decisions that increases the intensity of anthropogenic climate-induced natural hazards and disasters** that may become for billions of people an issue of survival become a **serious threat to international peace and security during the 21st century?**
- **May anticipative learning & a forward looking public & global discourse on the necessary long term transformative change contribute to a sustainable development & counter new threats for international peace & security in a preventive manner?**