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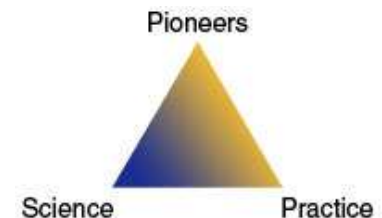
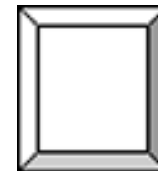
Tuesday, 4 December 2012, 9.30-12.45
FST CONFERENCE ROOM

**FACULTY OF SCIENCE AND TECHNOLOGY,
UNIVERSITI KEBANGSAAN MALAYSIA**

**ROUNDTABLE DISCUSSION: "GLOBALIZATION, PEACE AND HUMAN
SECURITY IN SOUTHEAST ASIA"**

Hans Günter Brauch, Editor

Hexagon Series on Human, Environmental Security and Peace, vol. 8
Springer Briefs in Environment, Security, Development & Peace, vol. 1-2
SpringerBriefs on Pioneers in Science & Practice, vol. 1



Contents

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4. Climate Paradox: Legal obligations & limited implementation
5. Paralysis of climate negotiations
6. 2 alternative perspectives and visions: business-as-usual vs. long-term transformative change to sustainable development
7. Emerging Discourse on Sustainability Transition
8. EU-27 climate & energy policy goals: GHG reductions:2020-50
9. Energy Transition: bottom-up vs. top-down
10. Sustainable Development and the Nexus between Climate Change and Energy Security

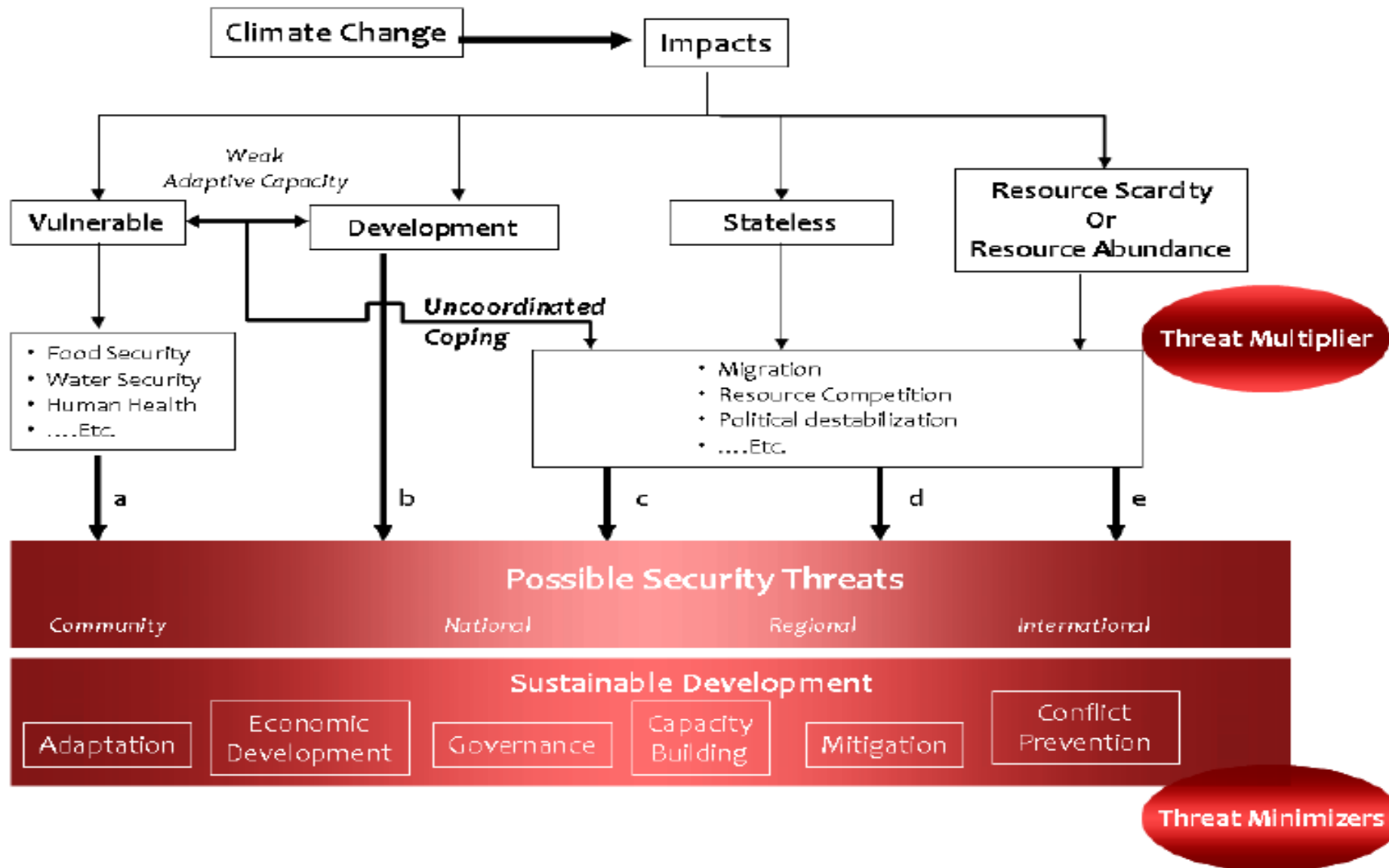
1. Triple Launch: 3 Springer Book Series

- **Launching of Hexagon Series on Human, Environmental Security and Peace**
 - Vol. 8: Scheffran, Jürgen; Brzoska, Michael; Brauch, Hans Günter; Link, Peter Michael; Schilling, Janpeter (Eds.): **Climate Change, Human Security and Violent Conflict: Challenges for Societal Stability**
- **Noting Springer Briefs in Environment, Security, Development & Peace,**
 - Vol.1: Mely Caballero-Anthony, Youngho Chang and Nur Azha Putra (Eds.): **Energy and Non-Traditional Security (NTS) in Asia**
 - Vol. 2: Mely Caballero-Anthony, Youngho Chang, Nur Azha Putra (Eds.): **Rethinking Energy Security in Asia: A Non-Traditional View of Human Security.**
- **Noting Springer Briefs on Pioneers in Science & Practice,**
 - Vol. 1: Arthur H. Westing: **Arthur H. Westing: Pioneer on the Environmental Impact of War.**

1.1 Three anniversaries and 2 debates

- **Three anniversaries & Topical Event**
 - **25 years:** Brundtland Report (1987)
 - **20 Years:** Rio Earth Summit: UNFCCC (1992)
 - **15 years:** Kyoto Protocol (1997)
 - UNCED summit **Rio+20 (2012):** Future we Want!
 - UNFCCC-COP 18: Doha, until end of this week
- **2 Policy Debates & Scientific Discourses:**
 - Climate Change and Security: Implications of GEC & CC for international, national & human security
 - Decarbonization or Greening of the Economy
 - Longterm transformative change to sustainable development or: sustainability transition

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



1.3. 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

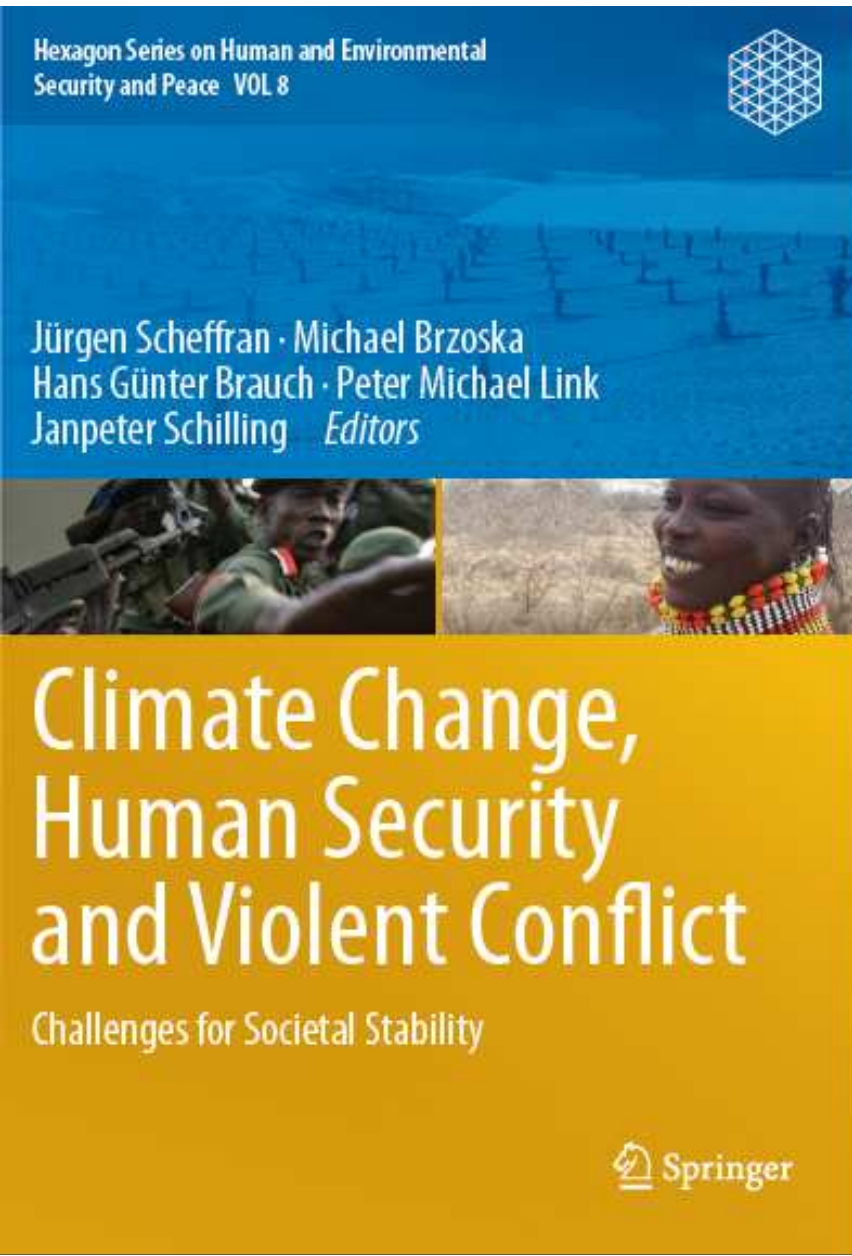
Climate change & national security discourse:

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

Climate change & human security discourse

- IHDP (GECHS): Lonergan & Brklacich (chairmen)
 - 2005: conference in Norway on Climate 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**

1.4 Volumes on 2 Discourses



- Scheffran, Jürgen; Brzoska, Michael; Brauch, Hans Günter et al. (Eds.): ***Climate Change, Human Security and Violent Conflict: Challenges for Societal Stability*** Hexagon Series, vol. 8 (Heidelberg – Dordrecht – London – New York: Springer, 2012). http://www.afes-press-books.de/html/hexagon_08.htm
- Brauch, Hans Günter; Oswald Spring, Úrsula et al. (Eds.): **Sustainability Transition & Sustainable Peace workshops. Hex. Series, vol. 11**
- **Workshop 1: September 2012, Mexico**
- **Workshop 2: 2 April 2013, SF, USA**
- **<[http://www.afes-press-books.de/html/ events.htm](http://www.afes-press-books.de/html/events.htm)>**

1.5 Theme of this book

- **38 peer reviewed chapters by more than 60 authors from 4 continents (based on a workshop in Hamburg, in Nov. 2009)**
- Climate change is becoming a focal point of security and conflict research and poses challenges to the world's structures of policymaking and governance.
- This handbook explores empirical and theoretical links between climate change, environmental degradation, human security, societal stability and violent conflict that could trigger cascading events and critical tipping points in climate-society interaction.
- Based on an extensive analysis of the securitization discourse, various conflict constellations are assessed, including water scarcity, food insecurity, natural disasters and mass migration. The security risks of climate are discussed in detail with regard to regional climate hot spots in Africa, the Middle East, Asia and the Pacific.
- Constructive approaches are examined for improving climate security through capacity-building for sustainable peace and cooperative policies leading to local and global governance structures.

1.6 Structure & Forewords

With Forewords by

- Olusegun Obasanjo, former President of Nigeria;
- Connie Hedegaard, European Commissioner for Climate Action;
- Christiana Figueres, Executive Secretary, UNFCCC;
- R.K. Pachauri, Director General, The Energy and Resources Institute (TERI), Chairman, Intergovernmental Panel on Climate Change (IPCC).

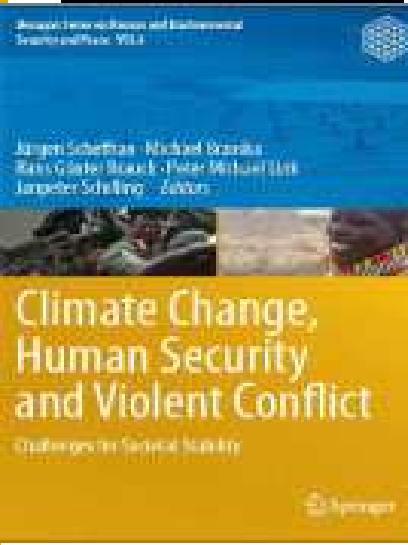
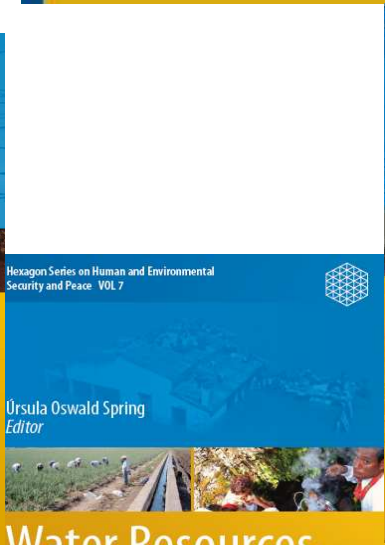
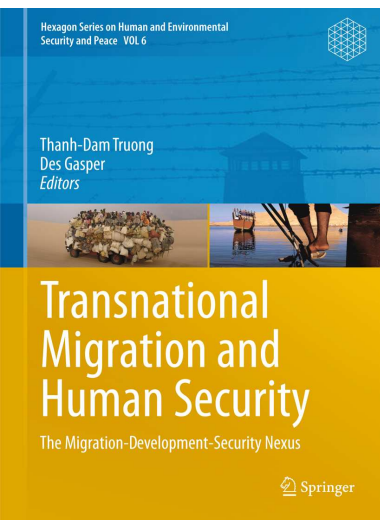
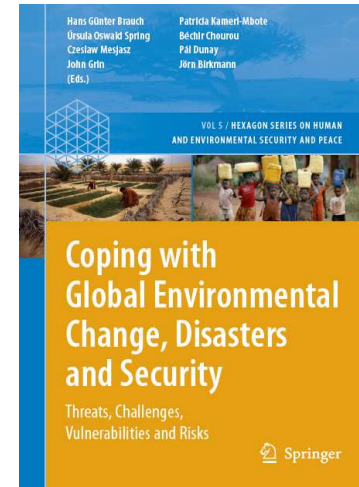
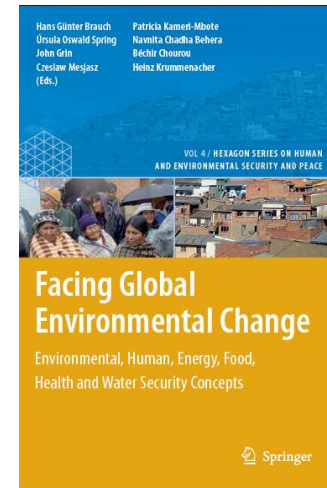
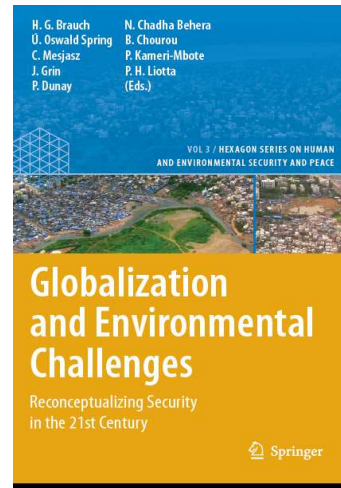
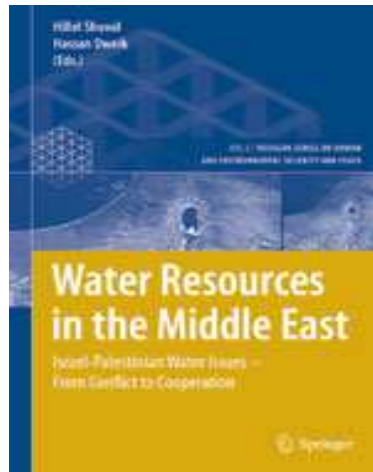
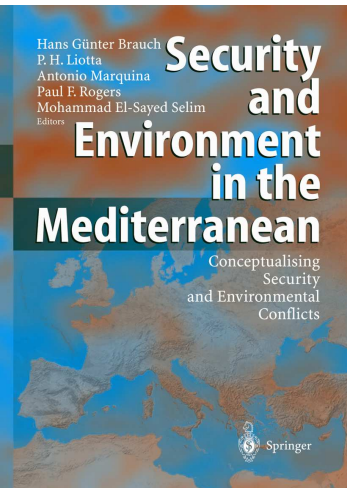
Contents:

- Part 1: Introduction. –
- Part II: Climate Change, Human Security, Societal Stability, and Violent Conflict: Empirical and Theoretical Linkages. –
- Part III: Climate Change and the Securitization Discourse. – Part IV: Climate Change and Migration.
- Part V: Climate Change and Security in the Middle East. – Part VI: Climate Change and Security in Africa.
- **Part VII: Climate Change and Security in Asia and the Pacific.**
- Part VIII: Improving Climate Security: Cooperative Policies and Capacity-Building.
- Part IX: Conclusions and Outlook.

1.7. Part VII: Climate Change and Security in Asia and the Pacific

- 28 Climate Awareness and Adaptation Efficacy for Livelihood Security against Sea Level Rise in Coastal Bangladesh 575
Md. Mustafa Saroar and Jayant K. Routray
- 29 Security Implications of Climate Refugees in Urban Slums: A Case Study from Dhaka, Bangladesh 595
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- 30 A Psychological Perspective on Climate Stress in Coastal India 613
Ruchi Mudaliar and Parul Rishi
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Achim Maas and Alexander Carius

1.8 Hexagon Series: Volumes I-VIII



Forthcoming Volumes

- Truong, Thanh-Dam; Bergh, S.I.; Gasper, Des; Handmaker, J. (Eds.): **Migration, Gender and Social Justice - Perspectives on Human Security**. Hexagon Series on Human and Environmental Security and Peace, vol. 9 (Heidelberg – Dordrecht – London – New York: Springer, 2013).
- Czeslaw Mesjasz: ***Stability, Turbulence or Chaos? Systems Thinking and Theory and Policy of Security***. Hexagon Series on Human and Environmental Security and Peace, vol. 10 (2013).

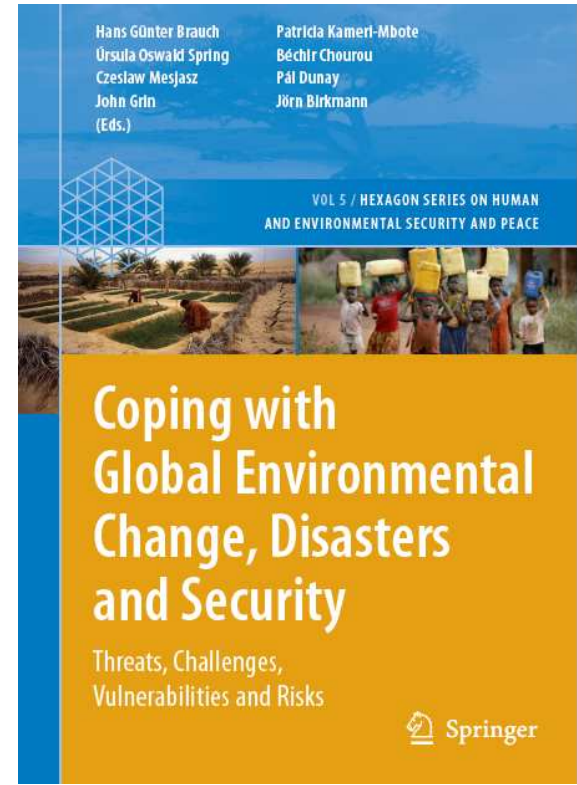
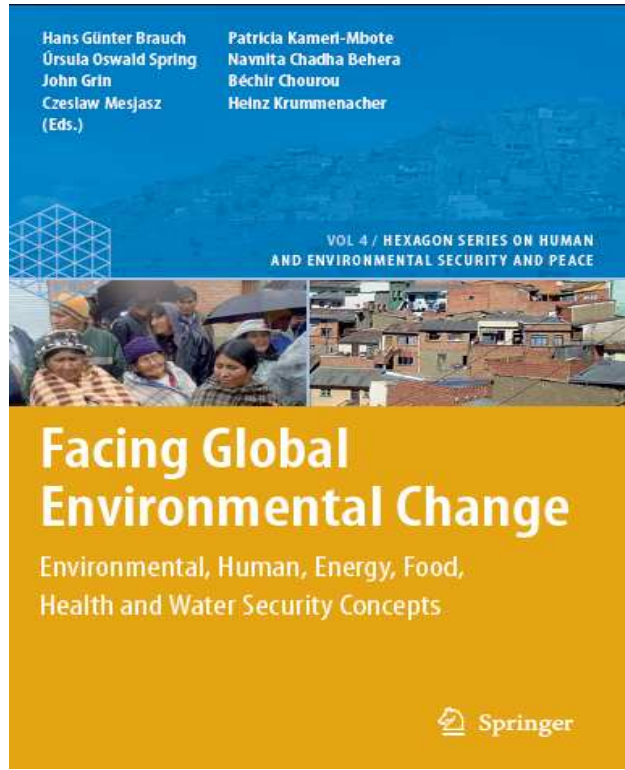
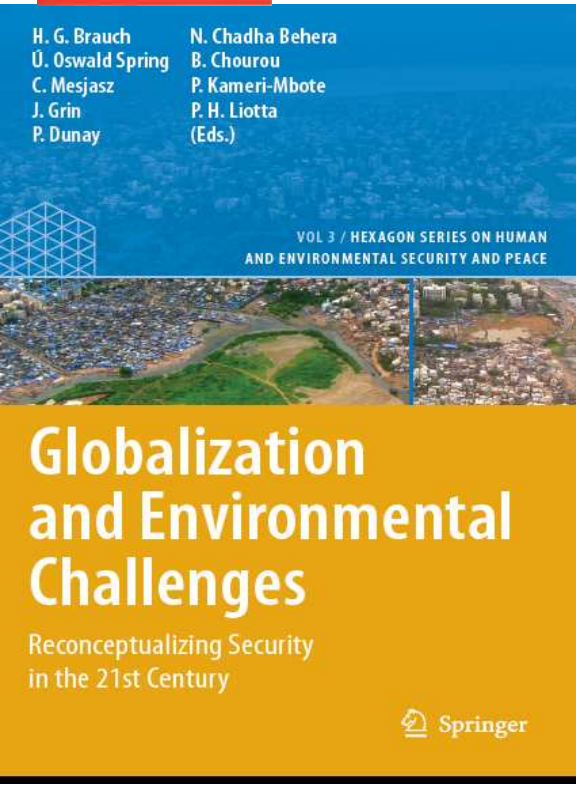
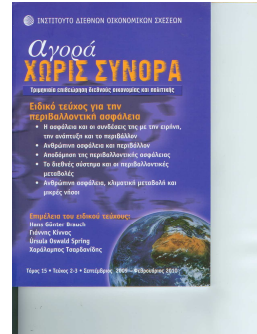
1.9 Global Environmental and Human Security Handbook for the Anthropocene

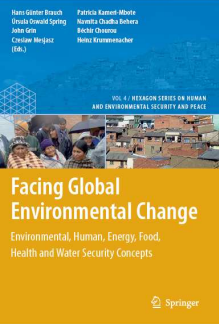
<http://www.afes-press-books.de/html/hexagon.htm>

Vol. 3 (1): Globalization and Environmental Challenges: 92 authors, 36 countries, 16 disciplines, (2008)

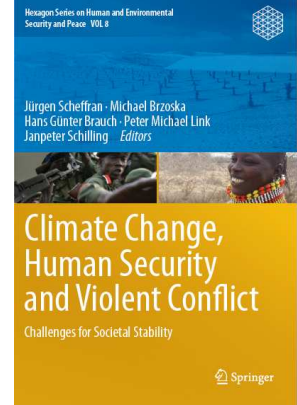
Vol. 4 (2): Facing Global Environmental Change: 132 authors, 49 countries on global debate and problems of environmental, human, energy, food, health, water security (2009)

→ Vol. 5 (3): Coping with Global Environmental Change: Disasters and Security – Threats, Challenges, Vulnerabilities and Risks 164 authors, 48 countries (2011).





1.10. Climate Change & Security Nexus in Social Sciences



Four Schools

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

Two Approaches

- **Policy & Scenario analysis Causal analysis**
 - Natural phenomena -> migration, crises, conflicts (violence)
- **Discourse analysis: climate change**
 - International security
 - National security
 - Environmental security
 - Human security

Objects of Security Analysis (Securitization)

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

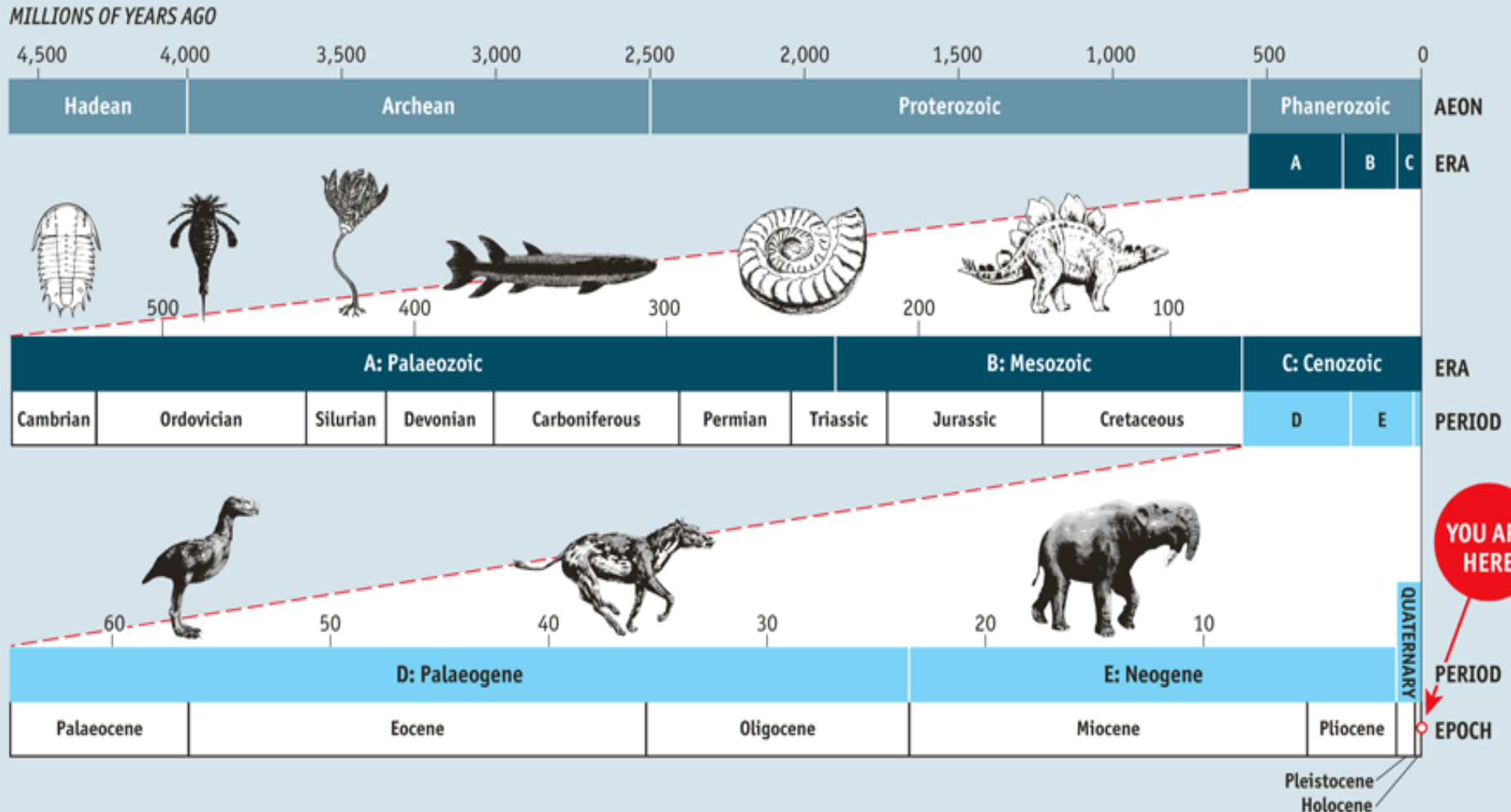
Whether they pose:

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

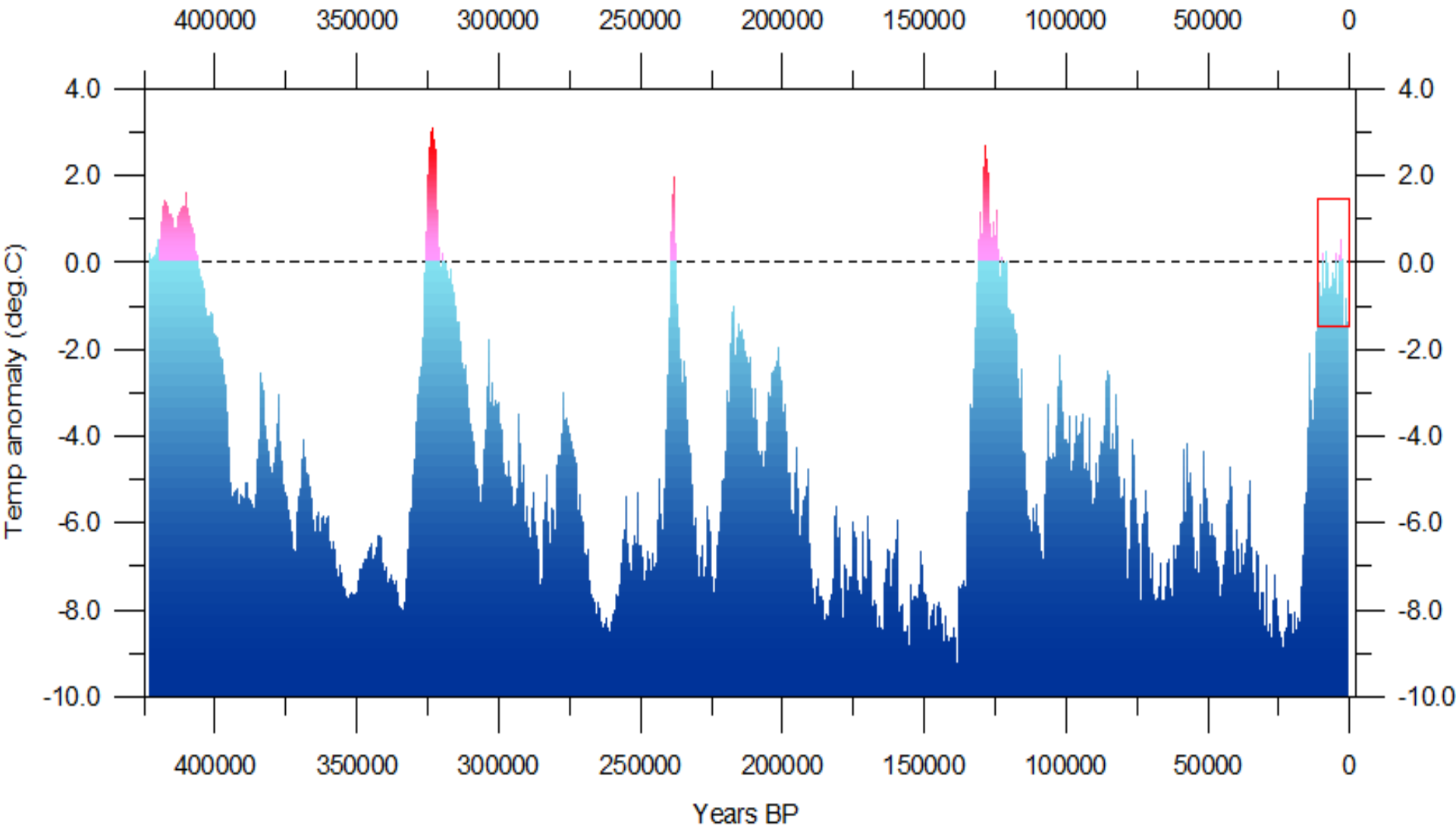
2. Transition of Earth History: From the Holocene to the Anthropocene

- We have mapped a fundamental and global **Reconceptualization of Security** since 1989 for three reasons:
- What has triggered this global contextual & conceptual change?
 - End of the Cold War
 - Process of Globalization
 - **Global environmental change: Transition from Holocene to Anthropocene**
- Which conceptual innovations affecting the security analysis
 - Ulrich Beck (1986, 2007): Theory of (international) risk society
 - Ole Wæver (1997): Theory of securitization (Copenhagen school of critical security studies)
 - **Paul J. Crutzen (2000): Humankind was instrumental for transition in earth history from Holocene (12000 BP) to Anthropocene**

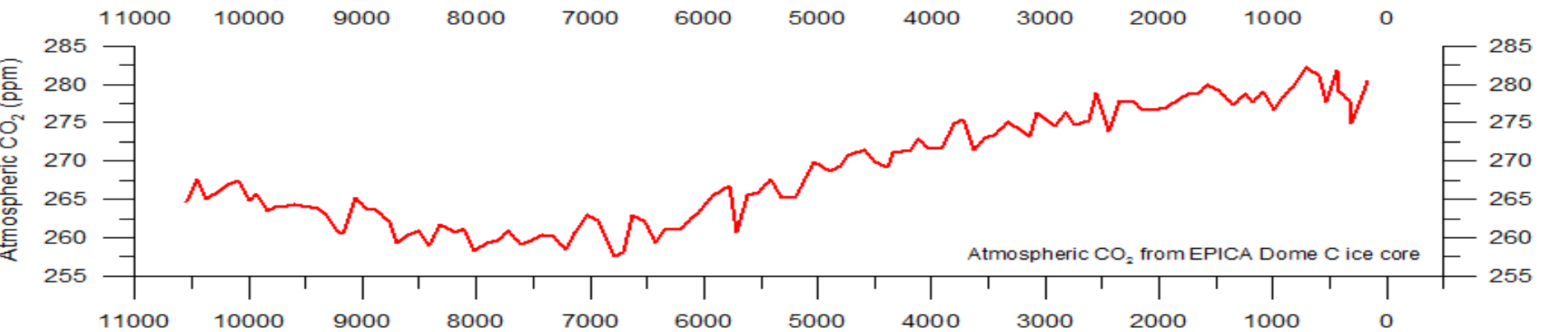
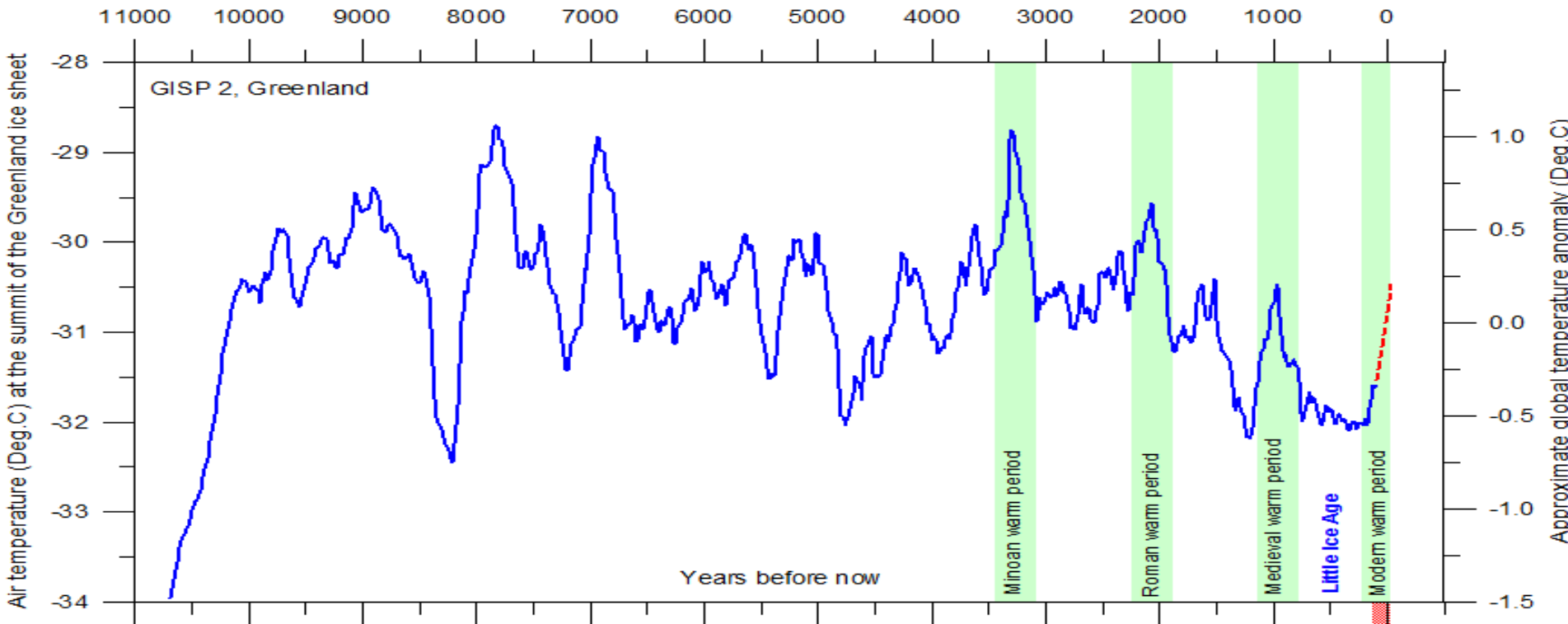
2.1 Geological Time: Earth History



2.2 Geological times: 400 000 years of climate history



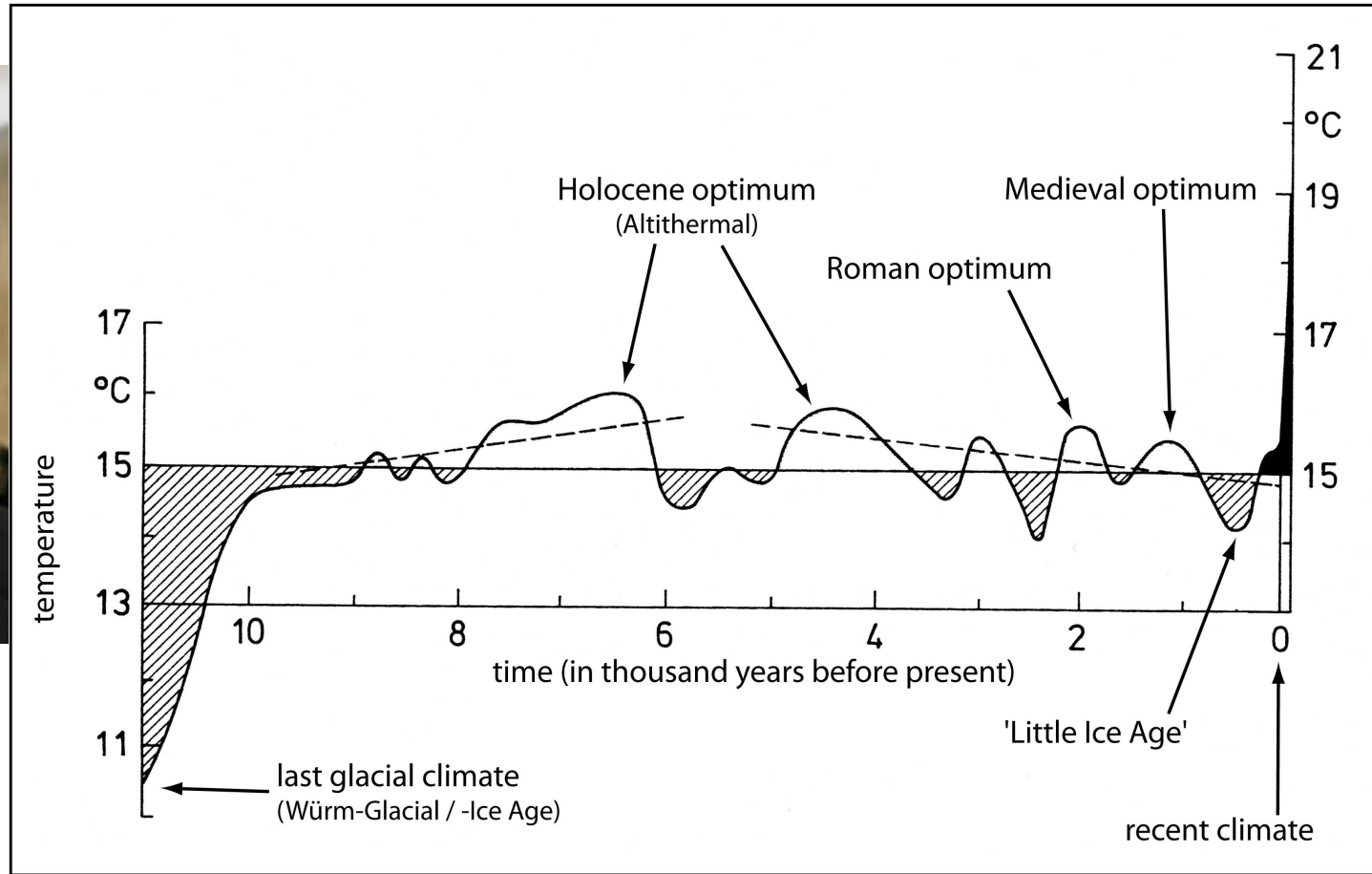
2.3 The Holocene (11600 BP-now)



2.4. From the **Holocene** (12.000 years b.p.) to the **Anthropocene** (1784 AD)

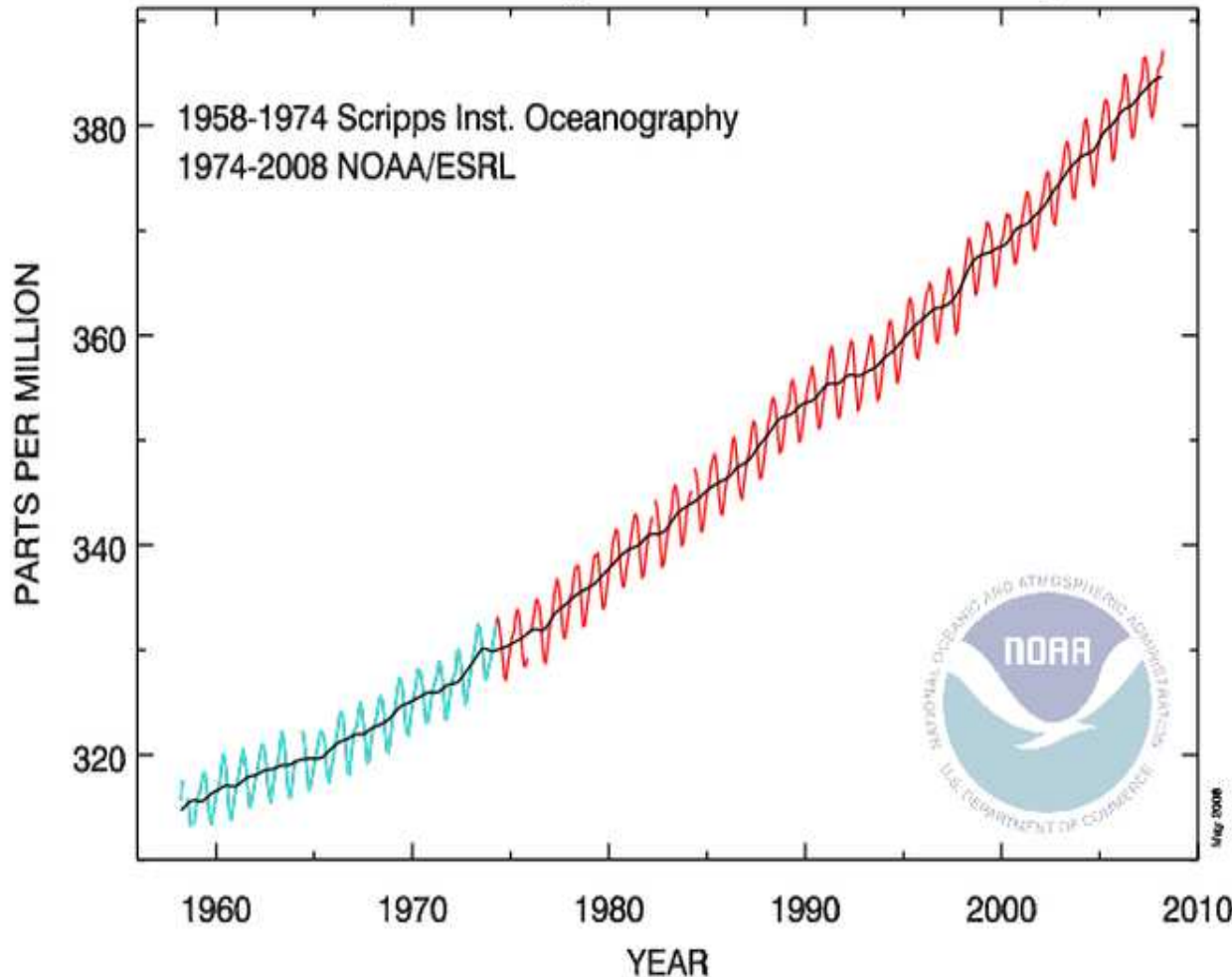


**Paul Crutzen,
Nobel Laureate for
Chemistry (1995)**



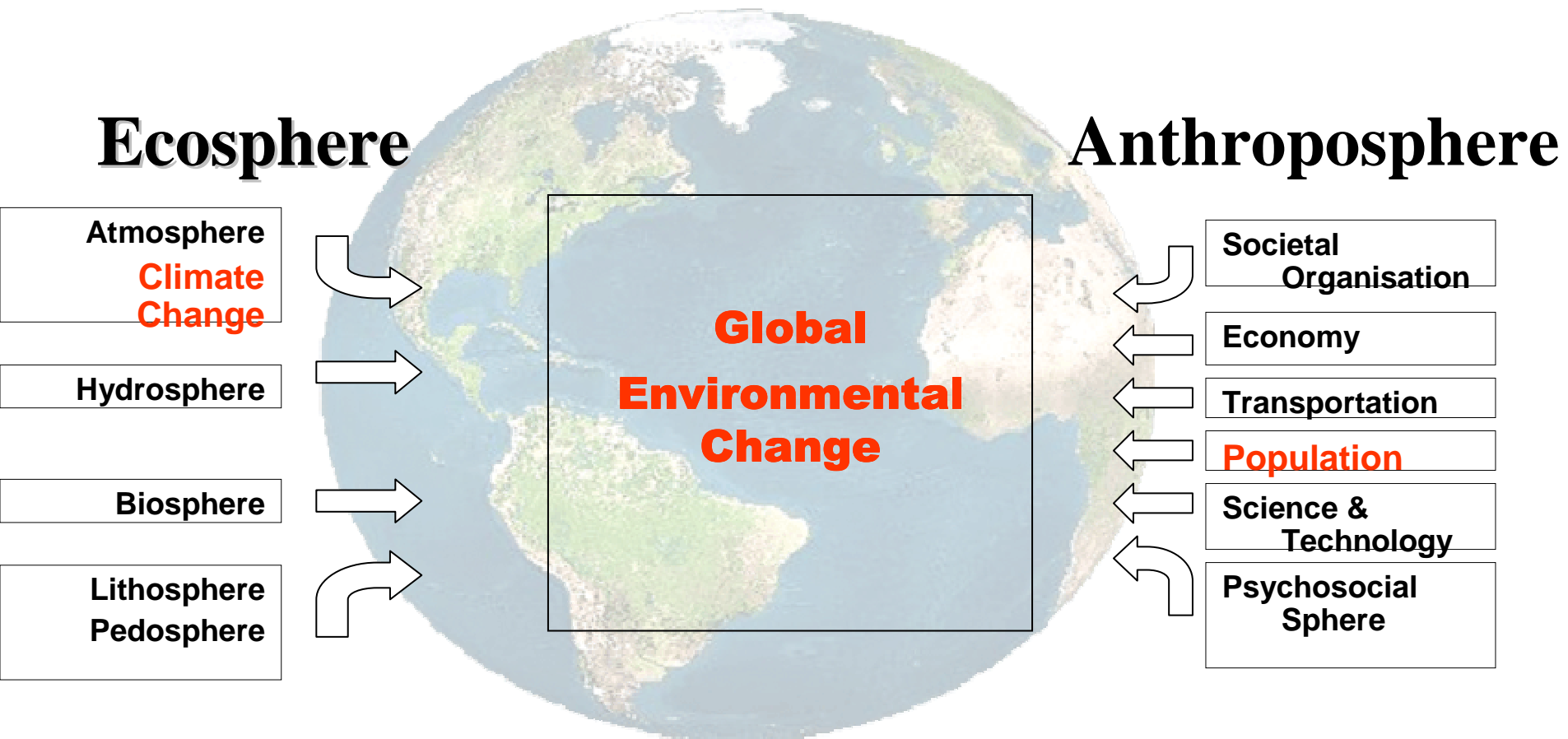
In Geology/geography: **Holocene** era of earth history since end of glacial period (10-12.000 years ago, Anthropocene, since industrial revolution (1784, J.Watt's invention of steam engine: anthropogenic climate change: burning of coal.oil,gas→GHG increase

2.5. Anthropogenic Climate Change in the Anthropocene Era (1750 to present)



- **GHG concentration in the atmosphere**
- **1750: 279 ppm, 1987: 387 ppm**
- **2011: 393 ppm**
- **2012: 396 ppm**
- **1/3: 1750-1958: 279 to 315 ppm**
- **2/3: 1958-2011: 315 to 393 ppm**

3. Global Environmental and Climate Change: Rio Conventions UNFCCC (1992) & Kyoto Protocol (1997)



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

4. Climate Paradox:

Legal Obligations & Limited Implementation

- A 'climate paradox' has emerged due to a **growing implementation gap in Canada, USA & Japan**, while Russia, Germany, UK, France & Italy fulfilled their GHG reduction obligation.
- As **Annex-1 & Annex-B** countries, G8 share a major responsibility for this policy failure, together with other G20 countries, which contribute more than 80% of global GHG emissions.
- **Three G8 countries face a 'climate paradox' due to their inability to implement their legal obligations and policy declarations for GHG reduction targets for 2050.**
- **Overcoming the 'climate paradox' in North America** requires a deliberate **climate leadership of EU countries** and a willingness to unilaterally implement their climate reduction goals & their different roadmaps for 2050.
- **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.

4.1. 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**

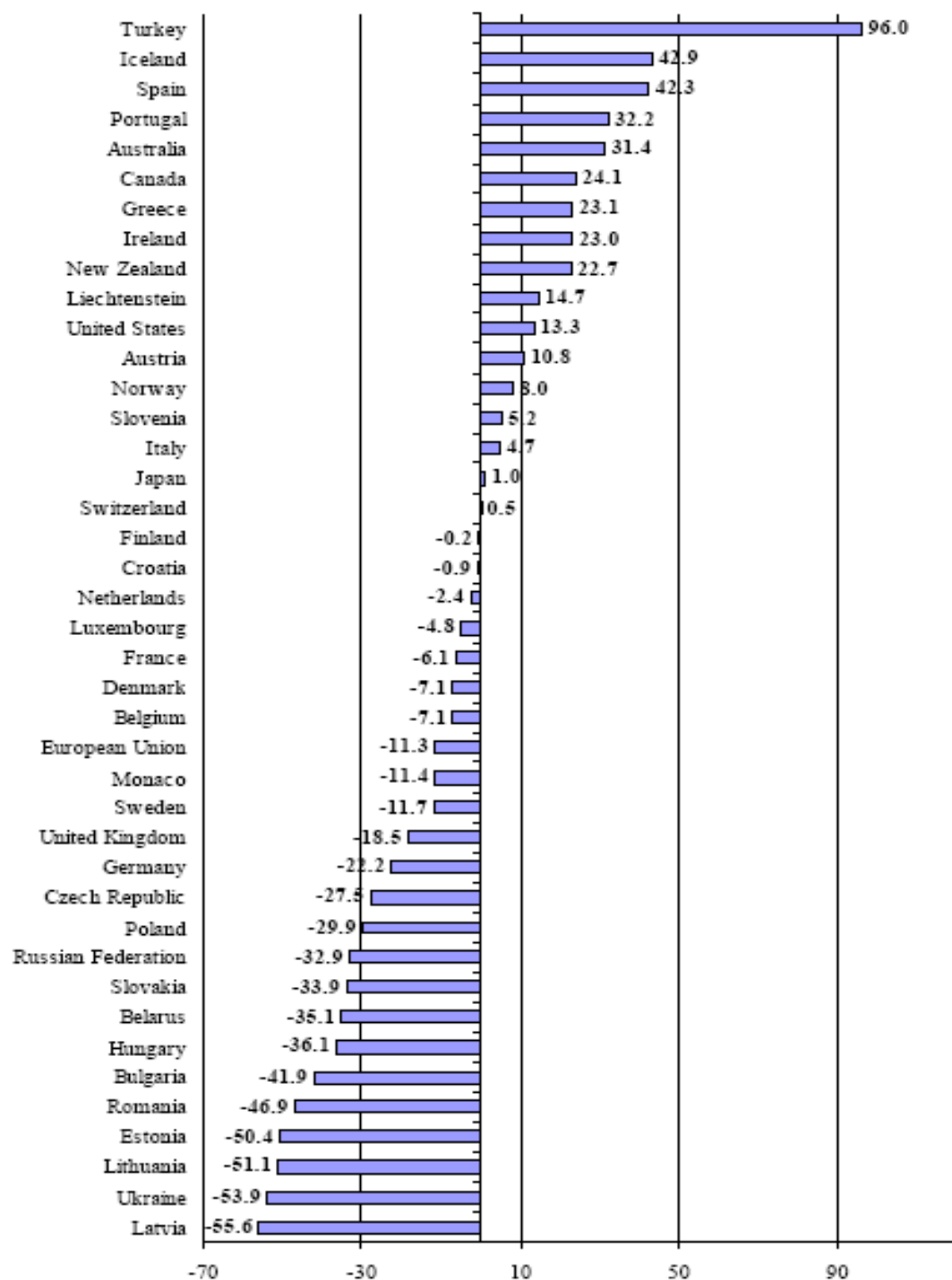
4.2. GHG Reduction Implementation Gap

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]



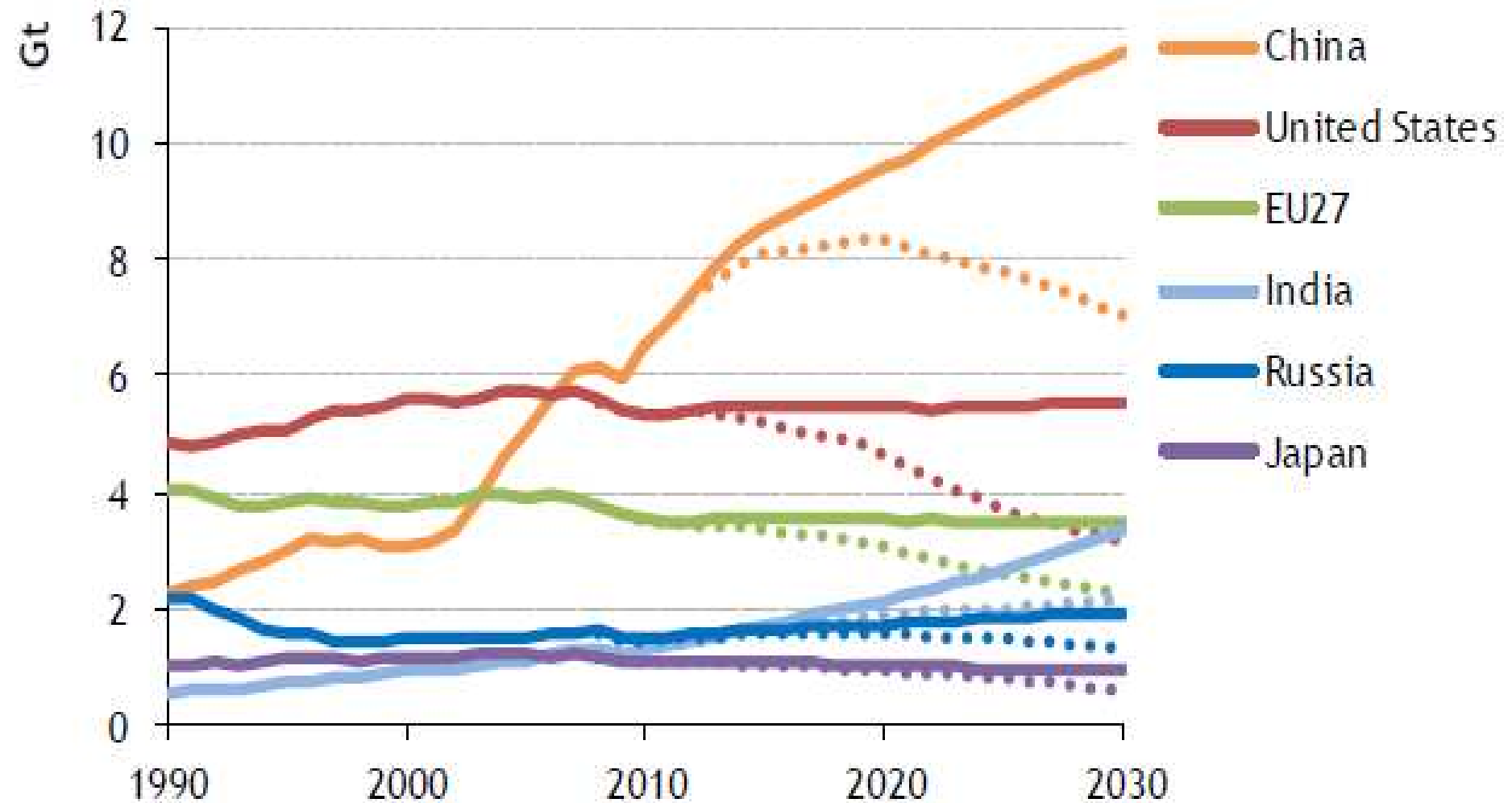
4.3. Performance of G-8: Mixed Performance: GHG Emissions

Country	UNFCCC (1992)		Kyoto Protocol (1997)		Reduction goal (%)	EU-15 Reduction goal (%)	Performance (1990-2009) GHG reductions in % 1990 (base year)		
	Annex 1	Annex 2	Annex B	In transition			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

4.4. Performance of G-20: No Commitment

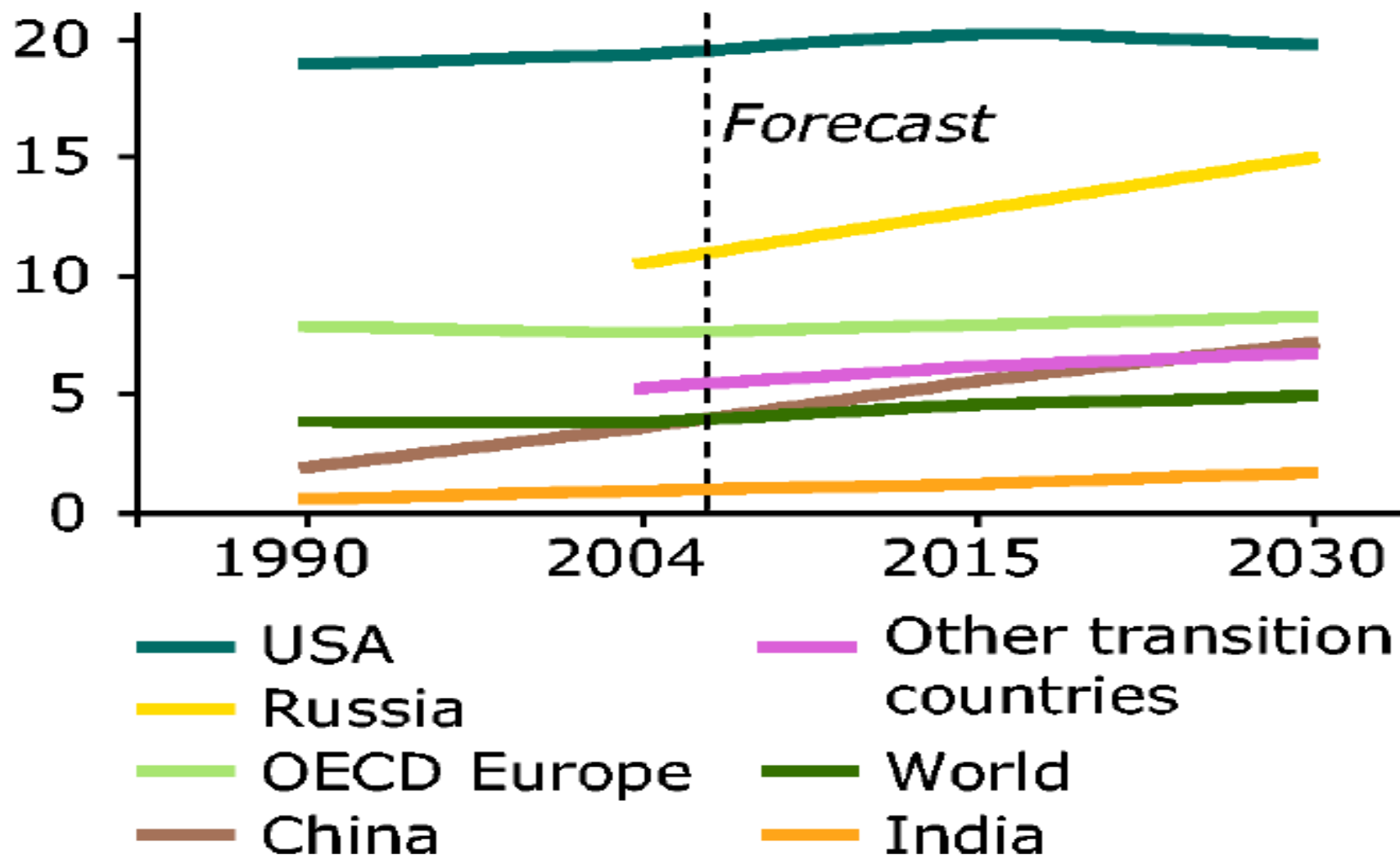
- Between 1950 and 2010 the population of the G20 increased significantly what coincided with a major increase in CO2 emissions since 1971 to 2009.
- With regard to the population projections until 2050 and 2100, population of 4 G8 is projected to continue to grow from 2010- 2100 (USA, France, Canada, 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.

4.5. Energy-related CO2 Emissions for EU27, US, Japan, Russia, China & India (1990-2030). IEA's Global Energy Projections to 2030/2050



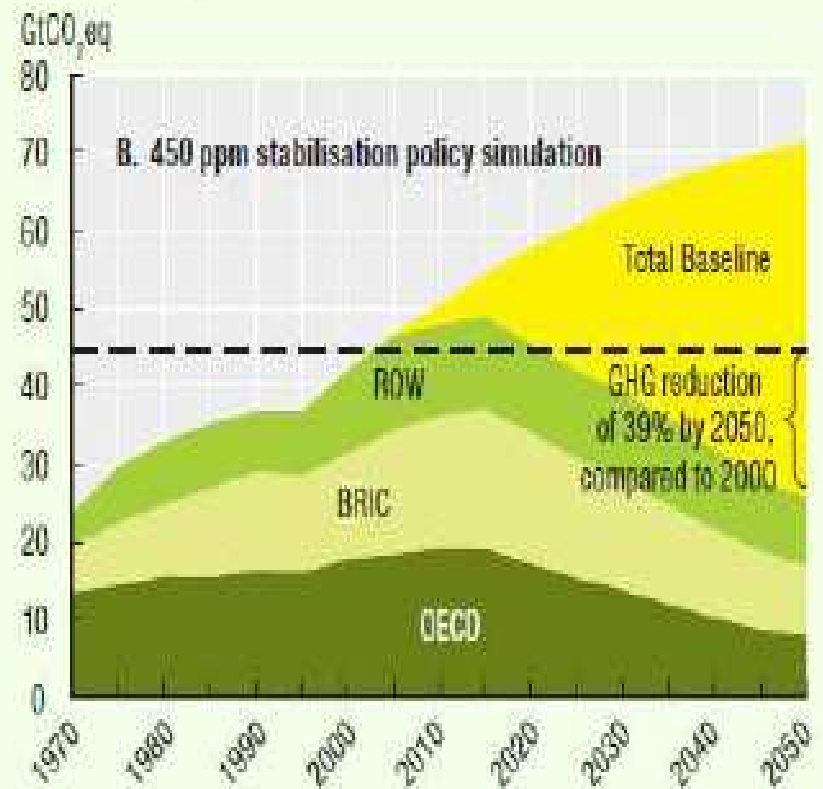
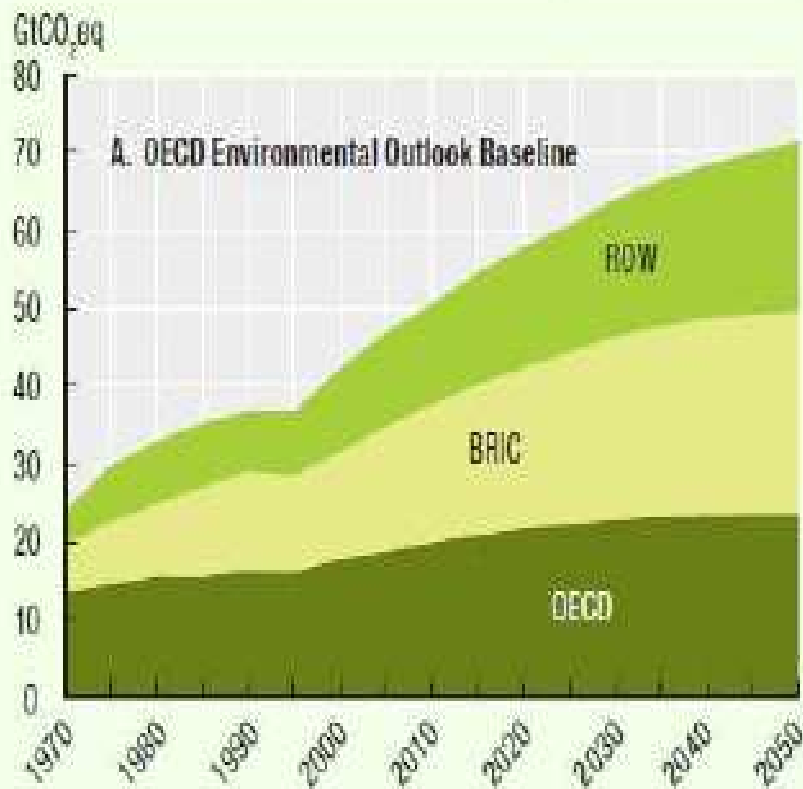
4.6. Energy-related CO₂ Emissions per cap. for EU27, US, Japan, Russia, China & India

Figure 2: IEA estimates and projections of energy-related CO₂ emissions per capita from 1990 to 2030. Source: IEA at: <<http://www.eea.europa.eu/data-and-maps/figures/iea-estimates-and-projections-of-energy-related-co2-emissions-per-capita-from-1990-to-2030>>.



4.7. IEA/OECD: Energy projections & GHG emissions until 2050: 2 scenarios

Figure 4: Total greenhouse gas emissions (by region), 1970-2050. Source: IEA



5. Paralysis of Climate Negotiations

- **Reagan Admin.** put climate change on G-7 agenda
- Domestic economic & ideological opposition: USA: Kyoto Protocol signed but not ratified
- Canada: withdrew in December 2011 from KP
- Canada, US, Japan (Australia) failed: Annex B targets
- COP 15 (Copenhagen) failed: US bypass UN negot.
- COP 16 (Cancun) Accords: voluntary commitments
- COP 17 (Durban): goal 2015 agreement, 2020 in force
- COP 18 (Doha): 26.Nov.-7 Dec. 2012: uncertain outc.

Kyoto Protocol will run out by end of 2012: no agreement on legally binding GHG reduction targets:

My thesis: If present trends continue: security consequences of climate change may occur!

5.1. Average Value of Surface Temperature (IPCC 2007, WG 1, AR4, p. 14)

MULTI-MODEL AVERAGES AND ASSESSED RANGES FOR SURFACE WARMING

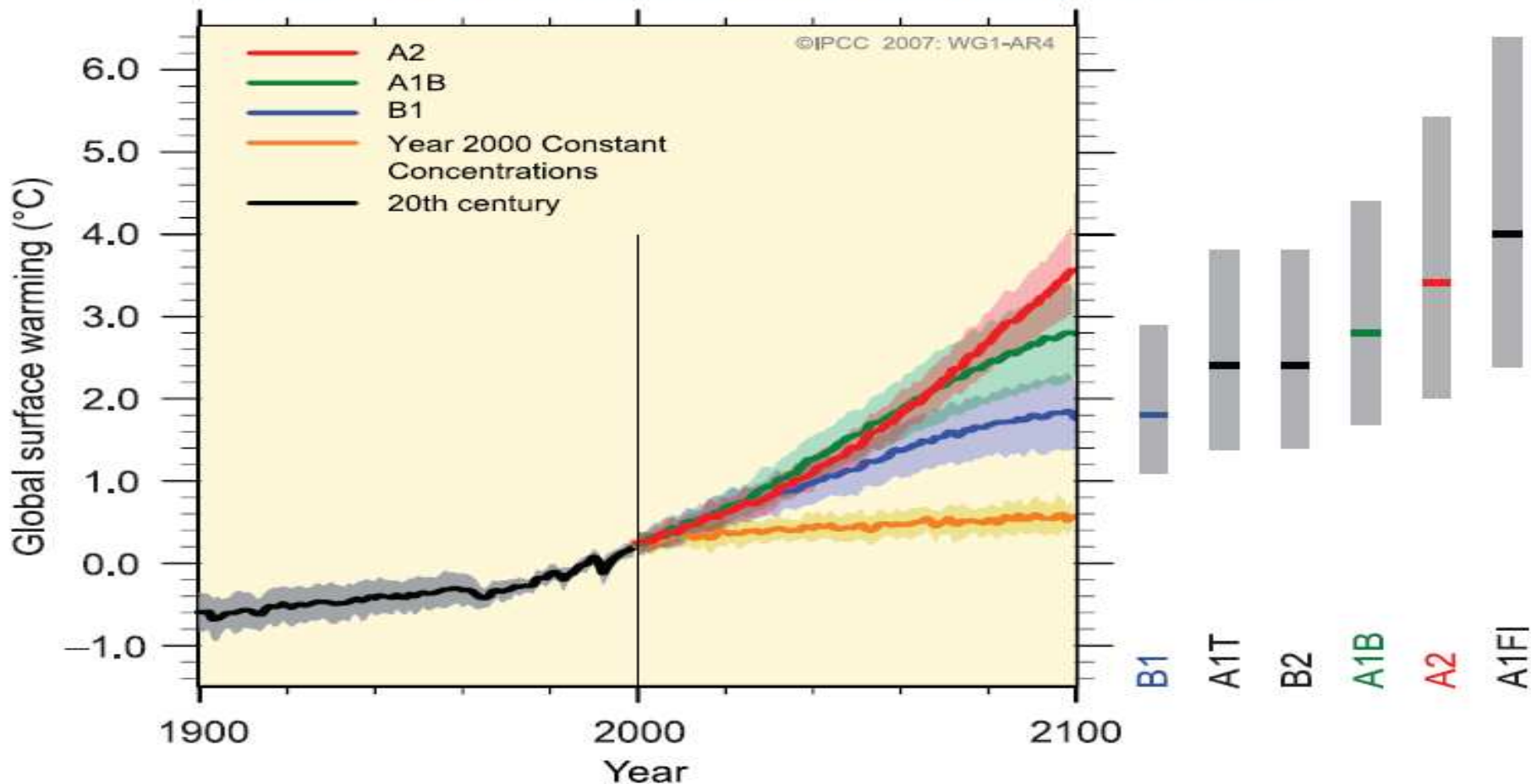


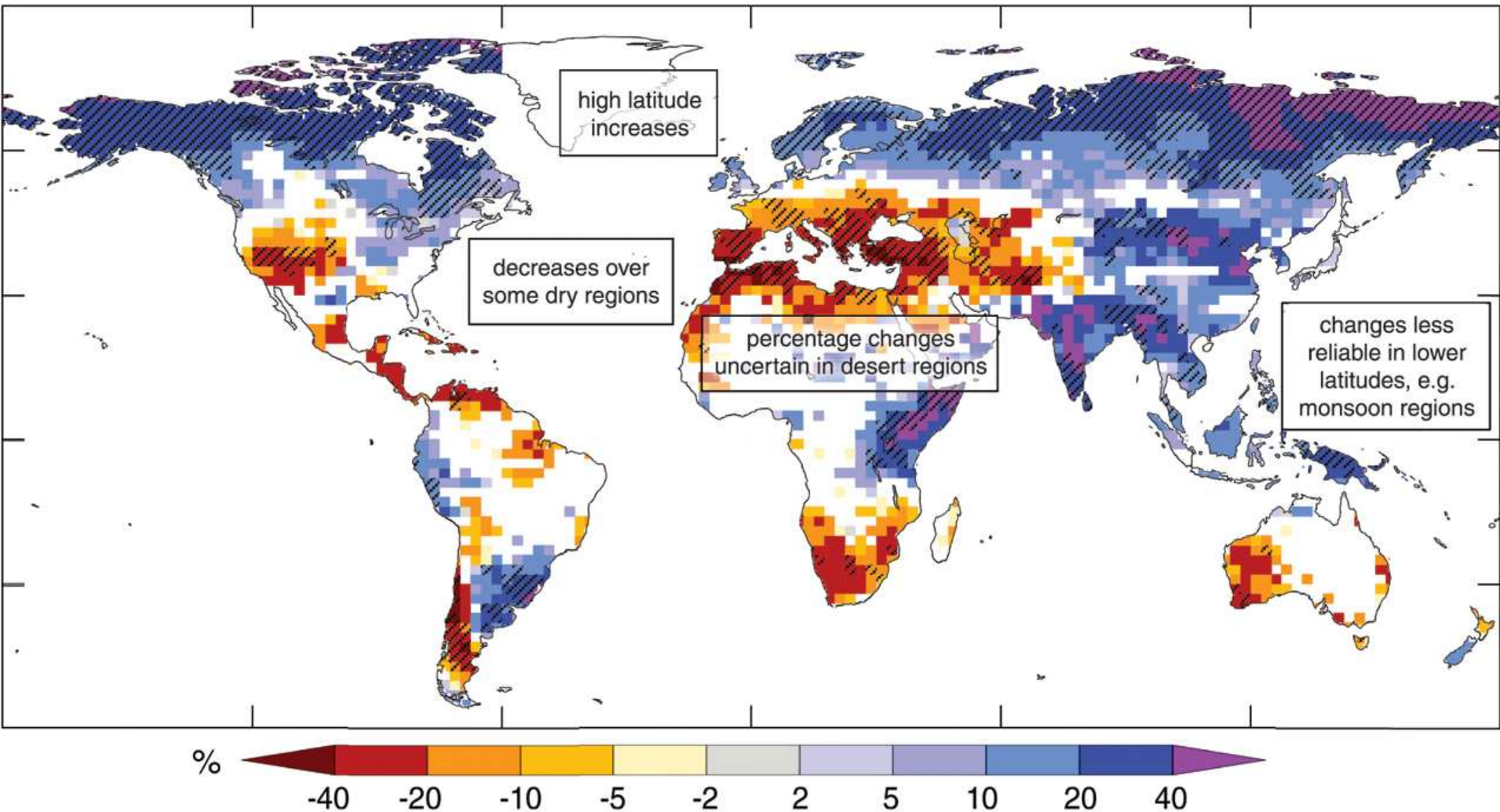
Figure SPM.5. Solid lines are multi-model global averages of surface warming (relative to 1980–1999) for the scenarios A2, A1B and B1, shown as continuations of the 20th century simulations. Shading denotes the ± 1 standard deviation range of individual model annual averages. The orange line is for the experiment where concentrations were held constant at year 2000 values. The grey bars at right indicate the best estimate (solid line within each bar) and the likely range assessed for the six SRES marker scenarios. The assessment of the best estimate and likely ranges in the grey bars includes the AOGCMs in the left part of the figure, as well as results from a hierarchy of independent models and observational constraints. [Figures 10.4 and 10.29]

5.2. From a 2°C to a 4°C World by 2100

- Many scientists agree that the goal of the stabilization of global average temperature at 2°C above the pre-industrial level by the year 2100 is becoming increasingly unlikely. An increase of 2–4°C is becoming more probable.
- This may result in a ‘dangerous climate change’, and an increase of 4–6°C above pre-industrial levels is becoming possible by 2100; this could result in a ‘catastrophic climate change’.
- In September 2009, a conference of the Royal Society (UK) addressed the impacts of a world experiencing the impacts of “four degrees and beyond” (New 2011), while Mark Lynas (2007) discussed Six degrees: Our future on a hotter planet.
- World Bank Study of November 2012 by Potsdam Institute of Climate Change Impact Research: we are moving to +4°C world
- Rahmsdorf study for COP 18 in Doha: Sea level rise: 50cm-1m

5.3. Precipitation Change by 2100:

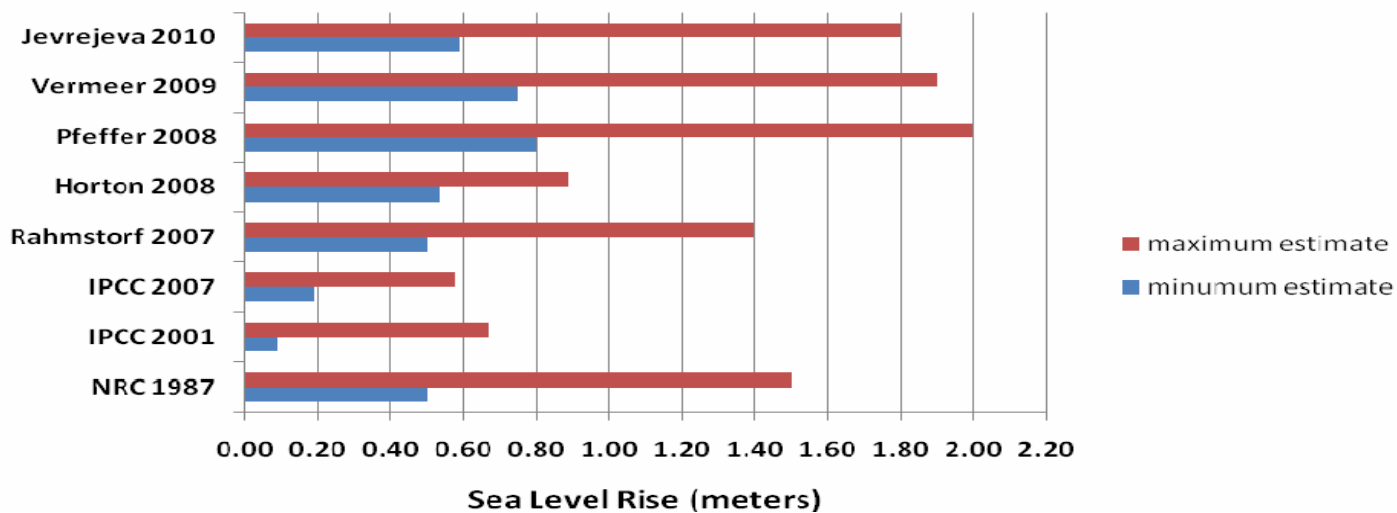
Projections and model consistency of relative changes in runoff by the end of the 21st century



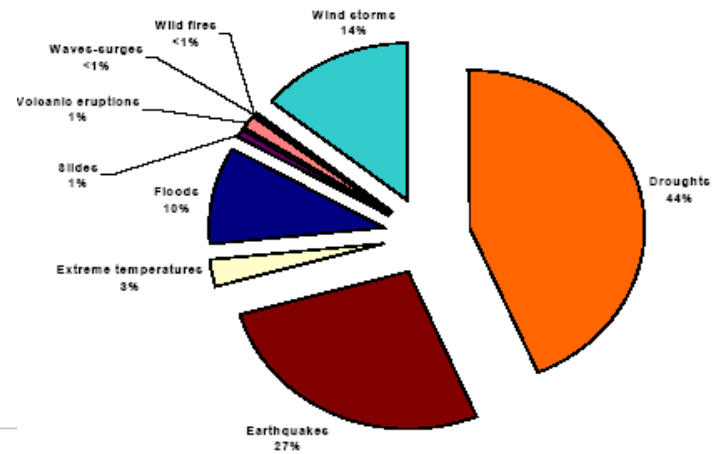
5.4. Projected Increase of Sea Level Rise (IPCC chair, Pachauri, 2008)

Stabilization level (ppm CO ₂ -eq)	Global mean temp. increase (°C)	Year CO ₂ needs to peak	Global sea level rise above pre-industrial from thermal expansion (m)
445 – 490	2.0 – 2.4	2000 – 2015	0.4 – 1.4
490 – 535	2.4 – 2.8	2000 – 2020	0.5 – 1.7
535 – 590	2.8 – 3.2	2010 – 2030	0.6 – 1.9
590 – 710	3.2 – 4.0	2020 – 2060	0.6 – 2.4

Comparison of Peer-reviewed Research Estimates: Global Sea Level Rise by 2100

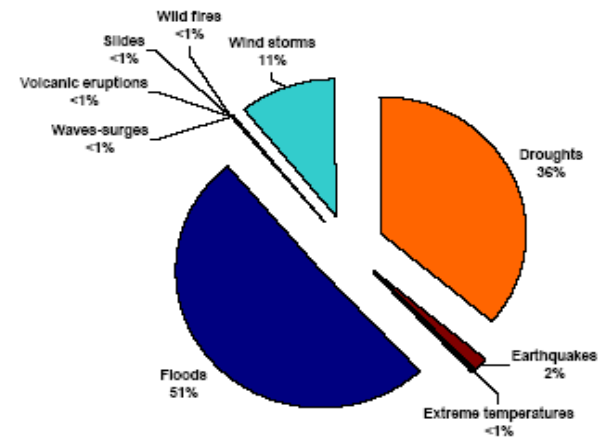


5.5. Climate-related natural hazards

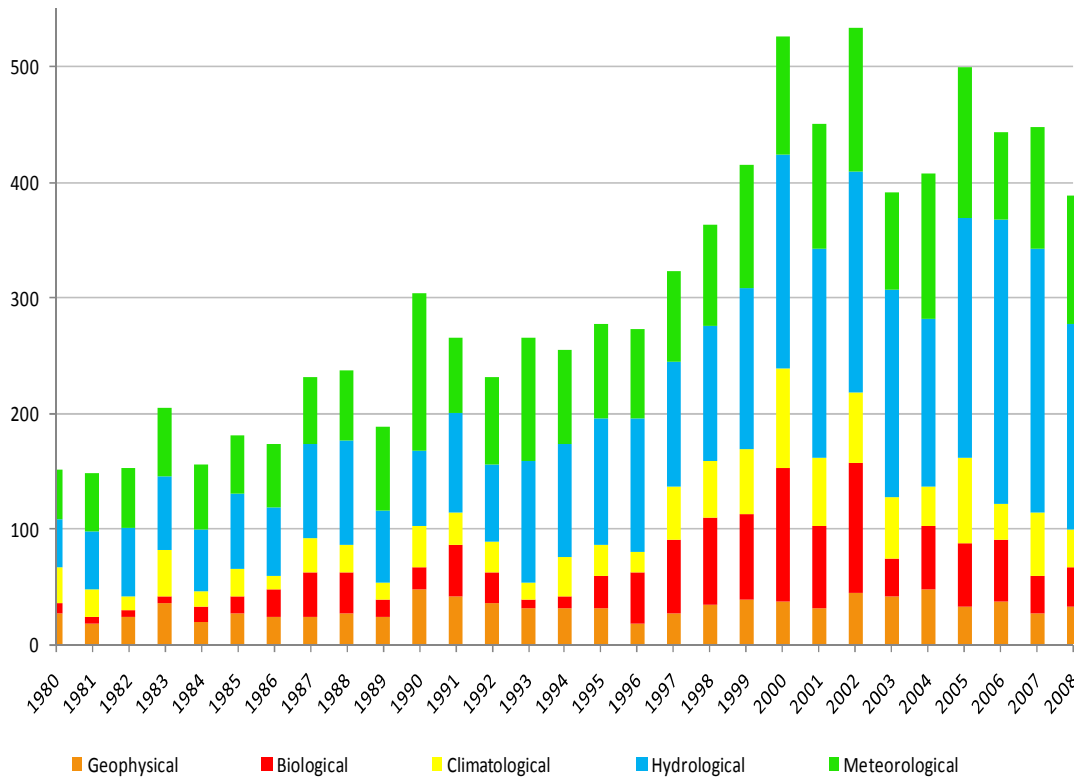


Reported Death of Natural Hazards globally (1974-2003): 2.066.273 persons

Affected persons of Natural Hazards globally (1974-2003): 5 076 494 541 persons



(1) injured + homeless + affected



Changes of Hydro-meteorological Hazards (Guha-Sapir 2010)

5.6. Tropical Cyclones: Threat to Megacities

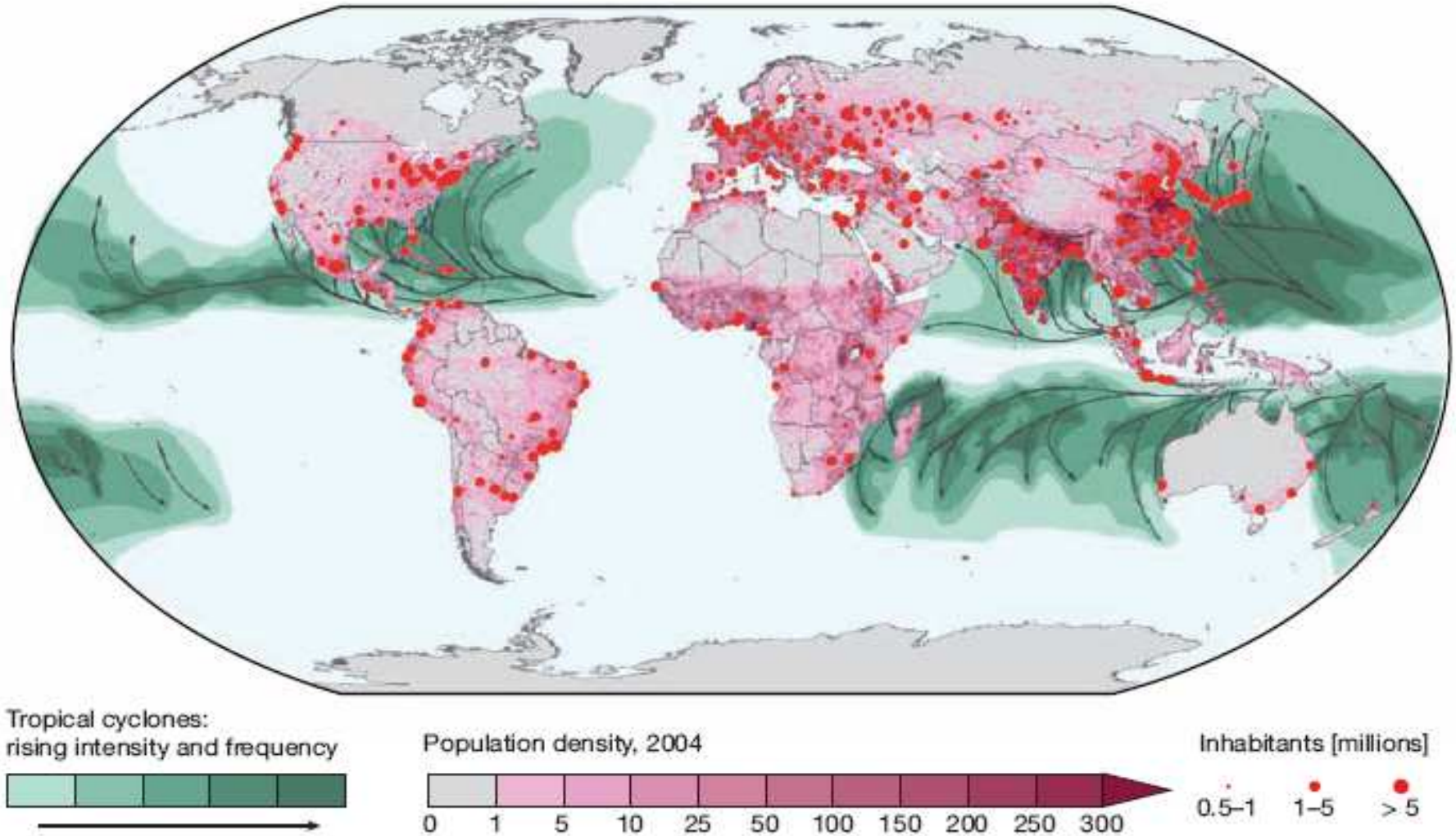
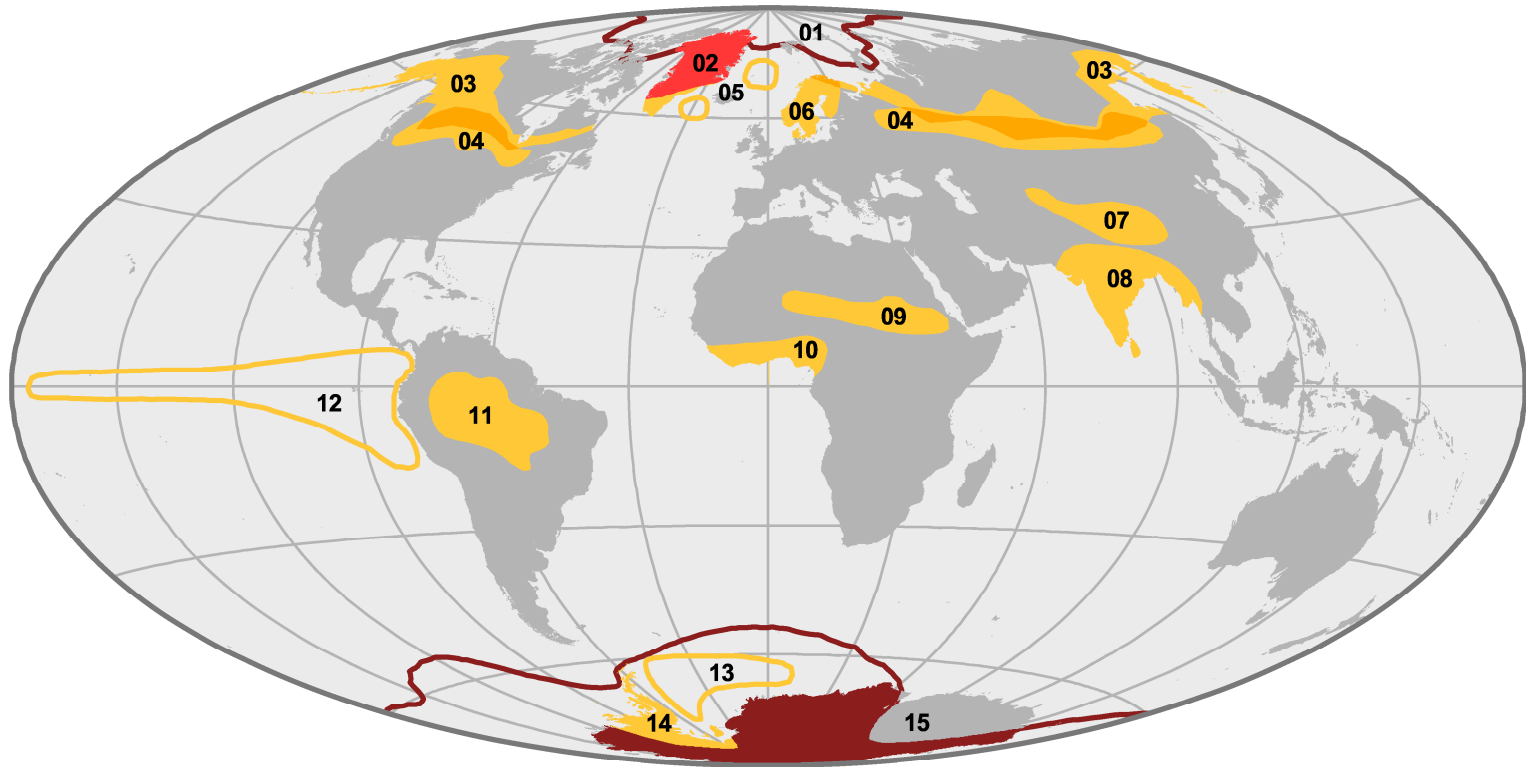


Figure 6.4-1
Tropical cyclone threat to urban agglomerations.
Cartography: Cassel-Gintz, 2006.
Source: WBGU

Potential Anthropogenic Tipping Elements in the Earth System



tipped already
 in limbo
 still stable

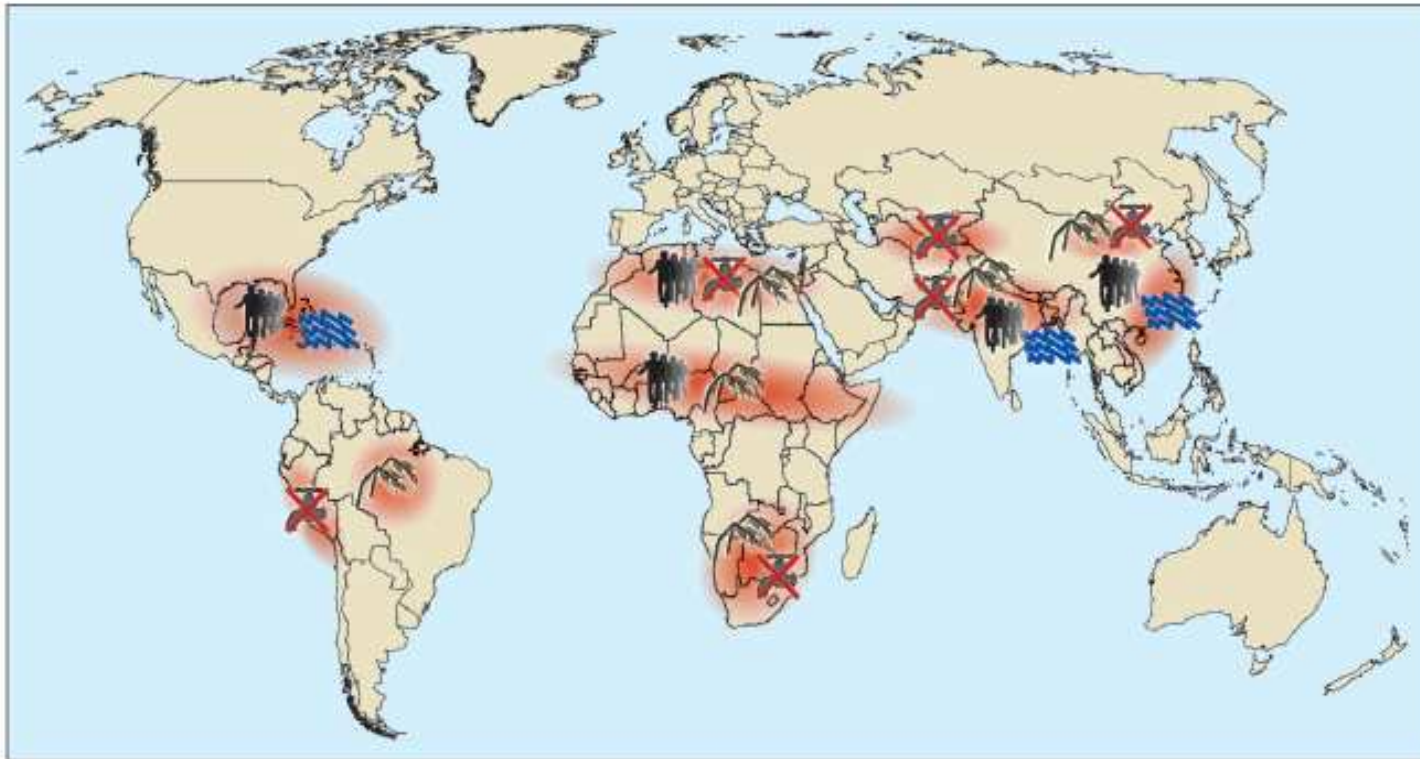
- 01 Arctic Sea Ice Loss
- 02 Greenland Ice Sheet
- 03 Thawing Permafrost / Methan Escape
- 04 Boreal Forest Dieback
- 05 Suppression of Atlantic Deep Water Formation

- 06 Climatic Change-Induced Ozon Hole over Northern Europe
- 07 Albedo Tibetan Plateau
- 08 Indian Monsoon
- 09 Re-Greening Sahara / Sealing of Dust Sources
- 10 West African Monsoon

- 11 Dieback of Amazon Rainforest
- 12 Southern Pacific Climate Oscillation
- 13 Antarctic Deep Water Formation / Nutrients Upwelling
- 14 Westantarctic Ice Sheet
- 15 Antarctic Ozone Hole

5.8. Global Climate Change Hotspots & Conflict Constellations

Figure 4.7: Regional hotspots and security risks associated with climate change. Source: WBGU (2008: 4). Reprinted with permission.



Security-related challenges in MENA region: Water scarcity to rise due to demand increase and supply decline

Rising food deficits

Rising environmentally induced migration

Conflict constellations in selected hotspots



Climate-induced degradation of freshwater resources



Climate-induced decline in food production



Hotspot

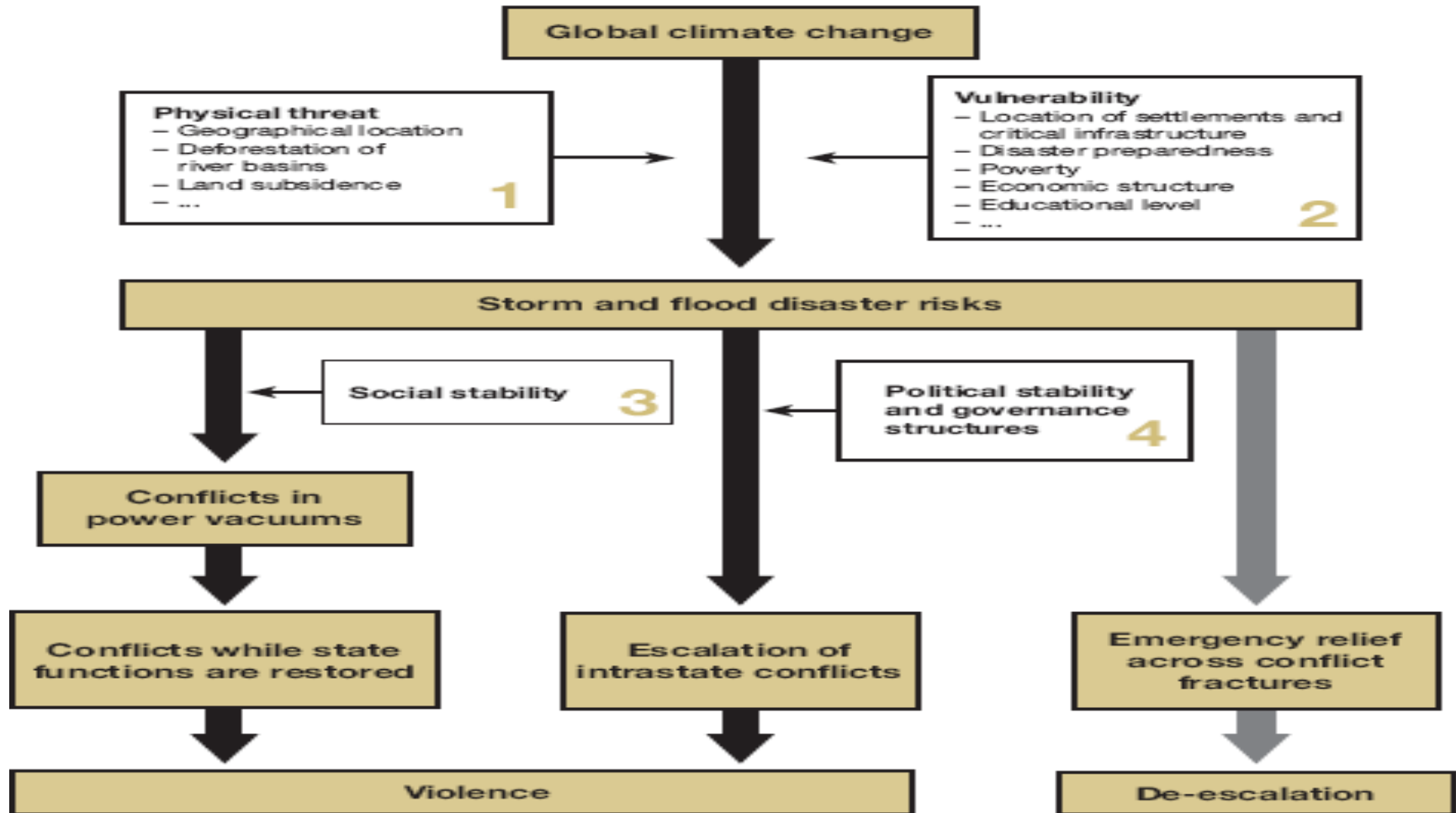


Climate-induced increase in storm and flood disasters



Environmentally-induced migration

5.9. Conflict Constellation Climate-induced Increase in Storm & Flood Disasters



Boxes 1–4: Dimensions of influence with key factors

➔ Central causal chain

→ Influence of key factors on the central causal chain

6. Alternative perspectives & visions: Business-as-usual vs. Sustainability Transition

Oswald Spring and Brauch (2011) argued that:

- **Vision of business-as-usual with minimal reactive adaptation & mitigation strategies** will most likely increase the probability of a 'dangerous climate change' or catastrophic GEC with linear and chaotic changes in the climate system & socio-political consequences that represent a high-risk approach.
- To avoid these consequences the **alternative vision and 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 as well as on interstate relations in the world), **mindsets** (strategic perspectives of policy-makers) and new forms of **national and global governance**.
- Alternative vision of a **new fourth 'sustainability revolution'**: 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.

6.1. 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**
- ***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.**
- **No Need for a Sustainability Revolution**

6.2. 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.

6.3. 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”

6.4. 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.

7. Discourse on Sustainability Transition: 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 transitions' 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.

7.1. 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.

7.2. Emerging Scientific ST Discourse

- **2001: Amsterdam conference** on Earth Systems Science (ESSP)
- **2004: Clark/Crutzen/Schellnhuber** provided conceptual context for the **Dahlem Workshop on “Earth Systems Science and Sustainability” (2003)**, where they pointed to “the need for harnessing science and technology in support of efforts to achieve the goal of environmentally sustainable human development in the Anthropocene”
- **2005: KSI started** to work on Sustainability transition (John Grin, co-chair)
- **2009: Amsterdam Conference on Sustainability Transition** resulted in Sustainability Transition Research Network (STRN)
- **2010: Routledge Series on Sustainability Transitions** was launched
- **2011: Elsevier: Environmental Innovation and Sustainability Transition**
- **2011: Oswald Spring/Brauch: Fourth Sustainability Revolution (FSR)**
- **2011: Brauch/Dalby/Oswald Spring: A Political Geoecology for the Anthropocene**
- **2011: WBGU. Report: A Social Contract for Sustainability**
 - We are currently witnessing the emergence of a new scientific paradigm that is driven by unprecedented planetary-scale challenges, operationalized by transdisciplinary centennium-scale agendas, and delivered by multiple-scale co-production based on a new contract between science and society.
- **2012: Third STRN Conference in Copenhagen: 30-31 August 2012**
- **2013: Fourth STRN Conference in Zürich in June**

7.3. 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.

7.4. Seven Dimensions of Emerging 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**

7.5. Discourse on Sustainability Transition

- **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.**

8. EU-27 Climate & Energy Policy Goals: GHG Reductions by 2020 & 2050

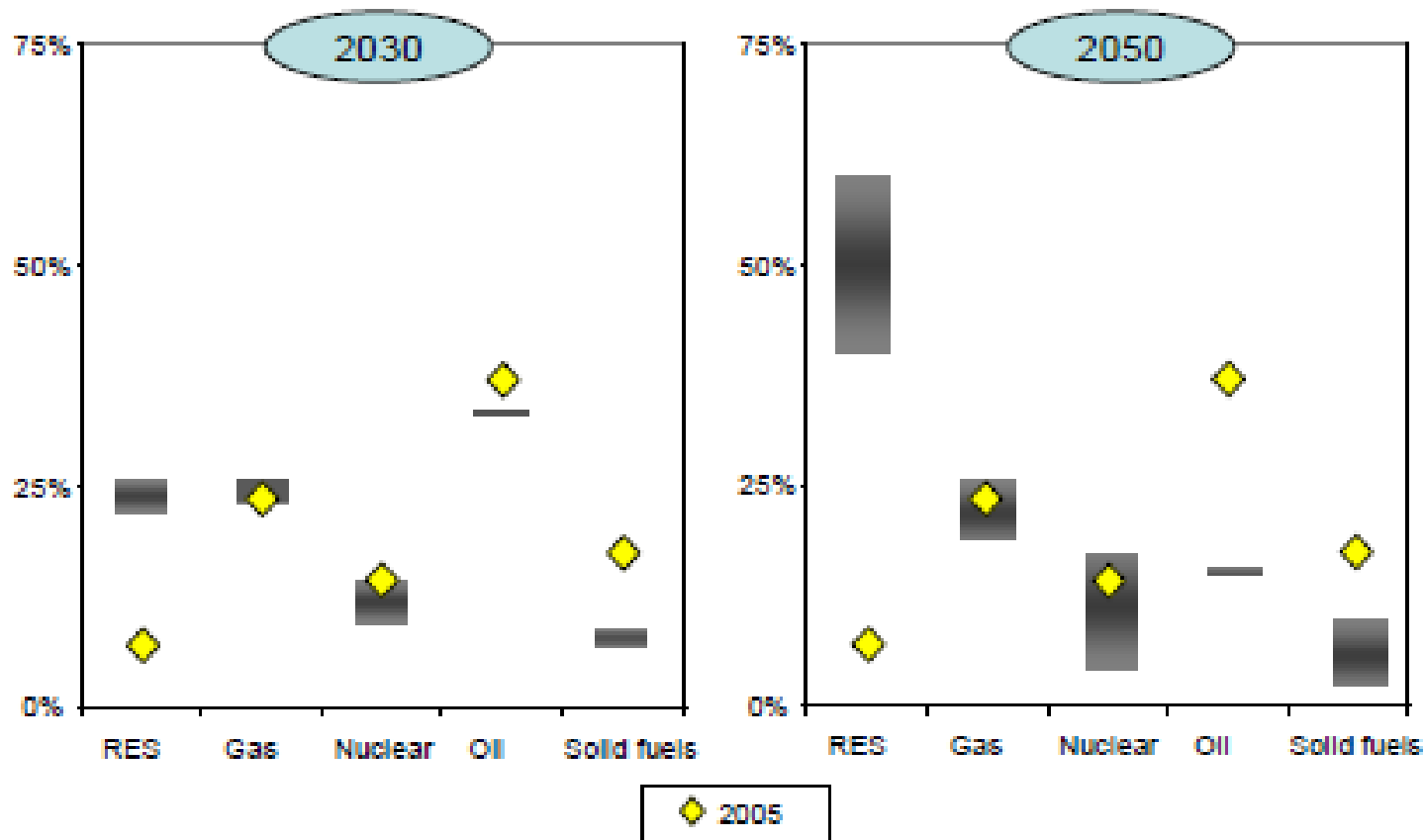
- Among EU-27 **Germany, UK, France & Italy: 54.9% of GHG** weighted emissions in CO2 equivalents who complied with their EU reduction targets.
- Among the 27 EU countries several laggards missed their reduction targets under Annex B of the KP and EU-15 'burden-sharing' approach, **Spain (+37.7/+11.8%), Portugal (+35.3/-3.0%), Ireland (+32.4/-0.8%), Greece (28.6/-10.5%)**; their combined share of the EU-27 was 13.7% in 2009.
- EU-27 are the global leaders in implementing their commitments under KP.
- **In March 2007**, the European Council decided for a 20/20/20 target by 2020:
 - reduction in EU GHG emissions 20% cent below 1990 levels;
 - 20% of EU energy consumption to come from renewable resources;
 - 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency.
- On 10–11 December 2009, the European Council offered to increase its emissions reduction to thirty per cent if other major emitting countries would commit to significant reductions under a global climate agreement.
- **On 15 December 2011 the European Commission (2011) released its Energy Roadmap 2050**

8.1. 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 energy sector.**

8.2. 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 %)



9. Energy Transition:

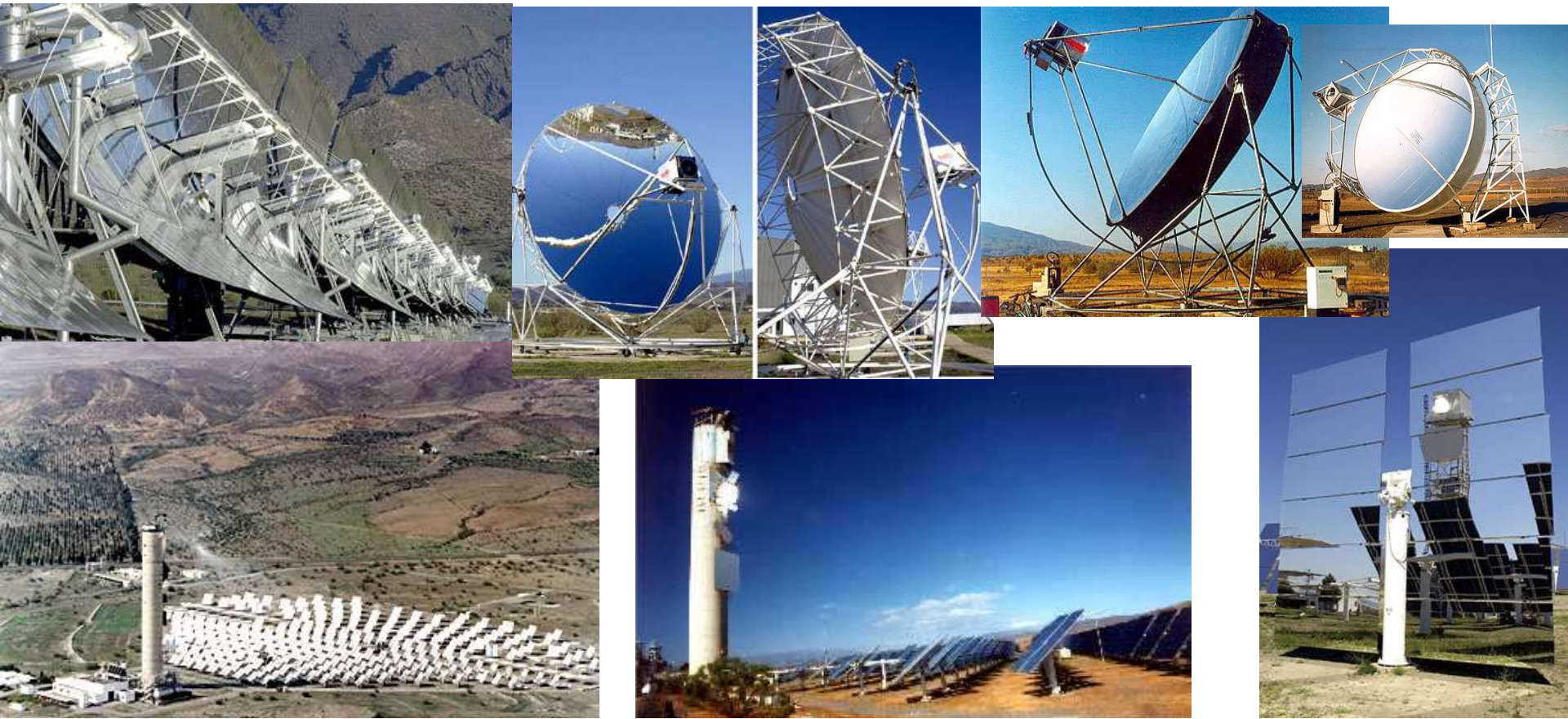
Bottom-up vs. top-down

- Energy transition has started globally & accelerated since 2009: China major producer
- Energy transition in Germany: bottom-up
 - State set the legal framework (national renewables)
 - Electricity Feed-In Law
 - Renewable Energy Law (2000)
 - Customers: Investment in Wind and Solar Power
- Top-down: Macro Scale Proposals
 - Import of renewable electricity from the desert
 - As part of a co-development strategy between Europe and MENA Region

9.1. Solar Thermal Technologies for Electricity Generation in the Deserts

Concentrating Solar Power Technologies:

- ❖ alternatives: a) Fresnel concentrators, b) parabolic trough (400-600 °C), c) solar tower concept with surrounding heliostat field (1200 °C, up to 50 MW), d) solar dish (for small applications up to 50 kW).

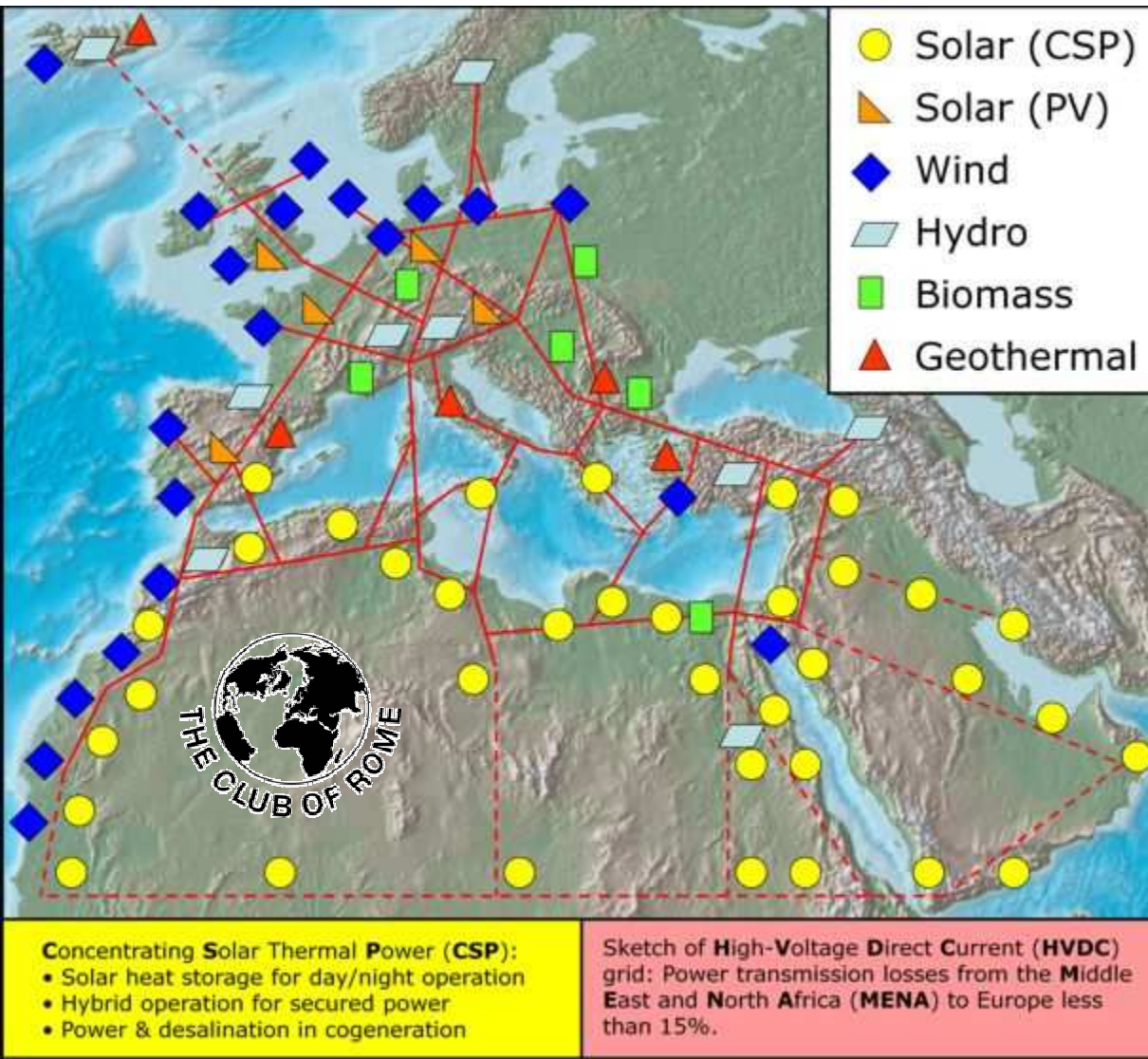


9.2. System of Solar Electricity Generation

SEGS, California, USA (354 MW, since 1985)
ANDASOL 1, Spain (50 MW, 7h storage, 2009)



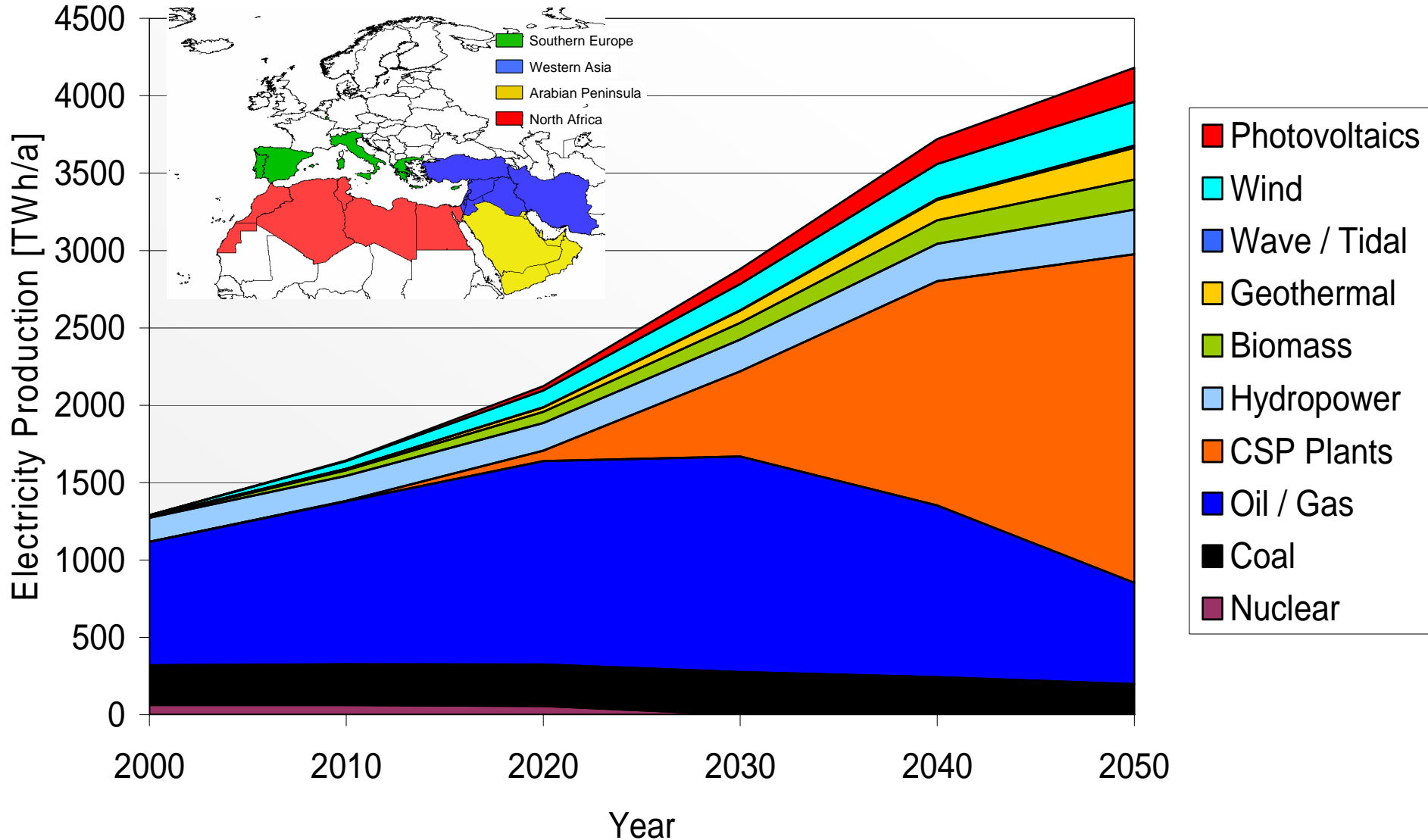
9.3. Mediterranean Renewable Energy Potential



Trans-Mediterranean Renewable Energy Cooperation (**TREC**) is an initiative that campaigns for the transmission of clean power from deserts to Europe.

Since 2003 TREC has developed the **DESERTEC Concept**.

9.4. Annual electricity demand & generation within the countries analysed in the MED-CSP scenario

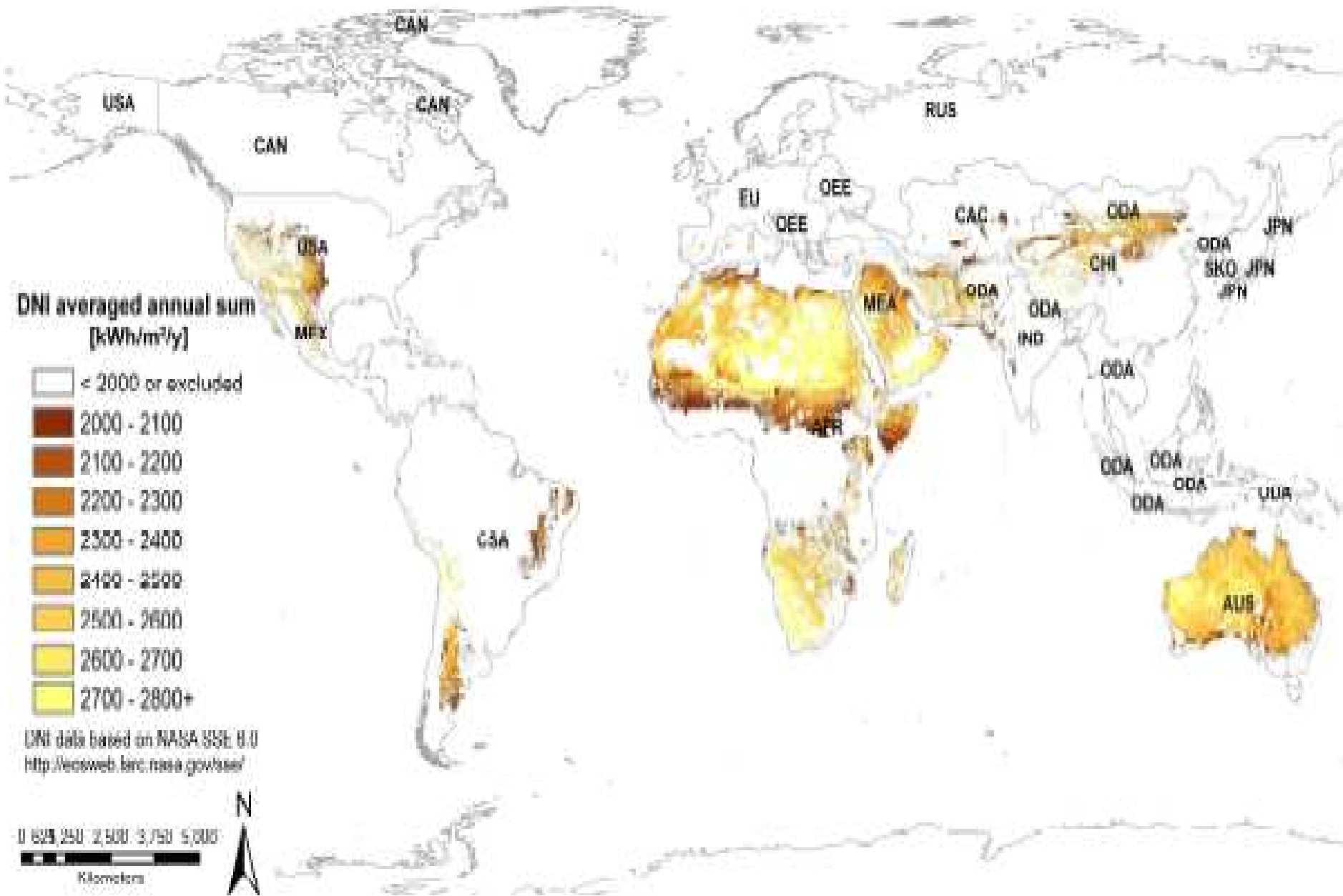


9.5. Desertec Vision: An Intercontinental Mega Project

An Initiative of

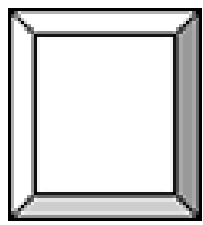


9.6. World Solar Potential



10. Launch of two Springer Briefs in Environment, Security, Development & Peace & Pioneers in Science & Practice

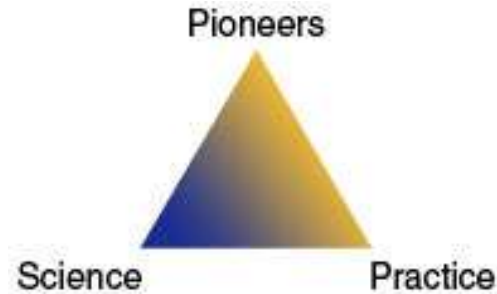
- ***Goal: conceptual quartet:***
 - 4 key concepts and linkages among: Environment, Security, Development & Peace
- ***Goal: global, multidisciplinary, peer-reviewed***
 - Global: more voice and visibility
 - Multidisciplinary: social & natural sciences
 - Peer-reviewed: 2-3 anonymous reviews (listed in Thompson of peer reviewed books)
- **Publisher: Springer: one of two largest scientific publishers globally (biggest electronic book collection)**
- **Three versions:**
 - Electronic book (SpringerLink; all chapters)
 - Softcover book (digital printing, with colours,
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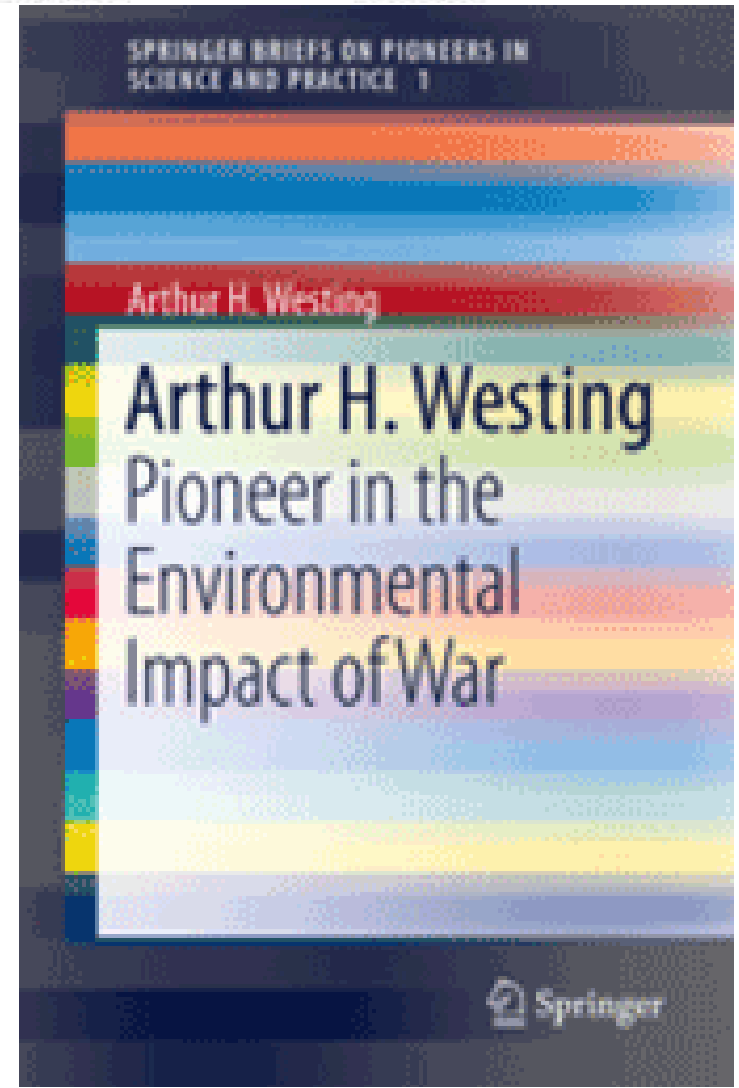
the language of science

- **SpringerBriefs in Environment, Security, Development and Peace (ESDP): Peer Reviewed Book Series**
- Mely Caballero-Anthony, Youngho Chang and Nur Azha Putra (Eds.) [Singapore]: **Energy and Non-Traditional Security (NTS) in Asia.** [ESDP] vol. 1 (Heidelberg – Dordrecht – London – New York: Springer-Verlag, 2012).
- Mely Caballero-Anthony, Youngho Chang and Nur Azha Putra (Eds.) [Singapore]: **Rethinking Energy Security in Asia: A Non-Traditional View of Human Security.** [ESDP] vol. 2 (Heidelberg – Dordrecht – London – New York: Springer-Verlag, 2012).
- Philip Jan Schäfer [Germany]: **Human and Water Security in Israel and Jordan.** ESDP, vol. 3 (Heidelberg et al: Springer-Verlag, 2012).
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