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Deutsches Institut für
Entwicklungspolitik

German Development
Institute

Addressing global challenges through multilateral cooperation in science, technology and innovation

Some preliminar thoughts based on the examples of STI governance for food security and the energy/climate challenge

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“Unsustainable patterns of production, consumption, and population growth are challenging the resilience of the planet to support human activity. At the same time, inequalities between and within societies remain high, leaving behind billions with unmet basic human needs and disproportionate vulnerability to global environmental change.”

“We are the first generation facing the evidence of global change. It therefore falls upon us to change our relationship with the planet, in order to tip the scales towards a sustainable world for future generations.”

3rd Nobel Laureate Symposium on Global Sustainability
Transforming the World in an Era of Global Change
Stockholm, May 16-19, 2011

THE STOCKHOLM MEMORANDUM



- We need to address global challenges through cooperation and collective action, empirical evidence shows that this can be done (banning of CFC).
- STI is a key factor in addressing global challenges. International cooperation in STI is the core of the STIG project: How can it be done to deliver fast and effective results
- Considering the scale of the challenges and the urgency to address them, the existing modes of governance are insufficient to deliver the required responses
 - example: Food security
 - example energy
- A broad and „border-crossing“ approach to global STI cooperation is needed



- Climate Change
 - Global Health
 - Food Security
 - Biodiversity
 - Water Security
 - Population
 - Energy Security
- What about
- Soil Erosion?
 - Endangered Fish Stocks?

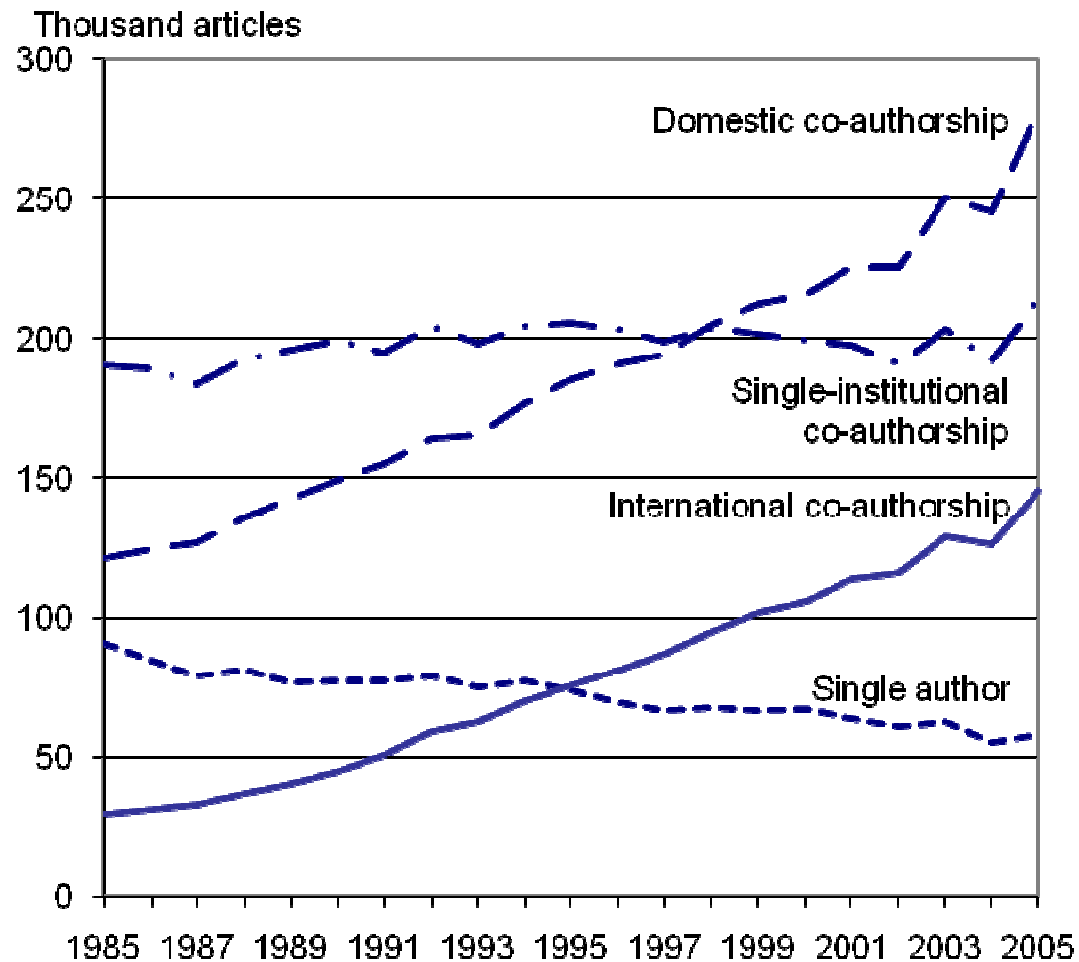


- Climate Change
- Global Health
- **Food Security**
- Biodiversity
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➤ What about

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Growing international cooperation in STI



Source: OECD STI Scoreboard 2009

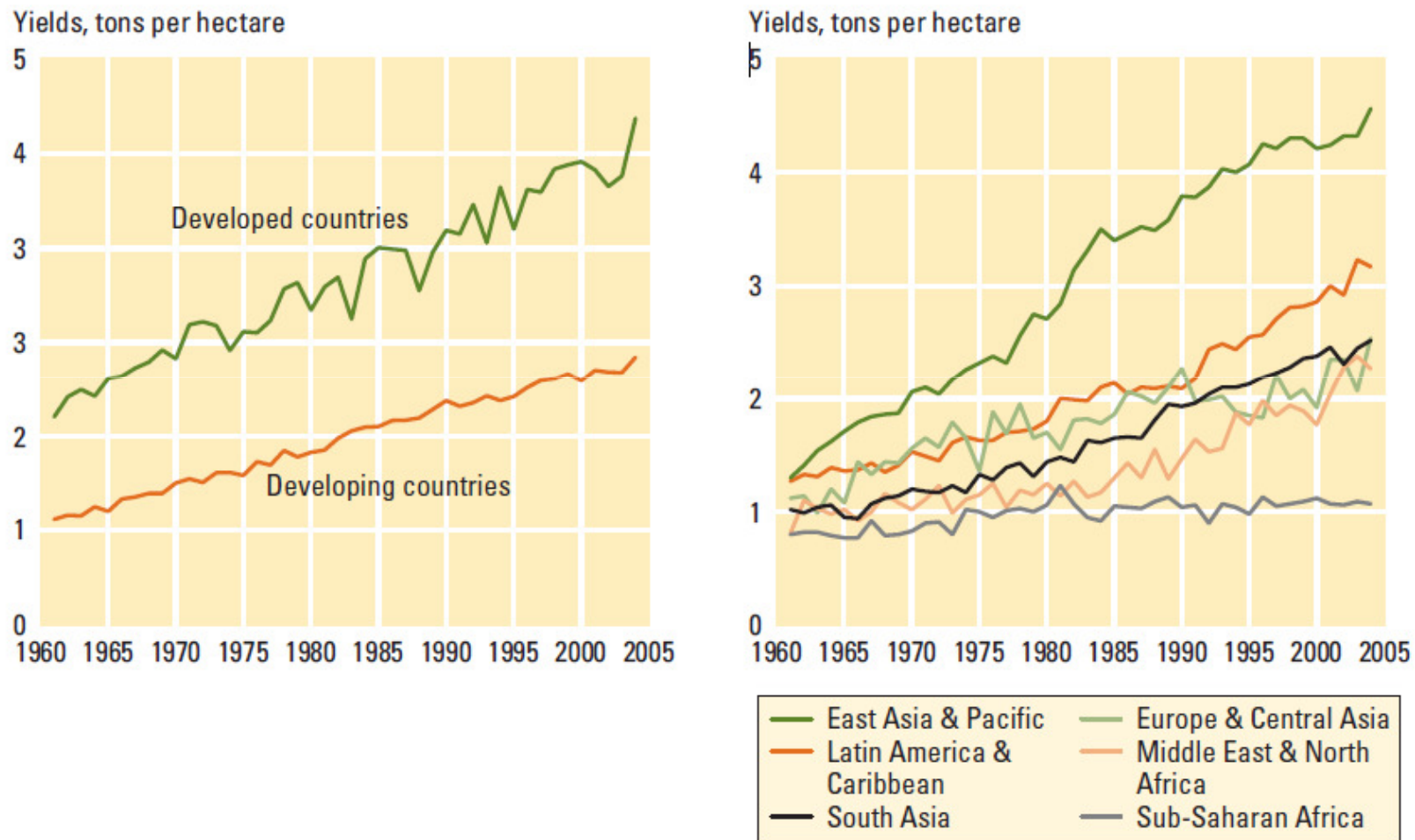


- World food production must rise by 50% by 2030 to meet the increasing demand (UN Secretary General, Ban Ki-moon, at a UN world food summit in June 2008)
- 78 % of the increase in crop production between 1961 and 1999 was attributable to yield increases, and 22 % to expansion of harvested area.
- Extensification may still contribute to crop production in Sub-Saharan Africa (27%) and Latin America (33%) but almost no additional land available in South/East Asia and Near East/North Africa

STI ensuring stepping-up of food production



Figure 2.1 Cereal yields rose, except in Sub-Saharan Africa



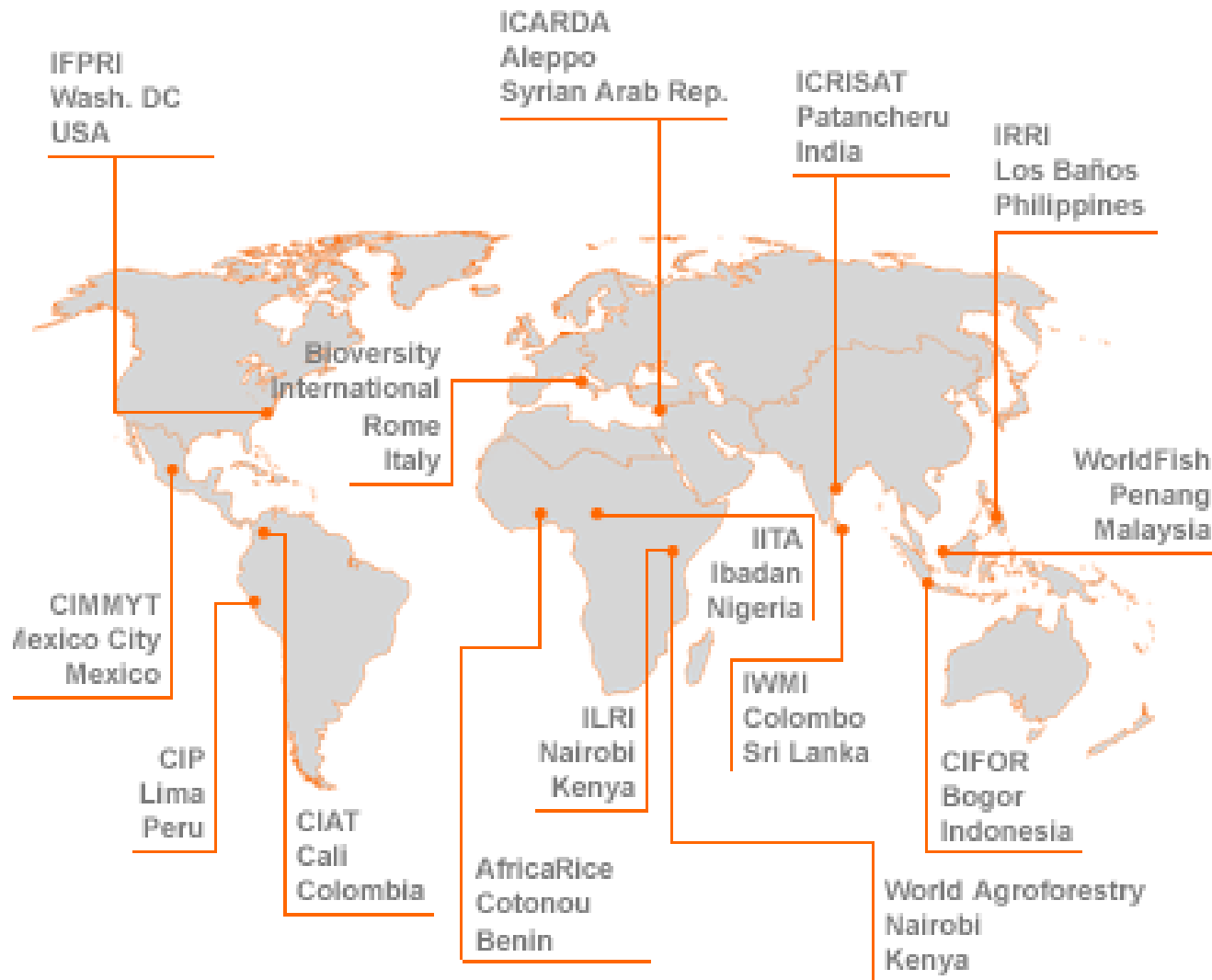
Source: FAO 2006a.

CGIAR as a driver of food security



- Established 1971 as joint initiative of World Bank, FAO, UNDP, Rockefeller and Ford Foundation
- Mission: Combine cutting-edge global research with practical local impact
- Linking up with local communities to harness local knowledge (traditional varieties, soil conditions, farming practice, social and dietary preferences)

15 CGIAR Centers – across the (developing world)




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- Annual budget of US-\$ 550 million
 - (Monsanto's annual research budget US-\$ 1.2 billion)
- Every \$1 invested - \$9 worth of additional food produced in developing countries
- Without CGIAR
 - world food production 4-5% lower
 - world grain prices 18-21% higher
 - 13-15 million more children malnourished



- Establishment of a Global Fund for Research
- Legal body of the consortium
- STI delivered through eight “mega-programmes”

 focus and more centralized governance in order to achieve higher impact - at the expense of bottom-up governance and autonomy of researchers and Institutes



"Given the nature and magnitude of the challenge, national action alone is insufficient. No nation can address this challenge on its own. No region can insulate itself from these climate changes."

Ban Ki-Moon, Secretary-General of the United Nations, in his opening address to the High-Level Event on Climate Change, 24 September, 2007.

EURATOM: Early example of multilateral energy cooperation



- 1951: European Coal and Steel Community (ECSC), six Western European Nations, first roots of the EU
- 1957: European Atomic Energy Community (EAEC or EURATOM) created by the Treaty of Rome, together with the European Economic Commission (EEC).
- 1993 (Maastricht Treaty), 2007/2009: Treaty of Lisbon: Fusion of EEC, ECSC to form the EU
- EURATOM maintains a distinct legal personality
- Why ?
- Main reason: lack of political support to nuclear energy



- to develop research and ensure the dissemination of technical knowledge;
- to establish uniform safety standards for the health protection of the general public and workers, and to monitor their application;
- to facilitate investment and ensure the establishment of the basic installations necessary for the development of nuclear energy in the Community;
- to ensure that all users in the Community receive a regular and equitable supply of ores and nuclear fuels;
- to make certain, by appropriate supervision, that nuclear materials are not diverted to purposes other than those for which they are intended;
- to exercise the right of ownership conferred upon it with respect to special fissile materials;
- to create large markets and access to the best available technical means by establishing a common nuclear market;
- to establish relations with third countries and international organisations to foster progress in the peaceful use of nuclear energy.



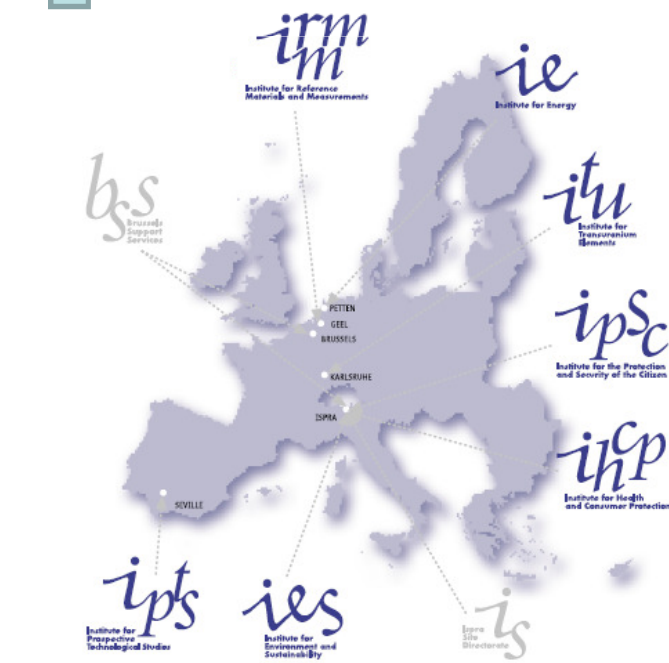
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Instruments of joint EUROPEAN research in nuclear energy



- Knowledge sharing
- Assuring access to nuclear fuels
- Coordinated national programs
- Collective ownership and monitoring of nuclear fuels to avoid nuclear armament
- Pooling of resources in Framework programs
- Joint Research Centers

N° FP	Period	Fusion	Fission	JRC	Total
FP4	1994-1998	794 M Euros	170 M Euros	271 M Euros	1235 M Euros
FP5	1998-2002	788 M Euros	191 M Euros	281 M Euros	1260 M Euros
FP6	2002-2006	824 M Euros	209 M Euros	319 M Euros	1352 M Euros
FP7	2007-2011	1947 M Euros	287 M Euros	517 M Euros	2751 M Euros



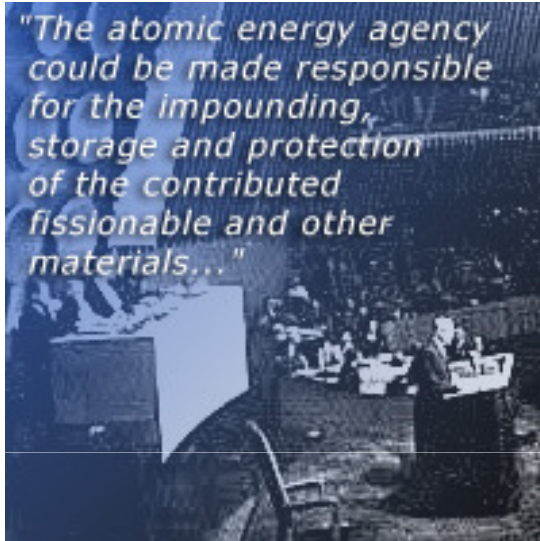
Multilateral cooperation in long-term energy research (Nuclear fusion energy)



- International Thermonuclear Experimental Reactor ITER
- Launched in 1985 at the Geneva Superpower Summit
- Initial members: USSR, USA, EURATOM and Japan,
- 2003: China and Korea
- 2005: India
- 2008: Start of the construction work in Cadarache (Southern France)
- Estimated costs: 10 bn. €



IAEA: The intergovernmental “Atoms for Peace” Agency

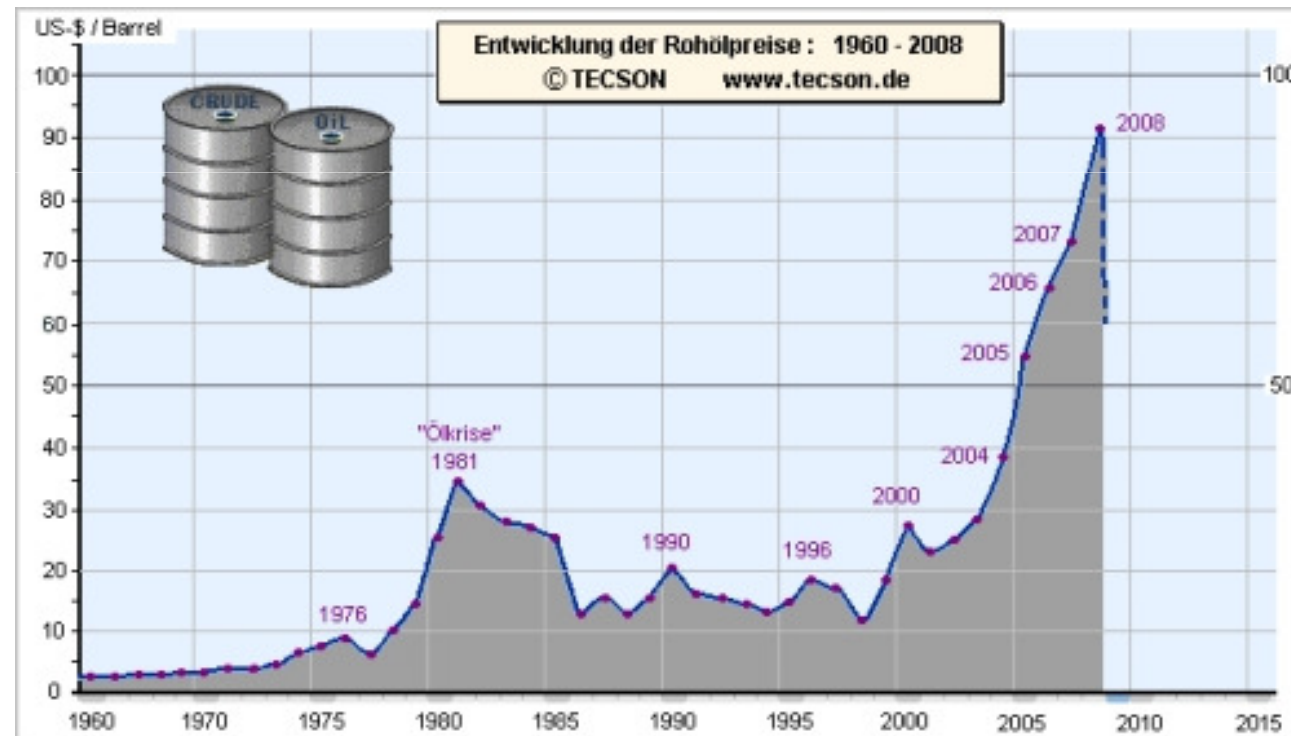


- Idea launched by Eisenhower in his “Atoms for Peace” speech in 1953
- Established in 1957 (approved by 81 member states)
- Headquarter in Vienna, research labs in Seibersdorf/Austria
- 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT)
- Three pillars:
 - Safeguards & Verification
 - Safety and Security
 - Science & Technology





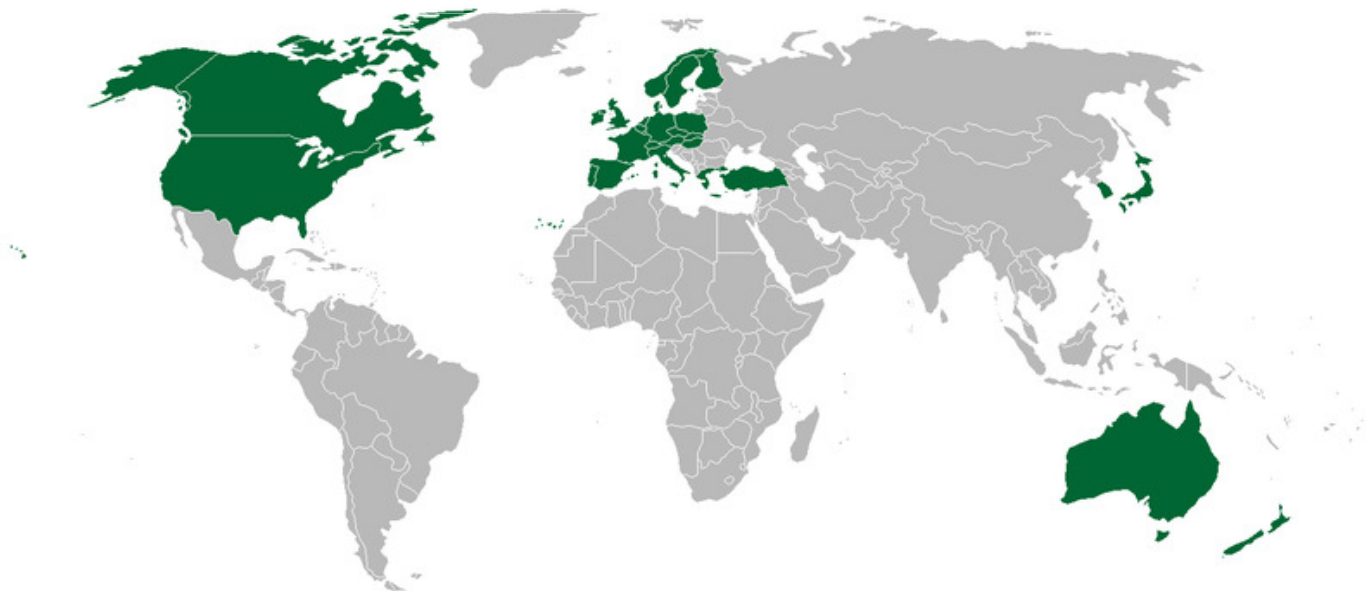
- Background: 1973 Oil Crisis, triggered by the Yom Kippur War (Israel, Egypt, Siria)
- OPEC reduced oil production as a response to West support to Israel



The International Energy Agency



- Established 1974 in the context of the OECD (today 26 of 30 member countries)
- Implementation Agreements (40) as the main format for R&D cooperation
- **Cost sharing**, in which participants contribute to a common fund to finance the work.
- **Task sharing**, in which participants assign specific resources and personnel to carrying out their share of the work.





- Established 2009 in Bonn
- Signatory countries: 142 states and the EU
- Main objectives:
 - promote renewable energies
 - develop adequate policies at the local, regional and national level
 - Secretariat: Abu Dhabi
 - Innovation Center: Bonn



Some lessons to be learned from global energy related research (1)



- (Nuclear) energy related research as an early example of international STI cooperation
- Nuclear energy seen both as a global opportunity (endless energy supply) and a global threat (proliferation of nuclear weapons)
- Working in pre-competitive fields led to interesting modes of cooperation even across the global power blocs



- Fragmentation of governance in international energy STI
 - due to vested and new stakeholders' interests (fossil fuel: IEA; nuclear: IAEA; renewables: IRENA)
 - due to differences in the assessment of risks and opportunities (nuclear, CCS)
 - due to clearly separate epistemic communities (nuclear, renewables)
- Hampers the development of strategies towards green energy economies

Final remarks (1): “Life is not a pony farm” ... nor is it “all guns and roses”



- ... and neither is the sustainability transition
- The required changes will lead to open or implicit conflicts
 - between vested interests (oil, coal, nuclear; meat or vegetarian etc.)
 - between people with varying assessments of risks and opportunities - we have to act under conditions of urgency and of imperfect information (CCS)
 - with people following the “NIMBY” ideas (not in my back yard) – they may have legitimate reasons for this
 - between generations (Brundtland definition of sustainability)
- Raising awareness, convincing, Bargaining, buying-in ...



- Social sciences have to play an important role in the sustainability transition
 - ... in understanding the social implications of the required transformation
 - ... in understanding the structures of vested interests and related power relations
 - ... in developing strategies for convincing and “buying in”, not only, but including financial transfers
 - ... etc.
- Complex interaction between natural, technical and social sciences



Thank you for your attention !