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Deutsches Institut für
Entwicklungspolitik

German Development
Institute

Multilateral STI cooperation – Required to Address Global Challenges

Science diplomacy in action

Governance for international science co-operation

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Global challenges – back on the agenda



The 2012 Report of the Club of Rome

The Rio + 20 Summit

Climate change conferences (Durban 2011,
Doha 2012)



„Welcome to the Anthropocene“



National Science Foundation
WHERE DISCOVERIES BEGIN



<http://www.youtube.com/watch?v=fvgG-pxlobk>



RIO+20
United Nations Conference
on Sustainable Development



What makes challenges „global“ ?

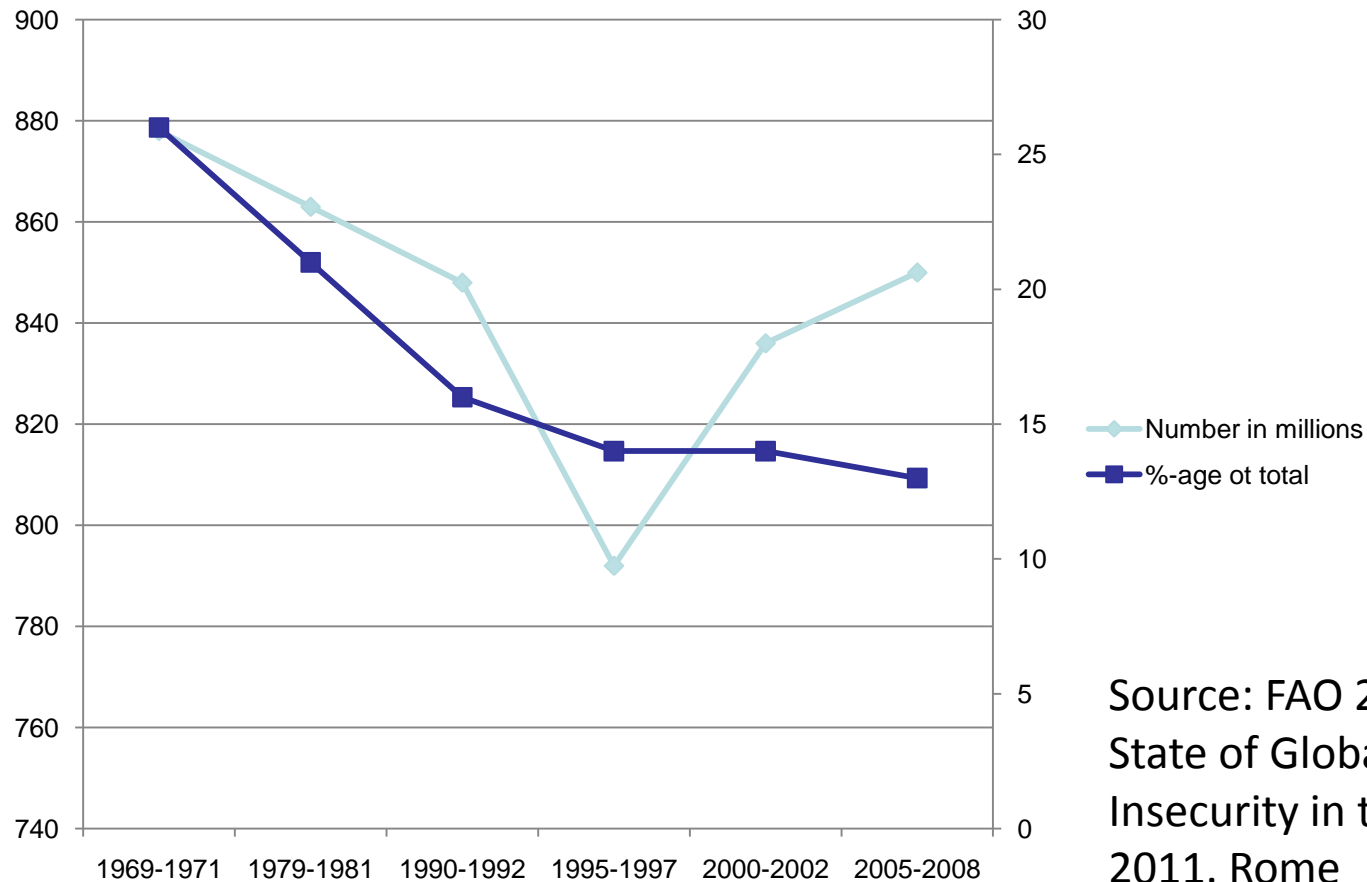


- Global challenges (GCs) are not caused by single actors, but by many individuals and countries.
- The negative consequences of GCs do not stop at national borders, but affect many societies, sometimes the entire globe.
- This does not exclude a differentiated impact in different world regions.
- GCs have to be addressed by a multitude of actors and countries.
- GCs have to be addressed under the „double imperative of urgency and responsibility“
(freely adapted from Hans Jonas, 1903-1993)

Global hunger: unresolved problem



Absolute number and %-age of undernourished people, 1969-2008



Source: FAO 2011: The State of Global Food Insecurity in the World 2011. Rome

Unresolved challenge: Providing clean energy to a rising world population

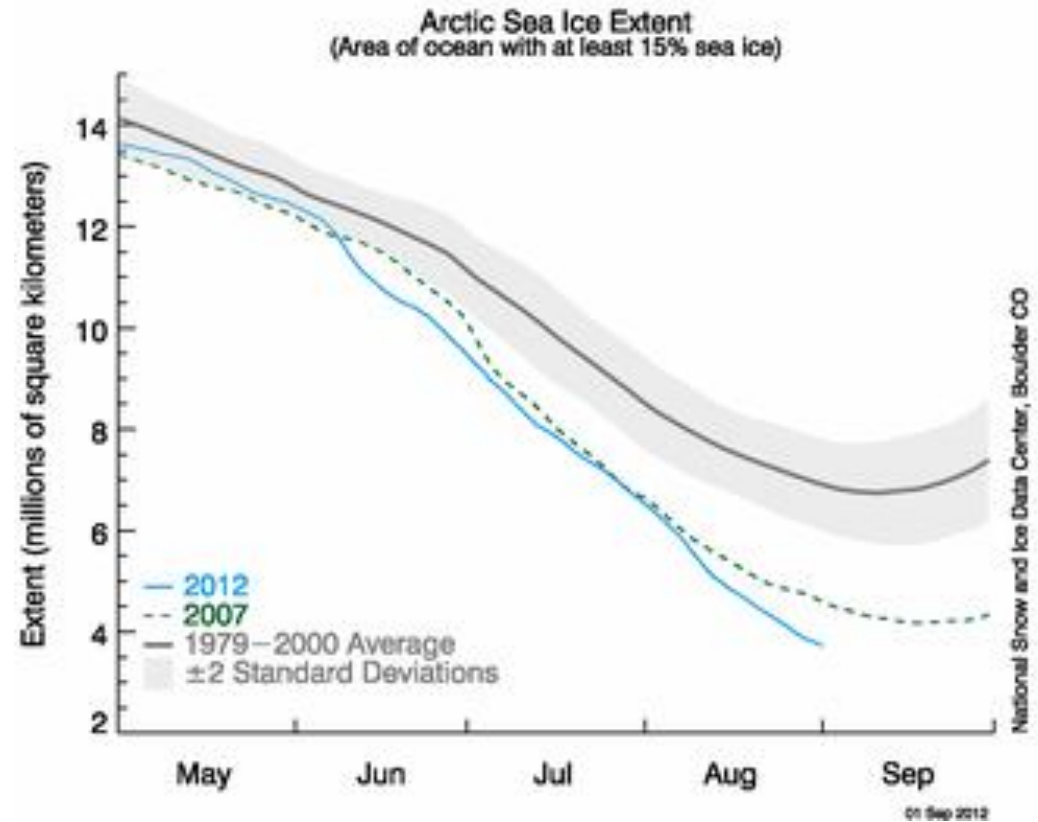
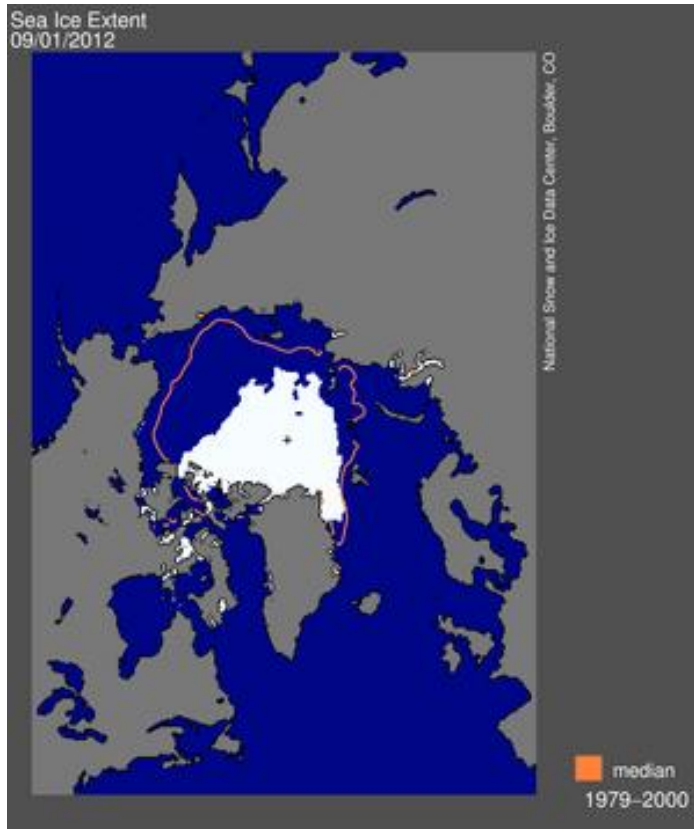


Regional energy use (kWh/capita & TWh) and growth 1990–2008

	kWh/capita			Population (million)			Energy use (1,000 TWh)		
	1990	2008	Growth	1990	2008	Growth	1990	2008	Growth
USA	89,021	87,216	- 2 %	250	305	22%	22.3	26.6	20%
EU-27	40,240	40,821	1%	473	499	5%	19	20.4	7%
Middle East	19,422	34,774	79%	132	199	51%	2.6	6.9	170%
China	8,839	18,608	111%	1,141	1,333	17%	10.1	24.8	146%
Latin America	11,281	14,421	28%	355	462	30%	4	6.7	66%
Africa	7,094	7,792	10%	634	984	55%	4.5	7.7	70%
India	4,419	6,280	42%	850	1,140	34%	3.8	7.2	91%
Others*	25,217	23,871	no data	1,430	1,766	23%	36.1	42.2	17%
The World	19,422	21,283	10%	5,265	6,688	27%	102.3	142.3	39%

Source: IEA/OECD, Population OECD/World Bank

The real threat of environmental „tipping points“



Do we need STI to address GCs ?



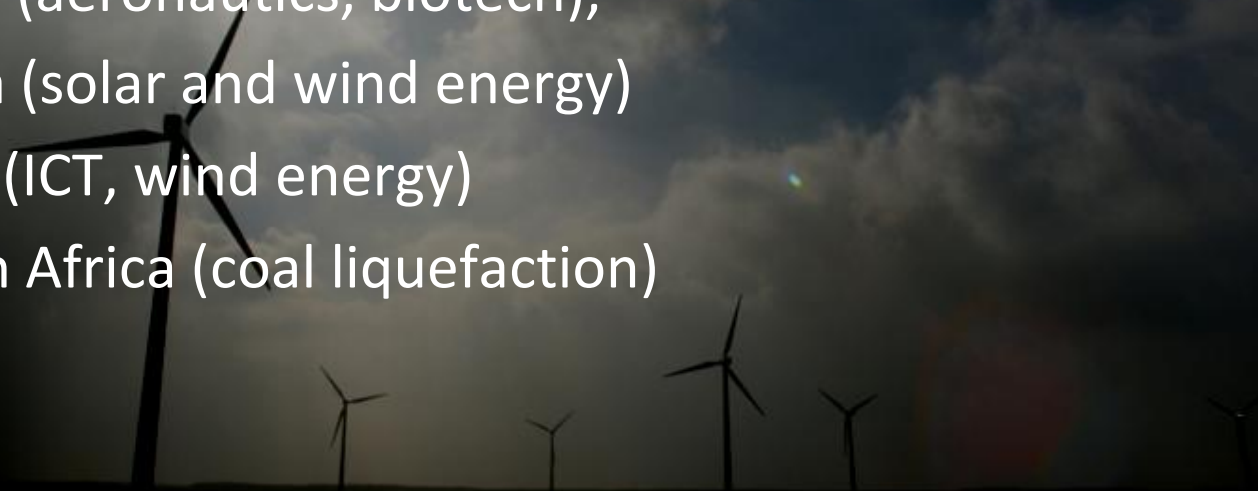
- **Yes**, to enhance our understanding of impact chains.
- **Yes**, to develop research based narratives to make policy makers and the general public understand the seriousness of the situation.
- **Yes**, to develop (technical) solutions.
- **Yes**, to adapt these to different ecological, social, cultural context.

- Yes**, to embed technical solutions in more comprehensive social change processes
- to enhance acceptance,
 - to avoid „rebound effects“.



The new global dimension adds complexity as well as new possibilities

- Until recently, global STI activities were mainly clustered in the “triad” (North America, Europe, Japan).
- New countries are appearing on the global STI arena
 - Korea as example of successful technological catch up
 - Brazil (aeronautics, biotech),
 - China (solar and wind energy)
 - India (ICT, wind energy)
 - South Africa (coal liquefaction)
 - ...



OECD Project on the Governance of multilateral STI cooperation



- **Expert group:**

Australia

Austria

China

France

Germany

Norway

South Africa

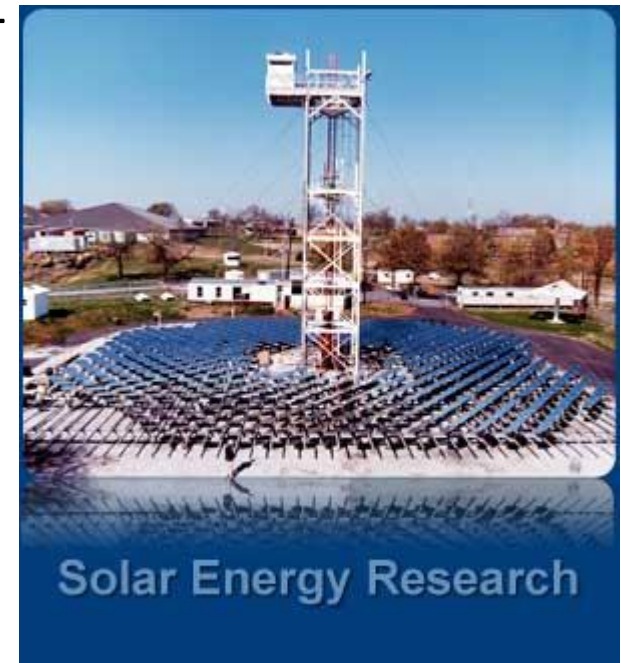
South Korea



Some features of today's global governance



- There is no world government
- But in many fields of human activities, global governance structures exist, e.g. :
 - Intergovernmental agreements and related organizations
 - International networks of public, semi-public and private institutions
 - Multi-stakeholder initiatives with strong influence of civil society
 - Private governance, e.g. standards imposed by lead firms in global value chains
 - Private and civil initiatives



Case Studies

1. **CGIAR:** Consultative Group on International Agricultural Research
2. **Gates:** The Bill and Melinda Gates Foundation
3. **GEO:** Group on Earth Observations
4. **IAI:** Inter-American Institute for Global Change Research
5. **IAEA:** The International Atomic Energy Agency
6. **IEA:** The International Energy Agency – Implementing Agreements
7. **JPI:** EU Joint Programming Initiatives – Agriculture, Food Security and Climate Change (FAACCE)



+ 2 mini case studies

Five governance dimensions used in the case studies

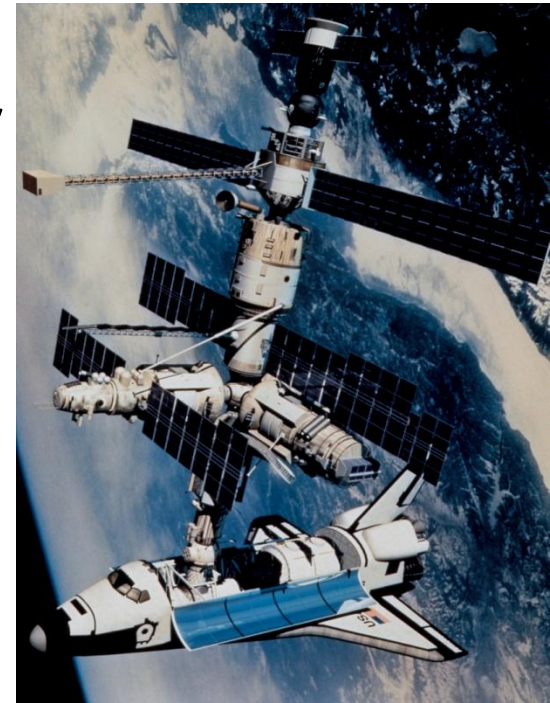
- Priority setting
- Funding and spending arrangements
- Knowledge sharing and intellectual property
- Putting STI into practice
- Capacity building for research and innovation



Some basic findings of the project



- There is a basic international consensus on the need for multilateral STI cooperation.
- Research on multilateral STI cooperation is extremely limited to date.
- Multilateral STI cooperation has very limited space, in terms of policy making and funding.
- Case studies of our report shed light on strengths and weaknesses of various governance modes.
- More work will come.



Policy Challenges



- Develop narratives to make policy makers and the general public understand the seriousness of the situation and the value of STI.
- Lobby for up-scaling of multilateral STI cooperation.
- Analyze the specificities of GC and the required response from STI to them (CCS vs. climate change adaptation)
- Develop comprehensive governance modes along the five dimensions.





Thanks for your attention !

Planned activities



- An OECD brochure that presents highlights from the report
- A thematic issue of the Journal of the Knowledge Economy covering governance dimensions
- Workshop in London end of October (exploring follow-up project)
- Additional presentations of outcomes in South Africa, Mexico, Costa Rica, possibly China and South Korea



RIO+20
United Nations
Conference on
Sustainable
Development



ICSU
International Council for Science



Broad based approach

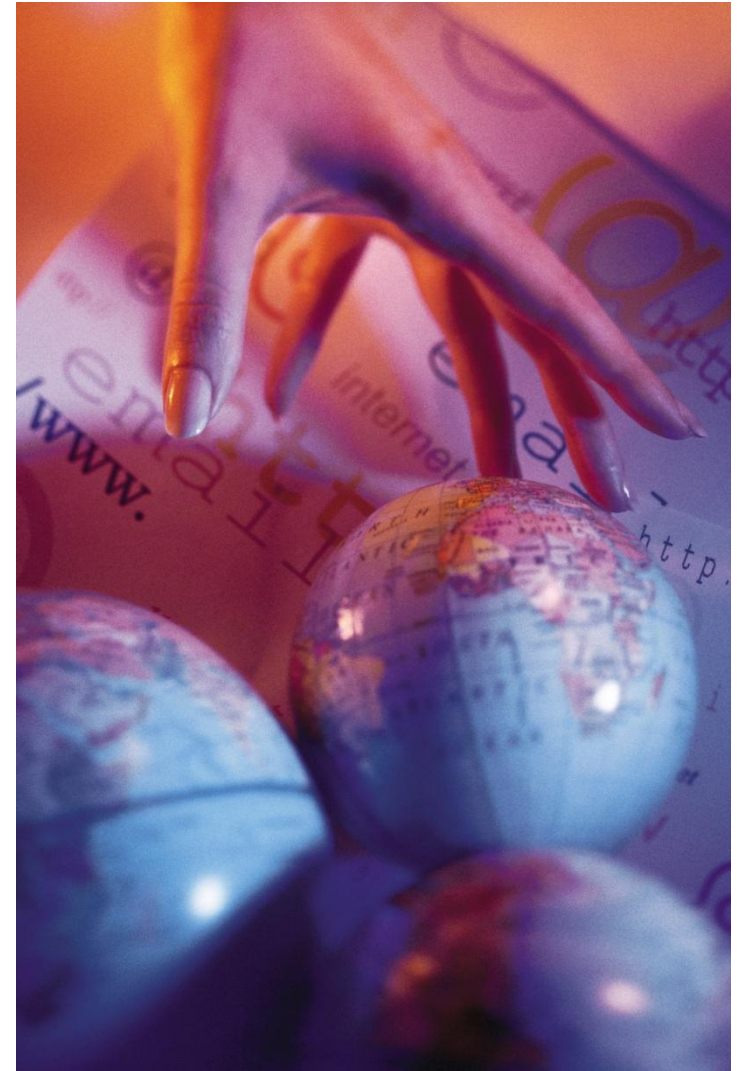
- Go beyond “technology fix” paradigm.
- Understand the socio-cultural context.
- Technologies and solutions are more likely to be adapted if the political, economical and cultural conditions are addressed.
- Exploit the economies of scale (specialization and complementarities) and scope (savings, cross-fertilization)



Diversity and flexibility

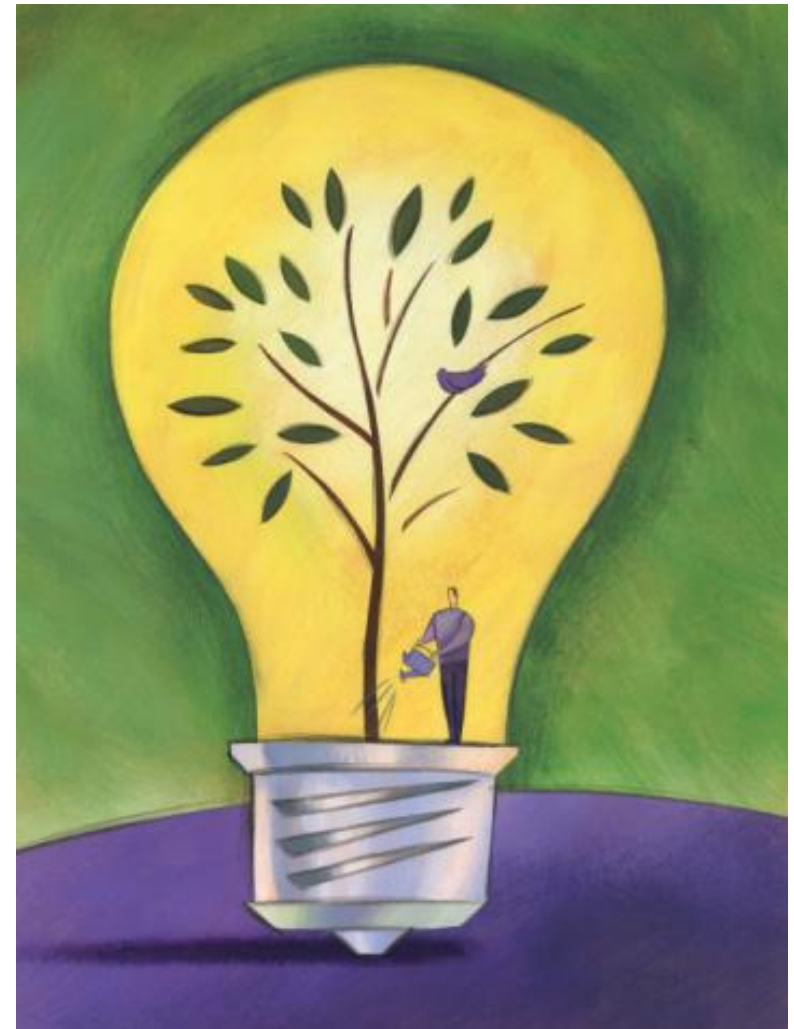


- Respect the diversity
- There is no universal solution to effective governance approaches for international co-operation in STI
- The changing nature of global challenges requires nimble governance approaches that allow for shifts to address arising needs
- Implement strategies and tools for communication with stakeholders and the public





- Need for high-level coordination
- Priority setting, budgetary and implementation issues must be linked from the outset
- Arrangements need to be flexible, informal and adaptable to changing circumstances and knowledge base
- A combination of bottom-up and top-down approaches may ensure intelligent agenda- and priority-setting, and avoiding bias in selection process



National agendas



- Effectiveness is enhanced if aligned with national research priorities
- Some challenges run counter to national agendas
- International co-operation leads to higher citation impact and resulting visibility
- Convince existing funders to orient calls to the goals of international institutions





- Funding and spending mechanisms should contain contingency provisions (cp. delayed payments etc)
- Harmonize funding of special projects with core institutional funding
- Multi-annual funding is preferable. Alternatively: Create funds within agencies.

Capacity Building



- This is also about building the competences and networks needed for future endeavors
- Capacity building, has to be included, in developing as well as developed countries
- Joint efforts STI and development cooperation
- Some duplication is needed to develop alternative approaches
- Foster south-south co-operation



Knowledge sharing and IPR



- There is no one size fits all solution
- Inventors and innovators may realize gains while still sharing results
- Prioritize outreach from the research community to other stakeholders
- Need for tailored approaches considering research needs as well as implementation/policy (acknowledging the two tribes of science and policy)
- Knowledge sharing and IP provisions should be adapted to each phase of the collaboration life cycle
- Industry involvement is important.



Thanks to:

The STIG Steering Group

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The STIG Expert Group, Experts from

Australia

Austria

China

France

Germany

Norway

South Africa

South Korea



Renewables and Jobs



- 2004: 165 000 jobs
- 2010: **367 000 jobs** (BMU)

Most important “**sunrise industry**”:
Solar-PV

2008: 53,000 - 2009: 63,000 jobs

85 % of all modules reach the market
through “plumbers” (SMEs)

Comparison with a “**sunset industry**”:

Job losses in the coal mining industry

- **27,000** between 1997 and 2008 in
the Ruhr Area, - **70,000** between
1960 and 2005 in the Saar Area

~ **45,000** mining jobs remaining in
both areas together



Job potential of the low carbon transition

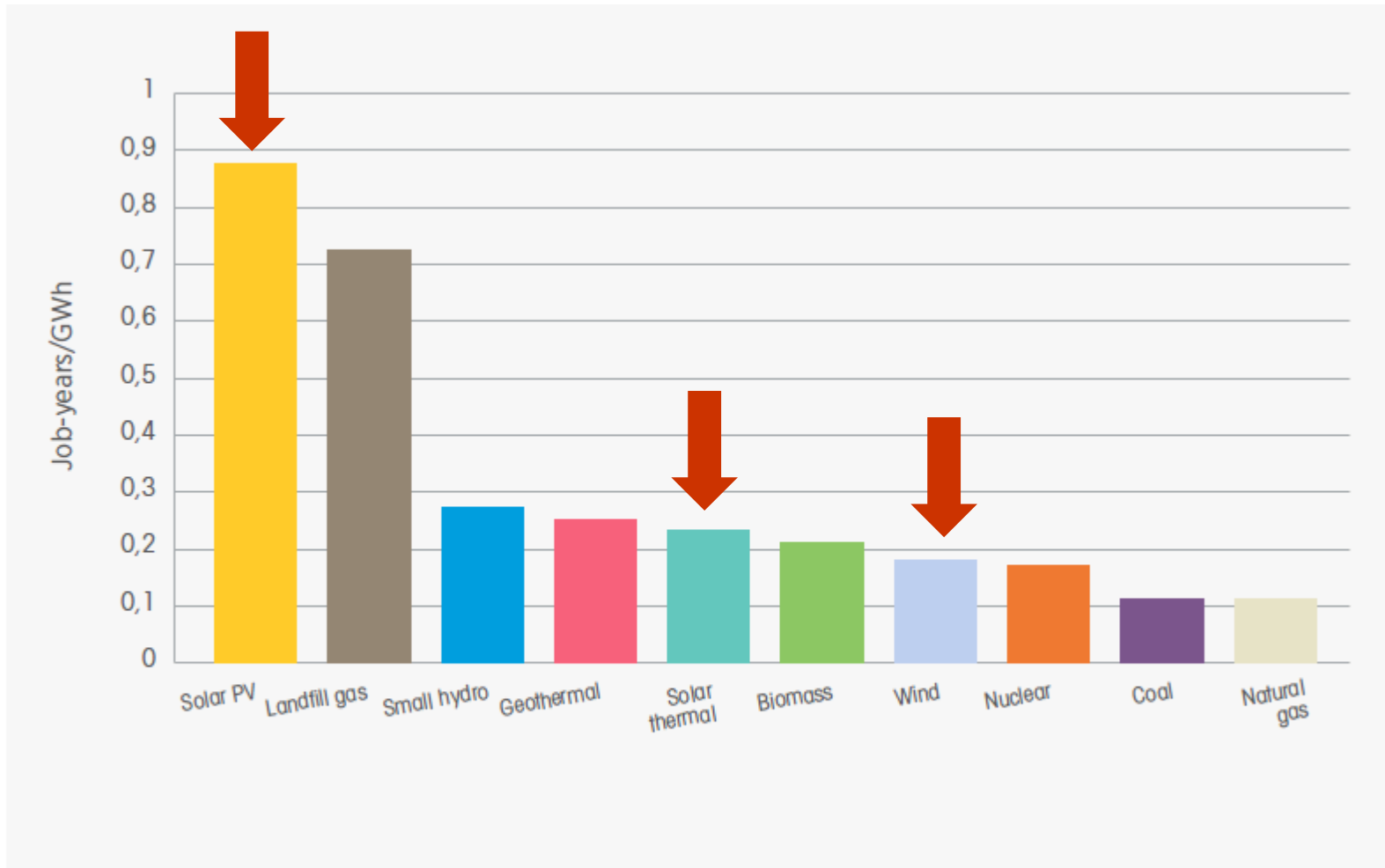


FIGURE 3. COMPARISON OF JOB-YEARS ACROSS TECHNOLOGIES (JOB-YEARS/GWh)

IRENA 2011

Renewable energies feed-in tariffs



- Renewable Energy Law

approved by the German parliament in March 2000;

fixes an attractive price for clean energy fed into the electricity grid (for 20 years)

- biomass,
- geothermal,
- photovoltaic,
- wind energy,
- hydropower

Guaranteed price for photovoltaic energy: 44 ¢– 47 ¢ / kW

Current consumer price for electricity
< 20 ¢ / kW

