



Europäisches  
Patentamt  
European  
Patent Office  
Office européen  
des brevets

# Patents for emerging technologies; *the example of clean energy*

## The World Conference on Intellectual Capital for Communities

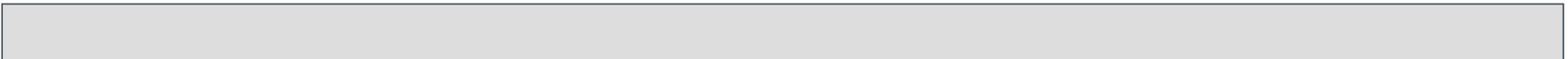
World Bank, Paris, 26 May 2011

Nikolaus Thumm, EPO  
Chief Economist

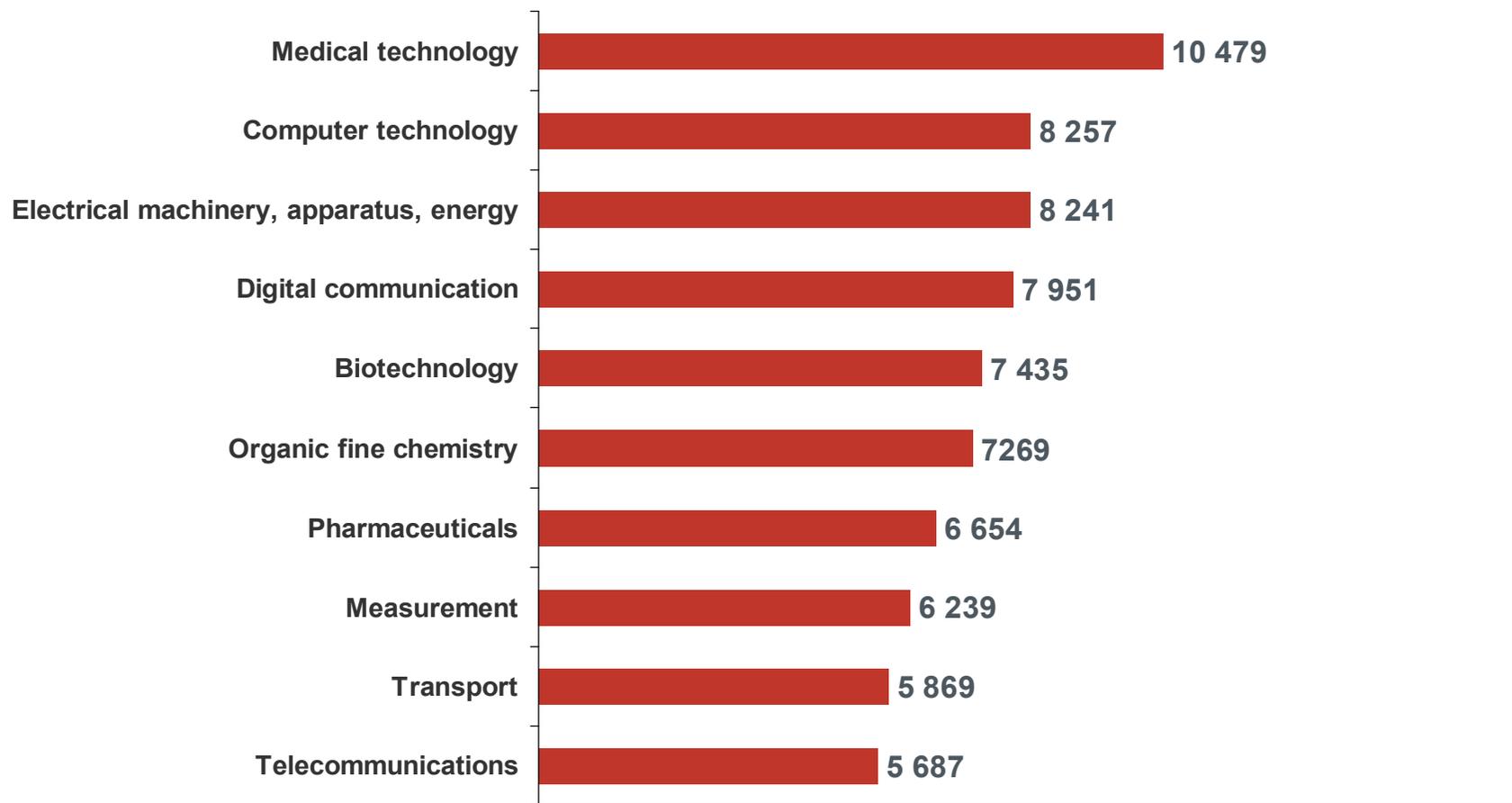


# Overview

- Introduction
- Classifying clean energy patents
- The bigger issue: climate change and patents
- Technology transfer - licensing
- Developing countries/emerging economies (China)
- Conclusion



## EPO Technical fields <sup>1</sup> with the most applications (2010) <sup>2</sup>



<sup>1</sup> Classified according to the IPC and technology concordance table compiled by the Fraunhofer ISI for WIPO.

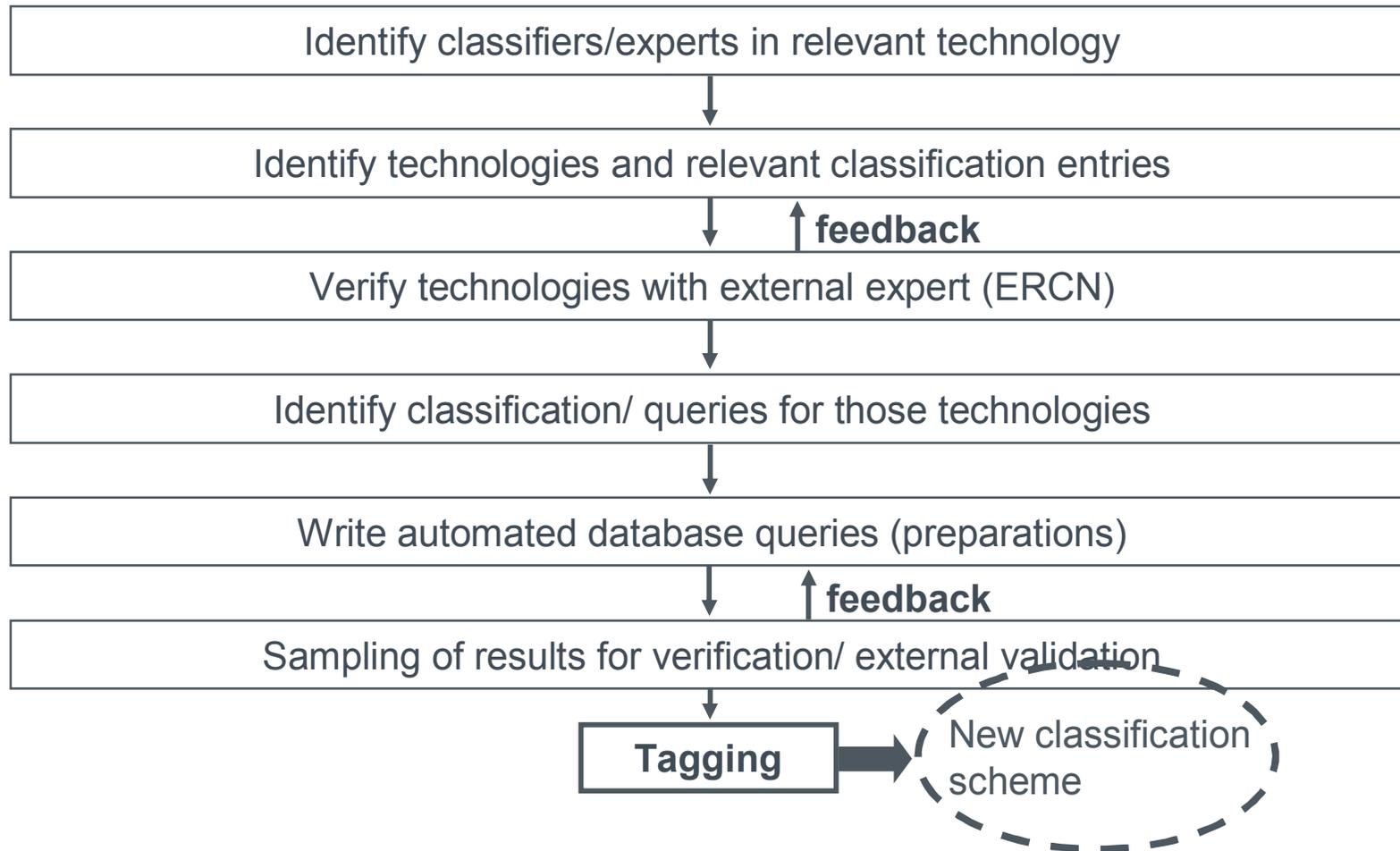
<sup>2</sup> Based on European patent applications filed with the EPO.

## The eight main IPC and ECLA sections

A	Human necessities
B	Performing operations; transporting
C	Chemistry; metallurgy
D	Textiles; paper
E	Fixed constructions
F	Mechanical engineering; lighting; heating; weapons; blasting engines or pumps
G	Physics
H	Electricity

IPC: approx 70.000 codes; ECLA: approx 138.000 codes

## Classifying clean energy patents: Methodology to identify relevant patent records



## New Classification Scheme: Example Wind Energy

Hierarchy level    Description

●	Wind energy
● ●	Wind turbines with rotation axis in wind direction
● ● ●	Blades or rotors
● ● ●	Components or gearbox
● ● ●	Control of turbines
● ● ●	Generator or configuration
● ● ●	Nacelles
● ● ●	Offshore towers
● ● ●	Onshore towers
● ● ●	Electrical/electronic aspects
● ● ● ●	Power interface
● ● ● ●	Power management
● ●	Wind turbines with rotation axis perpendicular to the wind direction



## Resuming:

- Patent documents relating to climate change mitigation technologies can be found in so many areas of technology (do not fall under one single classification section!)
- Climate change mitigation technologies as new develop very quickly
- Catchword indexes are a certain help, but leave considerable work
- EPO established a new tagging scheme, similar to ECLA providing **easy access** to the general public to climate change mitigation technologies
- Online:

Y02C	Greenhouse gases – capture or storage/sequestration or disposal
Y02E	Greenhouse gases – emissions reduction technologies related to energy generation, transmission or distribution

Let's have a look

[esp@cenet](mailto:esp@cenet)



## Summarising advantages of EPO's new classification system

- More than 200 new categories related to climate change mitigation technologies in the energy field
- Worldwide coverage of all available patent data
- All relevant technologies gathered together in one place
- Detailed break-down to component level (600.000 documents tagged)
- Regularly updated with the newest patent publications
- Open and transparent procedure (several checks with external experts at interfaces), highest expertise in the field (patent searches carried out by EPO examiners)



## The bigger issue: Climate change and patents

### Climate Change Mitigation Technologies (CCMT) and IPR

#### Issues

IPRs a barrier for technology transfer into DCs?

IPRs an incentive to innovate and a tool to bring inventions to the market?

**What are CCMT, who owns them and what are their licensing practices and intentions?**

#### Solutions under discussion

Facilitating access for DCs? ('Doha-type' approach)

Capacity building?  
Alternative approaches to IPR?

Who defines what is environmentally relevant and how? (Unintended) consequences?

**Lack of empirical evidence!**

## EPO Project objectives

Relationship between patents and the development and transfer of clean energy technologies

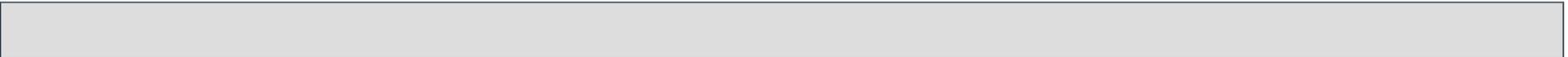
➔ **EPO takes care of the broader/economic impact of its operational work**

EPO enters as an expert organization

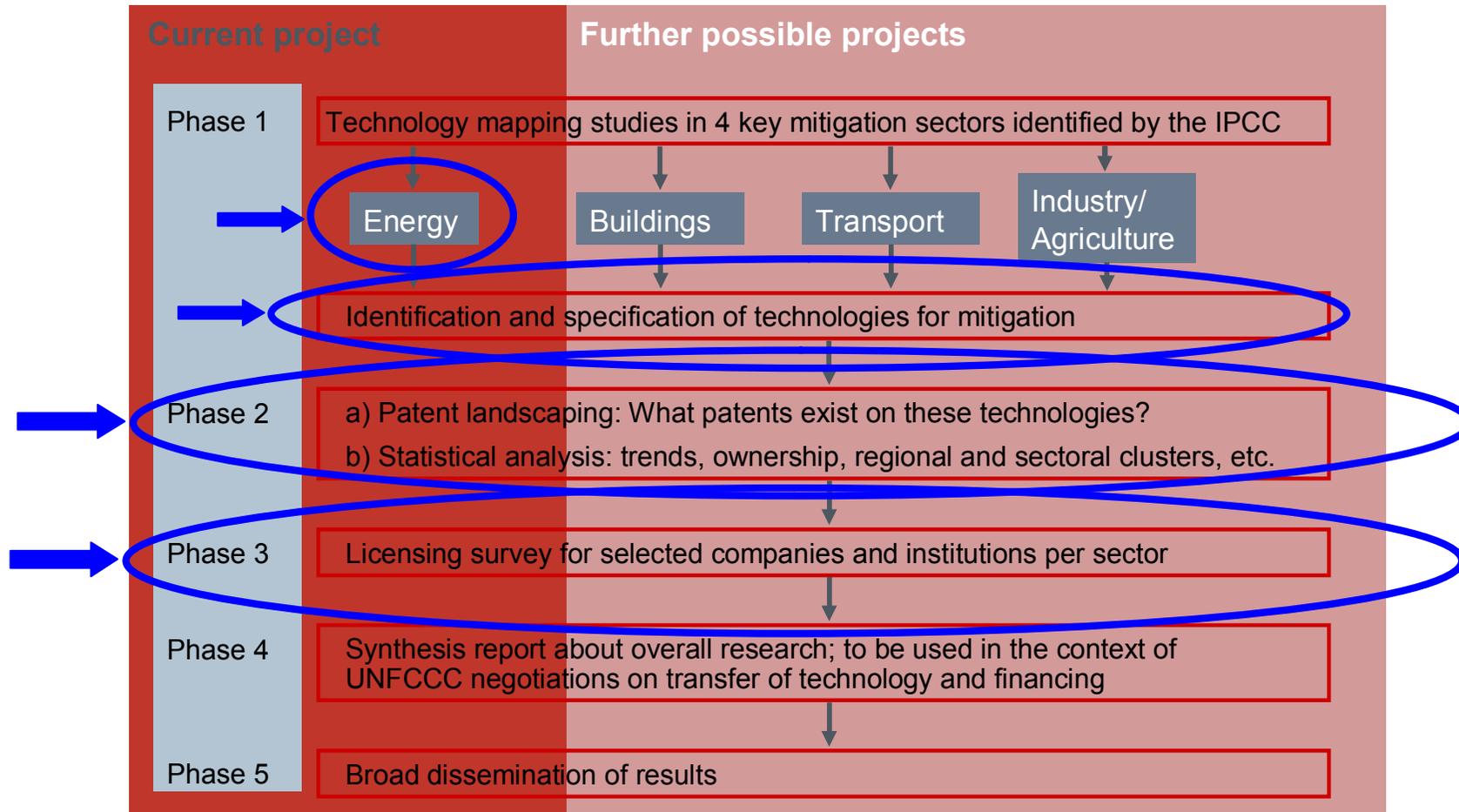
➔ **EPO has no position in the negotiations**

Lack of empirical data for informed and objective decision-making

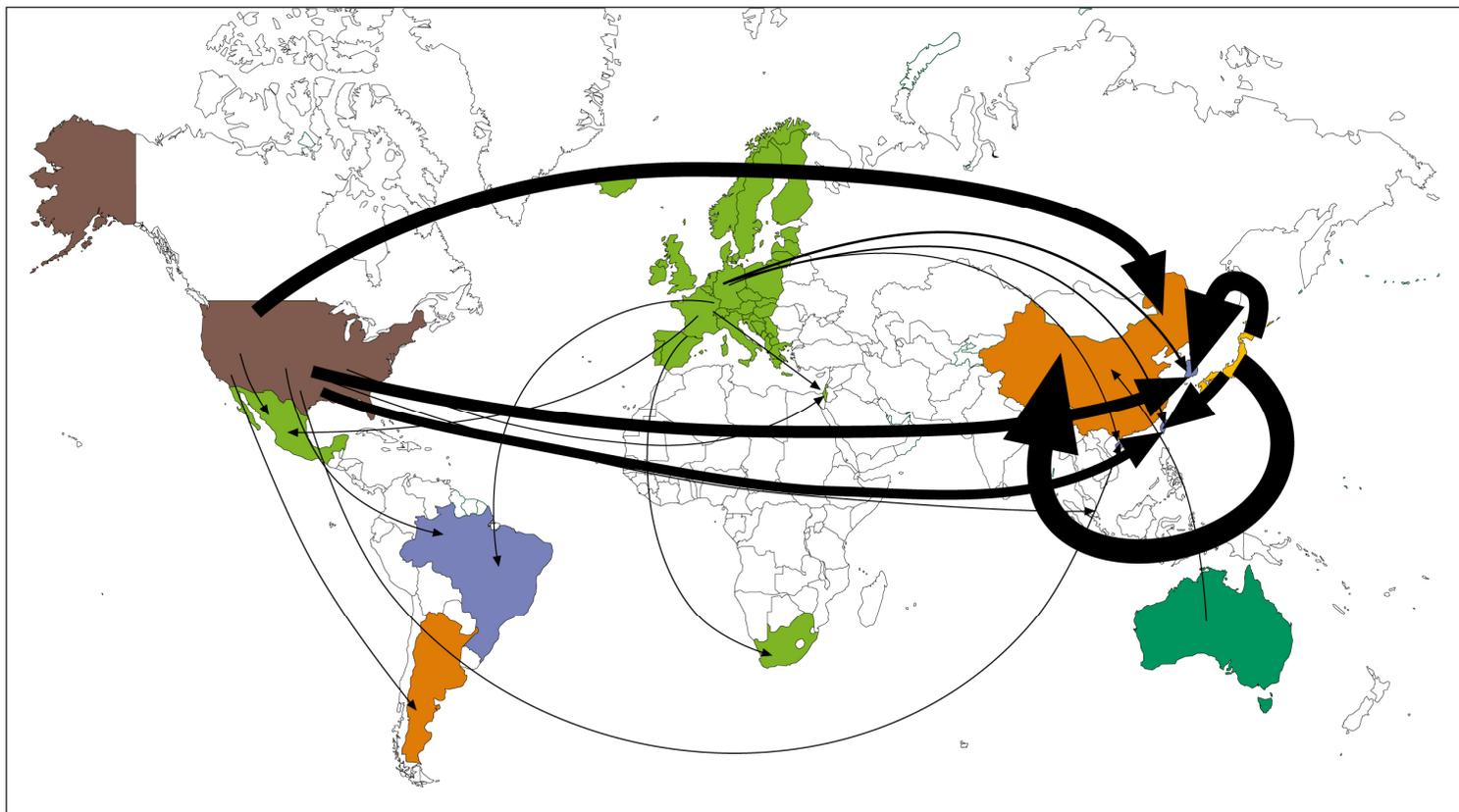
➔ **Facilitate 'evidence based policy making'**



# UNEP-EPO-ICTSD Project structure

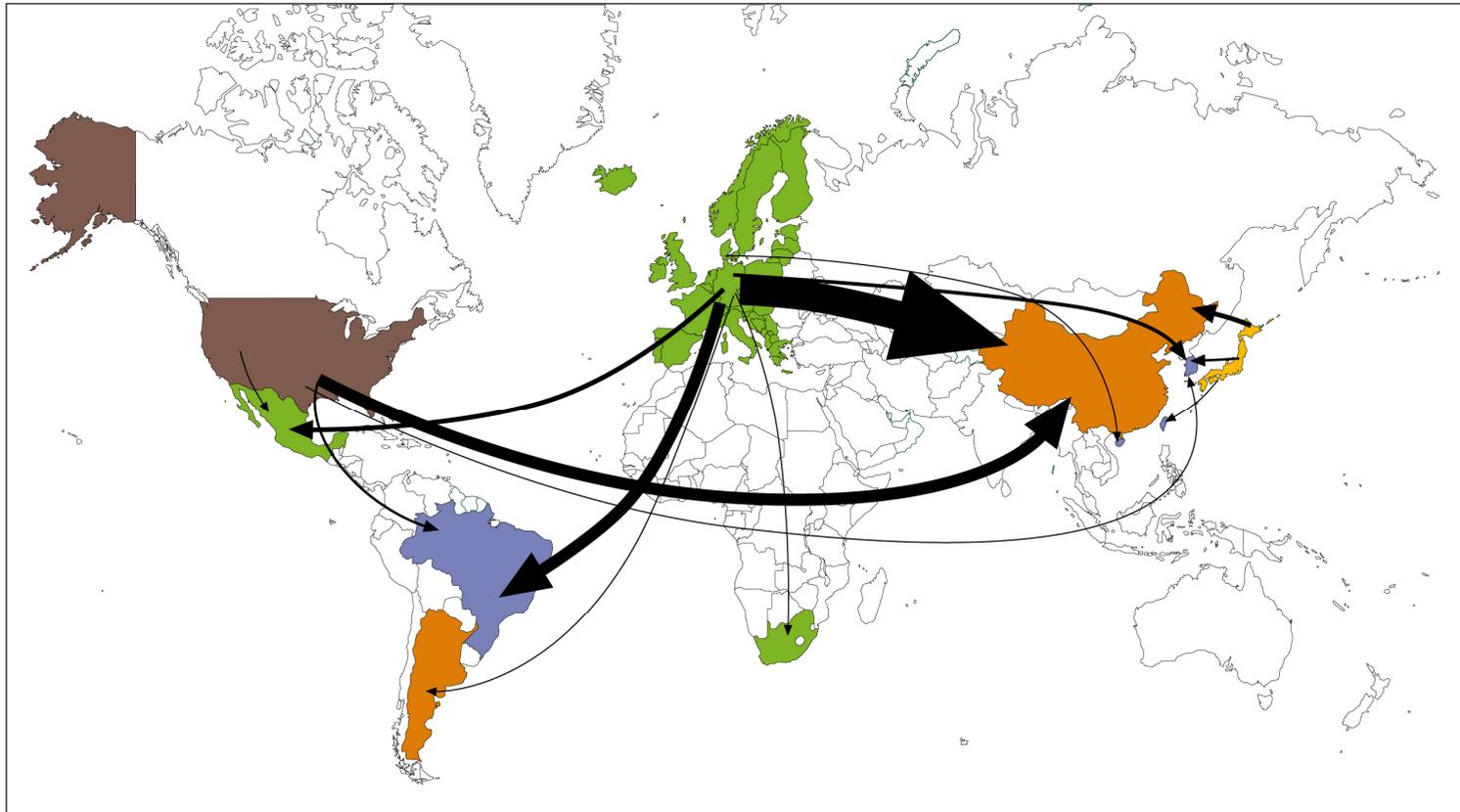


## Patenting trends: example solar photo voltaic technologies



Patenting between source country (“inventor country”) and countries in which IP protection is sought.

## Patenting trends: example wind energy technologies



Source: OECD

Patenting between source country (“inventor country”) and countries in which IP protection is sought.

## Co-inventions: example solar photo voltaic technologies



Source: OECD

The map shows the frequency of co-operation between inventors from different countries in the development of patented technologies.

## Co-inventions: example wind energy technologies



Source: OECD

The chart shows the frequency of co-operation between inventors from different countries in the development of patented technologies.

## Technology Transfer - Licensing

'How can licensing facilitate diffusion and implementation of renewables?'

### **Technology Transfer via:**

- Imitation
- Trade in goods and services
- Foreign direct investment
- Joint venture
- Cross-border movement of personnel
- **Licensing**

# Economic Theory of Licensing

## Licensing ...

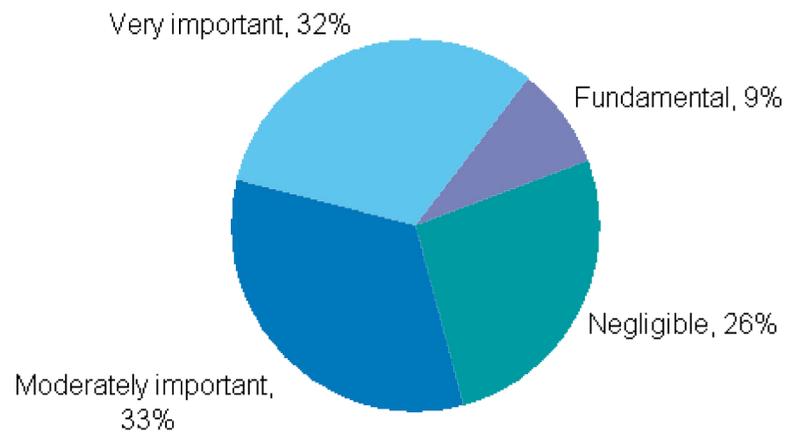
- increases exploitation of technology,
- increases diffusion of technology,
- facilitates vertical specialisation and division of tasks,
- but may reduce competition and innovation.

## Firms license in order to ...

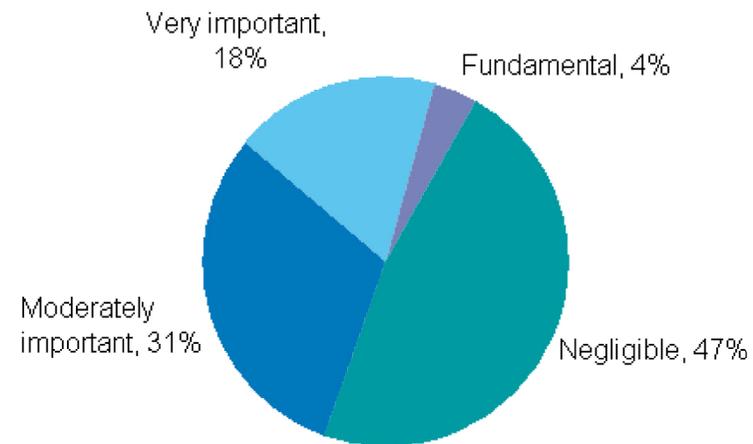
- leverage economic revenue from unused inventions,
- establish technologies as de facto standard,
- influence competition and stimulate market demand,
- expand the range of uses (markets),
- exchange knowledge (cross licensing),
- solve conflicts with intellectual property rights.

# Importance of out- and in-licensing

Out-licensing activities



In-licensing activities

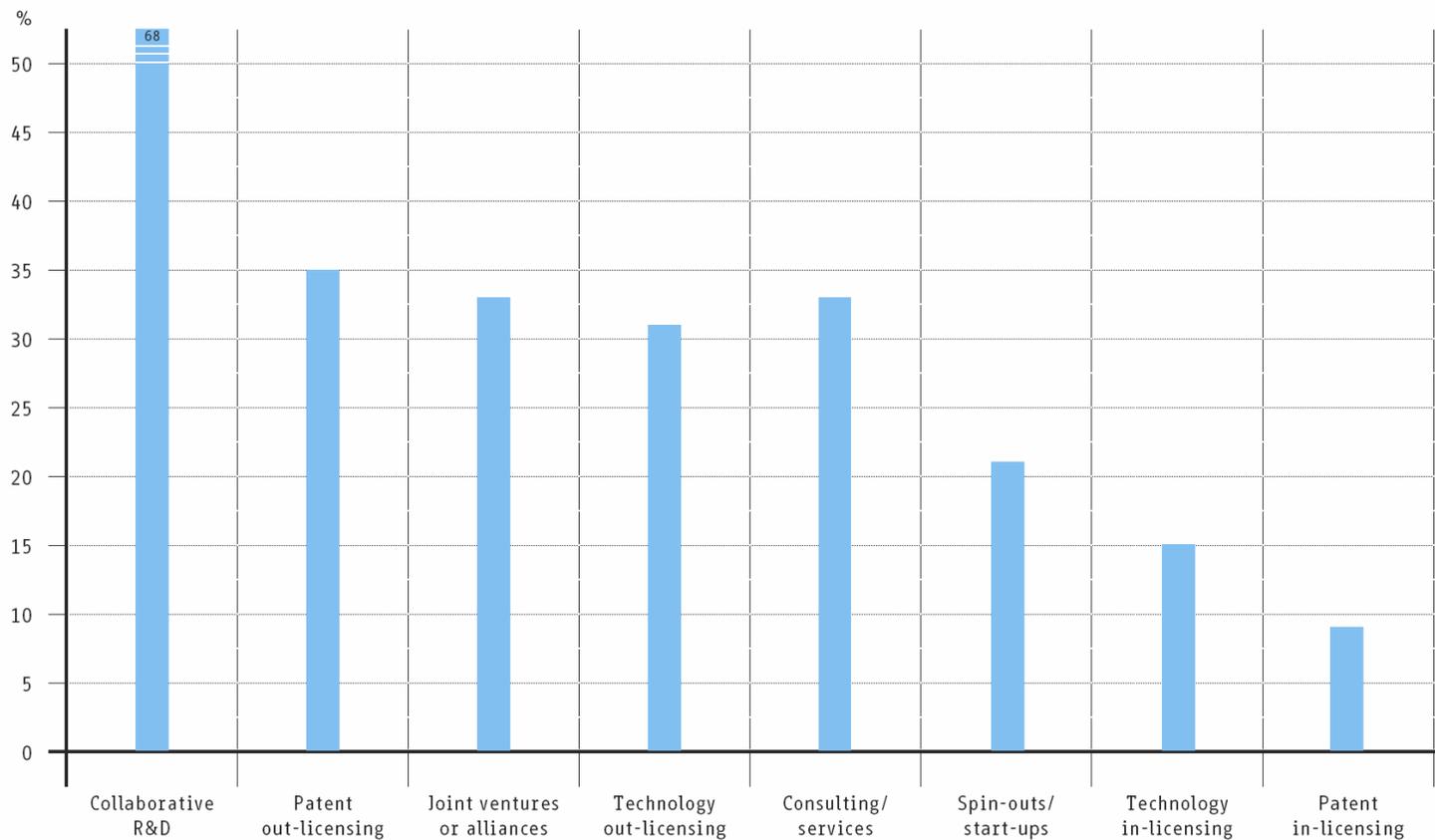


Licensing is an important instrument in the transfer and utilisation of CETs



## Collaborative R&D in the vanguard

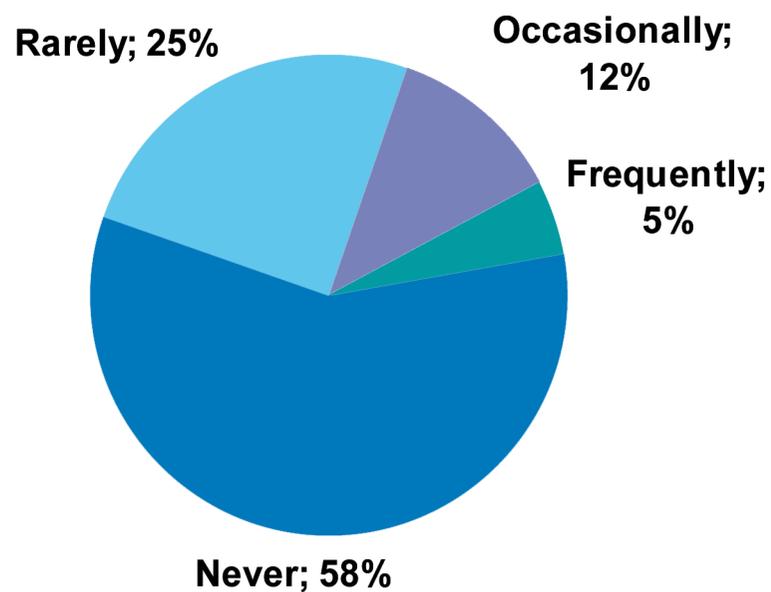
*'Please rank your organisation's intellectual property activities relating to CET patents and technology (including know-how) in the following areas.'*



Analysis is based on the frequency of respondents giving a high ranking (answers 3 and 4) to each activity.

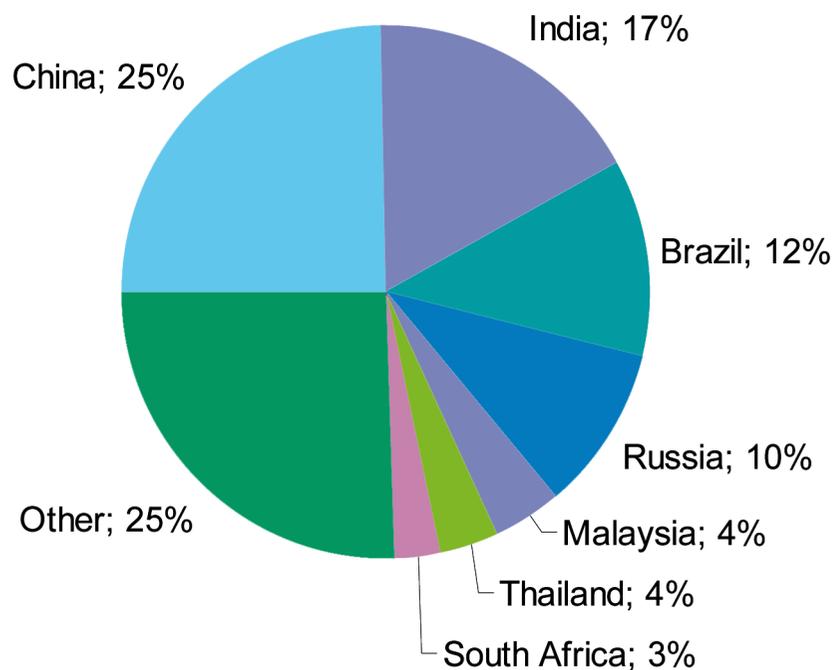
## Untapped licensing potential in developing countries

*'To what extent has your organisation entered licensing agreements that involve licensees (which are not majority-controlled subsidiaries) based in developing countries in the last three years?'*

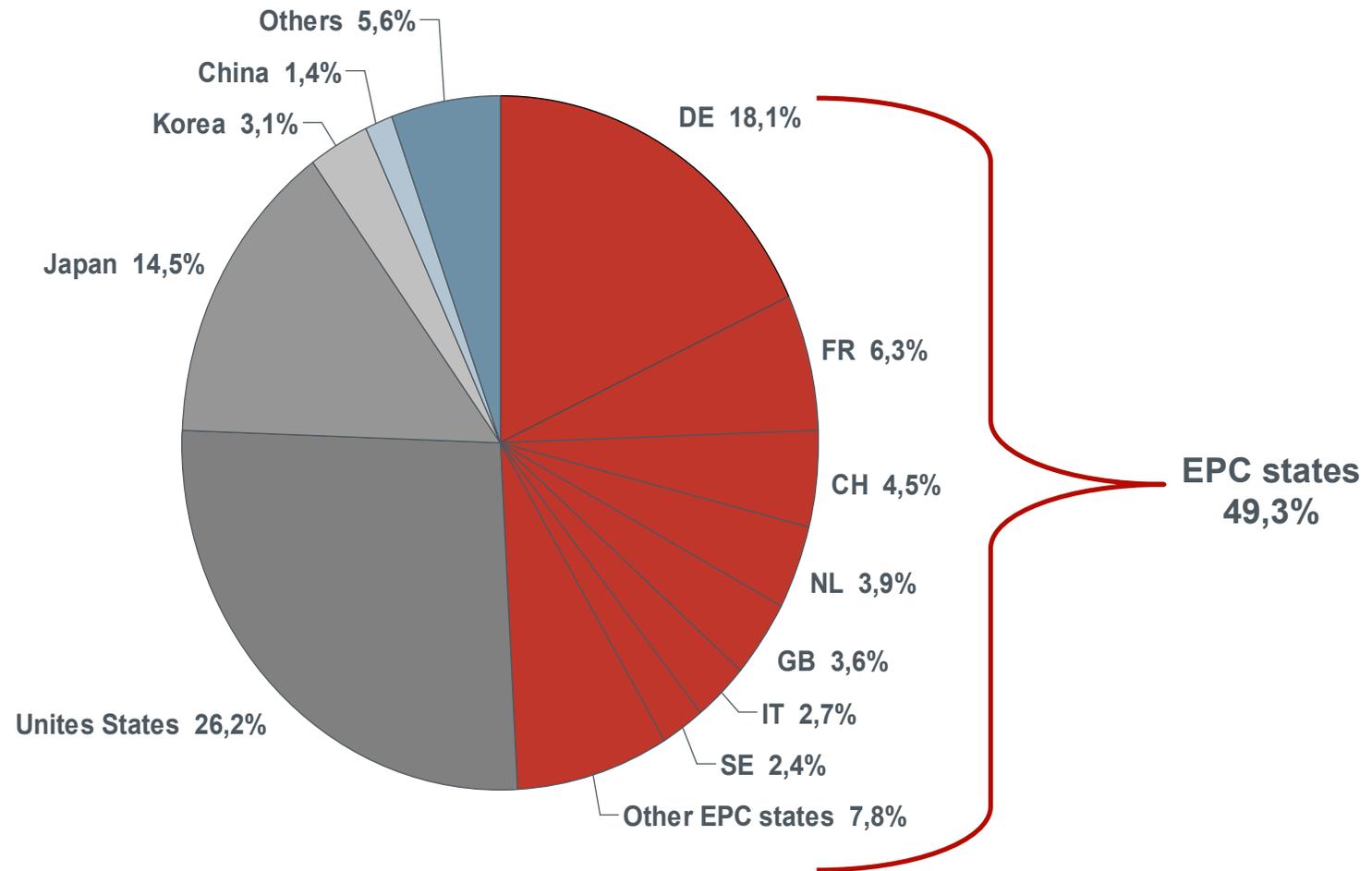


## BRIC countries important for IP-related activities

*'With which countries has your organisation been most involved in licensing or other commercialisation activities of intellectual property in the field of CETs?'*



## Origin of European patent applications (2010)<sup>1</sup>

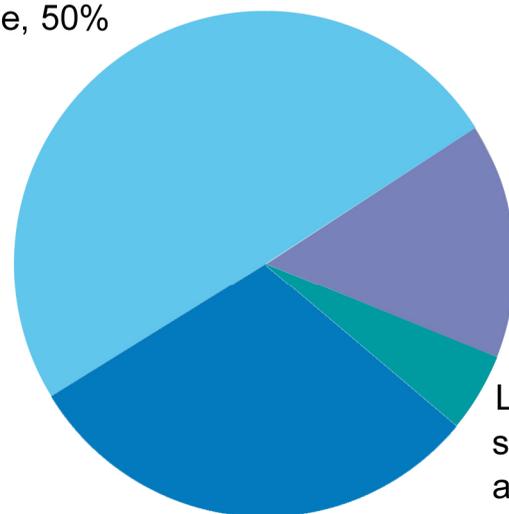


<sup>1</sup> European patent applications filed with the EPO have been allocated to the country of residence of the first-named applicant.

## Strong willingness for greater lenience versus developing countries

*'When entering into an out-license agreement with parties that are based in developing countries, to what extent do the monetary terms of your license reflect your willingness to introduce greater lenience due to differences in the purchasing power of the parties?'*

Licensing terms are  
more flexible, 50%



Licensing terms are  
much more  
accommodating, 15%

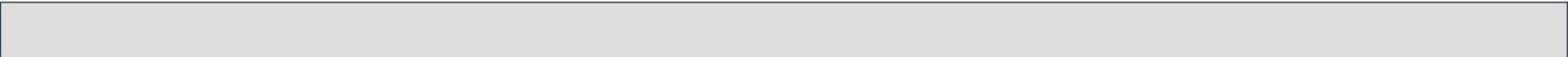
Licensing terms are  
substantially more  
accommodating, 5%

No difference in  
licensing terms, 30%

## Conclusion and outlook

---

- First joint UNEP-EPO-ICTSD project has been completed and published in 2010. Findings were disseminated in different forums, including the UN Climate Change Conference in Cancún.
- Going far beyond initial targets, the EPO has established a public technology information platform for climate change mitigation technologies (new classification scheme), starting with clean energy technologies.
- Based on project findings, further co-operation is envisaged among core partners, in particular in studying issues at the demand side (technology needs of developing countries).
- The EPO is considering expanding the classification scheme to cover other sectors (buildings, transportation, etc.) in co-operation with prospective senior users of the system, in particular with UNFCCC circles.



**Thank you for your attention!**

**[nthumm@epo.org](mailto:nthumm@epo.org)**

