Technology mapping and patent data delimitation of EST

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Overview

- Short introduction/overview
- European Patent Office (EPO)
- Strength of the EPO in patent data retrieval
- Boundaries
- Patent data delimitation methodology
- Current Focus of delimitation
- Datasheet
- Some results of retrieval
- Type of results possible?

European Patent Office

- The European Patent Office is the patent granting authority for Europe.

- Core tasks enabling this are:
  - Classification of patent documents
  - Prior art search
  - Examination of applications (grant or refusal)
  - Opposition
  - Providing patent information

Member states

Member states of the European Patent Organisation
AT Austria, BE Belgium, BG Bulgaria,CH Switzerland,
CY Cyprus, CZ Czech Republic, DE Germany, DK Denmark,
EE Estonia, ES Spain, FI Finland, FR France, GB United
Kingdom, GR Greece, HR Croatia, HU Hungary, IE Ireland,
IS Iceland, IT Italy, LI Liechtenstein, LT Lithuania,
LU Luxembourg, LV Latvia, MT Malta, MC Monaco,
NL Netherlands, NO Norway, PL Poland, PT Portugal,
RO Romania, SE Sweden, SI Slovenia, SK Slovakia,
TR Turkey

States which have been invited to join the EPC
MK Former Yugoslav Republic of Macedonia,
SM San Marino

**States recognising European patents
("EXTension states")**
AL Albania, BA Bosnia-Herzegovina,
MK Former Yugoslav Republic of Macedonia, RS Serbia

(01.2008)

Strength of the EPO in patent data retrieval (1)

- Technically qualified examiners routinely classify EST patent documents:

    – technical knowledge of the field and trends in that field

    – knowledge of the various patent classification systems used worldwide

    – practical daily experience in searching those documents

- EPO has largest worldwide searchable collection of patent documents (60 million)

- EPO has very refined classification system (ECLA), which is a refinement of the International Patent Classification, often used for previous studies.

Strength of the EPO in patent data retrieval (2)

➢ High level of refinement possible.

• Generally find more relevant classification places for technologies due to combination of technical and classification/search knowledge:

➢ More relevant documents found (larger data-sets).

Example: CCS (Carbon capture and storage) (1)

- previous studies used solely IPC class **B01D53/62** (chemical or biological purification of waste gasses: carbon oxide<u>s</u>)

  – No information on what carbon oxides were removed (CO removal often large issue in the past).

  – No information on what was done with the removed gas (just separation, could very well have been vented).

Example: CCS (Carbon capture and storage) (2)

- European classification:

  - capture

    L01D257/00   (27)   Components to be removed [N9702]
    L01D257/50   . (157)   Carbon oxides [N9702]
    L01D257/504   . . (2066) Carbon dioxide [N9702]

    B01D53/14   . (2165) by absorption
    B01D53/14H   . . (1513) [N: Gases containing acid components] [N9503]
    B01D53/14H6   . . . (1124) [N: containing only carbon dioxide] [N9503]

  - Storage:

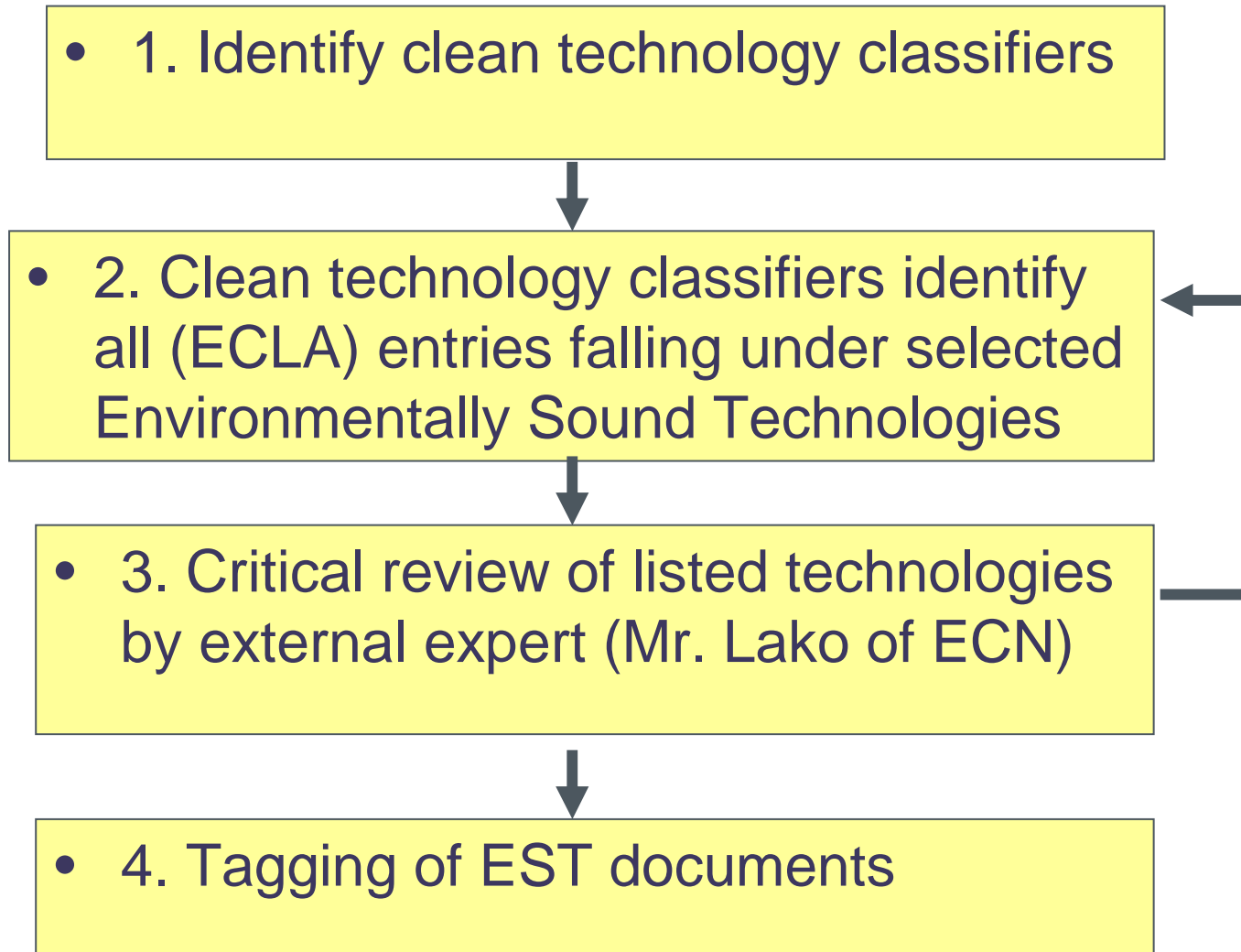   E21B41/00M2C   . . . (617)   [N: Carbon dioxide sequestration

Boundaries (1)

- European classification is routinely given to:
    - All EP-documents
    - All US-documents
    - All WO-documents (PCT)
    - Many European national documents
    - Au/Ca documents

- It propagates to patent-family members (i.e., any further patent documents based on the same invention (priority), such as JP, CN, KR, RU etc.

- It is **not** given to:
    - JP/CN/KR/RU etc. without any family member as defined above.

- We are checking if it is useful to supplement the ECLA-based data with IPC based data, if necessary delimited with keywords.

Boundaries (2)

- Examiners use (mainly) EPODOC database for data retrieval:
  - Not the most suitable database for statistical /econometric studies.

  - Transfer of data-sets to the PATSTAT database.

Patent data delimitation methodology

- 1. Identify clean technology classifiers

- 2. Clean technology classifiers identify all (ECLA) entries falling under selected Environmentally Sound Technologies

- 3. Critical review of listed technologies by external expert (Mr. Lako of ECN)

- 4. Tagging of EST documents

Europäisches
Patentamt

European
Patent Office

Office européen
des brevets

Current Focus

- Wind energy
- Solar energy: PV + materials, solar thermal
- Hydro/marine
- Biofuels
- Geothermal
- Energy storage: Fuel cells, advanced batteries
- CCS

Mapping of technologies

- An example of the current mapping exercise (in progress).

	Adaptations of wind motors for special use	Criado, Angelucci	F03D9
	Details, component parts, or accessories not provided for in other groups	Criado, Angelucci	F03D11
	. Bearing or lubricating arrangements		F03D11/00b
	. Transmission of power		F03D11/02
	. Mounting structures		F03D11/04
Solar	Crystalline and polycrystalline PV modules	Visentin	H01L31/042, H01L31/042B, H01L31/042D, H
	Thin Film PV modules	Visentin	H01L27/142R2
	Concentrating PV systems	Visentin	H01L31/052B
	Direct conversion of light radiation	Visentin	H02N6/00
	Nanotech for PV	Veefkind, Verbandt	very small parts of Y01N6 or Y01N10 (?)
	Concentrated Solar Thermal (Mirror):	Merkt, Angelucci	f03g6/06,f24j2/06+
	.Parabolic Trough	Merkt, Angelucci	f03g6/06,f24j2/10b,f24j2/14+
	.Solar Tower	Merkt, Angelucci	f03g6/06,f24j2/07
	.Solar Dish	Merkt, Angelucci	f03g6/06,f24j2/12+
	Concentrated Solar Thermal (Lenses):	Angelucci, Merkt	f03g6/06,f24j2/08+
	.Fresnel lenses	Merkt	(people of lenses?) F24J2/08b
	Rankine turbine cycle	Angelucci	f03g6/06r or f03g6/00r
	Solar heat exchanger systems	Merkt	f24j2/04-51b
	Solar heating and cooling	Merkt, Angelucci	f03g6,f24d
	Arrangements of mountings and supports for solar devices (PV and Thermal)		f24j2/52+
	.static	Merkt	f24j2/52+
	.non-rotary movement	Merkt	f24j2/52b
	.rotary movement (solar tracker)	Merkt	f24j2/54+,f24j2/38
	Heat pipe solar collectors	Merkt	f24j2/32
	Evacuated solar collectors	Merkt	f24j2/05+
	Lens-Reflector-combined systems	Merkt	f24j2/06
	Solar roofing tiles	Merkt	f24j2/04b14
	Hybrid solar systems (PV and thermal)	Merkt,Visentin	h01l31/058
	Devices for producing mechanical power from solar energy	Angelucci	f03g6
	. having a Rankine cycle		f03g6/00R
	. with means for concentrating solar rays		f03g6/06
Hydro/Marine	Salinity Gradient	Angelucci	F03g7/04 and (sea or water or ocean?)

Some very preliminary results

- initial results

Secondary industry	Tertiary industry	NR. DOCS ECLA/ICO/KW*	% of total retrievable	Nr. DOCS IPC**	% of total retrievable	TOTAL***
WIND	Onshore tower	3169	52,95%	4893	81,75%	5985
	Offshore fixed and floating tower technology	677	79,09%	480	56,07%	856
	Nacelles	277	46,55%	354	59,50%	595
	Generator and configuration	1987	38,02%	3797	72,66%	5226
	Control	5395	56,82%	9017	94,97%	9495
	Conponents, gearbox..	3919	35,09%	10712	95,93%	11167
	Blades and rotors	6147	62,76%	9067	92,58%	9794
HYDRO	Conventional	4995	35,88%	13810	99,19%	13923
	OTEC	351	58,50%	580	96,67%	600
	Oscillating Water Column	480	88,72%	118	21,81%	541
	Salinity	343	34,03%	878	87,10%	1008
	Stream (tide, rivers)	3008	67,81%	3325	74,95%	4436
	Wave	4644	66,89%	6706	96,59%	6943

- Compare with Annex 2 of Dechezleprêtre et al.(Cerna/ Mines ParisTech):
    - Wind: 16309
    - Hydro: 6604
    - Ocean: 6235

Type of results possible

- depends on needs.

- Introduction of datasets retrieved from database EPODOC into database PATSTAT necessary for achieving full potential.

- Cooperation with OECD foreseen since they have extensive experience in obtaining EST-related patent data from PATSTAT.
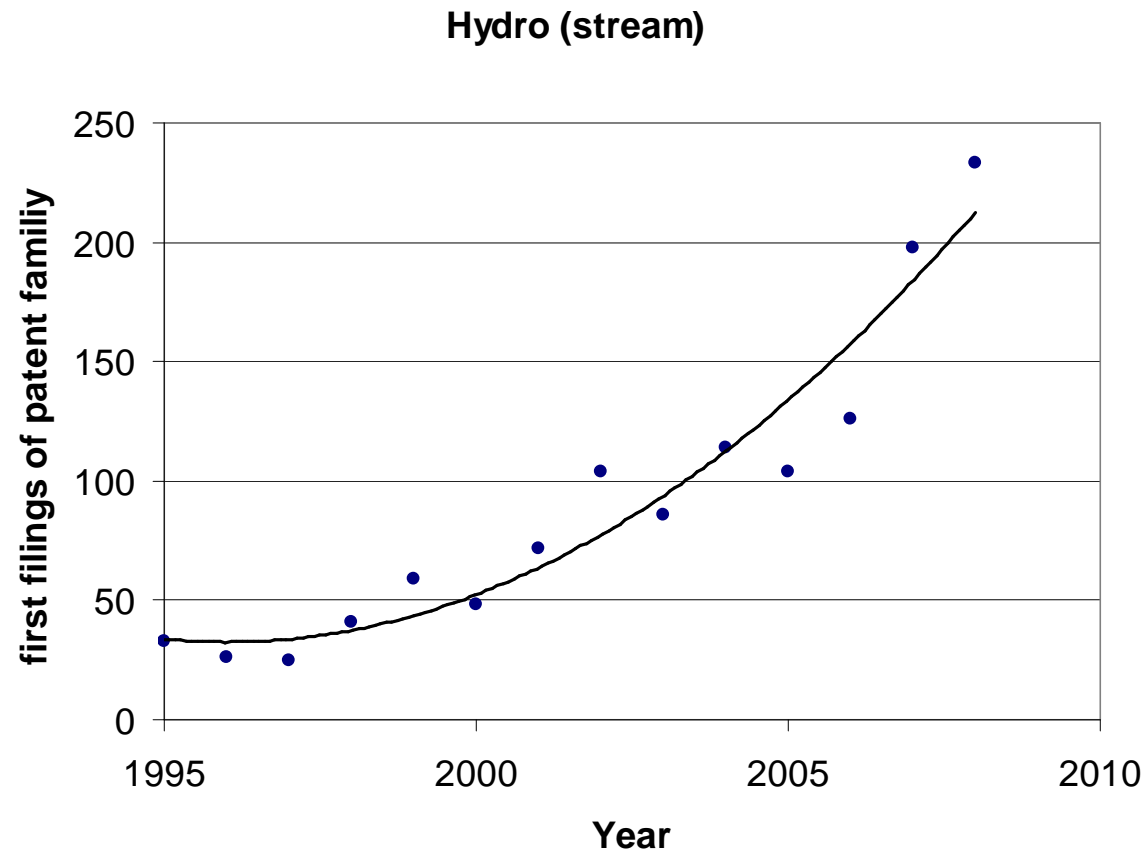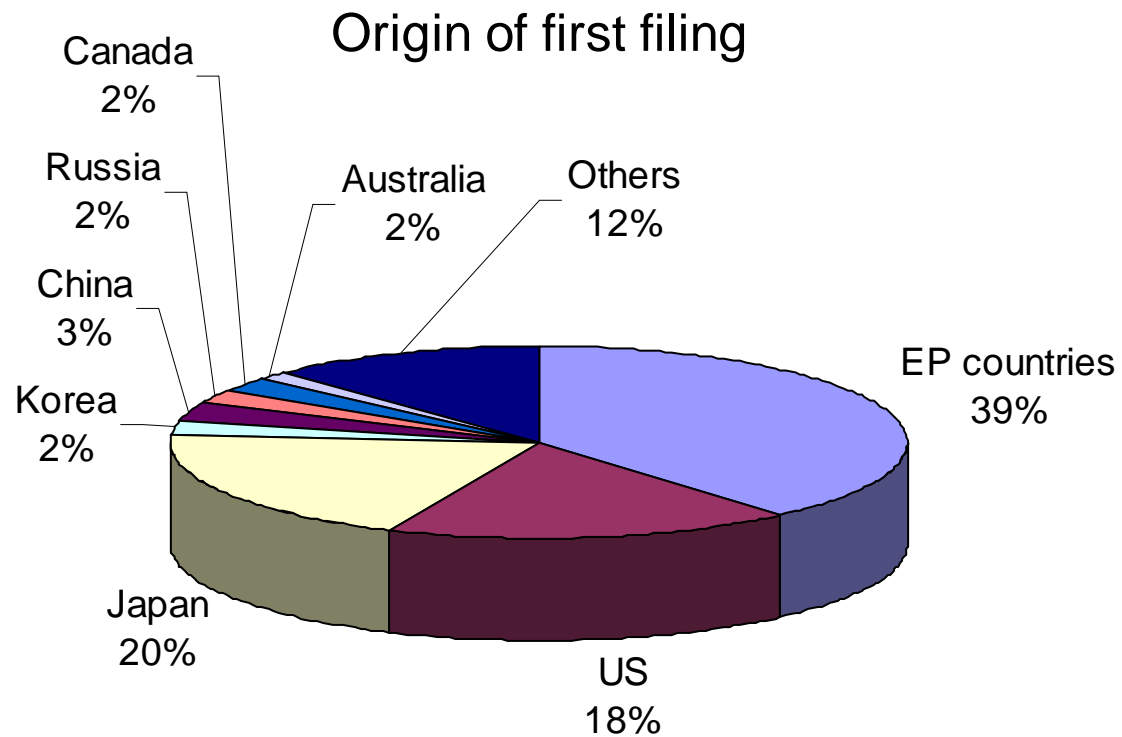
Some preliminary results (exemplary, indicative)

Hydro (stream)

Some preliminary results (exemplary, indicative)

- **Hydro (stream)**

Origin of first filing

Canada 2%
Russia 2%
China 3%
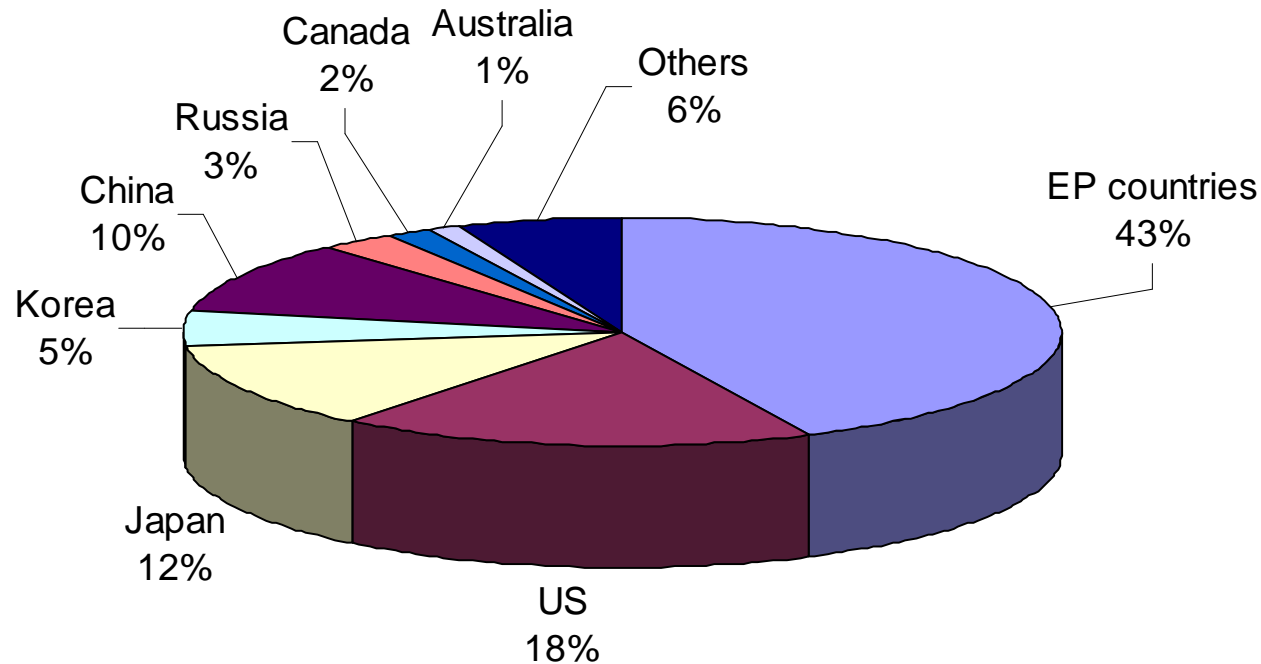Korea 2%
Japan 20%
Australia 2%
Others 12%
US 18%
EP countries 39%

Some preliminary results (exemplary, indicative)

- **Hydro (stream)**

Origin of first filing in 2008

Status

- Delimitation Exercise in Renewable Energy, Batteries and Fuel cells is practically finished and verified by external technology expert.

- The delimitation is correlated to search queries in EPODOC.

- Examiners are writing retrieval programs based on these search queries. Some of these are finished and first preliminary results are in.

- Patent data verification (in cooperation with OECD?) and feedback should be next step to ensure highest quality data.

- Data are periodically refreshable without any major effort!

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Thank you for your attention!