PATENTS: basic concepts and processes –
Case study: Patents and Access to Clean Technologies in Developing Countries

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What is a patent?

• A patent is an exclusive right granted for an invention.
• To get a patent, technical information about the invention must be disclosed to the public in a patent application.
• The term of protection: 20 years counted from the filing date.
• Patent protection is territorial.
Rationale for IPRs/patent protection

TRIPS Article 7, Objectives

“The protection and enforcement of intellectual property rights should contribute to:

• the promotion of technological innovation
• the transfer and dissemination of technology,
• to the mutual advantage of producers and users of technological knowledge
• and in a manner conducive to social and economic welfare, and
• to a balance of rights and obligations.”
What can be patented?

Patents shall be available for any inventions, whether products or processes, in all fields of technology. (TRIPS Article 27, 1).
Requirements for patentability

• NOVELTY

• INVENTIVE STEP

• INDUSTRIAL APPLICATION
Exclusions from patentability

Members may exclude from patentability inventions,

• to protect “ordre public” or morality,
• including to protect human, animal or plant life or health or
• to avoid serious prejudice to the environment,

Exclusions from patentability can also vary according to national legislation

(TRIPS, Art.27, 2).
Key international agreements on patents

- **Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)**
  - Establishes *minimum standards* for protecting and enforcing patents for all WTO members

- **Patent Cooperation Treaty (PCT)**
  - International Treaty administered by WIPO (World Intellectual Property Organization) which enables to make a *single international patent application*

- **Patent Law Treaty (PLT)**
  - Establishes common and maximum requirements regarding many of the *procedural formalities* relating to national/regional patent application.
Where to apply for a patent?

International route
Application at the WIPO in Geneva (Max. 148 Countries)

National route
Application at a national patent office, e.g. at the USPTO

Regional application
Application filed with a regional IP office
TITLE: BLOCK FORMING APPARATUS

(57) Abstract: Block forming apparatus comprises a compression chamber with upper and lower ends. A main ram extends into the compression chamber from the lower end, while an auxiliary ram is mounted on a pivoting arm and can be moved into the upper end of the compression chamber. A skeleton mixture is introduced into the compression chamber and a precompression stroke is carried out by the upper ram (36), before a main compression stroke is carried out by the lower ram (38). The operating force applied by the upper ram is substantially less than that applied by the lower ram.
Patent application process

- FILING → FORMAL EXAMINATION → PRIOR ART SEARCH → PUBLICATION → EXAMINATION
  - APPEAL ← OPPOSITION ← GRANT
Life of a patent

Source: Professor Felix Abbott, 2015
Patent activity in the world

Source: WIPO
Rights conferred by a patent

1. A patent shall confer on its owner the following exclusive rights:

   • (a) where the subject matter of a patent is a product, to prevent third parties not having the owner’s consent from the acts of: making, using, offering for sale, selling, or importing for these purposes that product;

   • (b) where the subject matter of a patent is a process, to prevent third parties not having the owner’s consent from the act of using the process, and from the acts of: using, offering for sale, selling, or importing for these purposes at least the product obtained directly by that process.

2. Patent owners shall also have the right to assign, or transfer by succession, the patent and to conclude licensing contracts.

   (TRIPS article 28)
Licensing of patents

1. Voluntary Licensing

The patent owner grants permission to another individual/organization to make, use, sell etc. his/her patented invention. This takes place according to agreed terms and conditions (for example, defining the amount and type of payment –royalty- to be made by the licensee to the licensor), for a defined purpose, in a defined territory, and for an agreed period of time.

2. Compulsory Licensing

Compulsory licensing is when a government allows someone else to produce the patented product or process without the consent of the patent owner. Certain requirements should be met (for instance: use shall be authorized predominantly for the supply of the domestic market, the right holder shall be paid adequate remuneration etc..).

TRIPS Article 31.
Patents and technology transfer

- The patent system sets up a legal framework that allows technology holders to disclose their inventions to the public and license or sell their patents without fear of free-riding.

“Members agree that some licensing practices or conditions pertaining to intellectual property rights which restrain competition may have adverse effects on trade and may impede the transfer and dissemination of technology.” (TRIPS Article 41, 1).

- Technology transfer is ultimately a complex and multidimensional process contingent on many factors (finance, local absorptive capacity, enabling environment).
IPRs and of Environmentally Sound Technologies (ESTs): A long running debate (1)

Are IPRS a key incentive for the development and diffusion of ESTs or a barrier for the affordable access to ESTs by developing countries?

Agenda 21 (1992)

Objectives

To promote, facilitate and finance, as appropriate, the access to and the transfer of ESTs and corresponding know-how, in particular to developing countries, on favorable terms, including on concessional and preferential terms, as mutually agreed, taking into account the need to protect intellectual property rights as well as the special needs of developing countries for the implementation of Agenda 21;
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<td>- Formulation of policies and programs for the effective transfer of ESTs that are publicly owned or in the public domain;</td>
<td>We emphasize the importance of technology transfer to developing countries and recall the provisions on technology transfer, finance, access to information, and intellectual property rights, in particular to developing countries, on favorable terms, including on concessional and preferential terms, as mutually agreed.</td>
<td>17.6 Enhance North-South, South-South and triangular regional and international cooperation on access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism.</td>
<td>The report suggests the use of compulsory licensing and patent pools in the context of policies to facilitate access to green technologies: &quot;Making it easier for countries to issue compulsory licenses under appropriate circumstances can help ensure more affordable access to patented green innovations by poorer households in low-income countries.&quot;</td>
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<td>- Purchase of patents and licenses on commercial terms for their transfer to developing countries on non-commercial terms, taking into account the need to protect intellectual property rights;</td>
<td>17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed.</td>
<td>- The Technology Executive Committee is the policy body of the Technology Mechanism of the United Nations Framework Convention on Climate Change (UNFCCC).</td>
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<td>- In compliance with and under the specific circumstances including rules with respect to their acquisition through compulsory licensing, with the provision of equitable and adequate compensation;</td>
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The Technology Executive Committee is the policy body of the Technology Mechanism of the United Nations Framework Convention on Climate Change (UNFCCC). In 2012, it adopted by consensus the following message on IPRs to the UNFCCC COP:

"IPRs were identified as an area for which more clarity would be needed on their role in the development and transfer of climate technologies, based upon evidence on a case-by-case basis."
Key challenge regarding patents in clean technologies: the extraordinary diversity of clean technologies
UNEP-EPO-ICTSD Report on Patents and Clean Energy

Mapping of renewable energy technologies
- ERI (China)
- TERI (India)
- ECN (Netherlands)

Patent landscape of clean energy generation technologies

Survey of licensing practices in clean energy technologies

New patent classification for clean energy technologies (Y02C, Y02E)

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<th>Code</th>
<th>Description</th>
<th>Comment</th>
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<tr>
<td>1000</td>
<td>Energy generation through renewable energy sources</td>
<td>Creative: wind, hydro, oceanic, solar (PV and thermal), tidal, wave, etc.</td>
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<tr>
<td>2000</td>
<td>Combustion technologies with intrinsic potential</td>
<td>Nuclear, geothermal, solar, wind, etc.</td>
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<tr>
<td>3000</td>
<td>Energy generation of nuclear origin</td>
<td>Fusion and fission</td>
</tr>
<tr>
<td>4000</td>
<td>Technologies for efficient electrical power generation, transmission or distribution</td>
<td>Reactive power compensation, efficient operation of power networks, etc.</td>
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<tr>
<td>4500</td>
<td>Technologies for the production of fuel or non-fuel benign</td>
<td>Hydrocarbons, from waste, etc.</td>
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<tr>
<td>5000</td>
<td>Technologies with potential or inherent contribution to GHG emissions mitigation</td>
<td>Hydrogen storage (batteries, ultracapacitors, pyrolysis, etc.), hydrogen technology and fuels, etc.</td>
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<tr>
<td>7000</td>
<td>Other energy innovation or management systems reducing GHG emissions</td>
<td>Synergies among renewable energies, fuels, and energy storage</td>
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Growth rate of clean energy technology patenting

Figures refer to claimed priorities.
Key findings of patent landscape

- Patenting rates in the selected clean energy technologies (CETs) have increased at roughly 20% annually since 1997. The surge of patenting activity in CETs coincided with the adoption of the Kyoto Protocol in 1997.

- The fields experiencing the most intensive growth include solar PV, wind, and carbon capture.

- The leading six countries with actors innovating and patenting CETs are Japan, the United States, Germany, the Republic of Korea, France and the United Kingdom. They account for almost 80 per cent of all patent applications.

- Concentration of patenting activity in these countries reflects patenting trends in other technology sectors.
Licensing survey

- **Part A: General questions**
  - Proportion of CET-related patents
  - Importance and trends in in- and out-licensing activities
  - Collaborative IP mechanisms, importance for overall business strategy

- **Part B: Developing countries (DCs)**
  - Licensing activities in DCs? Which ones?
  - Factors affecting licensing agreements in DCs?
  - Flexibility of licensing terms in DCs?

- **Part C: General statistics**
  - Type of organisation, country of headquarter, size, CET fields, R&D
Emerging economies 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?'
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 substantially more accommodating, 5%
- Licensing terms are much more accommodating, 15%
- No difference in licensing terms, 30%
Thank you

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Additional slides
Exclusions form patentability (2)

Members may also exclude from patentability

(a) diagnostic, therapeutic and surgical methods for the treatment of humans or animals;

(b) plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, Members shall provide for the protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof.

(TRIPS, Art.27, 3).
Exclusions form patentability (3)

• Exclusions from patentability vary according to national legislation

• Many countries exclude:
  – Discoveries, scientific theories and mathematical methods
  – Aesthetic creations
  – Methods for medical treatment (as opposed to medical products)
  – Plants and animals
  – Computer programs
Block forming apparatus comprises a compression chamber with upper and lower ends. A main ram extends into the compression chamber from the lower end, while an auxiliary ram is mounted on a pivoting arm and can be moved into the upper end of the compression chamber. A consolidation mixture is introduced into the compression chamber and a precompression stroke is carried out by the upper ram (32), before a main compression stroke is carried out by the lower ram (30). The operating force applied by the upper ram is substantially less than that applied by the lower ram.
Limitations and exceptions to patent rights

• L & E to patent rights aim to strike a balance between interests of a right holder, third parties and public interest.

• Members may provide limited exceptions to the exclusive rights conferred by a patent, provided that such exceptions:
  – do not unreasonably conflict with a normal exploitation of the patent and
  – do not unreasonably prejudice the legitimate interests of the patent owner,
  – taking account of the legitimate interests of third parties.

   (Article 30 TRIPS)

• Examples of exceptions:
  – Experimental use and/or scientific research
  – Acts for obtaining regulatory approval from authorities