

2. TARGETING NEW GROWTH AREAS

2.10. Nanotechnology patents

Nanotechnology – the science of the very small – is likely to have a major economic and social impact in the years ahead. It may help further miniaturise information technology devices, resolve fundamental questions related to the immune system, accelerate advances in genomics and contribute to the generation of renewable energy.

Inventive activities in nanotechnology have risen substantially since the end of the 1990s. At 16.5%, the average annual growth rate in nanotechnology patents filed under the Patent Co-operation Treaty (PCT) surpassed that of overall PCT patents (11%) between 1996 and 2006. Most countries report a significant increase in their shares of nanotechnology in total national patenting since the late 1990s, although activity remains relatively limited (1.1% of total patents on average). Singapore is the country most specialised in nanotechnology with respect to relative patenting activity: its proportion of nanotechnology patents is nearly three times the average share of nanotechnology patents in all patents over 2004-06.

During the same period, more than two-thirds of nanotechnology patents originated from the United States (43%), Japan (17%) and Germany (10%). Korea has also broadly invested in nanotechnology and ranks fourth in producing nanotechnology patents (3.7%).

Nanotechnology patents

Reflecting the increasing interest and importance of nanotechnology in patents, the United States Patent and Trademark Office (USPTO), the European Patent Office (EPO), and the Japan Patent Office (JPO), have made intense efforts to improve their respective classification systems and collect all nanotechnology-related patents in a single patent class. Nanotechnology patents presented in this section were identified via the EPO using the following definition:

“The term nanotechnology covers entities with a controlled geometrical size of at least one functional component below 100 nm in one or more dimensions susceptible to make physical, chemical or biological effects available which are intrinsic to that size. It covers equipment and methods for controlled analysis, manipulation, processing, fabrication or measurement with a precision below 100 nm.”

Identification of nanotechnology patents is a complex task. A nanotechnology working group (NTWG) was created by the EPO in 2003. At first,

it worked on the definition of nanotechnology in order to follow trends in nanotechnology patents. Then it identified nanotechnology patents through keyword searches, consultations with nanotechnology experts in the EPO, and peer reviews by external experts. Patent applications from 15 countries or organisations were analysed. As a consequence of these endeavours, about 90 000 out of 20 million patent or non-patent literature documents were tagged to class Y01N.

Nanotechnology patent applications were further categorised into six fields of application by the OECD, i.e. “Electronics”, “Optoelectronics”, “Medicine and biotechnology”, “Measurements and manufacturing”, “Environment and energy”, and “Nanomaterials”, based on the International Patent Classification (IPC).

Source

OECD Patent Database, June 2009,
www.oecd.org/sti/ipr-statistics.

Going further

Igami, M. and T. Okazaki (2007), “Capturing Nanotechnology’s Current State of Development via Analysis of Patents”, *OECD Science, Technology and Industry Working Papers* 2007/4, OECD, Paris,
www.oecd.org/sti/working-papers.

OECD (2009), *OECD Patent Statistics Manual*, OECD, Paris.

Scheu, M., et al. (2006), “Mapping Nanotechnology Patents: The EPO Approach”, *World Patent Information* 28, pp. 204-211.

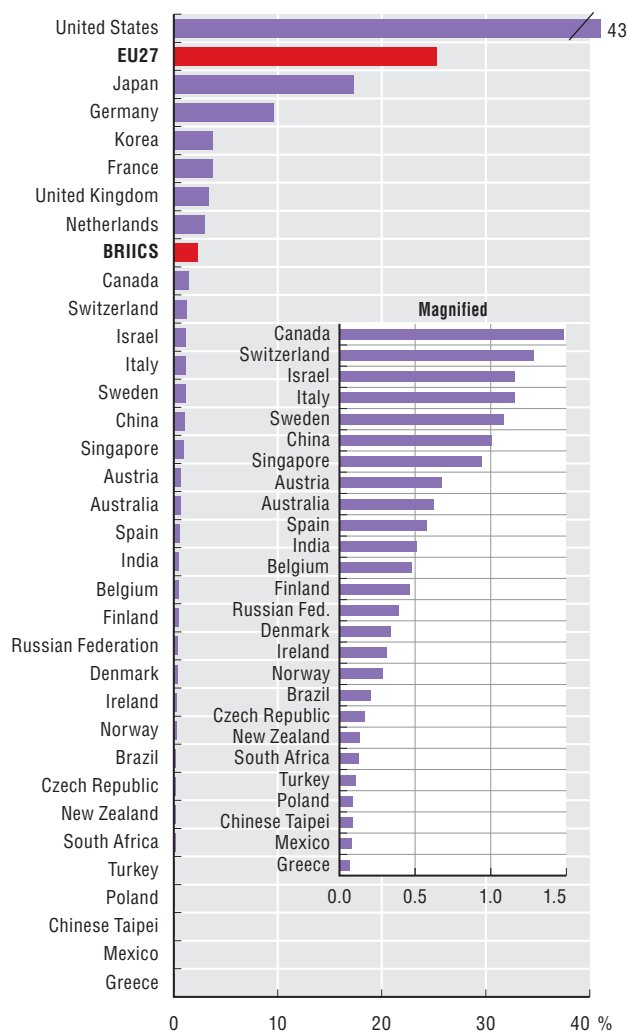
Figure notes

Data relate to patent applications filed under the PCT, at international phase, designating the European Patent Office. Patent counts are based on the priority date, the inventor’s country of residence and fractional counts. BRIICS refers to Brazil, the Russian Federation, India, Indonesia, China and South Africa.

The revealed technological advantage indicator is calculated as the share of nanotechnology in a country’s patents relative to share of nanotechnology in total patents. Only countries with more than 250 patents during the periods are included in the figure.

Share of economies in nanotechnology patents filed under PCT, 2004-06

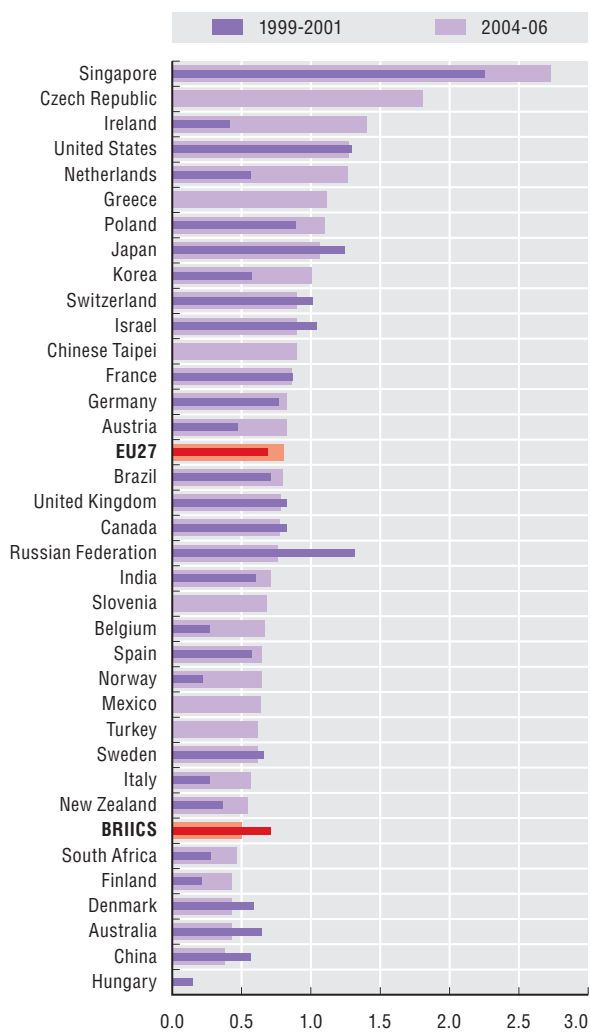
Percentage



StatLink <http://dx.doi.org/10.1787/743710614871>

Revealed technological advantage in nanotechnology

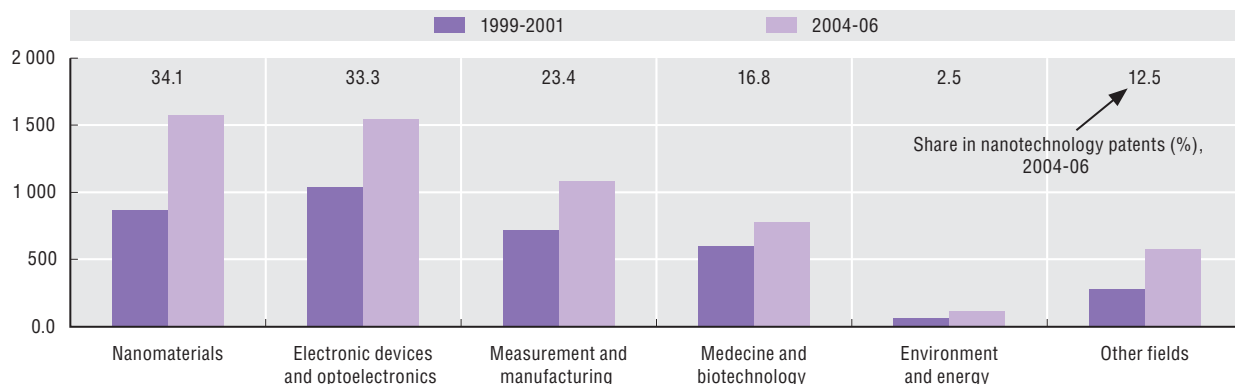
PCT patent applications



StatLink <http://dx.doi.org/10.1787/743727147336>

Trends in nanotechnology patents by field of application

World total



StatLink <http://dx.doi.org/10.1787/743854706424>



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