

UK losing out on commercialisation of 'wonder material' graphene, report claims

o Matthew Finnegan
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The UK risks losing out in the commercial development of graphene, according to a report highlighting a surge in patents awarded across the globe.

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The UK risks losing out in the commercial development of graphene, according to a report highlighting a surge in patents awarded across the globe.

Research published by Cambridge IP shows that the number of graphene-related patents awarded by the end of 2012 grew to 7,351, with China accounting for the highest number, with 2,204 patents. USA based organisations were responsible for 1,754 patents or patent applications, followed by South Korea, with 1,160.

The UK meanwhile has produced only 54 graphene related patents since the material was first developed by scientists Andre Geim and Konstantin Novoselov at Manchester University in 2004. CambridgeIP does note however that there could be an 18 month lag in some applications being published.

Although the UK has led initial scientific discoveries around graphene there is a concern that other regions could capitalise on production and development at a commercial level.

Samsung, one of the leading companies developing graphene, has 407 patents filed, followed by IBM with 134. Sandisk and Xerox are two of the other major tech firms cited as being involved in the production of patents according to CambridgeIP, though Nokia has also been developing the material.

Graphene has been touted as revolutionising various areas of electronics, with its remarkable strength, conductivity and thinness opening up new technological possibilities in a variety of areas. For example, the material is cited as a potential successor to silicon in some semiconductor applications, with IBM producing its first integrated circuit using the material in 2011.

Despite the small number of patents being awarded in the UK, experts are confident that there will be opportunities to benefit from graphene in future, following greater government investment.

This includes the £61 million institute at Manchester University, a 7,600 square metre building which will house research facilities when completed, that will encourage a bridge between scientists and wider industry figures.

Funding awarded to other universities leading research in the UK include £4.5 million given to Imperial College, while the University of Cambridge has been awarded over £12 million for research purposes.

Earlier this month £21 million has also been earmarked by the government for investment in the production of graphene-based superconductors.

Quentin Tannock, Chairman of CambridgeIP commented that despite trailing in patent numbers, there is still ample opportunity for the UK to stake its own claim with graphene development.

"The UK has enormous potential to secure future value in the graphene patent landscape," he said in a statement. "However both additional funding and a greater consciousness of the importance of patents to business models in many of the end-use sectors for graphene are likely to be essential in ensuring UK based players secure most value from their graphene innovations.

Andrea Ferrari, Professor of Nanotechnology at Cambridge's Department of Engineering, told

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Computerworld UK that while some regions appear to have the edge in terms of patents granted, these have been clustered around certain applications such as displays, with the UK retaining a strong position in other areas.

"We are a little bit late, but things are going to change with the funding available now," he said.

"There have been quite a few announcements of funding in the UK, so the UK is now focused on the engineering and applications of graphene rather than the basic science, and we would expect more patents to come out."

He added that there is still a commercial presence in the UK supporting research in universities, with Nokia involved in development here, even if there is not the financial muscle available in other regions,

"Of course we don't have the same amount of money to spend on patenting, but if you are clever you can still find applications that have not been covered in Korea, for example," he said.

Prof Ferrari explained that the UK has "world leading" patents centring around the use of graphene ink, which covers applications for printed electronics and flexible electronics. Other areas where there the UK is "world leading" in graphene development is in optoelectronics and battery applications.

He added that in order to reap the maximum benefits from its graphene development the UK should concentrate on key areas which are not currently monopolised by the likes of Samsung.

"We need to focus core activities where the UK has leading expertise, and those fields which are not covered by existing patents, because you have to distinguish between the number of patents and the topics they cover."

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