

## **Innovation Insights Submission to the Special Rapporteur in the field of Cultural Rights**

Innovation Insights thanks the Special Rapporteur for the opportunity to submit observations about the intersection of intellectual property (IP) protection and the enjoyment of the right to science and culture. This submission focuses on patents, one form of IP rights (IPRs), specifically the contribution of patents to the enjoyment of scientific and technological progress. We would welcome the opportunity to elaborate on any of the points below.

Innovation Insights is a Geneva-based initiative dedicated to supporting technological innovation and its dissemination, a key element of improving human welfare. Our member companies operate at the cutting edge of health, information and communications, green, and other fields of technology. We advocate for innovation policy frameworks that are business model-neutral and that provide incentives for investments in research and development (R&D) and the scaling of new technology solutions over the long term. We are committed to innovation policy-making that is rooted in empirical evidence.

From firsthand experience, our members know that patents facilitate the enjoyment of scientific and technological progress, *first*, by contributing to R&D which leads to the development of new and more cost-efficient technology solutions and, *second*, by enabling the global diffusion of knowledge and solutions through training, joint research, joint ventures, sales, licensing, and other forms of engagement. Patents supply legal certainty to technology transactions, enabling innovators to share their knowledge without undermining their investment in its creation.

This submission emphasises the following points:

- Technological innovation is critical for human development;
- Patents are a key part of an enabling environment for innovation, helping to incentivise investments in innovation and the dissemination of R&D outcomes;
- Patents support the translation of initial stage research to scalability by enabling early innovators to capture value and transfer the related rights;
- Patents enhance the innovation process by furthering collaboration, including for the adaptation of technology to local circumstances;
- Patents supply broader access to new technology and knowledge;
- Innovation policies should reflect the long-term interests of an economy; and
- Patents support the development of innovative solutions to address global challenges.

Technological innovation is critical for human development.

Innovation is important to help address global challenges, such as climate change and healthcare, which require the development and diffusion of a wide variety of new and cost-effective technologies, within and between developed and developing countries (Lybecker & Lohse 2015). Moreover, innovation performance is a key determinant of

competitiveness and economic growth. It has become the essential means for businesses and other organisations to justify investments in technology and work across borders (David & Foray 2003).

Patents help to incentivise investments in innovation and the dissemination of R&D outcomes.

Investments in innovation are influenced by many factors including infrastructure, target market size, and absorptive capacity and human capital. The translation of research into new products and services is supported by an enabling policy environment. IP protection is one essential element of an enabling policy framework for innovation, and patents in particular facilitate investments in R&D activities.

R&D, an inherently risky endeavor, aims to translate basic research into new products and services that improve human welfare. By temporarily conferring exclusive rights on specific improvements, patents permit companies, universities, and other innovators to capture a part of the added value of their inventions, and to support their investments in developing them. Patents provide a means of rationalizing investments in R&D. Without the possibility of recuperating R&D investments upon success, financial and human capital may be allocated towards activities other than technology research.

IP ownership based upon quality patents can enable innovative organisations signal their value, to facilitate partnerships and investments. Thus patents contribute to reducing information asymmetries that result from the outsiders' incapacity to adequately assess the value of R&D projects.

Patents enhance the innovation process by furthering collaboration.

Against a backdrop of greater product complexity, convergence of different technology areas, and globalisation, the "open innovation" model is expected to become the leading approach to technology development of the 21<sup>st</sup> century. Rather than developing and scaling products and processes exclusively within the boundaries of a single entity, today firms, research centers, universities, foundations, and NGOs are working with external collaborators in order to enhance the innovative process (Gross 2013). By "opening" the R&D process, they are able to acquire essential complementary knowledge and resources, thus accelerating innovation. In addition, collaboration is critical to upgrading absorptive capacity, *i.e.*, the ability of people in a given institution or region to work with and adapt technologies to local needs.

Patents can effectively underpin collaborative innovation. With an idea protected, an innovator will be more willing to work with others to refine his solution. He knows that, during the period of patent protection, information shared about his patented innovation cannot be used against him in the marketplace. Within a partnership, patents delineate who brings what to the table, and how the fruits of collaboration will be owned and managed.

Patents allow entities to simultaneously disclose and protect their know-how. For example, through cross-licensing of patents, a company can offer the use of its proprietary technology in exchange for use of others' inventions.

Patents support the translation of initial stage research to scalability.

Patents are particularly important for small and medium-sized enterprises (SMEs), enabling them to attract investors and partners. Because SMEs generally lack the necessary resources and expertise to bring their ideas to the market, they tend to work with partners to scale (De Rassenfosse 2012). Similarly, academic institutions are typically not engaged in distributing or otherwise scaling their innovations for the market. They tend to lack experience with manufacturing, distribution, regulatory approval, and other actions necessary to disseminate technology (Kayje *et al* 2012). To overcome this, increasingly, they patent their discoveries and license them for further development. Without such a possibility, much university research may never be transformed into an actual product or service that can enhance quality of life.

Patents enable broader access to new technology solutions and knowledge.

In order to receive a patent, inventors must disclose their inventions. By requiring and incentivising the publication of key research results and scientific data, patent systems support further innovation and development of new, derived products and technologies (World Energy Council 2011). Based on a review of what others are patenting, an innovator can determine trends in R&D in a given sector. He can also identify potential partners for a project then seek to establish collaboration.

A patent may be granted in relation to a breakthrough invention, or for a specific technical improvement in a field of technology. For instance, a patent may be granted on an innovation that improves the functioning of one part of a machine, enhancing overall cost-efficiency. Depending on the field of technology, over time, multiple improvements to the same technology solution may be developed by different innovators, which may hold patents in relation to their own improvements. These entities could decide to license or cross-license to each other, in order to integrate their improvements into one offering. Or they could develop their own competing products with different innovative features.

Once issued, patents are managed by firms, universities, individual inventors, research centers, foundations, and others to support the development and scaling of new technology solutions, whether in-house or in collaboration with external partners. Patents are bought and sold, licensed, and traded in cross-licensing deals for access to others' intellectual property every day, in many jurisdictions. The result of these IP transactions is that proprietary technology is broadly diffused around the world. There is consensus among international economists that strong patent rights can significantly expand trade, foreign direct investment, and licensing, thereby contributing to economic development, in particular in developing countries (Maskus & Saggi 2014).

Innovation policies should reflect the long-term interests of an economy.

Governments and actors have the responsibility to adopt a long-term perspective when shaping policies that affect innovation and technology diffusion. In particular, IP systems should not be modified in response to transitory considerations. Any short-term gains will, in all likelihood, ultimately be outweighed by damage to the economy or sector in question. Modification of innovation frameworks creates legal uncertainty for businesses, interfering with long-term planning and investment by increasing risk.

In certain emerging markets, domestic industries currently focused on imitation rather than innovation may lobby their governments for weaker IP protection, or for the imposition of non-commercial technology transfer obligations for foreign technology providers. Government action to honor such requests may benefit such domestic industries in the short term. However, such policies are likely to negatively impact innovators, whether located at home or abroad. Also, as domestic industries move up the value chain and become innovators in their own right, such policies may slow down this transition. Domestic actors are most knowledgeable about local needs and conditions, and are thus poised to partner with technology providers to adapt offerings to a local context. Without an adequate framework for IP protection, opportunities for partnership and the associated knowledge exchange may be lost.

Patents support the development of innovative solutions to address global challenges.

Below are two examples that show how companies use patents as tools for R&D and the deployment of new solutions. The first example illustrates how through collaborative innovation local absorptive capacity and human capital can be enhanced. The second example demonstrates the value of open innovation in translating the outcomes of publicly-funded research into products that improve human welfare.

- GE-Transnet Joint Venture: Upgrading human capital through green tech transfer<sup>1</sup>

General Electric and Transnet Freight Rail have been engaged in a manufacturing joint venture (JV) in South Africa for several years. As part of this partnership, more than 150 advanced green locomotives have been built for customers in South Africa and other African markets, resulting in the emergence of a center of excellence for locomotive technology near Pretoria. Transnet Freight Rail is part of Transnet SOC Ltd., South Africa's state-owned ports and rail operator.

The collaboration began in 2010 as an order to purchase "Evolution Series" advanced locomotives from GE. Transnet's role was to assemble the majority of the locomotives – which use advanced materials and innovative computer-controlled operating architecture – in South Africa, using parts made in the United States. In 2012, the South African government announced that the locomotives made included 37 per cent local content, thus enhancing regional economic benefits and knowledge spillovers. Working

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<sup>1</sup> Case study from Brant & Parthasarathy (2015).

with GE, domestic suppliers had been able to quickly increase their supply of certain inputs, at the required level of quality, for the production of the locomotives.

Deployment of the advanced locomotives made by GE and Transnet will result in significant benefits for Transnet, as well as other railway operators in Africa: lower fuel and maintenance costs, significantly lower emissions, and improvements in hauling capacity. As infrastructure is a critical foundation for development, the positive economic impacts of the manufacturing JV are expected to be significant. Moreover, through collaboration, knowledge and technology are being shared between GE and Transnet, contributing to higher productivity, creation of skilled jobs in the region, and a stronger industrial base for South Africa. Transnet is now encouraging GE and other infrastructure companies to set up permanent train-assembly plants. This would replicate an earlier initiative by the South African government to attract partners from the automotive industry, which established manufacturing plants in the country, resulting in jobs and export capacity in that sector.

- ActoGeniX: Transforming university research into healthcare products<sup>2</sup>

ActoGeniX, an innovative SME from Belgium, attributes its success to judicious IP management and to collaboration with public and private entities. ActoGeniX was spun out from the Vlaams Instituut voor Biotechnologie (VIB) in Ghent, a research institute with a rich history of incubating technology solutions in-house before spinning them out. Using public funding, VIB researchers had been exploring the expression and delivery of proteins via bacteria since 1995. They pioneered the development of a platform for the oral delivery of therapeutic proteins, which VIB protected by filing several patent families. ActoGeniX was created in 2006 to further develop this proprietary platform. At this time, VIB made a contribution in-kind of the patents, in return for shares in the new company.

ActoGeniX continued the VIB strategy of building a secure IP position, filing for patent protection in order to protect the company's niche. Besides the attractiveness of its technology solution, it was its strong IP portfolio that enabled ActoGeniX to attract investment, to engage in partnerships with larger players seeking to use its proprietary platform to orally deliver their products, such as antibodies, and ultimately to be acquired by the US firm Intrexon in 2015. Upon the acquisition by Intrexon, VIB was compensated for having contributed the patent family (when ActoGeniX was formed), and will allocate these funds towards new research.

ActoGeniX/Intrexon is the only company developing an oral delivery mechanism for proteins via bacteria, working at the clinical stage. The solutions under development are aimed at treating unmet needs in relation to gastrointestinal, immunological, and metabolic diseases.

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<sup>2</sup> Case study from Brant & Lohse (2013).

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