



# Promoting Technology Diffusion To The Developing World

## *A Blueprint for Advancing, Protecting, and Sharing Innovation*

The developing world faces many challenges. Most are quite daunting; several are tragic. Rampant disease, lack of clean water, inadequate healthcare, and food shortages are a few that top the list. As the international community struggles to surmount these challenges, two fundamental questions arise: what is the best way to incentivize the innovations that can remedy these problems, and what are the obstacles to deploying them?

Too often the global intellectual property (IP) system of legal rights and obligations has been attacked by a vocal minority who paint it as an “obstacle” to progress and a “barrier” to development. Study after study, however, has demonstrated that the opposite is true. IP protections incentivize innovation and maximize the diffusion of new technologies that lead to job growth and international development.<sup>1</sup> The real obstacles to technology transfer, most agree, involve some combination of inadequate infrastructure, extraordinary tariff and non-tariff barriers, protectionist industrial policies, limited human capital, insufficient financing, corruption, and poor governance.

It is imperative that cutting-edge technologies that can aid others and advance development be made available around the world. It is also important that the real barriers to progress are identified and removed, that market-friendly inducements to facilitate tech development and transfer are established, and that the global IP system responsible for spurring innovation is not undermined by the shortsighted political agendas of a few.

### Threats to Innovation and Technology Diffusion

In recent years, some foreign governments and NGOs have tried to portray IP rights as an obstacle to technology diffusion and an impediment to helping the developing world. Whether it is pharmaceuticals, medical devices, “green” technologies, or some other discovery, they have argued that the expropriation of these inventions—through compulsory licensing, patent exceptions, and other involuntary measures—is the most effective way for them to be shared. For example, in UN climate change negotiations, proposals have been offered by China, India, Brazil and others that would permit the “taking” of patented environmental technologies, all in the name of addressing global warming. But with such an approach, our ability to invent the technologies and address the problems will be seriously harmed over the long run.

A growing and persuasive body of economic analysis rebuts the assumption that IP is a barrier to tech transfer. Research has found the

opposite to be true—strong IP rights facilitate technology diffusion. The U.S. International Trade Commission conducted a thorough analysis of the global flow of biotechnology-related innovations in 2008 and found conclusively that “patents and other types of intellectual property facilitate increasingly frequent collaborations by providing the foundation for the transfer of technology.”<sup>2</sup> In fact, the publication of patent applications and patents are in and of themselves one of the most powerful mechanisms of technology transfer. Today, the combination of patent application publication and the Internet makes this information more accessible by developing countries than ever before.

A 2009 study sponsored by the EU Commission also makes clear that “IPR protection is not the main barrier preventing the transfer of environmental technologies to developing countries.” The EU report goes on to say that, “there is a serious risk that a broad use of compulsory licensing (or other measures weakening IP rights) would constitute a disincentive for companies engaged in that sector, which might reduce their investment in such technologies.”<sup>3</sup>

Finally, the OECD conducted an exhaustive study in 2008 on the role that IP plays in technology transfer and concluded that, “Focusing on technology transfer to developing countries ... stronger levels of patent protection are positively and significantly associated with the inflows of *high-tech* products, like pharmaceutical goods, chemicals, aerospace, computer services, information, and office and telecom equipment.”<sup>4</sup>

### The Real Obstacles to Technology Diffusion

Most developing countries are actively seeking various ways to enhance their economic development and improve the quality of life for their people, and often see technology transfer as a mechanism to achieve those goals. Yet, the real barriers to tech diffusion are often the laws, regulations and policies a country imposes to protect local industries from global competition. For example, according to a July 2009 story in the *New York Times*, China considers renewable energy a “strategic industry” that it is “protecting” to “make sure its companies dominate globally.” Supporting national champions, as a new report by Chatham House points out, “may hinder global innovation in energy systems.”

A report by the U.S. Chamber of Commerce stated that “many countries impose tariffs of up to 70% on climate-friendly goods and services, impeding access to cutting edge technologies.” In fact, a

2007 report by the World Bank concluded that by removing these types of barriers, trade in green technologies and services could rise 7-14% annually.

This attempt to have it both ways – trying to lessen the IP rights of inventors while simultaneously tilting the playing field in favor of domestic champions – magnifies the problem, slowing innovation and the diffusion of technologies to the people who need them most. In the context of “green” technologies, specific examples of tariff and non-tariff barriers include:<sup>5</sup>

- **A tariff and non-tariff barrier of 40% on clean coal technologies in China**
- **A tariff barrier of 15% on solar technology in India**
- **A tariff and non-tariff barrier of 101% on wind technology in Brazil**

In addition to these impediments, a 2009 report by researchers from The Colorado College concluded that “there are a number of characteristics and circumstances of developing nations that hinder innovation: a lack of scientists and researchers, brain drain, small market size, the lack of infrastructure, the quality of the business environment and governance conditions, bureaucratic climate and the formal/informal regulations regarding economic transactions, cash-strapped governments, and inability to make public investments in research and infrastructure.”

A 2008 study by Park and Lippoldt found that while technology transfer was enhanced by stronger levels of patent protection, other complementary factors such as “infrastructure, effective government policies and regulations, knowledge institutions, access to credit and venture capital, skilled human capital, and networks for research collaboration” were also necessary. It is this “absorptive capacity” of each country, along with other factors, that affects a company’s willingness to transfer technology.

## Recommendations for Improving Technology Diffusion

One of the first things countries should do is **eliminate tariff and non-tariff barriers** on technology imports that make their transfer more costly and less welcome. In addition to eliminating barriers, other actions governments can take include:

- **Establish a strong legal environment.** Legal environments that provide strong, predictable and enforceable IP rights are essential to giving innovators the ability to efficiently manage the movement of their products into global markets.
- **Stimulate R&D and globally-based invention.** Technological breakthroughs are the product of massive amounts of R&D carried out by scientists and researchers collaborating across the globe. Governments need to prioritize basic scientific research and encourage global collaborations.
- **Adopt economic policies that induce innovation.** Fiscal measures such as tax incentives for R&D, promoting

collaboration between research institutions and the private sector, supporting open markets and trade, and national policies that prioritize innovation provide critical support to technology diffusion.

- **Improve local infrastructure.** Fund infrastructure projects to attract, support and effectively utilize advanced technologies, from improving roads, facilities, and power grids, to building local communities and improving healthcare.
- **Invest in human capital.** Make the long term investments necessary to create a knowledge-based society, such as building a strong educational system that includes technical skills training; incentivizing students to pursue careers in science, technology, engineering, and math; establishing first-rate universities and research centers; and, developing programs in the short-term to attract scientists and researchers from other countries in collaborative endeavors.

These are just a few ideas that can facilitate tech transfer, a long term process that occurs largely (and most effectively) within the private sector along voluntary, commercially-viable and IP-compliant terms. It involves the interactions between companies and individuals, not governments, and involves everything from the simple marketing and sale of patented products in the global marketplace, to co-production agreements, joint ventures, and sundry licensing arrangements, to name a few. This cooperation also includes any number of activities over a period of time to deliver, install, implement, maintain, and upgrade the technology, and may require transfer of technical know-how, trade secrets, and manufacturing specifications that are not disclosed in patent documents, and cannot be learned through compulsory licensing.

Developed countries can help in a number of ways by providing technical assistance and establishing incentives for innovation and technology diffusion. They can help developing countries improve their absorptive capacity; provide grants, low-interest loans, or other forms of assistance to the least developed countries; offer tax relief and other incentives to companies who trade or partner with firms in developing countries; use fiscal policies and other measure to promote joint research and collaboration; and, contribute to a global fund from which LDCs can receive financial assistance to purchase technologies.

## A Future Based on Global Collaboration

Meaningful technology diffusion can only be driven by voluntary, market-based, IP-friendly transactions and collaborations that establish real win-win scenarios. These transactions do not exist in negotiating texts of global treaties and do not find any meaning in formal declarations that undermine global IP rights. They do not thrive in environments where infrastructure is poor and legal frameworks are weak. What these transactions and collaborations do require and respond to is a strong respect for their investments, innovations, and IP rights, as well as an open and receptive marketplace to tap new ideas, establish new partnerships, and reach new consumers. This is the proven path forward for the developing world and the international community.

### (Endnotes)

1. See, for example: Copenhagen Economics (2009); Johnson and Lybecker (2009); Chatham House (2009); Appel, P.A. and T.R. Irvin (2008); Park and Lippoldt (2008); Arimura, T.H., A. Hibiki and N. Johnstone (2007); Barton, J.H. (2007); Chandrashekar, Coppola, N.W. (2007);

Bosetti, V., C. Carraro, and M. Galeotti (2006b); Aubert, J.-E. (2004); Jasinski, A. (2004); Hoekman, Maskus and Saggi (2004); Gallini. 2. [http://www.usitc.gov/publications/docs/pubs/research\\_working\\_papers/pub4039.pdf](http://www.usitc.gov/publications/docs/pubs/research_working_papers/pub4039.pdf) 3. <http://trade.ec.europa.eu/doclib/docs/2009/>

february/tradoc\_142371.pdf 4. [http://www.oilis.oecd.org/olis/2007doc.nsf/LinkTo/NT00005B06/\\$FILE/JT03239222.PDF](http://www.oilis.oecd.org/olis/2007doc.nsf/LinkTo/NT00005B06/$FILE/JT03239222.PDF) 5. [http://www.ipa.org.au/library/publication/1219192134\\_document\\_wilson\\_mitigationtechnology.pdf](http://www.ipa.org.au/library/publication/1219192134_document_wilson_mitigationtechnology.pdf)