GREEN TECHNOLOGY IN DEVELOPING COUNTRIES: CREATING ACCESSIBILITY THROUGH A GLOBAL EXCHANGE FORUM

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ABSTRACT

As they pursue economic development, developing countries possess high demand for processes and technologies that have climate-friendly methods or alternatives. However, these nations currently face barriers to entry because of trade policies and intellectual property regulations that render procurement of these technologies cost-prohibitive. In light of the recent breakdown in negotiations at the United Nations climate conference in Bali to remove tariffs on green technology, a new approach to green technology diffusion should be considered in order to balance the demand among developing nations for fluid technology transfers with the profit-driven needs and intellectual property considerations of technology holders. A potential solution to overcome the high fixed costs of technology diffusion could involve the creation of a global exchange forum in which transnational green technology holders, green venture capitalists, and developing country entrepreneurs could broker for efficient allocation of investment, resources, and technologies.

INTRODUCTION

¶1 The recent United Nations Climate Change Conference in Bali, held from December 3 to 14, brought together members of 180 nations and numerous public and private entities in order to set the stage for a 2009 international agreement on climate change[2] as a successor to the Kyoto Protocol.[3] One of the major topics pursued during these negotiations involved conceiving methods by which developing countries could attain

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[2] United Nations Climate Change Conference, Dec. 3–14, *The United Nations Climate Conference in Bali*, http://unfccc.int/meetings/cop_13/items/4049.php (last visited Nov. 13, 2008).

[3] Robert Collier, *Bali Needs to Know – Can China go Green?*, S.F. CHRON., Dec. 9, 2007, at C1, *available at* http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2007/12/09/IN2HTP07B.DTL.

environmentally-friendly "green technology."[4] Talks ended with developing countries pitching their strong demand for technologies in alternative energy and emissions control and need for fluid technology transfer,[5] while developed countries insisted that technology transfer is proceeding significantly but prudently in light of the need to protect intellectual property.[6] By the end of the conference, a draft technology transfer agreement pinpointed certain goals for future progress on this front, including technology needs assessment, joint R&D programs, a healthy technology transfer environment, and licenses.[7] However, despite the US and European Union's stated hopes of eliminating numerous tariffs on climate change mitigation techniques to allow the flow of "valuable skills and experience . . . from one part of the global economy to another,"[8] this plan faltered because developing countries viewed the proposal as "disguised protectionism" to boost exports from wealthy nations.[9] The results of this climate change conference demonstrate the need to devise a global interface under which both developing and developed nations and entities can be reassured that their interests will be protected.

¶2 Section I of this article analyzes the booming market for green technology venture capitalists in developed countries. Section II describes the nascent demand for green technology in developing countries and the extent to which barriers of entry and transaction costs currently prevent the efficient capture of this demand. Section III lays out a technique involving a global exchange forum modeled after successful entrepreneurial technology transfer schemes in order to bring lucid valuation and assessment of specific opportunities and a common point of exchange where supply can be most efficiently matched with demand.

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[4] Susan Schwab & Peter Mandelson, *Working Towards an Open Global Market in Green Technology*, Dec. 7, 2007, http://ec.europa.eu/commission_barroso/mandelson/speeches_articles/artpm046_en.htm (last visited Oct. 28, 2008).

[5] Joseph Coleman, *Poor Nations Demand Green Technology*, USATODAY.COM, Dec. 14, 2007, http://www.usatoday.com/news/world/2007-12-14-2873179395_x.htm (last visited Oct. 28, 2008).

[6] *Id.*

[7] GLOBE-Net, *CleanTech Investing: The Green Gold Rush*, GREENBIZ.COM, Jan. 6, 2008, http://www.greenbiz.com/news/reviews_third.cfm?NewsID=36480 (last visited Sept. 13, 2008).

[8] *See* Schwab & Mandelson, *supra* note 4.

[9] *Plan to Scrap Tariffs on Green Technology Falters in Bali*, CBC NEWS, Dec. 9, 2007, http://www.cbc.ca/world/story/2007/12/09/bali-tariffs.html (last visited Oct. 28, 2008).

I. THE MARKET FOR GREEN TECHNOLOGY

A. Green technology is becoming an attractive component of companies' business plans

¶3 The creation of working technology that is applied either to conventional processes to make them more environmentally-friendly or to substitute for existing processes is already being driven forward in developed countries through a variety of mechanisms. Well-established existing companies are deciding to adopt green technology practices to supplement or complement their production techniques for both goods and services.[10] For example, IBM recently declared in Project Big Green[11] that they would spend $1 billion annually to research ways to make computing more environmentally friendly, which it predicts would yield IT enterprises an average savings of 42%.[12] Additionally, IBM has found that two-thirds of consumers are willing to pay more for green energy options if it is shown to reduce greenhouse gas emissions.[13]

¶4 The conventional wisdom that adopting green technology necessarily comes at an additional cost to firms has been challenged both empirically and theoretically over the past decade. Michael Porter first hypothesized in 1995 that environmentally-conscious practices can stimulate innovation that compensates for the costs of implementation.[14] These mechanisms may include channeling better access to markets, product differentiation that increases profits, the sale of pollution-control technologies, and cost reductions in regulations, materials, energy, services, capital, and labor.[15] In a recent cost-benefit analysis of the production

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[10] *See, e.g.*, Bosch, *Expanding with Green Technology*, http://www.bosch.com/content/language2/html/4445.htm (last visited Sept. 13, 2008).

[11] Paul McDougall, *IBM To Spend $1 Billion Per Year On Green Technologies*, INFORMATIONWEEK.COM, May 11, 2007, http://www.informationweek.com/news/showArticle.jhtml?articleID=199501024 (last visited Oct. 28, 2008). IBM's Project Big Green involves a five-step approach for companies looking to cut power usage that 1) utilizes software to model power usage; 2) eco-friendly building construction; 3) virtualizing infrastructures; 4) power management software; 5) liquid cooling systems. *Id.*

[12] *Id.*

[13] Press Release, IBM, IBM Survey: Consumers Will Pay More for Environmentally Friendly Energy Options (Dec. 13, 2007), http://www.ibm.com/press/us/en/pressrelease/22947.wss (last visited Oct. 28, 2008).

[14] *See* Michael E. Porter & Class van der Linde, *Towards a New Conception of Environment-Competitiveness Relationship*, 9 J. ECON. PERSP. 97, 105 (1995).

[15] Stefan Ambec & Paul Lanoie, *When and Why Does it Pay to Be Green?* 2 (Grenoble Applied Econ. Laboratory, Working Paper No. 200704, 2007).

components of Swiss companies implementing environmental management systems, 66% of those surveyed identified cost reduction potential as a motivating factor in adopting such systems, while nearly 80% of the same companies identified product differentiation.[16]

¶5 It is hardly surprising that many companies see product differentiation as a benefit of going green. A major driving force behind the ability to garner a profit is the opportunity to capture an untapped market, stimulate productive activity, and secure that market share through intellectual property rights on innovation.[17] Examples of such product differentiation include "bio food" industries, green energy, and hybrid cars. The success in the marketplace of such pursuits has been suggested to be contingent upon credible information on the environmentalism of the product, willingness to pay, and barrier to imitation from competitors.[18] On the flip side, process differentiation in prospective anticipation of tighter environmental regulations can afford first-mover advantages in budgeting liability costs, fines, and litigation.[19] Even on the current balance sheet, moving toward processes that lead to less pollution is often tied in with more efficient utilization of raw material, thus promoting improved productivity.[20] As a concrete example, more stringent sulfur dioxide emissions standards in the United States as enacted from a cap-and-trade program in 1990 reduced compliance costs while enhancing innovation and promoting competition in the raw materials input market.[21] The key to the success of this program involved companies banking allowances during the initial years when abatement costs were low and then using these credits to smooth out costs over time.[22]

¶6 Capital costs can also be reduced through the implementation of green technology. Banks are increasingly allowing for easier borrowing from companies that pursue projects deemed to reflect sound environmental practices[23] because such practices serve as a proxy to demonstrate quality of

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[16] *See* Jost Hamschmidt & Thomas Dyllick, *ISO 14001: Profitable? Yes! But Is it Eco-Effective?* 34 GREENER MGMT. INT'L 43, 47 (2001).
[17] *See* Sanjaya Lall & Manuel Albaladejo, *Indicators of the Relative Importance of IPRs in Developing Countries* 4–5 (QEH Working Paper Series, QEHWPS85, 2002).
[18] *See* Ambec & Lanoie, *supra* note 15, at 7–8.
[19] *See* Ambec & Lanoie, *supra* note 15, at 8.
[20] *See* Porter & van der Linde, *supra* note 14, at 105.
[21] Dallas Burtraw, *Innovation Under the Tradable Sulfur Dioxide Emission Permits Program in the U.S. Electricity Sector* 3–4 (Resources for the Future, Discussion Paper 00-38, 2000), *available at* http://www.rff.org/documents/RFF-DP-00-38.pdf.
[22] *Id.*
[23] *See* The Equator Principles, *The Equator Principles: A Financial Industry Benchmark for Determining, Assessing, and Managing Social & Environmental*

management and market opportunities.[24] A large majority of empirical studies over the past decade involving portfolio analysis show a positive correlation between environmental performance and better financial performance.[25]

B. Venture capitalists are already investing heavily in green technology prospects in developed countries

¶7 Green technology opportunities are already attractive enough in developed countries for venture capitalists (VCs) who are banking on the profitability and growth of this sector to invest a rapidly growing amount of resources in these endeavors. In 2006, VCs invested $2.6 billion in clean technologies, an 80% increase over the previous year.[26] The majority of these investments are currently devoted to alternative energy solutions, including wind, solar, and low-carbon technologies.[27] VCs are still typically investing in United States companies, or companies with U.S. headquarters.[28] By 2009, green technology is expected to account for 8 to 10% of all venture capital investments.[29]

¶8 VCs are banking on green technology in large part because they see new regulations in the pipeline placing restrictions on conventional technologies and promoting incentives to demand greener alternative processes.[30] Not only that, but going green in and of itself results in profitable outcomes. According to DuPont, $5 billion of that company's

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Risk in Project Financing (2006), http://www.equator-principles.com/documents/Equator_Principles.pdf (last visited Sept. 13, 2008).

[24] *See* Bertrand Montel & Guy Debailleul, *Les élevages porcin face à l'environnement : reconstruction du système de gestion et norme* [*Pig Farming and the Environmental Challenge: The Rebuilding of the Management System and the ISO 14000 Standard*], Proceedings of the Conference: Les systémes de production agricole: Performances, évolutions, perspectives 14 (2004), *available at* http://www.sfer.asso.fr/download/71/D_MONTEL_debailleul.pdf.

[25] *See* Ambec & Lanoie, *supra* note 15, at 28.

[26] Kate Williamson, *Clean, Green Technology Moving into the Mainstream*, EXAMINER, Feb. 26, 2007, http://www.examiner.com/a-585931~Clean__green_tech_industry_growing.html (last visited Oct. 28, 2008).

[27] *See* GUINNESS ATKINSON ALTERNATIVE ENERGY FUND, FUND FACT SHEET (2008), http://www.gafunds.com/alt.pdf (last visited Oct. 28, 2008).

[28] Matt Marshall, *VCs Invest More in Green Technology, But Is It Enough?*, VENTUREBEAT, Sep. 26, 2007, http://venturebeat.com/2007/09/26/vcs-invest-more-in-green-technology-but-is-it-enough/ (last visited Oct. 28, 2008).

[29] NICHOLAS PARKER & ANASTASIA O'ROURKE, CLEANTECH VENTURE CAPITAL REPORT – 2006 (2006) (on file with author).

[30] Zoe Van Schyndel, *Clean or Green Technology Investing*, INVESTOPEDIA, http://www.investopedia.com/articles/07/clean_technology.asp (last visited Sept. 13, 2008).

$29 billion in revenue comes from sustainable products such as the corn-based Bio-PDO,[31] which can be used in place of petroleum-based substances in a wide variety of manufactured products. Similarly, GE expects a doubling of revenues, from $10 to $20 billion, in its "Ecomagination" line of products in a five-year period,[32] constituting what GE Chief Executive Jeff Immelt called "a sales initiative unlike any other I've seen in 25 years at GE."[33]

¶9 Although the conventional "giants" seem to be taking on a stake in the green movement, VCs are devoting key attention to small entrepreneurial startups. Nth Power, an energy-industry focused VC firm based in San Francisco, is "very focused on small companies that will move faster than large companies with these solutions."[34] Well-established VC firm Kleiner Perkins Caufield & Byers, which currently manages a $600 million fund, invests a third of it in carbon-reducing technologies and recently added Al Gore to its management roster.[35]

¶10 With the nearly exponential growth in VC investment in this sector, it is important to note that green technology growth, like all prospective investment, does not always meet expectations. Kleiner Perkins, for example, encountered some turbulence in 2007 as some of its portfolio companies failed to meet expectations.[36] In most instances, production delays accounted for the failure to meet expectations.[37] Thus, even though the portfolio took a hit, it was not because demand for the products being pursued by the portfolio companies had decreased, but instead seemed

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[31] Nicholas Varchaver, *Chemical Reaction*, FORTUNE, Apr. 2, 2007, at 52, *available at* http://money.cnn.com/magazines/fortune/fortune_archive/2007/04/02/8403424/index.htm.

[32] Kevin Voigt, *Business Sees Green in Going Green*, CNN.COM INT'L, Dec. 21, 2006, http://edition.cnn.com/2006/BUSINESS/12/14/environment/index.html (last visited Nov. 4, 2008).

[33] Brad Kennedy. *Green Equals Green At GE*, IndustryWeek, May 31, 2007, http://www.industryweek.com/ReadArticle.aspx?ArticleID=14284 (last visited Nov. 14, 2008).

[34] Ryan J. McCarthy, *Venture Capitalists Flock to Green Technology*, INC.COM, Mar. 28, 2006, http://www.inc.com/news/articles/200603/green.html (last visited Nov. 4, 2008).

[35] Marc Gunther & Adam Lashinsky, *Al Gore's Next Act: Planet-saving VC*, FORTUNE.COM, Feb. 12, 2008, http://money.cnn.com/2007/11/11/news/newsmakers/gore_kleiner.fortune/index.htm (last visited Nov. 4, 2008).

[36] Michael Kanellos, *2007 a Bit Off for Kleiner Perkins' Green-Tech Portfolio*, CNET NEWS, Dec. 21, 2007, http://www.news.com/8301-11128_3-9837301-54.html (last visited Nov. 4, 2008).

[37] *Id.*

associated with the inherent uncertainty associated with innovation and the conception and execution of new technologies.

II. GREEN TECHNOLOGY IN DEVELOPING COUNTRIES: BARRIERS TO ENTRY PREVENT TECHNOLOGY DIFFUSION

¶11 An idealistic notion conceived by many public policy theorists over the past decade is that developing countries should "leapfrog" over conventional dirty technologies, instead implementing green technologies from the start to avoid getting trapped in high-carbon paradigms.[38] Conventional approaches to this "leapfrogging" have centered around the notion of five prerequisite conditions: a shift to "clean" production, immediate action, technology transfer from developed countries, the strengthening of incentive regimes, and international assistance.[39] Shifting to clean production was thought to utilize process efficiency to immediately reduce the economic burden of health and ecosystem damage[40] and enhance competitiveness in international markets by lowering costs of achieving environmental targets.[41] Installing clean technologies at the early stage of industrialization would preclude the "lock-in" effect for conventional methods.[42] Garnered technology already in existence from North-South transfers, primarily available through the participation of transnational corporations and their subsidiaries in developing countries, would supplant the inability of domestic firms that are financially-strapped and allow for lower-cost green technology introduction.[43] These technology transfers are conventionally viewed as requiring an economic policy forum supporting competitive markets[44] and strong governmental frameworks for environmental protection.[45] Additionally, international assistance is viewed

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[38] Richard Perkins, *Environmental Leapfrogging in Developing Countries: A Critical Assessment and Reconstruction*, 27 NAT. RESOURCES F. 177, 177 (2003).
[39] *Id.*
[40] WORLD BANK, GREENING INDUSTRY: NEW ROLES FOR COMMUNITIES, MARKETS, AND GOVERNMENTS 99 (2000).
[41] Perkins, *supra* note 38, at 178.
[42] *See Gregory* C. Unruh, *Understanding Carbon Lock-In*, 28 ENERGY POL'Y 817, 820 (2000). The "lock-in" effect in a technological paradigm occurs when polluting measures experience the benefits of cost savings, design improvements, learning effects, and positive externalities in systematic relations in the production structure, precluding subsequent adoption of environmentally-friendly technologies. *Id.*
[43] Amy Shankle, *Sustainable Industrialization*, 6 J. ENV'T & DEV. 464, 464–465 (1997) (reviewing DAVID WALLACE, SUSTAINABLE INDUSTRIALIZATION (Earthscan ed., 1996)).
[44] *See* WORLD BANK, *supra* note 40, 58–59.
[45] Perkins, *supra* note 38, at 179.

as a necessary component to bridge the gap in information, cost, and competing technologies.[46]

¶12 The problem with these conventional approaches is that many of them incorrectly assume the origin and possibilities of such technology entrance and incompletely address the requirements of technological changeover.[47] Basing technology diffusion solely on transnational firms or North-South transfers to established companies misses the important role of indigenous firms that arguably are better aware of local needs and responses, and thus are better able to implement technologies concomitant with the demand and economic potential of their surroundings.[48] Additionally, leapfrogging requires not just strong incentives, but capabilities of firms to respond to incentives[49] and a high-enough level of skill and expertise to manage the process of technological change.[50] The latter involves human capital that generally requires inputs from complementary institutions.[51] Even for nations attracting foreign direct investing and transnational companies, large doubts exist as to whether positive spillover effects to local learning will occur.[52] These effects are important considering that developing countries will have small markets for low value items that would still be serviced mainly by local firms and not transnationals.[53] Lock-in of conventional technologies remains a significant risk when so much technology procurement is dependent upon the adoption of the mix of technologies put into action by the technological regimes from the developed countries who are bestowing it, which many times include conventional technologies.[54]

¶13 In an environment that empirically has proven less inviting than early theorists may have suggested, venture capitalists in developing countries have flourished mainly in arenas where technology and industrial

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[46] Ernest Worrell et al., *Technology Transfer of Energy Efficient Technologies in Industry: A Review of Trends and Policy Issues*, 29 ENERGY POL'Y 29, 40–41 (2001).
[47] Perkins, *supra* note 38, at 179.
[48] *See* James J. Dooley & Paul J. Runci, *Developing Nations, Energy R&D, and the Provision of a Planetary Public Good: A Long-Term Strategy for Addressing Climate Change*, 9 J. ENV. & DEV. 215, 234 (2000).
[49] *See* Sanjaya Lall, *Technological Capabilities and Industrialization*, 20 WORLD DEV. 165, 166 (1992).
[50] *See id.*
[51] *Id.* at 182–183.
[52] *See* Jesus Felipe, *Convergence, Catch-up and Growth Sustainability in Asia: Some Pitfalls*, 28 OXFORD DEV. STUD. 51, 65 (2000).
[53] Perkins, *supra* note 38, at 182.
[54] *Id.*

policy promote development of new products.[55] While adopting these new technologies requires the abrogation of high uncertainty and information costs associated with credit constraints and knowledge gaps,[56] venture capital can provide information to assess investment plans, bridge information asymmetries, and lower the transaction costs of screening and contracting.[57] VC firms have only made their presence felt in the developing world over the past decade.[58] The main barrier to entry for VCs in developing countries is the lack of an organized market for public equity.[59]

III. LOWERING THE COSTS OF GREEN TECHNOLOGY ENTRY

A. Recharacterizing barriers to entry of green technology allows more efficient solutions to be pinpointed

¶14 In light of the multitude of factors already mentioned in this article that hinder the entrance of green technology—intellectual property rights concerns, financing issues, technical know-how of the putative recipients, complementary inputs and institutions to cultivate technologies, small producers catering to local markets, and trade barriers—solutions to the green technology dilemma could theoretically target one or many of these factors. However, this paper will focus on the role of venture capitalists and devise a strategy whereupon prospective assurance of market success is increased via removing information asymmetries and fostering information and equity exchange, diffusion of technology upon which the proprietary value has already been reduced, and where trade barriers are not amended but diminished in importance.

¶15 Some scholars contend that one of the main misconceptions about green technology is the extent to which intellectual property makes its diffusion cost-prohibitive during risk valuation.[60] Unlike the pharmaceutical sector, where drug developers are pursuing technologies without many substitutes, thus conferring substantial pricing power, competitiveness

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[55] *See* Sunil Mani & Anthony Bartzokas, *Institutional Support for Investment in New Technologies: The Role of Venture Capital Institutions in Developing Countries* 47 (UNU/INTECH Discussion Paper Series, No. 2002-4, 2002).
[56] *Id.* at 9.
[57] *See id.* at 10.
[58] *Id.* at 18.
[59] *See* Leslie A. Jeng & Philippe C. Wells, *The Determinants of Venture Capital Funding: Evidence Across Countries*, 6 J. CORP. FIN. 241, 285–286 (2000).
[60] *See generally* John H. Barton, *Patenting and Access to Clean Energy Technologies in Developing Countries*, BRIDGES TRADE BIORES: TRADE & ENVIRONMENT REV., December 2007, at 8, *available at* http://ictsd.net/i/news/bioresreview/10629/.

exists within green technology markets.[61] Competitiveness suggests that for a given technology, a subset of the knowledge required to produce an end-product is shared between competing firms and thus is not the basis upon which competitive advantage is garnered. In other words, for a given technology that is afforded intellectual property rights, the value-added portion of that right for which protection is necessary to maintain financial viability is quite small compared to the functional existence of the technology in some form. Sliced another way, in a competitive scheme in which producers of green technology are working to distinguish their products in ways that create market niches, older yet fully functional versions of that technology will have been created but left aside from the competitive equilibrium transaction.[62]

B. A global exchange forum would capitalize upon the stratification of intellectual property valuation

¶16 These two ancillary aspects of intellectual property in a competitive regime afford an opportunity in which producers could theoretically increase their market share by treating older versions of technology—or the common aspects of the technology that have become components for which protection no longer affords any pricing advantage to the technology—as a separate niche from the competitive equilibrium upon which extraction of profits from a niche market could be garnered. Theorists who suggest that publicly funded inventions should be voluntarily licensed[63] begin to pick up on this notion but ignore to some extent the regulatory necessity of compelling a firm to do so— such a transfer would not be costless. Instead, employing a free market mechanism would incentivize firms to give up aspects of their technology, perhaps even in "ready-to-install" form, if profits could be made from that transaction.

C. The global exchange framework: Bringing technology holders, VCs, and domestic entrepreneurs together to remove information asymmetries

¶17 The framework under which such transactions would occur could resemble the successful non-governmental global exchanges that bring together domestic firms, venture capitalists, and technology holders in a forum that reduces information asymmetries and transaction costs, promotes agreements to the extent of resources and technologies that can be bestowed without infringing upon the IP rights of others, and matches technology with uses and settings for which their implementation serves aggregate

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[61] *Id.*
[62] Think Windows 95 in a world of Windows XP.
[63] *See* Barton, *supra* note 60.

social utility most efficiently. For example, New Ventures India is a program seeking to facilitate green technology investment in India.[64] Its genesis was premised upon bridging the gap between small and medium sector private businesses and the investor community by "providing innovative entrepreneurs with management training, business advisory services, professional mentoring and access to capital and markets."[65] The program achieves this goal by providing mentoring opportunities to entrepreneurs to erase the learning gap by connecting them to potential investors, and by creating a network of investors in order to foster the creation of completely new green enterprises.[66]

¶18 The techniques that New Ventures India has employed could very well be utilized on a more global scale. Developing countries and domestic entrepreneurs could join together in a global consortium with VCs and holders of technology. However, because one of the main goals of this global network would be to get entrepreneurs and developing countries with very low economic capital access to green technology, the nature of the investment relationship would be somewhat different. Each party that demands technology would present a business plan that chronicles the extent to which this technology could be put to productive use in its specific market and its potential for growth. Venture capitalists would read this demand and its investment potential and choose which portfolios to help in terms of building equity and strategy. These VCs would then, still within the operation of the forum, analyze the technological supply held by technology holders. This mechanism is synergistic because technology holders could survey the various opportunities presented within the forum and subsequently analyze its own business strategy to see whether investing various technological components would be in its business interest.

¶19 The key to this mechanism is that the opportunities would not necessarily speak to the cutting-edge or extremely high-end of the technological spectrum. Since many technology holders have working forms of green technology that would not be viable in a higher-end competitive market, they have a lot of latent technology that is not exchanged in the marketplace. Because this forum would involve a lot of entrepreneurs in countries that have not reached the cutting-edge on the technological scale but still demand green technology in a form that is

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[64] *See generally* New Ventures India: About Us, http://www.newventuresindia.org/nvi/newdesign/aboutus.jsp (last visited Nov. 4, 2008).

[65] NEW VENTURES INDIA, INVESTOR FORUM 07: FACILITATING SUSTAINABLE ENTERPRISES 3 (2007), *available at* http://www.newventuresindia.org/nvi/mmbase/attachments/2194/IF%2007%20Program%20book.pdf.

[66] *Id.*

preferable to conventional methods and would help plant the seed for technology utilization in a "green" direction, the forum essentially opens up demand and supply that otherwise is obfuscated by the prior inability of the market to effectively capture these elements. Here, all holders of a given technology, such as solar power, could come together in the forum and perceive what aspects of their technological holdings are shared by all members and thus not necessary to preserve in an exclusive rights sense under traditional notions of intellectual property protection. They could then agree to "pass off" this technology, either in technical know-how, allowances to produce, or by packaging it in workable form, to entrepreneurs who would then produce or put into use these technologies in their destination markets.

¶20 The same notion of latent technology diffusion, although not employing a profit-oriented incentive scheme, has already proved successful in the realm of patent donations. For example, the Wisconsin-based Center for Advanced Technology and Innovation (CATI) creates a forum whereby companies may donate patented technologies to be utilized by potential entrepreneurs.[67] These are technologies that companies are not putting to use because their business strategy turned elsewhere, but would still be useful vis-à-vis commercial demand.[68] CATI determines which of these donations are commercially viable and pairs them with entrepreneurs who have a business plan to introduce them into the marketplace. Alternatively, in the case of pre-commercialization technologies, CATI partners academia and industry together to render the donations commercially viable.[69] CATI has successfully leveraged donations from Kraft, S.C. Johnson, and Boeing.[70]

¶21 Here, the scheme would be a combination of a donation, license, and sale. The technology transfer would be a donation to the extent that technology that is technically an IP right would be allowed to be used freely because it adds no value to the firms' competitive advantage. It would be a license to the extent that firms might decide to garner a share of the profits from end-users by granting this permission. It could be a sale if technology holders decide to sell "old" versions of technology. The point of the forum is not to limit the type of transfer to one form over another, but to facilitate in every way possible the type of transfer that increases aggregate utility while at the very least being profit-neutral on the one end, and profit-inducing on the other.

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[67] Jeremy Bond, *Leveraging Patent Donation to Grow Technology-Based Businesses*, 7 EDNOW, May 21, 2007, at 2.
[68] *Id* at 1.
[69] *Id.* at 1–4
[70] *Id.* at 2.

CONCLUSION

¶22 The market for green technology in developed countries is growing at a nearly exponential rate—along with VC investment in these portfolios—but the nascent demand for green technology in developing countries remains largely untapped. Creating a global exchange network involving holders of existing green technology, venture capitalists with the equity and financing know-how to seek out strong investment opportunities, and indigenous demanders of green technology well aware of their local environment who would put the technology to positive use, allows for many of the conventional barriers of entry to be transcended. Intellectual property rights concerns would be reduced because stratification of technologies would occur so that only the portions of technology that do not impinge upon competitive advantage would be considered. Knowledge and learning to successfully produce and operate such technologies is cured by the information exchange when VCs work with technology demanders to devise successful business plans and equity utilization. Credit constraints and equity barriers would thus be lowered. Instead of creating mandates that impinge upon the profit motive of firms, or the heretofore futile attempts to lower trade barriers that merely reduce disincentives instead of create incentives, a global exchange forum of green technology would help match the positive incentives of VCs, large firms, and indigenous operators to promote technology flows that increase the individual utility of each party and also speaks very strongly to aggregate social utility.