

together have 13% of all relevant patents whereas their collective market share for wind turbines is 57%.³⁰

3. Increasing Investment and Technology Transfer

Particularly in certain developed countries, companies invest increasingly in green technology business plans and practices.³¹ In Silicon Valley, more than 100 green patent technology patents were registered between 2006 and 2008, an increase of 7% over the previous three years.³² Deutsche Bank predicts an increase in private equity, venture capital and infrastructure investment in climate change.³³ Such investment is propelled by innovation policy,³⁴ whereby investors want to make sure that what they contribute has appropriate IP protection.³⁵

An OECD study reveals that whereas overall green technology innovation is concentrated in developed countries, with Japan, the US and Germany together accounting for 60% of total innovations, innovation in emerging economies such as China and Korea is not insignificant.³⁶ In terms of international technology diffusion, the percentage of so-called 'exported inventions' (e.g., a patent filed in the US by a German inventor) between 1998 and 2003 suggests that three-quarters of exports occurred among developed countries.³⁷ Exports of inventions from developed countries to developing countries during the same period were less substantial (17.8%) but growing fast. At 1.5%, technology transfer among developing countries was minimal, leaving important potential for more exchanges in the future.³⁸

The least developed countries (LDCs), small island developing states and other non-industrialized nations are vulnerable to climate change as their emissions are

30 *Supra* note 24 at 25. *Cf. supra* note 24 at ix (the spread of ownership varies significantly across the sectors. For example, the top 20 companies in clean coal technology own 42% of total relevant patents whereas the top 20 in concentrated solar power technology have only 12%).

31 E.g., Michael Hasper, *Green Technology in Developing Countries: Creating Accessibility through a Global Exchange Forum*, 1 DUKE L. & TECH. REV. 1, 3-6 (2009) (referring to Bosch and IBM's examples).

32 JOINT VENTURE SILICON VALLEY NETWORK, CLIMATE PROPERTY: A GREENPRINT FOR SILICON VALLEY – 2009 38 (Feb. 2009) (reporting that 9% of all U.S. solar energy patents between 2005 to 2007 were registered in the Silicon Valley area, up from 3% in the mid-90s).

33 DB CLIMATE CHANGE ADVISORS, INVESTING IN CLIMATE CHANGE 2010: A STRATEGIC ASSET ALLOCATION PERSPECTIVE 11-17 (2010).

34 *Id.*

35 *Supra* note 9.

36 *See generally*, ANTOINE DECHEZLEPRÊTRE, MATTHIEU GLACHANT, IVAN HAŠČIĆ, NICK JOHNSTONE, YANN MÉNIÈRE, OECD, INVENTION AND TRANSFER OF CLIMATE CHANGE MITIGATION TECHNOLOGIES ON A GLOBAL SCALE: A STUDY DRAWING ON PATENT DATA (2008).

37 *Id.*

38 *Id.*

increasing. Attention is needed for “orphan” areas of research even with few market incentives for innovation (*e.g.*, drought-resistant plant varieties or small-scale desalination).³⁹ To an extent, indigenous innovation or traditional knowledge at the local level could facilitate adaptation to changing weather conditions, but integrating such knowledge with modern technology may be necessary.⁴⁰

39 Wendy Neal, Ashok Gadgil and Josephin Mutugu, Panel Discussion at the Conference on Intellectual Property Rights and Technology Transfer in the U.N. Climate Negotiations, University of California, Berkeley (Oct. 27, 2009).

40 Alfred A. Oteng-Yeboah, Deputy Director General, Council for Scientific and Industrial Research, Ghana, The Challenges Faced by Emerging and Developing Countries Regarding Eco-innovation and on Policies to Remedy These Challenges: The Case of MEAs, Presentation at the Global Forum on Environment on Eco-Innovation, OECD (Nov. 5, 2009).

