nccr trade regulation
swiss national centre of competence in research

Working Paper No 2013/17| June 2013

Green entrepreneurship: the missing link towards a greener economy: Positive externalities of green entrepreneurship and innovation

Fulvia Farinelli / Marino Bottini / Sule Akkoyunlu / Philipp Aerni

Abstract
Most international organizations – including the World Bank, UNCTAD, OECD, UNIDO, WTO and FAO – share the view that there needs to be a global transformation towards a greener economy. However, in the aftermath of the Rio+20 UN Summit, some key issues about the green economy must be clarified to reach a global consensus for collective action. In this article, it is argued that a green economy cannot be mandated from above but needs to be driven by entrepreneurs who respond to policy incentives through innovation in management and technology. These private sector investments in green innovation not only generate private profits but also (create) large positive externalities for society and the environment as a whole, especially when they not only contribute to the creation of a small niche market, but have the potential to be scaled up to reach the sustainable transformation of a entire industry. In this article, it is therefore argued that the emphasis of the term 'green innovation' must be on 'innovation' rather than what is generally perceived to be 'green'. This would imply that governments focus more on the creation of an enabling environment for large-scale innovations that contribute to the global green transformation of an entire industry rather than merely subsidizing green niche markets.

Research for this paper was funded by the Swiss National Science Foundation under a grant to the National Centre of Competence in Research on Trade Regulation, based at the World Trade Institute of the University of Bern, Switzerland.

FNSNF
FONDS NATIONAL SUISSE
SCHWEIZERISCHER NATIONALFONDS
FONDO NAZIONALE SVIZZERO
SWISS NATIONAL SCIENCE FOUNDATION

Die Nationalen Forschungsschwerpunkte (NFS) sind ein Förderinstrument des Schweizerischen Nationalfonds.
Les Pôles de recherche nationaux (PRN) sont un instrument d'encouragement du Fonds national suisse.
The National Centres of Competence in Research (NCCR) are a research instrument of the Swiss National Science Fondation.

Green Entrepreneurship: The Missing Link Towards a Greener Economy

Fulvia Farinelli
Division on Investment and Enterprise Development (UNCTAD)
Email: fulvia.farinelli@unctad.org

Marino Bottini
Green Economy Expert
Email: imbecio@hotmail.com

Sule Akkoyunlu
Boğaziçi University and University of Bern
Email: sule.akkoyunlu@gmail.com

Philipp Aerni
University of Bern and ETH Zurich)
Email: philipp.aerni@wti.org

1. Introduction

In this article, we will address the pressing need to promote new generations of entrepreneurs who are able to identify and take advantage of green business opportunities. The perspectives of developed and developing countries on this issue often diverge, due to conflicting interests and unanswered questions.

Firstly, there is widespread concern that the need to promote a greener economy will mainly be used by developed countries as a new excuse for protectionism and for imposing conditionalities on developing countries (UNCTAD 2011b). How can we minimize the risk that the term 'green economy' will not just become a new vehicle for developed countries governments to use to repackage their economic interests in the guise of the new language of 'sustainable economic development'?

Secondly, until now, the development of green products that meet the needs of poor consumers has been limited. Do we have to assume that green entrepreneurship and green innovation are mainly about the production and trade of environmentally friendly but expensive products aimed at affluent consumers in developed countries? Will the large number of green projects currently implemented in developing countries continue once the funding from international donors is withdrawn?

Thirdly, even though niche markets for green products contribute to more sustainable consumption and production patterns, they will not lead to a global transformation towards a green economy until they reach the masses. How can we make sure that the models used in welfare economics take into account the positive externalities generated by social and green entrepreneurship through private sector activities, and acknowledge such welfare gains?

2. Defining Green Entrepreneurship

In the past few years considerable interest and research have been devoted to understanding the determinants of green growth. However, an important and relevant issue seems to have escaped the attention of both economists and policy-makers: ultimately, green products and technologies are to be introduced into the marketplace by 'green' entrepreneurs. These are the economic actors who make it possible to turn ideas into reality, by transforming prototypes into commercially viable products. However, the majority of policy mechanisms that have tried to enable green growth are aimed at identifying the technological innovations capable of mitigating the human impact on the environment and addressing global environmental issues – such as climate change, land degradation and loss of biodiversity. From a policy perspective, less attention has been paid to commercialization of technology and to the need to subsidize the 'public good' component of green entrepreneurship. From an analytical perspective, a series of key questions still remain, namely: what are the traits of green entrepreneurs? In what kind of institutional environment do they best flourish? Are the drivers of green entrepreneurship common to both industrialized and developing countries?

Indeed, there is an essential difference between the ways of looking at green entrepreneurship in developed countries and developing countries. Developed countries and international organizations tend to put more emphasis on the term 'green' and on market opportunities, while developing countries tend to focus more on the term 'entrepreneurship' and on market needs. Chinese and Indian entrepreneurs, for example, are genuinely transforming the emerging economies by developing affordable products that meet the needs of the poor, but still need to become more green (Khanna 2011). Developed countries tend to spend large amounts of money on

green innovation projects, but then face the missing link of entrepreneurs who move the product from a prototype to a commercially viable product (Macilwain 2011).

Entrepreneurs are business people who envisage new business opportunities and ventures by taking risks and converting their ideas into commercial reality. Entrepreneurs introduce innovation, and new ideas to the economy as well as to society. Entrepreneurial activities are related to Schumpeter's (1934) notion of 'creative destruction', in that entrepreneurs promote change in the economic and business environment and overtake the old ways of operating. Yet, there seems to be no clear definition of entrepreneurship in the literature, especially with regard to the degree of innovation and size of a particular activity that is necessary for it to count as entrepreneurial (Ulijn & Brown 2003). There is a general consensus that an entrepreneur generally acts on a valuable opportunity and is driven by a special motivation (Miller 2003). Thornton (1999) defines entrepreneurship as the creation of new organizations, which implies a certain degree of innovation and a certain size. This creation occurs as a context-dependent, social and economic process.

The entrepreneurship literature can roughly be divided into according to whether it takes a supply-side perspective, which looks at the availability of individuals with traits that make them potential entrepreneurs, or a demand-side perspective, which looks at the number and nature of entrepreneurial roles that need to be filled in a society (Thornton 1999). On the supply side there is a wide body of literature that tries to capture entrepreneurial orientation (Kreiser et al. 2002) and motivational constructs that are linked to individual value orientation (Schwartz 1992). They represent individual traits and personal values that apply across cultures and time. On the demand side, research mainly focuses on how institutions (Williamson 2000) and culture (Hofstede 1980, Hayton et al. 2002, Shane 2003) either enable or hinder entrepreneurial activity in a particular region or country. Often the supply and demand-side analyses of entrepreneurship are eventually combined; for example by unearthing the cultural orientation within personal traits. It then reflects the embeddedness of the economic environment in social and structural relationships (Granovetter 1985). These insights were mainly gained from empirical research in developed countries. Research on entrepreneurs in emerging economies is scarce (Tan 2001) and it is even scarcer in least developed countries.

The research literature on green entrepreneurship is even less widespread and lacks a broad empirical foundation. This may also be related to the difficulty of drawing the boundaries between green and non-green entrepreneurship. It was not until the 1990s that the studies on green entrepreneurship emerged. Bennett (1991), Berle (1991) and Blue (1990) first adopted the notions 'environmental entrepreneur', 'green entrepreneur', 'eco-entrepreneur' and 'ecopreneur' in their studies. Based on the review of such literature, the basic characteristics of green entrepreneurs are as follows:

- Green entrepreneurs try new business opportunities and undertake ventures, which usually involve a very high risk. The outcome of these business ventures is often unpredictable.

- Green entrepreneurs are intrinsically motivated. Their business activities have an overall positive effect on the natural environment and on economic sustainability, and consciously aim at ensuring a more sustainable future.

Green entrepreneurs often struggle to survive, due to an unstable commitment from the public sector, whose support is easily withdrawn in response to everyday changes in politics and the efforts of lobbyists.

Just to cite a few examples, the solar and wind energy business emerged in the 1970s, mainly in the United States due to the government's response to the oil crisis. The big improvements in solar and wind energy technology happened in public sector research and policy incentives led the private sector to further invest in the commercialization of these emerging technologies. However, once oil became cheap again, most government efforts to further strengthen the green economy sector were abandoned and investment in alternative energy technologies decreased rapidly (OECD 2011b). The same is true for the promotion of sustainable intensification in agriculture. Large public sector investments in agricultural research and development were made during the Cold War period. But once the communist threat disappeared at the end of the 1980s, most governments lacked the will to invest further in agriculture and left it up to the private sector. The global food crisis, combined with unsustainable agricultural practices, is to a great extent the result of this neglect of agriculture over the past two decades (Aerni 2008).

3. Stimulating Green Innovation

The concept of 'green innovation' is often associated with renewable energy (e.g. wind power and fuel cells). However, the shift to a post-carbon economy depends on much more than technological improvements in energy-related technologies: it needs a watershed on several levels, from innovation in lifestyle to innovation in investment and governance (Kemp, 2011). Additionally, non-technological innovations are at least as relevant, considering the case of new business models that develop new organizational approaches.

Before Prahalad (2004), most economists believed that markets always fail to address the needs of the poor. They doubted that there was any growth opportunity at the bottom of the pyramid. Many of the reports on the green economy today are similarly sceptical about the ability of the market to address environmental concerns and to provide enough stimuli to incentivize green innovations (UNEP 2011, FAO 2011, OECD 2011a). Yet, there is evidence that green innovation existed throughout the 20th century, even in the absence of government interventions (Silverthorne 2011). Successful green innovators had an intrinsic motivation to improve through experimentation and, at the same time, were able to create successful businesses. They also reinvested most of their profits in the improvement of their green product or technology. In this way, they created large social and environmental welfare gains while ensuring the commercial viability of their business (Aerni 2010).

Today, despite the modest results achieved by large international forums and the retreat of public finances, green business is creating new economic opportunities for both multinational corporations and small and medium-sized enterprises (SMEs). The private sector, stimulating economic growth and development, is increasingly playing an essential role in finding solutions to global sustainability challenges (ICC, 2012). Green enterprises are increasingly successful in proving to shareholders and stakeholders that sustainability is not just a cost but that it also provides an opportunity to increase revenues and customer loyalty, while protecting the environment. To reinforce the business core for sustainability and promote a culture of innovation within all staff divisions, all kinds of companies have been looking at sustainability comprehensively, taking steps in the direction of water conservation, carbon

neutrality, reduction of solid waste, and post-consumption recycling, while measuring rigorously the costs and benefits of each business unit. In some cases, companies have also managed to leverage governments to improve standards, education and labour skills.

Large and well-established corporations often associate green innovation primarily with ‘green labels’, corporate social responsibility and private standards, designed to avoid risk and enhance public reputation (Freidberg 2007). New players in the market, however, more often focus on investing in R&D in order to launch innovative and more resource-efficient products that have the potential for increasing returns (Shellenberger and Nordhaus 2007, Lovins 2011). Indeed, international corporations, in particular service-oriented companies and big retailers, are making innovative new commitments, investing an increasing amount of their budget in systematically improving the management of internal processes along the entire value chain, often involving suppliers directly. Among many other global companies which have gone green, the giant retailer Wal-Mart, started in 2005 to adopt more planet-friendly practices to reduce its footprint and the use of natural resources. Similar green initiatives (for example by Tesco, Migros, Coop, Woolworths, and IKEA), are aimed at more efficient trucking fleets, energy-saving lighting and refrigeration, reduced packaging, use of recycled materials, renewable energy micro-plants and cogeneration. Such initiatives have resulted in enormous cost reductions or even profits as from the reuse of waste (Humes, 2011). Equally, leading clothes and global retailers of sport footwear (Nike, Puma, Adidas, H&M, etc.) have joined forces to free their supply chains from nine classes of hazardous chemicals (‘Zero Discharge of Hazardous Chemicals by 2020 – Ø ZDHC’). Nevertheless at the Rio+20 Business Day, Carlos Busquets, ICC Deputy Director, particularly highlighted the fact that SMEs can play a critical role in green growth and environmental responsibility, through being a crucial component of larger corporations' global supply and value chains, as well as a major source of innovation and employment.

It is important to note that although Western-centric approaches might have influenced the discussions when looking at companies combining profits with debatable green ‘labels’ or arguing that ‘green’ is a rich-world luxury or rather a conspiracy of industrialized countries, green enterprises are also growing in emerging and developing markets. In BRICS countries (Brazil, Russia, India, China, and South

Africa) and rapidly developing countries, such as Turkey, Indonesia, and Mexico, business may suffer from weak infrastructures, not unreliable supply-chains, limited access to finance, inefficient institutions or burdensome regulations. But SMEs in these countries are being increasingly called upon to meet the needs of new customers, without compromising the local environment, and also to increase their organizational and productive efficiency by reducing consumption of natural capital.

In this regard, an increasing number of highly profitable businesses from the developing world are turning eco-consciousness into a competitive advantage, demonstrating that they can be just as green as their Western rivals. The World Economic Forum (WEF) and the Boston Consulting Group (BCG) have emphasized that these 'new sustainability champions' are adopting unique practices for doing business in resource-constrained and population-stressed environments, pro-actively turning constraints into opportunities through innovation. The study points out that sustainability is often embedded in the company's culture. When benchmarked against their peers these new green champions demonstrate superior financial performance, and prove that green enterprises creating unconventional and profitable ways to enhance sustainability and new market solutions may achieve higher-than-average margins for economic growth.

The WEF/BCG show a few interesting cases of successful emerging-world companies. The Chinese Zhangzidao Fishery Group, for example, has adopted an integrated multi-trophic aquaculture (IMTA) farming method to increase production and economic diversification while maintaining a balanced relationship with the marine ecosystem, reducing waste and increased levels of carbon sink. The Indian cement company, Shree Cement, in introducing an intelligent energy system to recover heat along with an innovative treatment to reduce waste and use of water, has achieved impressive energy efficiency results, enabling the company to perform well financially and environmentally. The Brazilian cosmetics manufacturer, Natura, has promoted the re-use, refilling and recycling of its packaging while using sugarcane-based plastic to reduce greenhouse gas (GHG) emissions, and is promoting resource-efficiency and conservation adopting Forest Steward Council certified raw materials.

Therefore, while it seems clear that sustainable economic changes need to come from the bottom up, the transition to a green economy requires the simultaneous integration

of top down incentives-regulations and bottom up solutions. The holistic vision which underpins the capability of innovation to create new ways and combinations, as well as the interdependency between the economic, social and environmental aspects of development ('the three strands of sustainable development'), and the economy itself, characterized by globally connected and cross-cutting value chains, require combined efforts from the public and private sectors.

Integrated governance and a conducive institutional framework reduce the uncertainties for green entrepreneurs and allow all actors to deliver on their shared responsibilities and to address the missing links within the marketplace. In this regard, governments must shape the context creating a supportive R&D infrastructure. The Organisation for Economic Co-operation and Development (OECD) report 'Fostering Innovation for Green Growth' contains some important policy recommendations. Governments should introduce appropriate regulatory incentives to strengthen markets for green innovation, and set up an effective intellectual property rights (IPR) system to foster private sector investment and diffusion of green innovation. They should also promote more entrepreneurship in the private sector and enhance public sector support for R&D to facilitate sustainable technological change (OECD 2011b).

The OECD report also points out that existing production technology and consumer behaviours can only be expected to produce positive outcomes for the economy and the environment if innovation is able to decouple growth from natural capital depletion. This is also the basic conclusion of New Growth Theory and its more recent emphasis on the importance of institutions (Jones & Romer 2009). The main argument is that population growth as such might not necessarily be a problem, if it also leads to more investment in the education of people. This investment would then be likely to increase the number of good ideas about how to address the problem of scarcity, which would be universally adopted if a conducive institutional environment is put in place.

Recently many countries, in their transition to a low-carbon economy, have been adopting strategies and policies to develop new opportunities and to attract new green investments. In this regard, very diverse economic entities have emphasized the role that the public sector can play in influencing markets to opt for sustainable paths without increasing the pressure on taxpayers or altering competition between different

industries. Although additional research is needed to understand how to create a more conducive environment for sustainable development and to explore the potential of sovereign wealth funds (SWFs), governments are increasingly encouraging public–private partnerships to attract green investments and creating competitive locations for green foreign direct investments (FDIs). While green special economic zones (SEZs), designed to operate in a sustainable way, usually target specific activities in the value chain creating Cleantech Parks for research, development and commercialization (WIF, 2012), budget-constrained authorities have been opening up to private investments and new ways of financing to reduce the environmental and economic bill for public infrastructure. For instance, under the Chicago Infrastructure Trust (CIT) – a US$1.7 billion private–public partnership to improve public infrastructure and overcome budget deficit – an initial private investment of US$225 million is aimed at making city buildings more energy-efficient and is expected to be recouped through an annual saving in energy costs estimated at US$20 million (Keyser, 2012).

Governments have also provided positive incentives to markets, channelling public expenditure into procedures for green public procurement (GPP). In particular, the European Commission has set specific green criteria for public tendering procedures. Europe's public procurers, with a collective annual budget of €2 trillion or 17% of the EU's GDP, can contribute significantly to fostering the establishment of sustainable production and consumption. Given that they encourage consumption of environmentally friendly products and services by both individuals and organizations owing to scientifically proven sustainability advantages (AEA, 2011).

A lesson to be learned from past attempts to promote a green economy is that not all types of government interventions successfully manage to foster green entrepreneurship and innovation. For example, Germany decided to promote the growth of its solar industry through subsidies and price guarantees for solar electricity rather than through investment in R&D. The result is that the German solar industry has not become more but less competitive. In 2011 it suffered from the competition of cheaper solar panels from China (Wiesmann 2012). The relationship between strict environmental regulation and private sector investment in more environmentally friendly products is also not very clear (Bernauer 2006). Often big corporations prefer to invest in green marketing rather than green innovation (Aerni 2009). Therefore, it is all the more important to understand and clearly define the patterns of green

entrepreneurship and to make essential distinctions about the degree of innovativeness, the different types of policy intervention that would promote it, and the potential for growth and job creation.

Multilateral approaches across countries and sectors, as well as integrated governance at all levels to combine economic and social advances while protecting the environment, are fundamental conditions to drive growth in a resource-constrained world. In order to avoid the collision between strong demographic and economic growth, strategies intended to reap short- to medium-term profits will have to be balanced by longer-term shared values (ICC, 2012).

So far accounting methods have made substantial progress. Several specific certificate systems and sustainability reporting standards are already broadly diffused in operational corporate schemes to assist green enterprises with lifecycle assessments and to provide relevant, verified and comparable information about the environmental impact of goods and services, e.g. FSC, Totally Chlorine Free (TCF), Environmental Product Declaration (EPD), and the Global Reporting Initiative (GRI). However, further analysis, better disclosure and reporting as well as accounting measures and metrics are needed to assess costs and benefits beyond the pure economic single data, including a wider review of correlated costs. Entire lifecycle assessment approaches and indicators, enabling comparison across nations and sectors, are the way forward to provide more analytical information and to make the green economy fully operational (ICC, 2012).

4. Conclusions

'Green entrepreneurship' is an increasingly relevant phenomenon from a development perspective, but it is still largely under-researched. While global inequality and rising unemployment pose major challenges to policy makers, the widespread destruction of wildlife and natural habitats, together with the emerging effects of climate change and the rapid loss of biodiversity, compound the vulnerability of already burdened social groups and ecosystems. The negative impacts that environmentally-inefficient economic activities have on the environment, and consequently on the economy, have induced policy makers and scientists to emphasize the urgent need to move towards a more environmentally-sustainable development path by encouraging the adoption of

sustainable practices and cleaner technologies. In this article, we have argued that fostering the development of green enterprises and enhancing the resilience of economies and natural ecosystems necessitates a more in-depth analysis of conditions and factorsthat influence green entrepreneurship. This is also in line with the outcomes of the Rio+20 Conference.

In particular, there is a need to define the boundaries of ‘green entrepreneurship’ and ‘green innovation’, to study the impact of system failures and to better understand how formal–informal networks determine the performance of (green) small enterprises and SMEs. These are crucial to the economy as they make significant contributions to job creation, are the engines of change, and have been credited for introducing innovation, adapting to new ideas and responding to changes more rapidly, flexibly and efficiently than larger organizations. Moreover, the patterns of technology development and adaptation are strongly influenced by the evolving nature of innovation and its determinants. The recent advance of new information technologies and the globalization of economic processes have drastically altered the traditional methods used by enterprises to innovate. Although impressive advances have been made in technological research and implementation as well as in environmental accounting and reporting, the gap to be filled in order to achieve sustainability is still significant. It is important to understand the preconditions for the creation of ‘green innovation’, the factors that act as barriers and triggers, and how changes in access to information, new technologies, resources and markets impact on or change the dynamics of innovation and management.

Systemic change is needed to foster progress in economics, accounting and legal frameworks. Although, as pointed out by a survey by Accenture (UN Global Compact-Accenture, 2010), sustainability has become a central worldwide component of corporate business plans, acknowledged by executives as being highly relevant for the future of their businesses (98% in the Asia Pacific region compared with a 93% average), the global transition to a green economy is only just beginning and the earth can no longer wait. The coming decades will see rapid growth in global population, industrialization and economic development. Resources are limited and we must meet the needs of the people. Green entrepreneurs are delivering on their commitments to provide efficient and safe operations while being environmentally and socially responsible.

References

Aerni, P. (2008). A New Approach to Deal with the Global Food Crisis. *ATDF Journal* 5(1/2): 16–32.

Aerni, P. (2009). What is sustainable agriculture? Empirical evidence of diverging views in Switzerland and New Zealand. *Ecological Economics* 68(6): 1872–1882.

Aerni, P. (2010). Reforming agricultural policy in Turkey in accordance with New Growth Theory. In B. Karapinar & F. Adaman (eds) Rethinking Structural Reform in Turkish Agriculture: Beyond the World Bank's Strategy: Nova Publishers, New York: 229–242.

Aerni, P. (2011). Learning from the Past: How to bring Ethics and Economcis in line with the Real Nature of the Human Being. In M. Cockell et al. (eds) Common Knowledge: the Challenge of Transdisciplinarity. EPFL Press, Lausanne.

Ahmad N., Hoffmann A. (2008). A Framework for Addressing and Measuring Entrepreneurship. OECD Statistics Working Paper.

Audretsch, D., Callejon M., & Aranguren M. J. (2008). Entrepreneurship, Small Firms and Selfemployment. High Technology, Productivity and Networks, Palgrave Macmillan, 117–137.

Bennett, S. J. (1991). Ecopreneuring: The Com plete Guide to Small Business Opportunities from the Envirobmental Revolution. Wiley: New York.

Berle, G. (1991). The Green Entrepreneur: Business Opportunities That Can Save the Earth and Make You Money. Liberty Hall Press, Blue Ridge Summit Pennsylvania.

Bernauer, T. (2006). Explaining Green Innovation. CIS Working Paper No 17. ETH Zurich.

Blue, J. (1990). Ecopreneuring: Managing For Results. Scott Foresman, London.

Daugbjerg, C., & Tinggaard Svendsen, G. (2010). Government intervention in green industries: lessons from the wind turbine and the organic food industries in Denmark.4 September 2010 Springer Science+Business Media B.V. 2010.

Dean, T.J., & McMullen, J.S. (2007). Toward a Theory of Sustainable Entrepreneurship: Reducing Environmental Degradation through Entrepreneurial Action. *Journal of Business Venturing*, 22(1): 50–76.

Dixon, S.E.A., & Clifford, A. (2007). Ecopreneurship – A New Approach to Managing the Triple Bottom Line. *Journal of Organizational Change Management*, 20(3): 326–345.

Duening, T. N., Hisrich, R. D., & Lechter, M. A. (2009). Technology Entrepreneurship. Academic Press (ISBN 978-0-12-374502-6).

Dutz, M. A., & Siddharth Sharma, S. (2012). Green Growth, Technology and Innovation. Policy Research Working Paper 5932. World Bank, Washington, DC.

Evans, L., Nuttall, C., Mouat, A., & Ewing, D. (2010). Assessment and Comparison of National GPP/SPP Criteria and Underlying Schemes. AEA Technology for DG Environment, European Commission.

Food and Agriculture Organization of the United Nations (2011). Save and Grow: A policymaker's guide to the sustainable intensification of smallholder crop production. FAO, Rome (http://www.fao.org/docrep/014/i2215e/i2215e.pdf).

Granovetter, M. (1985). Economic action and social structure: the problem of embeddedness. *American Journal of Sociolo*gy 91(3):481–510.

Hamilton, B. H. (2000). Does Entrepreneurship Pay? An Empirical Analysis of the Returns to Self-Employment. *Journal of Political Economy* 108:525–48.

Hayton, J., George, G., & Zahra, A. S. (2002). National Culture and entrepreneruship: A Review of Behavioral Research. *Entrepreneurship Theory and Practice* 26: 33–49.

Hofstede, G. H. (1980). Culture's Consequences: International Differences in Work-Related Values. Thousand Oaks, CA: Sage.

Humes, E. (2011). Wal-Mart's green hat. The company gets that a smaller carbon footprint is good for business. Los Angeles Times May 31, 2011.

International Labour Organization (2012). Green jobs becoming a reality. Progress and outlook 2012. ILO, Geneva (http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_168068.pdf).

Jones, C. I. & Romer, P. (2009). The New Kaldor Facts: Ideas, Institutions, Population and Human Capital. NBER Working Paper Series 15094. Cambridge, MA.

Keiser, J. (2012). Chicago Infrastructure Trust. A Model As More Mega-Projects Turn To Private Investors. The Huffington Post 07/07/2012.

Keivani, R., Tah, J.H.M., Kurul, E., & Abanda, H. (2010). Green Jobs Creation Through Sustainable Refurbishment in the Developing Countries. International Labour Organization Sectoral Activities Department.

Kemp, R. (2011). Ten Themes of Eco-Innovation Policies in Europe. S.A.P.IE.N.S. (Surveys and Perspectives Integrating Environment & Society) vol 4.2 http://sapiens.revues.org/1169 .

Khanna, T. (2011). Billions of Entrepreneurs: How China and India Are Reshaping Their Futures and Yours. Harvard Business Review Press, Watertown, MA.

Kreiser, P. M., Marino, L.D., & Weaver, K.M. (2002). Assessing the Psychometric Properties of the Entrepreneurial Orientation Scale: A Multi-Country Analysis. *Entrepreneurship Theory and Practice* 26, 71–94.

Lacy, P., Cooper, T., Hayward, R., & Neuberger, L. (2010). A New Era of Sustainability. CEO reflections on progress to date, challenges ahead and the impact of the journey toward a sustainable economy. UN Global Compact–Accenture CEO Study 2010.

Lovins, A. (2011). Reinventing Fire: Bold Business Solutions for the New Energy Era. Chelsea Green Publishing, London.

Macilwain, C. (2011). Europe's Innovation Engine, Eager to Grow, Faces Criticism. *Science* 333: 1090–91.

Miller, J. G. (2003). Culture and Agency: Implications for Psychological Theories of Motivation and Social Development. V. Murphy-Berman and J. J. Berman (eds.), Nebraska Symposium on Motivation: Crosscultural differences in perspectives on the self, 49:1–57. Lincoln: University of Nebraska Press.

Organization for the Economic Co-operation and Development (2010). Green Growth Strategy Interim Report: Implementing Our Commitment for a sustainable future. Meeting of the OECD Council at Ministerial Level C/MIN(2010)5 PARIS, 27–28 MAY.

Organization for the Economic Co-operation and Development (2011a). Towards green growth. Summary for policy-makers, OECD, Paris (http://www.oecd.org/dataoecd/37/34/48224539.pdf).

Organization for the Economic Co-operation and Development (2011b). Fostering Innovation for Green Growth. Green Growth Studies, OECD, Paris.

Ozertan, G., & Aerni, P. (2007). GM cotton and its possible contribution to environmental sustainability and rural development in Turkey. *International Journal of Agricultural Resources, Governance and Ecology* 6(4/5): 552–575.

38. Patzelt, H., & Brenner, T. (2008). Handbook of Bioentrepreneurship. *International Handbook Series* Volume 4, Springer.

39. Prahalad, C. K. (2004). The Fortune at the Bottom of the Pyramid: Eradicating Poverty Through Profits. *Wharton School Publishing, Philadelphia.*

40. Romer, P. (2010). What Parts of Globalization Matter for Catch-Up Growth? *American Economic Review* 100: 94–98.

Seelos, C., & Mair, J. (2005). Social Entrepreneurship – The Contribution of Individual Entrepreneurs to Sustainable Development. *IESE Business School Working Paper* No. 553.

Shane S. (1993). Cultural influences on national rates of innovation. *J. Bus. Venturing* 8: 59-73.

Shane, S. (2003). A General Theory of Entrepreneurship: the Individual-Opportunity Nexus. *Edward Elgar; (ISBN 1-84376-996-4).*

Shellenberger, M., & Nordhaus, T. (2007). Break Through: From the Death of Environmentalism to the Politics of Possibility. *Houghton Mifflin, New York.*

Silverthorne, S. (2011). The Untold Story of 'Green' Entrepreneurs. *HBS Working Knowledge, Cambridge MA* (http://hbswk.hbs.edu/item/6561.html).

Tamvada, J. P. (2008). Comparing Entrepreneurial Climates of Germany and India: More Similarities than Differences? *Sustaining Entrepreneurship and Economic Growth, Springer,* 111–121.

Tan, J. (2001). Innovation and risk-taking in a transitional economy: A comparative study of Chinese managers and entrepreneurs. *Journal of Business Venturing* 16 (4): 359–376.

Thornton, P. H. (1999). The Sociology of Entrepreneurship. *American Review of Sociology* 25:19–46.49. United Nations Conference on Trade and Development (2011a). Why a Green Economy Matters for the Least Developed Countries. J*oint publication of UNCTAD, UNEP, UN-OHRLLS.*

United Nations Conference on Trade and Development (2011b). The Green Economy: Trade and Sustainable Development Implications. *Background Paper. Second Preparatory Committee Meeting/2011/BP1* (http://www.uncsd2012.org/rio20/content/documents/UNCTAD-Report-EGM-on-Green-Economybackground2.pdf).

United Nations Environment Programme (2008). Towards decent work in a sustainable, lowcarbon world. *UNEP Publications.* (http://www.ilo.org/wcmsp5/groups/public/---ed_emp/-emp_ent/documents/publication/wcms_158727.pdf). United Nations Environment Programme (2011).

Towards a Green Economy – Pathways to Sustainable Development and Poverty Eradication. *A Synthesis for Policy Makers.* (www.unep.org/greeneconomy).

United Nations Framework Convention on Climate Change (2010). Further guidance relating to the clean development mechanism. *Decision 3/CMP.6. Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.*

United Nations Industrial Development Organization (2010). A Greener Footprint for Industry Opportunities and challenges of sustainable industrial development. *UNIDO, Vienna.* (http://www.unido.org/fileadmin/user_media/Services/Green_Industry/Green_Industry_Initiative.pdf).

Ulijn, J., & Weggeman, M. (2001). Towards an Innovation Culture: What are its National, Corporate, Marketing, and Engineering Aspects? Some Experimental Evidence. *C. Cooper, S. Cartwright and C. Early (eds), International Handbook of Organizational Culture and Climate, London: Wiley.* 487–517.

Wankel, C. (2008). Alleviating Poverty Through Business Strategy: Global Case Studies in Social Entrepreneurship. *Palgrave Macmillan, New York.*

Wiesmann, G. (2012). Cuts redraw Germany's solar power landscape. *Financial Times, March 27* (http://www.ft.com/cms/s/0/bf523938-741b-11e1-bcec-00144feab49a.html#axzz1qikCp6iQ).

World Economic Forum & The Boston Consulting Group (2011). The New Sustainability Champions. Redefining the Future of Growth. Key findings of 'Sustainability through Innovation' project. World Economic Forum's Centre for Global Growth Companies.

World Trade Organization (2011). Harnessing trade for sustainable development and a green economy. *WTO, Geneva*. (http://www.wto.org/english/res_e/publications_e/brochure_rio_20_e.pdf).