

Rich Greening - Poor Greening - the Green Economy and Economic Development

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Rich Greening- Poor Greening - the Green Economy and Economic Development

The Green Economy concept has emerged as an important policy concept the last ca. 10 years, recently fortified with the UN Sustainable Development goals (SDGs) from 2015 which call for 'inclusive and sustainable economic growth' and the development of more 'sustainable consumption and production patterns'. The SDGs are receiving considerable attention in both developed and developing countries creating a new momentum for the sustainable development agenda globally.

Much research into globalization and the Green Economy focus on analyzing a possible catch-up of developing countries to developed countries within eco-innovation. This paper takes a different perspective in seeking to highlight changes in the conditions for eco-innovation and green business development over time and space. In seeking to unfold an evolutionary economic perspective to the Green Economy, the paper takes as a starting point that the green economy is an emerging Techno Economic Paradigm (TEP) change that is entailing important and pervasive structural changes to the global economy. The paper proposes that there are considerable sunk costs to greening which are a neglected aspects in the green economy discussion. The paper argues further that because of the sunk costs late comer countries may gain important advantages to greening. The sunk costs are due to a) comprehensive institutional change associated with the green economy and b) learning effects particularly within companies but also knowledge institutions and consumers.

The paper analyses critically the nature and extent of these sunk costs to greening over time and space and discusses their implications for developing countries. The paper proposes that if well understood the sunk costs point to some leapfrogging opportunities, where developing countries may pursue different paths to greening than the developed countries have done. Noticeably in pursuing early a strong business rather than a traditional regulatory environmental approach. The policy implications of this are considerable as different types of policy measures and targets might be considered. The paper seeks specifically to discuss different conditions for eco-innovation in respectively rich and poor countries in the current stage of the green economic development.

The paper feeds more fundamentally into an evolutionary economic understanding of green economic change.

- Andersen, M.M., 1999. Trajectory Change through Interorganisational Learning. On the Economic Organisation of the Greening of Industry PhD. Serie., Copenhagen: Copenhagen Business School.
- Andersen, M.M., 2008. Eco-innovation. Towards a taxonomy and a theory. In *DRUID* Conference 2008 - Entrepreneurship and innovation - organizations, institutions, systems and regions.
- Andersen, M.M., 2009. Combating Climate Change through Eco-innovation Towards the Green Innovation System. In *Innovative Economic Policies for Climate Change Mitigation*. Lulu.com, pp. 37–58.
- Andersen, M.M., 2012. Into the Green Economy -Evolutionary Perspectives on Green Economic Change. In *Paper in Shumpeter Conference, Brisbane Australia 2012, unpublished*. Paper in Shumpeter Conference, Brisbane Australia 2012, unpublished.
- Andersen, M.M., 2001. Organising Interfirm Learning -Towards a dynamic institutional economic framework for the greening of industry. *Okologisches Wirtschaften*, 2, pp.23–26.
- Andersen, M.M., 2004. Partnership for green competitiveness An innovation system approach.
- Andersen, M.M., 1999a. Trajectory Change through Interorganisational Learning. On the Economic Organisation of the Greening of Industry PhD. Serie., Copenhagen: Copenhagen Business School.
- Andersen, M.M., 1999b. Trajectory Change through Interorganisational Learning. On the Economic Organisation of the Greening of Industry PhD. Serie., Copenhagen: Copenhagen Business School.
- Arrow, K.J. et al., 2007. Consumption, Investment, and Future Well-Being: Reply to Daly et al. *Conservation Biology*, 21, pp.1363–1365. Available at: http://www.blackwellsynergy.com/doi/abs/10.1111/j.1523-1739.2007.00783.x.
- Belin, J., Horbach, J. & Oltra, V., Determinants and specificities of eco-innovations An econometric analysis for France and Germany based on the Community Innovation Survey. , pp.1–20.
- Bergh, J.C.J.M.V.A.N.D.E.N. & Gowdy, J.M., 2000. Evolutionary Theories in Environmental and Resource Economics : Approaches and Applications. , pp.37–57.
- Brien, M.O. & Fischer, S., 2013. Europe in transition Paving the way to a green economy.,

(January).

- Costanza, R. et al., 2016. Modelling and measuring sustainable wellbeing in connection with the UN Sustainable Development Goals. *Ecological Economics*, 130, pp.350–355. Available at: http://www.sciencedirect.com/science/article/pii/S0921800915303359 [Accessed September 15, 2016].
- Costanza, R. et al., 2006. Natural Capital and Sustainable Development. *Sustainable Development*, 6(1), pp.37–46.
- Daly, H.E., 2005. Economics in a full world. *Scientific American*, 293(3), pp.100–107. Available at: http://www.ncbi.nlm.nih.gov/pubmed/16121860.
- Daly, H.E., 1993. Steady-State Economics : A New Paradigm. *New Literary History*, 24, pp.811–816.
- Daly, H.E., 1974. Steady-State Economics versus Growthmania : A Critique of the Orthodox Conceptions of Growth , Wants , Scarcity , and Efficiency *. *Policy Sciences*, 5, pp.149– 167.
- Davis, A. et al., 2015. Measuring the SDGs: a two-track solution. *Lancet (London, England)*, 386(9990), pp.221–2. Available at: http://www.sciencedirect.com/science/article/pii/S0140673615610819 [Accessed September 15, 2016].
- Dosi, G., 1982. Technological paradigms and technological trajectories. *Research Policy*, 11(3), pp.147–162. Available at: http://linkinghub.elsevier.com/retrieve/pii/0048733382900166.
- Ekins, P., 1993. Economic Values and the Natural World by David Pearce, Review. *International Affairs*, 69(4), pp.774–775.
- European commission, 2012. Europe in transition : Paving the way to a green economy through eco-innovation. *Eco-innovation observatory*, (January), pp.1–6.
- Flash Eurobarometer 342, How green are European SMEs? Available at: http://ec.europa.eu/enterprise/newsroom/cf/itemdetail.cfm?item_id=7191&lang=en.
- Freeman, C., 1988. *Japan: a new national system of innovation?*, Available at: http://www.lem.sssup.it/WPLem/files/dosietal_1988_V.pdf.
- Freeman, C., 1994. The economics of technical change. *Cambridge Journal of Economics*, 18, pp.463–514.
- Freeman, C., 1995. The "national system of innovation" in historical perspective. Cambridge

Journal of Economics, 19, p.5. Available at:

http://proquest.umi.com/pqdweb?did=4496238&Fmt=7&clientId=5646&RQT=309&VNam e=PQD.

- Frondel, M., Horbach, J. & Rennings, K., 2008. What triggers environmental management and innovation? Empirical evidence for Germany. *Ecological Economics*, 66(1), pp.153–160. Available at: http://linkinghub.elsevier.com/retrieve/pii/S0921800907004429 [Accessed August 20, 2013].
- Goodland, R. & Daly, H., 1996. Environmental Sustainability: Universal and Non-Negotiable. *Ecological Applications*, 6, pp.1002–1017. Available at: http://www.jstor.org/stable/2269583.
- Gowdy, J. & Erickson, J.D., 2005. The approach of ecological economics. *Cambridge Journal of Economics*, 29(2), pp.207–222.
- Hák, T., Janoušková, S. & Moldan, B., 2016. Sustainable Development Goals: A need for relevant indicators. *Ecological Indicators*, 60, pp.565–573. Available at: http://www.sciencedirect.com/science/article/pii/S1470160X15004240 [Accessed September 15, 2016].
- Horbach, J., Rammer, C. & Rennings, K., 2012. Determinants of eco-innovations by type of environmental impact — The role of regulatory push/pull, technology push and market pull. *Ecological Economics*, 78, pp.112–122. Available at: http://linkinghub.elsevier.com/retrieve/pii/S0921800912001358
- Johnstone, N. & Hascic, I., 2007a. Eco-innovation, policy and globalisation. *OECD Observer*, pp.15–16. Available at: http://www.oecd.org/greengrowth/consumption-innovation/40013511.pdf.
- Johnstone, N. & Hascic, I., 2007b. Eco-innovation, policy and globalisation. *OECD Observer*, (264–265), pp.15–16.
- Kemp, R. & Oltra, V., 2011. Research Insights and Challenges on Eco-Innovation Dynamics. *Industry & Innovation*, 18(3), pp.249–253. Available at: http://www.tandfonline.com/doi/abs/10.1080/13662716.2011.562399 [Accessed March 30, 2012].
- KEMP, R. & SOETE, L., 1992. THE GREENING OF TECHNOLOGICAL-PROGRESS AN EVOLUTIONARY PERSPECTIVE. *FUTURES*, 24(5), pp.437–457.

- Kemp, R. & Soete, L., 1992. THE GREENING OF TECHNOLOGICAL An evolutionary. *Futures*, (June).
- Kemp, R. & Andersen, M.M., 2004. *Strategies for eco-efficiency innovation. IMR strategielijnen* project voor VROM., Maastricht.
- Langlois, R.N., 1992. Transaction-cost Economics in Real Time. Industrial and Corporate Change, 1(1), pp.99–127. Available at: http://icc.oxfordjournals.org/cgi/doi/10.1093/icc/1.1.99.
- Lundvall, B., 2007. National Innovation Systems—Analytical Concept and Development Tool. *Industry & Innovation*, 14(1), pp.95–119. Available at: http://www.tandfonline.com/doi/abs/10.1080/13662710601130863.
- Lundvall, B.-Å., 1992. National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning, Available at: http://books.google.com/books?id=iDXGwacw-4oC&pgis=1.
- Machiba, T., 2010. Eco-innovation for enabling resource efficiency and green growth: development of an analytical framework and preliminary analysis of industry and policy practices. *International Economics and Economic Policy*, 7, pp.357–370.
- Malik, O.A. et al., 2015. A global indicator of wastewater treatment to inform the Sustainable Development Goals (SDGs). *Environmental Science & Policy*, 48, pp.172–185. Available at: http://www.sciencedirect.com/science/article/pii/S1462901115000076 [Accessed September 15, 2016].
- Mayumi, K., Giampietro, M. & Gowdy, J.M., 1998. Georgescu-Roegen/Daly versus Solow/Stiglitz Revisited. *Ecological Economics*, 27, pp.115–117.
- Nelson, R. & Winter, S., 1982. An Evolutionary Theory of Economic Change. *The Belknapp Press of Harvard University Press, Cambridge*.
- Nelson, R.R., 1993. *National Innovation Systems: A Comparative Analysis*, Available at: http://books.google.com/books?hl=en&lr=&id=YFDGjgxc2CYC&oi=fnd&a mp;pg=PP10&dq=National+innovation+systems:+a+comparative+analysis&ots= On8xpi4tNY&sig=3jWcgeyiE_eo1R6uR2bZ87Ue4oY.
- Nelson, R.R. & Winter, S.G., 1982. An Evolutionary Theory of Economic Change. *The Economic Journal*, 93, p.437.
- Nelson, R.R. & Winter, S.G., 1977. In search of useful theory of innovation. Research Policy,

6(1), pp.36–76. Available at:

- http://www.sciencedirect.com/science/article/pii/0048733377900294 [Accessed December 18, 2015].
- Nelson, R.R. & Winter, S.G., 1974. Neoclassical vs. evolutionary theories of economic growth: Critique and prospectus. *The Economic Journal*, 84, pp.886–905.
- Nill, J. & Kemp, R., 2009. Evolutionary approaches for sustainable innovation policies: From niche to paradigm? *Research Policy*, 38(4), pp.668–680. Available at: http://linkinghub.elsevier.com/retrieve/pii/S004873330900016X [Accessed August 6, 2013].
- No, E.E.A.R., 2013. Towards a green economy in Europe,
- OECD, 2007. Eco-innovation, policy and globalisation: Making a world of difference. *OECD Observer No. 264/265.* Available at: http://www.oecd.org/innovation/ecoinnovationpolicyandglobalisationmakingaworldofdifferenceoecdobserverno264265december2007.htm.
- Oecd, 2009. *Eco-Innovation in Industry: Enabling Green Growth*, Available at: http://www.oecd-ilibrary.org/environment/eco-innovation-in-industry_9789264077225-en.
- OECD, 2011a. Fostering Innovation for Green Growth,
- OECD, 2012. The Jobs Potential of a Shift Towards a Low-carbon Economy. *OECD Green Growth Paper 2012-01*.
- OECD, 2011b. *Towards Green Growth: Monitoring Progress: OECD Indicators*, Available at: http://www.oecd-ilibrary.org/environment/towards-green-growth-monitoring-progress_9789264111356-en\nhttp://www.oecd-ilibrary.org/environment/towards-green-growth 9789264111318-en.

Oltra, V., Kemp, R. & Vries, F. De, 2008. Patents as a measure for eco-innovation. , pp.1–32.

- Organisation for Economic Cooperation and Development, 2009. Sustainable Manufacturing and Eco-Innovation: Framework, Practices and Measurement. *Oe*, p.38.
- Patel, P. & Pavitt, K., 1994. The nature and economic importance of national innovation systems. *STI review*, 14, pp.9–32.
- Pearson, P.J.G. & Foxon, T.J., 2012. A low carbon industrial revolution? Insights and challenges from past technological and economic transformations. *Energy Policy*, 50, pp.117–127. Available at: http://linkinghub.elsevier.com/retrieve/pii/S0301421512006568.

- Rennings, K., 2000. Redefining innovation eco-innovation research and the contribution from ecological economics. *Ecological Economics*, 32(2), pp.319–332.
- Rennings, K. & Rammer, C., 2011. The Impact of Regulation-Driven Environmental Innovation on Innovation Success and Firm Performance. *Industry & Innovation*, 18(3), pp.255–283. Available at: http://www.tandfonline.com/doi/abs/10.1080/13662716.2011.561027 [Accessed April 9, 2012].
- del Río, P., Carrillo-Hermosilla, J. & Könnölä, T., 2010. Policy strategies to promote ecoinnovation: An integrated framework. *Journal of Industrial Ecology*, 14(4), pp.541–557.
- Samara, E., Georgiadis, P. & Bakouros, I., 2012. The impact of innovation policies on the performance of national innovation systems: A system dynamics analysis. *Technovation*, 32, pp.624–638.
- Schaltegger, S. & Wagner, M., 2011. Sustainable entrepreneurship and sustainability innovation: Categories and interactions. *Business Strategy and the Environment*, 20(4), pp.222–237.
- Schiederig, T., Tietze, F. & Herstatt, C., 2011. *What is Green Innovation ? A quantitative literature review*, Hamburg_Harburg.
- Selomane, O. et al., 2015. Towards integrated social–ecological sustainability indicators: Exploring the contribution and gaps in existing global data. *Ecological Economics*, 118, pp.140–146. Available at:
 - http://www.sciencedirect.com/science/article/pii/S0921800915003158 [Accessed September 15, 2016].
- UNCSD Secretariat and UNCTAD, 2012. Trade and Green Economy. In *Rio+20 Issues Briefs No.1*. pp. 1–6.
- UNEP, 2008. *Green jobs: towards decent work in a sustainable, low-carbon world*, Available at: http://www.ncbi.nlm.nih.gov/pubmed/20720328.
- UNEP, 2011. Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, UNEP/GRID-Arendal.
- United Nations, 2011. Working towards a Balanced and Inclusive Green Economy: A United Nations System-wide Perspective, Geneva: United Nations.
- United Nations & OECD, 2011. Working towards a Balanced and Inclusive Green Economy: A United Nations System-wide Perspective, Geneva: OECD Publishing. Available at: http://www.oecd-ilibrary.org/environment/towards-green-growth_9789264111318-

en;jsessionid=clgfntic30mef.delta.

- Wagner, M. & Llerena, P., 2011a. Eco-Innovation Through Integration, Regulation and Cooperation: Comparative Insights from Case Studies in Three Manufacturing Sectors. *Industry & Innovation*, 18, pp.747–764.
- Wagner, M. & Llerena, P., 2011b. Eco-Innovation Through Integration, Regulation and Cooperation: Comparative Insights from Case Studies in Three Manufacturing Sectors. *Industry & Innovation*, 18(8), pp.747–764.
- UNESCAP (2006) Green Growh at a Glance, the way forward for Asia and the Pacific, United Nations, ST/ESCAP/2407.
- van den Bergh, J, Faber, A, Idenburg, A and Oosterhuis, F (2006), 'Survival of the greenest: evolutionary economics and policies for energy innovation', *Environmental Sciences* 3(1): 57-71
- Wallace, D. (1995) *Environmental Policy and Industrial Innovation: Strategies in Europe, the US and Japan*, London: Royal Institute of International Affairs

Weber, M. and J. Hemmelskamp (eds.) (2005) *Towards Environmental Innovation Systems*, Springer Verlag

World Business Council for Sustainable Development (2000) *Eco-efficiency – creating more* value with less impact