Probing "green" industry enterprises in the UK: A new identification approach

Philip Shapira [a,b,*], Abdullah Gök [a], Evgeny Klochikhin [a], Marianne Sensier [c]

[a] Manchester Institute of Innovation Research, Manchester Business School, University of Manchester, Manchester M13 9PL, UK
[b] School of Public Policy, Georgia Institute of Technology, Atlanta, GA 30332-03345, USA
[c] Economics, School of Social Sciences, University of Manchester, Manchester M13 9PL, UK

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ABSTRACT

There is a growing interest in innovation for sustainability and the development of green industries and green jobs. But how can green industries, green manufacturing jobs, and green goods innovation be measured? This paper probes current and recent attempts to define and measure these categories, with a focus on studies in the UK. We review the methods, estimates and trends contained in these studies. While these efforts have value, they also raise significant conceptual and measurement issues. The paper discusses a series of these issues and considers strategies to further refine the categorization and detection of green sector enterprises. A new identification approach is put forward using search term combinations and text mining to discern green goods sector companies. This method is tested through a search of small and medium-size green goods enterprises in the UK. Findings from our search approach are presented, along with a discussion of advantages and limitations.

1. Introduction

There is growing policy interest in the development of green industries to address challenges of environmental sustainability. At the same time, it is also suggested that stimulating green industries is an avenue for generating jobs and new business development, particularly among small and midsize enterprises (SMEs), and for rectifying regional imbalances [32,43]. We are particularly interested in the business and economic justification for policy interest in green industries. However, we do not take it as axiomatic that industries grow just because they are greener. Rather, as part of a larger project on "Sustaining Growth for Innovative New Enterprises" [39], we seek to understand the performance and strategies of SMEs in emerging green goods sectors and to generate evidence about how and why such companies stay in business and grow.

One problem that immediately arises when one attempts to investigate green industries is that it is not straightforward to define and identify the industries and companies that comprise this sector. It is precisely this problem that we focus upon in this paper, where – dissatisfied with currently available methods – we propose a new approach to identify green enterprises. We concentrate on what we term the green goods sector (GGS) — comprising companies in a range of industries that produce or market manufactured items that have environmental or natural resource benefits when used by other businesses, organizations or households.

The paper proceeds as follows. After a concise review of the literature which highlights the potential of green sectors and green SMEs in fostering economic development, we consider existing definitions and methods of data collection on green industries. We note a series of measurement issues associated with current approaches. We then present a new method for identifying green firms. We illustrate the method by applying it to a search of green goods SMEs in the United

* Corresponding author at: Manchester Institute of Innovation Research, Manchester Business School, University of Manchester, Manchester M13 9PL, UK. Tel.: +44 161 900 9452.
 E-mail addresses: pshapira@mbs.ac.uk, pshapira@gatech.edu (P. Shapira), abdullah.gok@mbs.ac.uk (A. Gök), eklochikhin@gmail.com (E. Klochikhin), marianne.sensier@manchester.ac.uk (M. Sensier).

Kingdom (UK). We present the results in a section on findings, and also compare our strategy with results from searches using a standard industrial classification method. The concluding section discusses the strengths and limitations of our new identification method and considers opportunities for further application and improvement.

2. Literature overview

Efforts to foster "green" technologies and sectors have been launched in many countries and regions. For example, the European Commission launched a program dedicated to eco-innovation through the Executive Agency for Competitiveness and Innovation in 2008.[1] Here the objective is "to boost Europe's environmental and competitive standing by supporting innovative solutions that protect the environment while creating a larger market for 'green' technologies, management methods, products and services." As Kemp and Oltra [24] highlight "policy is crucial for giving environmental benefits a value in the marketplace through the use of regulation, taxes and tradable emission rights." Suppliers and customers of business also need to grasp the value of eco-innovation in order to stimulate both supply and demand for green technologies that have utility in reducing harmful environmental consequences and conserving scarce natural resources.

Although eco-innovation can raise concerns about potential negative consequences on business and employment, proponents of eco-innovation maintain that such policies will generally result in positive economic growth outcomes as well as beneficial environmental effects. There is indeed an empirical literature that tests the hypothesis [36,37] that environmental policies can foster competitiveness by inducing technological innovation. Böhringer et al. [7] analyze a panel of German manufacturing sectors and find a positive impact of environmental investment on production growth. Costantini and Mazzanti [13], in an analysis of sectors across 15 European Union (EU) countries, report that high tech sector exports have responded positively to energy and environmental taxation, although they suggest further research on the effect of environmental policies in inducing firms in specific green technology sectors to increase their innovative efforts (an issue that our broader study is also now considering). Using German innovation survey firm data, Rennings and Rammer [38] find that innovations stimulated by environmental regulation increased sales but when looking at different sectors within the green industry they report mixed results on profitability. Firms in recycling and waste management benefit, in terms of higher profit margins, from regulations but those in water management experience lower profitability, as costs for eco-innovation cannot be fully passed on through prices in this sector. Yet, while there has been a growth of research studies on eco-innovation and sustainability [8,28], there is also recognition that the linkages between eco-innovation, business development and jobs are still not fully explicated, including understanding the combined effects of mixes of policies related to eco-innovation, enterprise promotion, and sustainability [3].

The need for continued work, particularly at disaggregated levels, on the linkages between eco-innovation and business, is emphasized by changes in the context for green technology development. In recent years, interest in eco-innovation has been influenced not only by environmental and sustainability concerns but also by debate, in multiple countries around the world, on the importance of economic rebalancing following the financial sector crises of the late 2000s and their ongoing aftershocks [18,29,40]. While there is much variation as to how the objectives and processes of rebalancing are described, common themes can be discerned. In the UK, there has been heightened discourse about strengthening manufacturing and shifting towards low-carbon and greener production and consumption so as to counterbalance an overreliance on financial services, foster regional growth outside of the financial capital of London, promote exports, and ensure a more resilient path for economic recovery and sustainable growth [20]. Similarly, in the United States, there has been dialog about how to rebalance the economy, strengthen manufacturing, and using clean production technologies to foster domestic growth and exports [9,33,34]. The Obama administration launched several key initiatives including the Advanced Manufacturing Partnership, the Clean Energy Manufacturing Initiative, and a proposed National Network for Manufacturing Innovation [1,14]. China has also emphasized (in its latest 12th Five Year Plan and in recent governmental statements) the need for rebalancing strategies for regional and social development and to promote environmentally sustainable internal growth ([11]; see also [17]).

Alongside broader macro-economic, fiscal, and trade policies, it is evident that economic rebalancing requires enhanced and renewed enterprise growth and development particularly in sectors that can most readily meet rebalancing objectives. One of the domains which could be especially appropriate in this regard is the production of green goods — comprising manufactured items which help others to conserve natural resources or meet carbon reduction and other environmental goals. In this process, jobs associated with manufacturing may be sustained or expanded, and opportunities developed to increase manufactured exports and services associated with green goods production and use [21]. On a broader scale, the fostering of green economies, sectors, and industries has been highlighted as an imperative (to address sustainability challenges) and an opportunity (to reinvigorate economic growth) for both developed and developing economies [32,43].

3. Defining and measuring green sectors

While fostering a green economy has risen up as a priority target for policy makers throughout the world, the tasks of defining and identifying green industries, green companies, green products and green jobs are neither simple nor trivial. As a recent ILO [21] study points out, these categories do not always overlap. For example, energy conserving products may be marketed to consumers as green but may not necessarily be made of materials or processes that are themselves green. Similarly, green jobs in numerous occupations, for example, waste reduction engineering, may not be located in industries or companies designated as green. In this section, we consider a subset of this larger question of how greenness is demarcated: we focus on the specific problem of how green industrial sectors and green companies are defined and pinpointed. The reason for this is that if we (and others) wish to track whether

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[1] See the web-page at http://ec.europa.eu/eaci/eco_en.htm.