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The concept of “lead markets” revisited: Contribution to environmental innovation theory

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ABSTRACT

The economic potential of lead markets for environmental technologies has served as an important justification for policies to promote environmental innovations in Europe. The emergence of competition from emerging economies has revealed that a domestic lead market is no guarantee for long-term competitive success in an international context. This article reviews the academic literature on lead markets as well as its application in policy. It outlines the theoretical foundations of the concept and main insights obtained with it and relates these to its uses in policy. It then contrasts the lead market approach with the technological innovation systems framework and the multi-level perspective as these are both frequently employed in the transitions literature. The article addresses shortcomings of the current literature and proposes a number of avenues for further development of the concept.

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1. Introduction

The rapid development and international diffusion of environmental innovations is key to sustainable development. The threat of irreversible climate change and increasing resource scarcity have helped to bring this issue to the attention of a growing community of policy makers and researchers. In the European Union, for instance, the concept of eco-innovation has become an important issue of policy attention, as manifested by the Eco-Innovation Action Plan ([European Commission, 2011](#)) or the various efforts of the European Commission to promote environmental innovation and related R&D ([Quitzow, 2011](#)). Outside the EU, emerging economies, including China and India, are developing environmental technology sectors of their own. In 2011, China led the world in terms of investments in renewable energy technologies ([UNEP, 2012](#)), and it currently even tops the Renewable Energy Attractiveness Index published by [Ernst and Young \(2012\)](#).

The increasing engagement of emerging economies with environmental technologies has gone hand in hand with growing competition in the field. Both industrialized and emerging countries are increasingly positioning themselves to capture leadership positions in these industries. The EU's Europe 2020 growth strategy places particular emphasis on maintaining the EU's leadership position in developing green technologies ([European Commission, 2010](#)). Similarly, in May 2012, the Chinese government passed a plan to promote seven strategic emerging industries, including environmental protection and energy-efficiency technologies, renewable energy, and so-called new-energy vehicles ([Climate Group, 2011](#)).

In this context, eco-innovation policy is no longer viewed merely as a subset of environmental policy, but it represents an increasingly strategic element of a new generation of industrial policy. A unique feature of this new industrial policy is that it does not suffice to promote the competitiveness of national industries or technology clusters. In the absence of a self-sustaining market for environmental technologies, government intervention cannot limit itself to supply-side interventions, such as R&D policy or other incentives for technology development. Equally important are demand-side measures that promote market development.

A key concept that has entered the policy discourse in this context is the notion of a lead market. Policy makers, particularly in the EU and in Germany, have eagerly employed the term to justify demand-side measures aimed at promoting renewable energies or other environmental technologies. The promotion of lead markets for environmental technologies, so the argument goes, can secure first mover advantages for national firms.⁴ In this way, the lead market concept has made an important contribution to the development and diffusion of renewable energy technologies. By functioning as a justification for pioneering policies for promoting renewable energy in Germany, it has helped pave the way for international diffusion of technologies and rapid industrial development in the sector. At the same time, its alleged promise to secure a lasting competitive advantage for German companies has not always been fulfilled ([Federal Ministry of Education and Research, 2011](#)). The recent turmoil in the German solar industry is a case in point.

Against this background, this article seeks to revisit the lead market concept, placing it in the context of the broader literature on environmental innovation and technological change. The article begins with a brief history of the concept and an overview of its theoretical foundations and key policy applications. After this introduction, it discusses its contribution to the study of environmental innovation, contrasting it to the technological innovation system (TIS) framework and the multi-level perspective (MLP) from the transitions literature. Next, the article addresses shortcomings of the concept and proposes a number of avenues for its development and improvement. The paper ends by returning to the politically relevant discussion on environmental innovation and economic competitiveness and proposes important questions for further research.

⁴ A detailed economic rationale for promoting lead markets is provided in the European Commission Staff Working Paper "Explanatory Paper on the European Lead Market Approach: Methodology and Rationale" ([European Commission, 2007a](#)).

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