



NOTA DI LAVORO

71.2016

Transition Towards a Green
Economy in Europe: Innovation
and Knowledge Integration in the
Renewable Energy Sector

C. Conti, Sapienza University of Rome

M. L. Mancusi, Catholic University
(Milan) and CRIOS, Bocconi University

F. Sanna-Randaccio, Sapienza
University of Rome

R. Sestini, Sapienza University of Rome

E. Verdolini, Fondazione CMCC and
Fondazione Eni Enrico Mattei

Mitigation, Innovation and Transformation Pathways

Series Editor: Massimo Tavoni

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By C. Conti, Sapienza University of Rome

M. L. Mancusi, Catholic University (Milan) and CRIOS, Bocconi University

F. Sanna-Randaccio, Sapienza University of Rome

R. Sestini, Sapienza University of Rome

E. Verdolini, Fondazione CMCC and Fondazione Eni Enrico Mattei

Summary

A major concern regarding innovation in clean technologies in the EU is that the fragmentation of its innovation system may hinder knowledge flows and, consequently, spillovers across member countries. A low intensity of knowledge flows across EU states can negatively impact their technological base, suppressing opportunities for further innovations and hindering the movement towards the technological frontier. This paper evaluates the fragmentation of the EU innovation system in the field of renewable energy sources (RES) by examining the intensity and direction of knowledge spillovers over the years 1985-2010. We modify the original double exponential knowledge diffusion model to provide information on the degree of integration of EU countries' innovation efforts and to assess how citation patterns changed over time. We show that EU RES inventors have increasingly built "on the shoulders of the other EU giants", intensifying their citations to other member countries and decreasing those to domestic inventors. Furthermore, the EU strengthened its position as source of RES knowledge for the US. Finally, we show that this pattern is peculiar to RES, with other traditional (i.e. fossil-based) energy technologies behaving differently.

Keywords: Knowledge Spillovers, Renewable Energy Technologies, Fossil Energy Technologies, EU Innovation

JEL Classification: Q55, Q58, Q42, O31, O33

Earlier versions of this paper were presented at the Paris Environmental and Energy Economics Seminar and at the GRI Conference on Innovation and Growth. The authors would like to thank Laura Diaz Anadón, David Popp, and Francesco Vona as well as all the participants to seminars and conferences for insightful comments.

Funding: This work was supported by MIUR (Italian Ministry for Education, University and Research) under the research programme "Climate Change in the Mediterranean Region: Evolutionary Scenarios, Economic Impacts, Mitigation Policies and Technological Innovation" (PRIN project 2010-2011) and by the Horizon 2020 research and innovation programme [grant agreement n° 642147 (CD-LINKS) and grant agreement n° 730403 (INNOPATHS)].

Address for correspondence:

Elena Verdolini

Fondazione Eni Enrico Mattei

C.so Magenta, 63

20123 Milan

Italy

E-mail: elena.verdolini@feem.it

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Corso Magenta, 63, 20123 Milano (I), web site: www.feem.it, e-mail: working.papers@feem.it