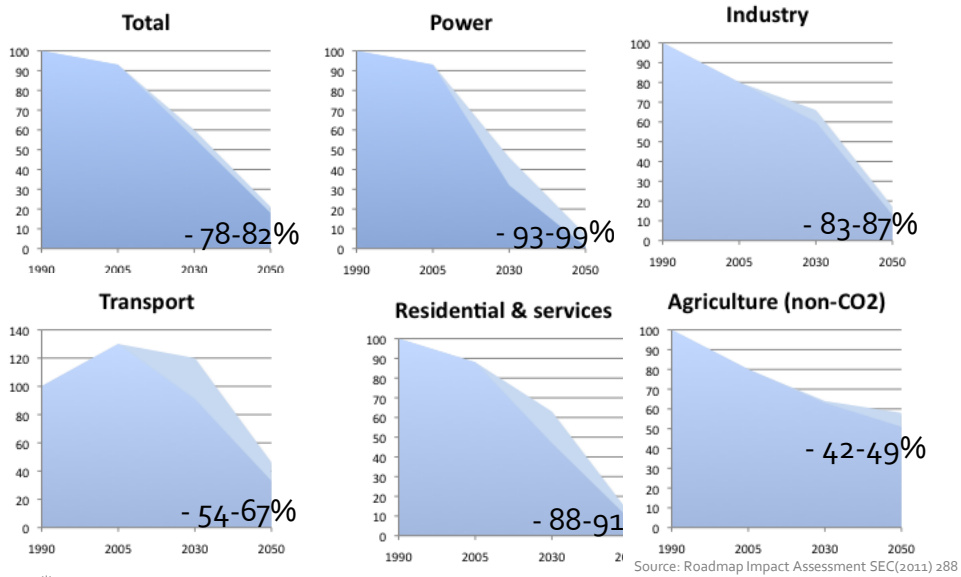
University of Ferrara

inno4sd.net
Innovation for Sustainable Development Network

The social, economic, environmental challenge

low-carbon economy requires a radical transformation…2050 EU targets…

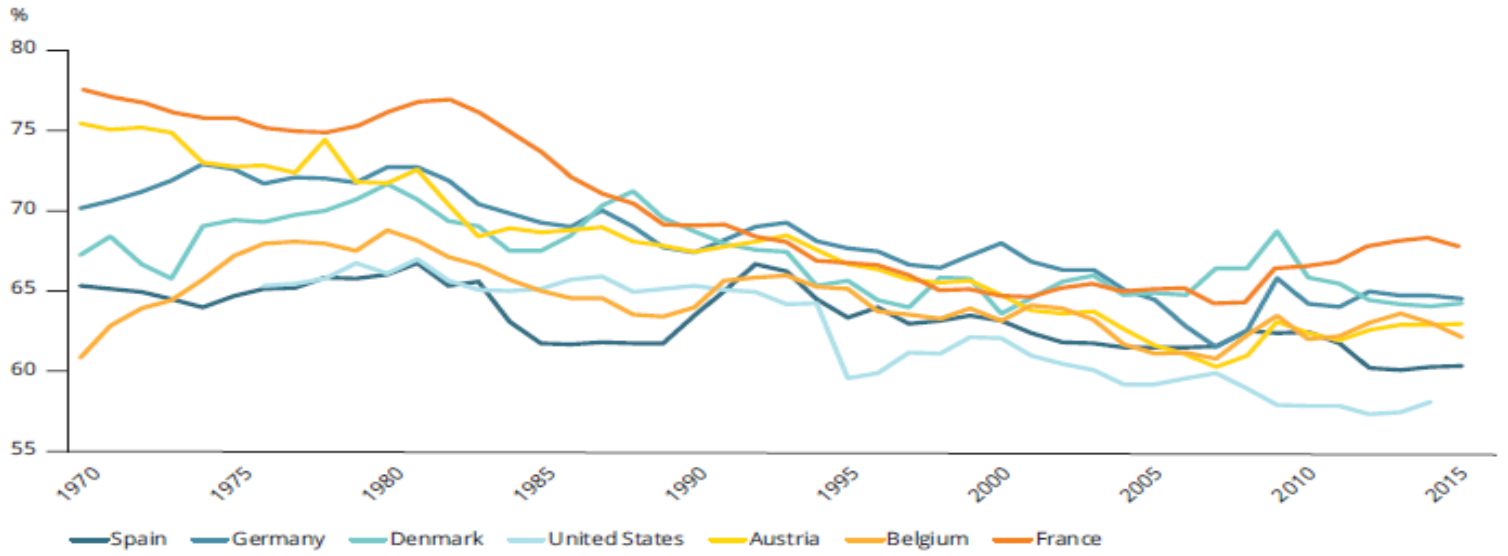


Source: Roadmap Impact Assessment SEC(2011) 288

www.cecilia2050.eu

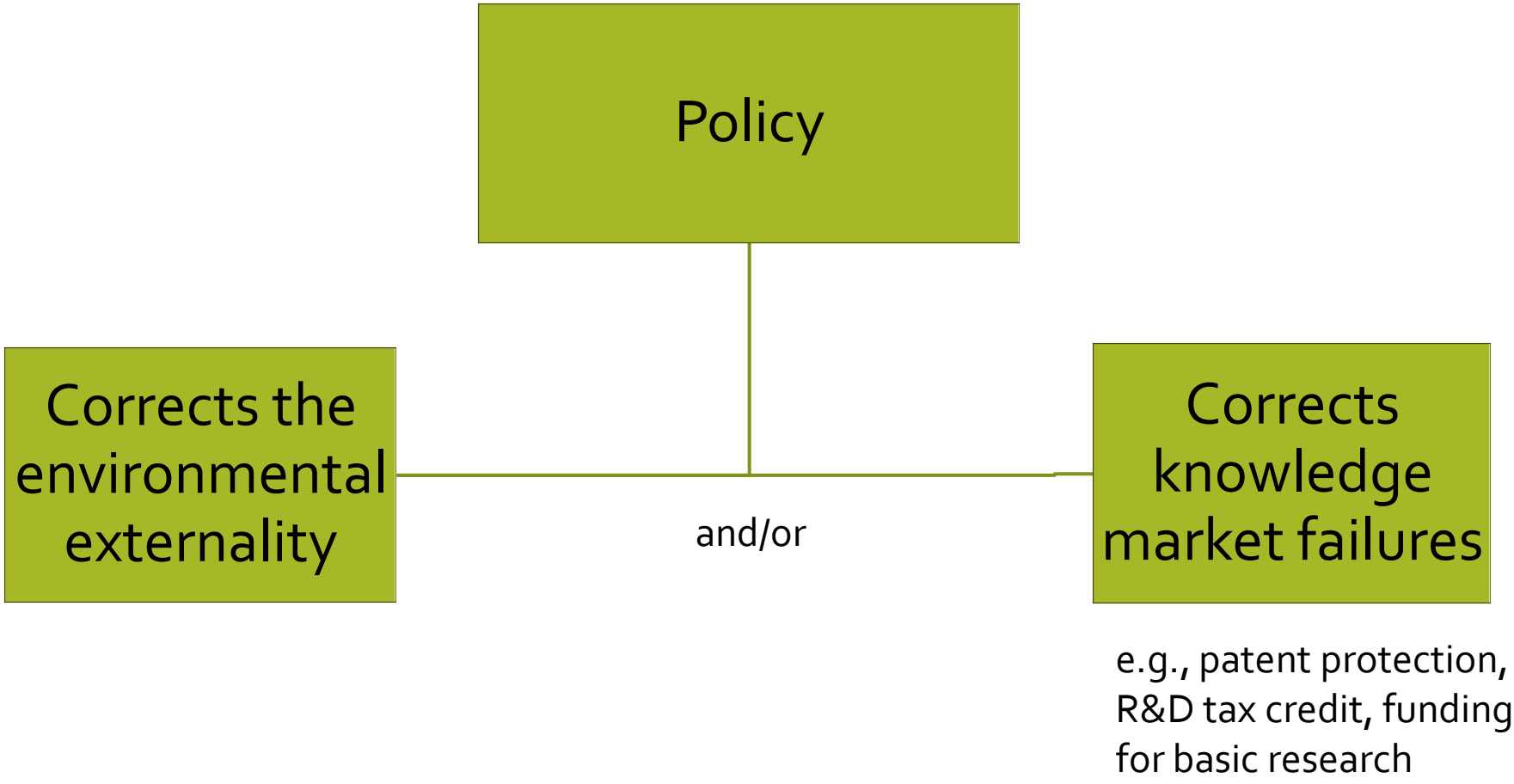
Inequality, labor and capital issues

Figure 3.1 **Trend in the labour share of national income (%) 1970-2014**



Source: Based on KLEMS data and calculated as labour compensation/(labour compensation + capital compensation).

The role of policy



…but the oses systemic

The sustainability transition in Europe in an age of demographic and technological change

An exploration of implications for fiscal and financial strategies

ISSN 1977-8449

Figure 1.1 Con

Demographic
• Population
• Labour forc
• Consumptio

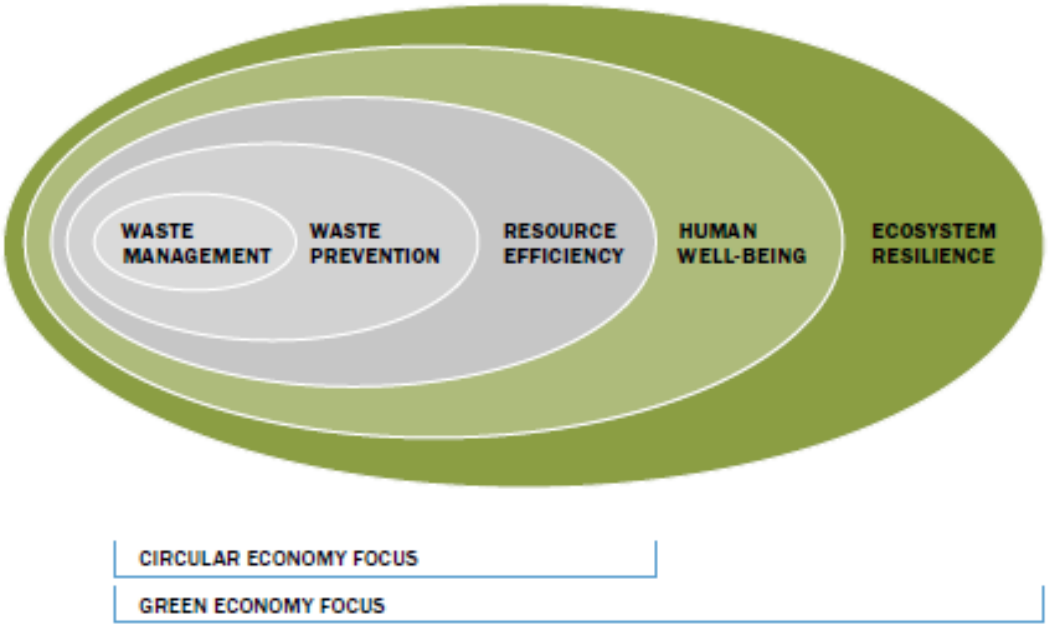
Fiscal transit
• Labour and
• Higher age-
• Investments

onmental impacts

olicies

Source: EEA.

Figure 1.5: The Circular Economy within the Green Economy according to the EEA



Source: EEA, 2015 https://www.eea.europa.eu/soer-2015/europe/green-economy


The Just Transition Mechanism:
Making Sure No One
Is Left Behind
The European
Green Deal
January 2020
#EUGreenDeal

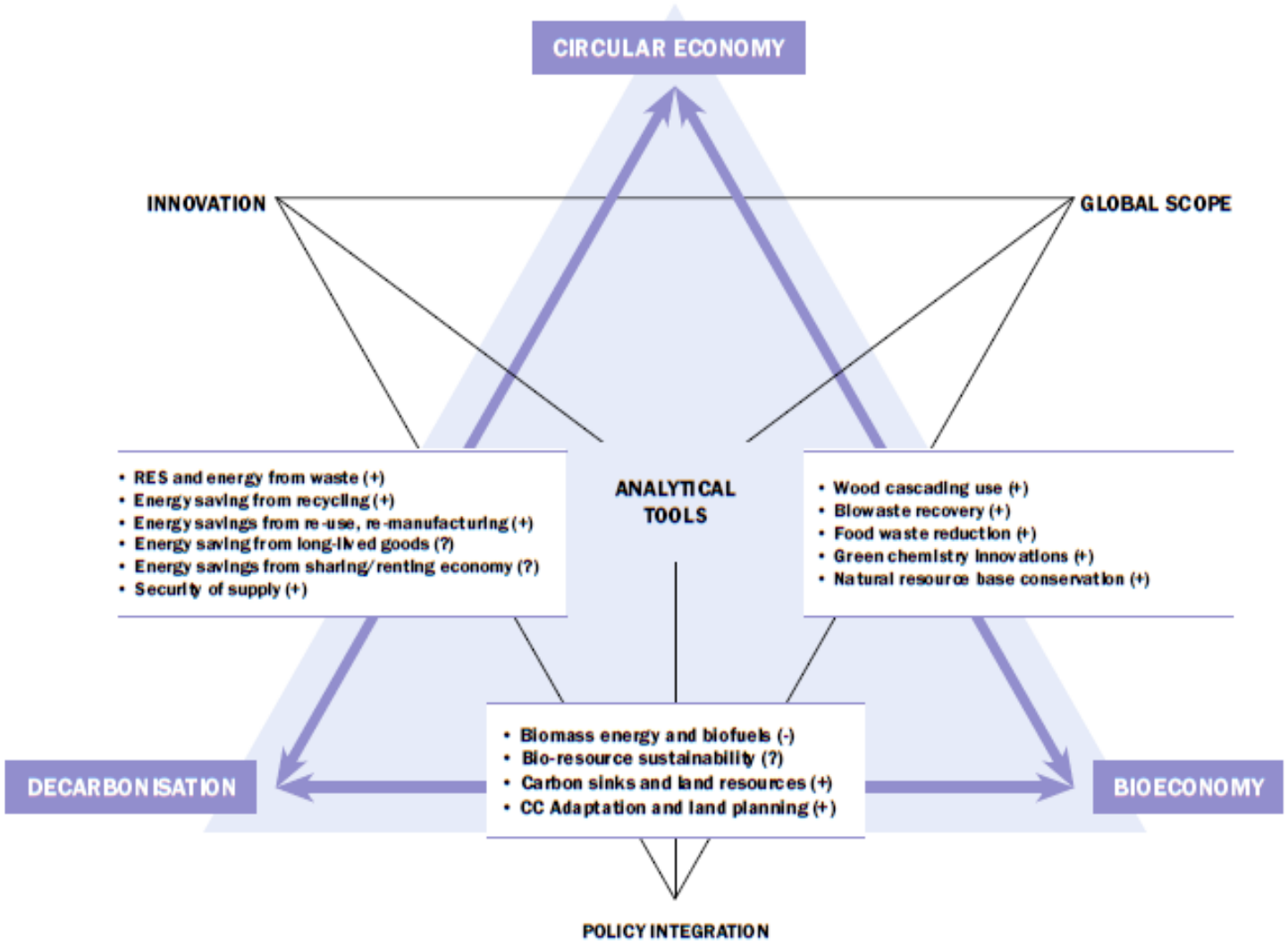


Figure 7.1. A sketch of the CE-DEC-BIO NEXUS

October 2019

Report

Towards an Innovation-Intensive Circular Economy. Integrating research, industry, and policies

Roberto Zoboli, Catholic University, Milan, and SEEDS

with contributions from

Nicolò Barbieri, University of Ferrara and SEEDS

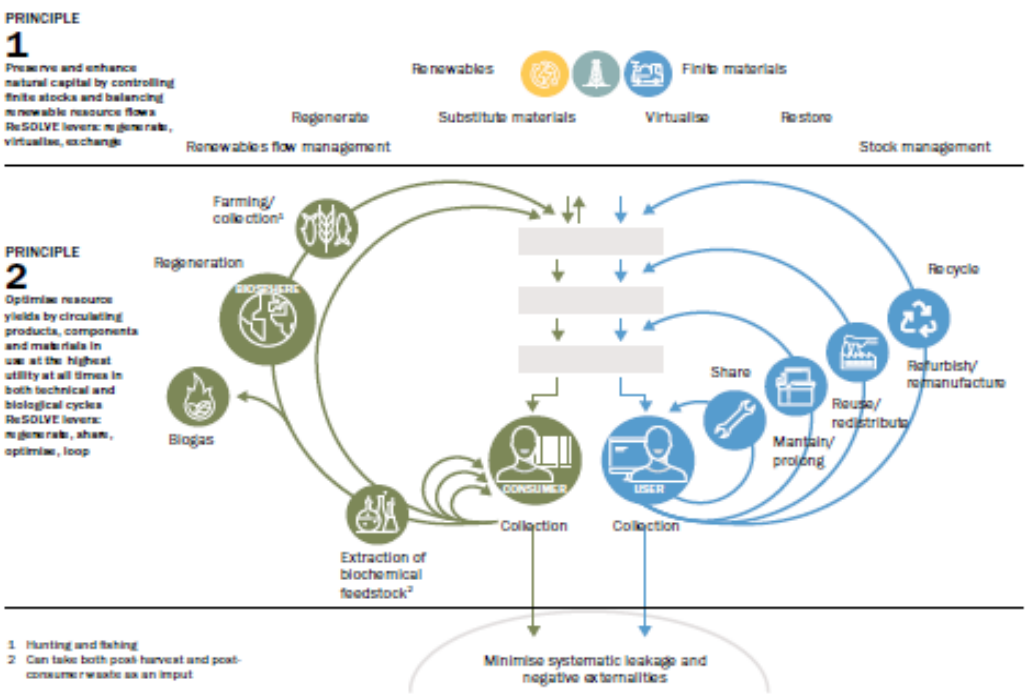
Claudia Ghisetti, Catholic University and SEEDS

Giovanni Marin, University of Urbino and SEEDS

Susanna Paleari, IRCrES-CNR

Edited by Stefano Pareglio, Catholic University, Milan, and FEEM

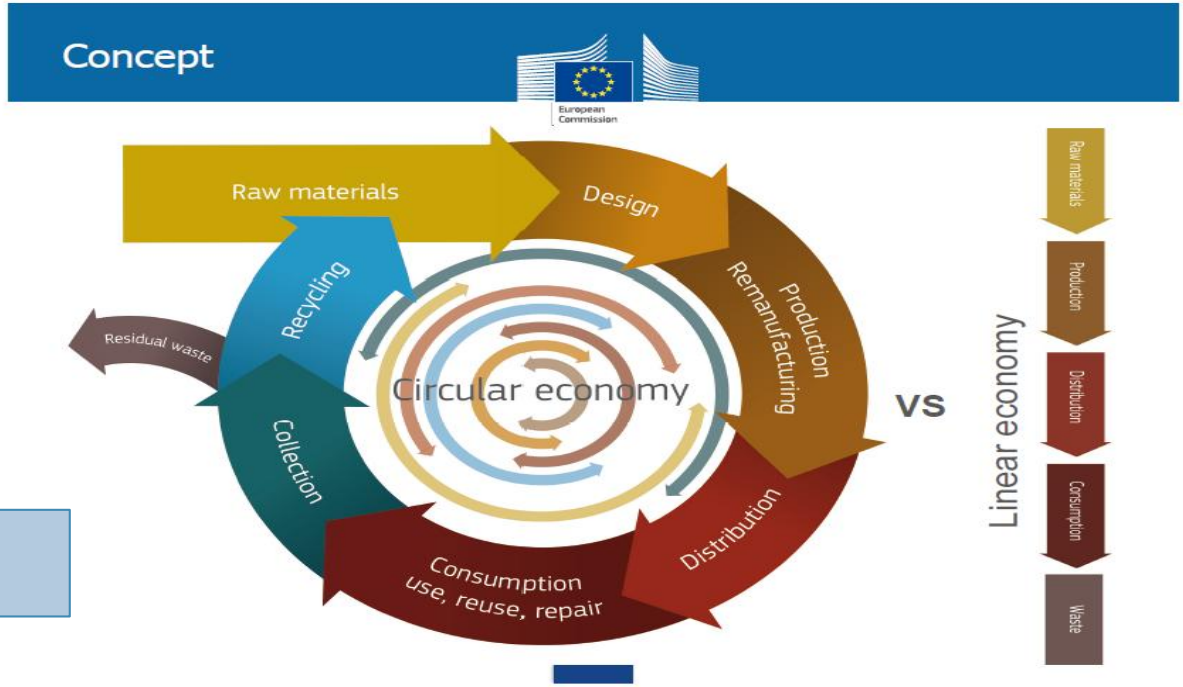
Figure 1.1. The Circular Economy according to the Ellen MacArthur Foundation



Source: https://www.ellenmacarthurfoundation.org/

- *"The Circular economy offers an opportunity to reinvent our economy, making it more sustainable and competitive"*
- *"This will bring benefits for European businesses, industries, and citizens alike"*

(European Commission, December 2015)



Resource efficiency

FORUM

Industrial Ecology and Competitiveness

Strategic Implications for the Firm

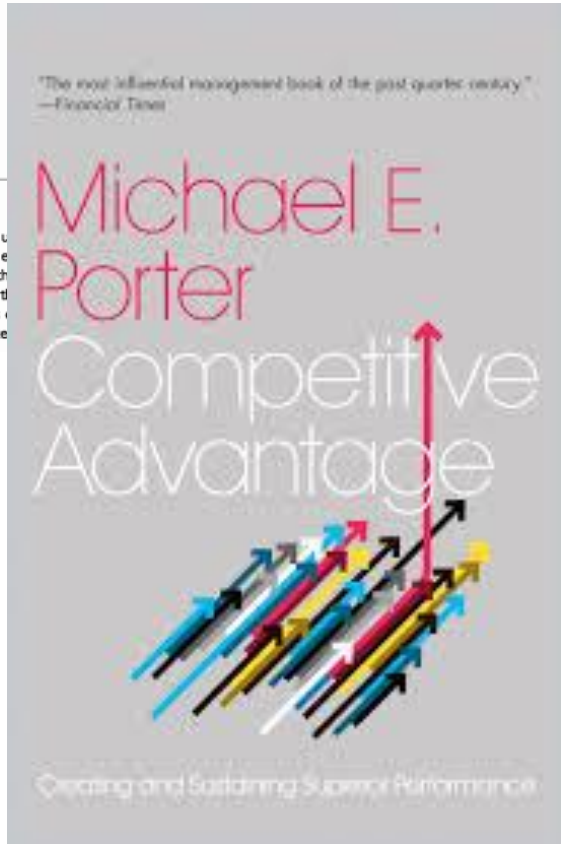
Daniel C. Esty
Yale Law School
Yale School of Forestry and Environmental Studies
New Haven, CT, USA

Michael E. Porter
Harvard Business School
Boston, MA, USA

Keywords
closed loop
competitiveness
corporate environmental management
eco-efficiency
externalities
resource productivity

Summary

In the emerging field of industrial ecology one of the u
settled questions is the degree to which design for the e
vironment, closing energy and materials loops, and oth
industrial ecology concepts apply at the firm level. In t
article we examine this issue with a particular focus
whether industrial ecology can guide company strate



Research Policy 49 (2020) 103827

Contents lists available at ScienceDirect

Research Policy

journal homepage: www.elsevier.com/locate/respol

Resource efficient eco-innovations for a circular economy: Evidence from EU firms

Giulio Cainelli[a,d], Alessio D'Amato[b,d], Massimiliano Mazzanti[c,d,*]

[a] University of Padova, Italy
[b] University of Rome "Tor Vergata", Italy
[c] University of Ferrara, Italy
[d] SEEDS, Italy - www.sustainability-seeds.org

Measuring eco-innovation for a green economy

René Kemp/Anthony Arundel/Christian Rammer/Michal Miedzinski/Carlos Tapia/Nicolò Barbieri/Serdar Türkeli/ Andrea M. Bassi/Massimiliano Mazzanti/Donald Chapman/ Fernando J. Díaz López/Will McDowall

René Kemp is Professorial fellow at UNU-MERIT and Professor of Innovation and Sustainable Development at ICIS, Maastricht University. He coordinated the work for the Manual.

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Michal Miedzinski is Senior Research Associate, University College London, Institute for Sustainable Resources

Carlos Tapia is Senior researcher at TECNALIA Research & Innovation, Energy and Environment Division

Nicolò Barbieri is Researcher at the Department of Economics and Management – University of Ferrara"

Serdar Türkeli is Post-doctoral researcher at UNU-MERIT, Lecturer in Science, Technology and Innovation Policy and Coordinator of Innovation, Institutions and Development specialisation at UNU-MERIT/MGSoG, Maastricht University

Andrea M. Bassi Founder and CEO of KnowlEdge Srl, Extraordinary Associate Professor of System Dynamics Modelling at Stellenbosch University, and Associate at the International Institute for Sustainable Development (IISD)

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Donald Chapman PhD research fellow in Ecological Economics and Sustainability Transitions at KU Leuven

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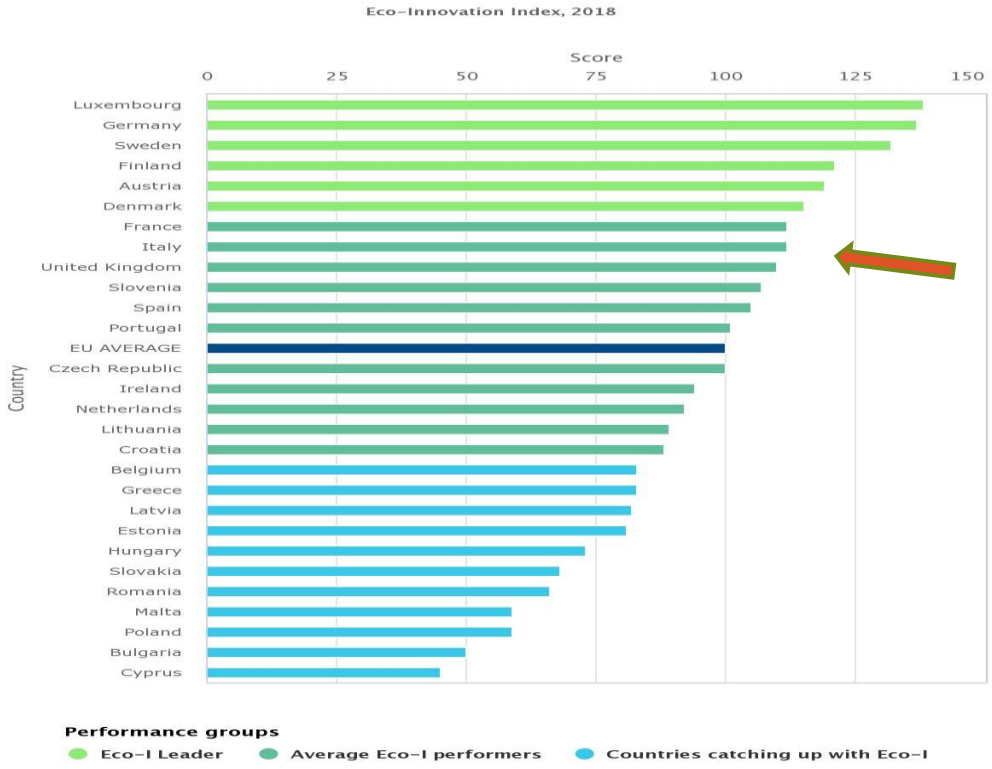
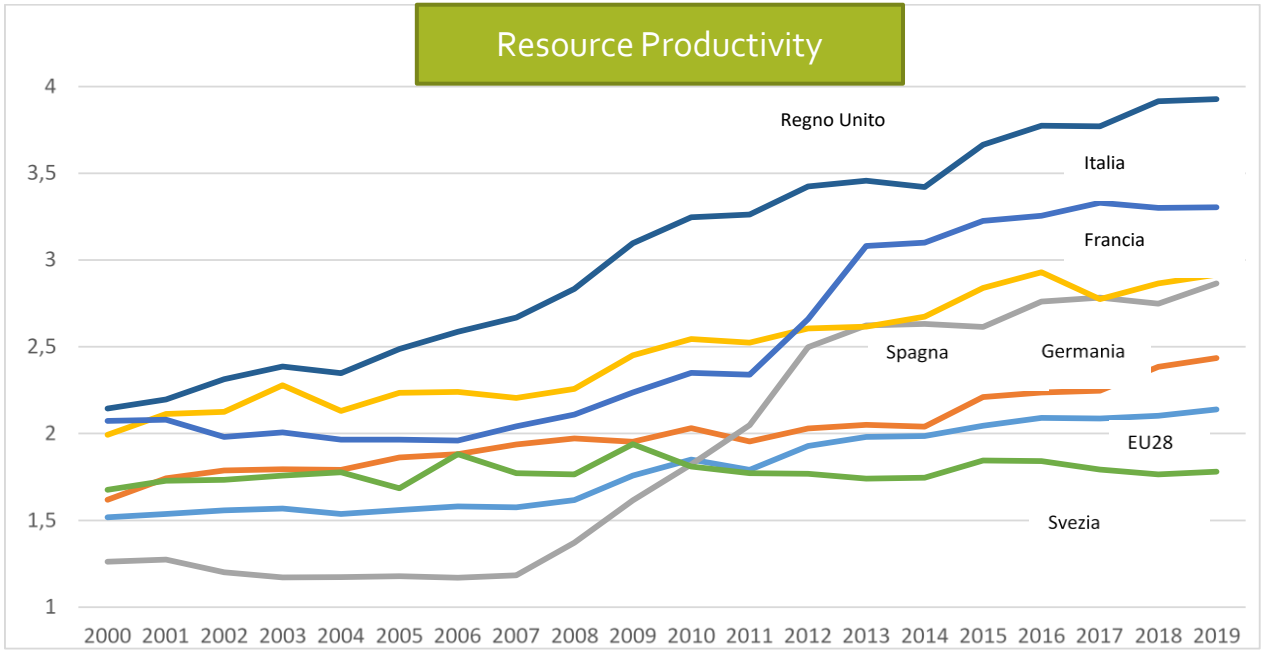
Will McDowall is Lecturer and Researcher, University College London, Bartlett School Environment, Energy & Resources

The 'Maastricht Manual'


Eco-Innovation Index, 2018
Score
0
25
50
75
100
125
150
Country
Luxembourg
Germany
Sweden
Finland
Austria
Denmark
France
Italy
United Kingdom
Slovenia
Spain
Portugal
EU AVERAGE
Czech Republic
Ireland
Netherlands
Lithuania
Croatia
Belgium
Greece
Latvia
Estonia
Hungary
Slovakia
Romania
Malta
Poland
Bulgaria
Cyprus
Performance groups
Eco-I Leader
Average Eco-I performers
Countries catching up with Eco-I



The indicator is defined as the gross domestic product (GDP) divided by domestic material consumption (DMC). DMC measures the total amount of materials directly used by an economy. It is defined as the annual quantity of raw materials extracted from the domestic territory of the local economy, plus all physical imports minus all physical exports. It is important to note that the term 'consumption', as used in DMC, denotes apparent consumption and not final consumption. DMC does not include upstream flows related to imports and exports of raw materials and products originating outside of the local economy.
(https://ec.europa.eu/eurostat/web/europe-2020-indicators/europe-2020-strategy/main-tables, accesso il 16 ottobre 2020)

University of Ferrara

CERCIS

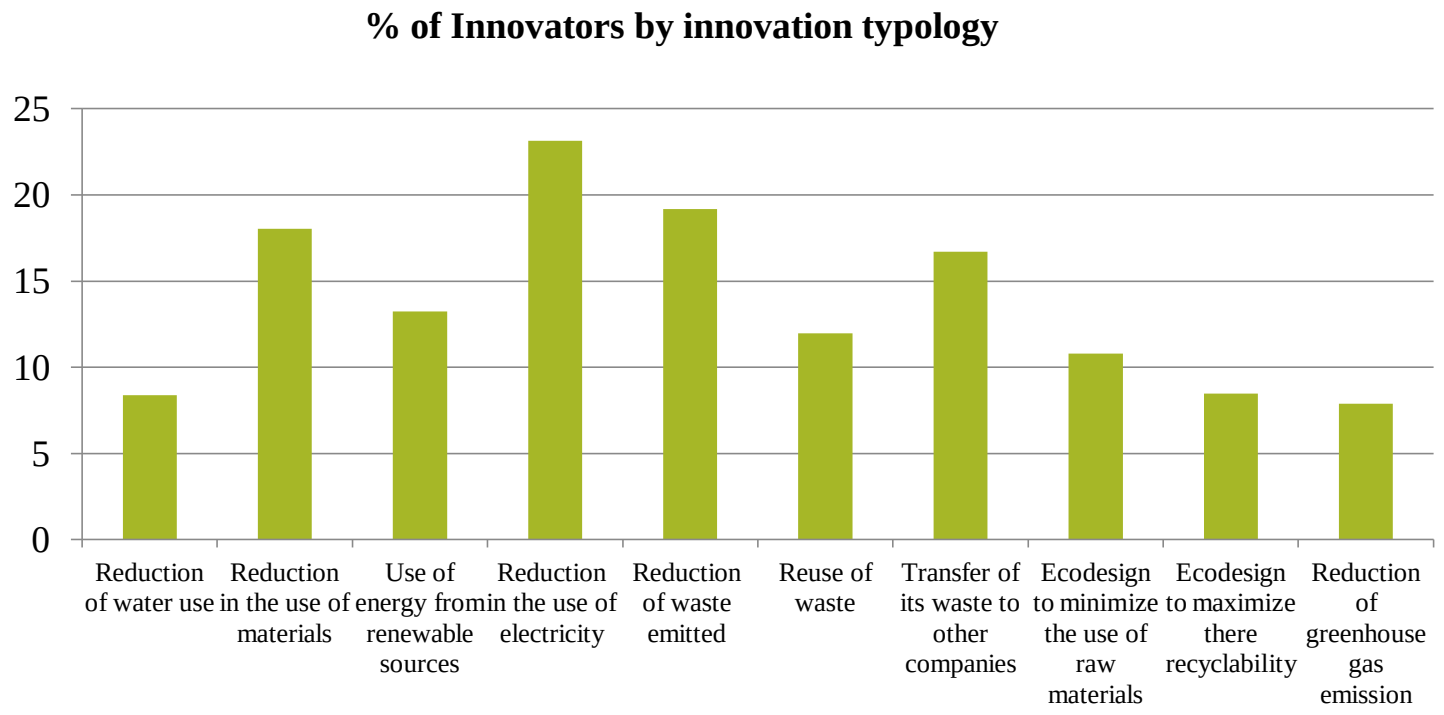
Survey on Italian manufacturing (SMEs) circular and energy innovations
2017 2018 (4600 firms)

Second wave next year on
2019 2020

Manufacturing is heavier.. But more innovative…

EU re-industrialisation strategy (vs?) climate and waste Targets

Environmental + industrial + innovation policy



Source: Survey University of Ferrara- Cercis 2017-2018, own elaboration

Complementarity is necessary

- Policy stringency, acceptability and credibility should further increase, but also complementari

- knowledge complementarity 'culture'
  - Technological innovations
  - Organizational Innovations
  - Human resource management

ELSEVIER Journal of Accounting and Economics 19 (1995) 179–208

JOURNAL OF Accounting & Economics

Complementarities and fit
Strategy, structure, and organizational change in manufacturing

Paul Milgrom[a], John Roberts*[,b]

[a]*Department of Economics, Stanford University, Stanford, CA 94305-6072, USA*
[b]*Graduate School of Business, Stanford University, Stanford, CA 94305-5015, USA*

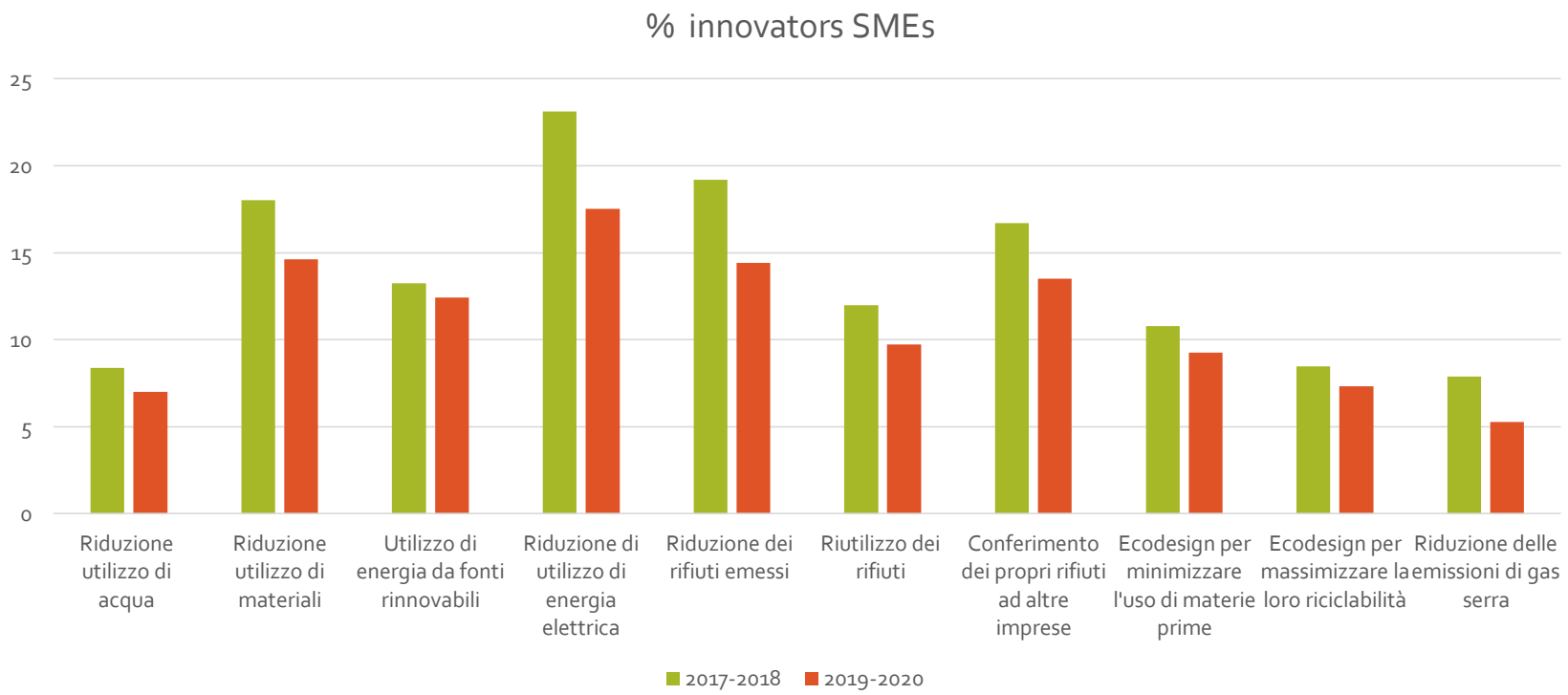
(Received September 1993; final revision received August 1994)

Abstract

The theories of supermodular optimization and games provide a framework for the analysis of systems marked by complementarity. We summarize the principal results of these theories and indicate their usefulness by applying them to study the shift to 'modern manufacturing'. We also use them to analyze the characteristic features of the Lincoln Electric Company's strategy and structure.


enel x

Innovazioni circolari through COVID19



BUSINESS MODELS IN SMES

Working Paper

029.2020

Which Innovations for Circular Business Models? A Product Life-Cycle Approach

Elisa Chioatto, Emy Zecca, Alessio D'Amato

Circular economy and different technological trajectories

- New Plastic economy (closing the loops within the firm and or creating consortia and agreements)
- Bio plastics from renewable sources and inventions

Hybrid


Hybrid


Buonristoro
VENDING GROUP
Un cielo mille volte più blu!
1000
Abbiamo scelto di migliorare sensibilmente il contenuto ecologico dei nostri servizi.
Buonristoro usa solo Hybrid Cup in tutti i distributori automatici di bevande calde.
Il progetto Hybrid Cup, ha permesso di risparmiare in un anno*, oltre 1.000 tonnellate di CO2 non immesse in atmosfera corrispondenti a oltre 400 tonnellate di petrolio risparmiato, a favore di oltre 30.000 alberi.
*Grazie alla sostituzione dei bicchieri tradizionali.
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Tel. 051.713556 - fax 051.713259 - daem@buonristoro.com
info@buonristoro.com - www.buonristoro.com
800-226110

Local example of a small firm, cooperating with other firms (Social capital)

Reduce but also rethink the plastic value chain

Plastics used for 7 years and after that almost fully recovered

Leasing, sharing economy, repair and resuse, closed loops, etc..


BIOLOGICO ORGANIC BIOLOGISK
5 elements
Lentils and bell peppers crumbles
BEAN GRANOLA
LEGUMI, VERDURE E PASTA MADRE CON
LENTICCHIE e PEPERONI
«Non togliamo e non aggiungiamo nulla alle nostre materie prime.»
PLASTIC FREE PACK
FORLI'
CESENA
RIMINI
SQUACQUERONE DI ROMAGNA DOP
OLIO EXTRA VERGINE DI OLIVA COLLINE DI ROMAGNA DOP
ACETO BALSAMICO TRADIZIONALE DI MODENA DOP
AMARENE BRUSCHE DI MODENA IGP
PATATA DI BOLOGNA DOP
AGNELLO DEL CENTRO ITALIA IGP
OLIO EXTRA VERGINE DI OLIVA DI BRISIGHELLA DOP
CILIEGIA DI VIGNOLA IGP
MARRONE DI CASTEL DEL RIO IGP
SCALOGNO DI ROMAGNA IGP
VITELLONE BIANCO DELL'APPENNINO CENTRALE IGP
FORMAGGIO DI FOSSA DI SOGLIANO DOP
CASCIOTTA D'URBINO DOP


100% Frutta
JUICE
Spremitura a freddo
ANANAS FRAGOLA LIMONE
250ml
TROPICO
250ml

Food sector: smoothies and snacks (a bioeconomy circular business model)

- Input: fresh fruits (process of production max 12 degrees)
- **Use of PLA (**polymer made from renewable resources) **bio plastic for bottles** (constraint: currently limits of production), need of higher prices for petroleum based products, lower subsidies to fossils…
- **Use of legumes and vegetables for snacks**
  - Legumes also have a value for rotations in cultivating lands, legumes consumption is actually declining even if health and social value is high..
  - Fiber consumption…

RECENT RESEARCH

INSIGHTS INTO REGIONAL DEVELOPMENT
ISSN 2669-0195 (online) http://jssidoi.org/IRD/
2022 Volume 4 Number 1 (March)
http://doi.org/10.9770/IRD.2022.4.1(4)

ENTREPRENEURSHIP AND SUSTAINABILITY CENTER

Publisher
http://jssidoi.org/esc/home

INNOVATIONS AND THE CIRCULAR ECONOMY: A NATIONAL AND REGIONAL PERSPECTIVE

Davide Antonioli [1,4], Elisa Chioatto [2,4] , Massimiliano Mazzanti [3,4]

[1,2,3] University of Ferrara – Department of Economics and Management (Ferrara, Italy), V. Voltapaletto, 11, 44121, Ferrara, Italy
[4] SEEDS Sustainability, Environmental Economics and Dynamic Studies, Italy

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Received 15 January 2022; accepted 13 March 2022; published 30 March 2022

Abstract. The introduction of innovative practices compatible with the objectives of the circular economy is one of the main enablers for transforming current production patterns towards more sustainable and competitive systems. Understanding whether and to what extent firms are introducing circular-oriented innovations allows monitoring where we stand in the circular transition and thus which further efforts are needed to achieve a resource-efficient economy. This study is based on data from two surveys on Small and Medium Enterprises: the first one reaches 4565 companies located throughout Italy (in the two-year period 207-2018) and the second one focuses on 1603 companies operating in the Emilia-Romagna region (in the three-year period 2017-2019). The analysis is aimed at offering a broad

INSIGHTS INTO REGIONAL DEVELOPMENT
ISSN 2669-0195 (online) http://jssidoi.org/jesi/
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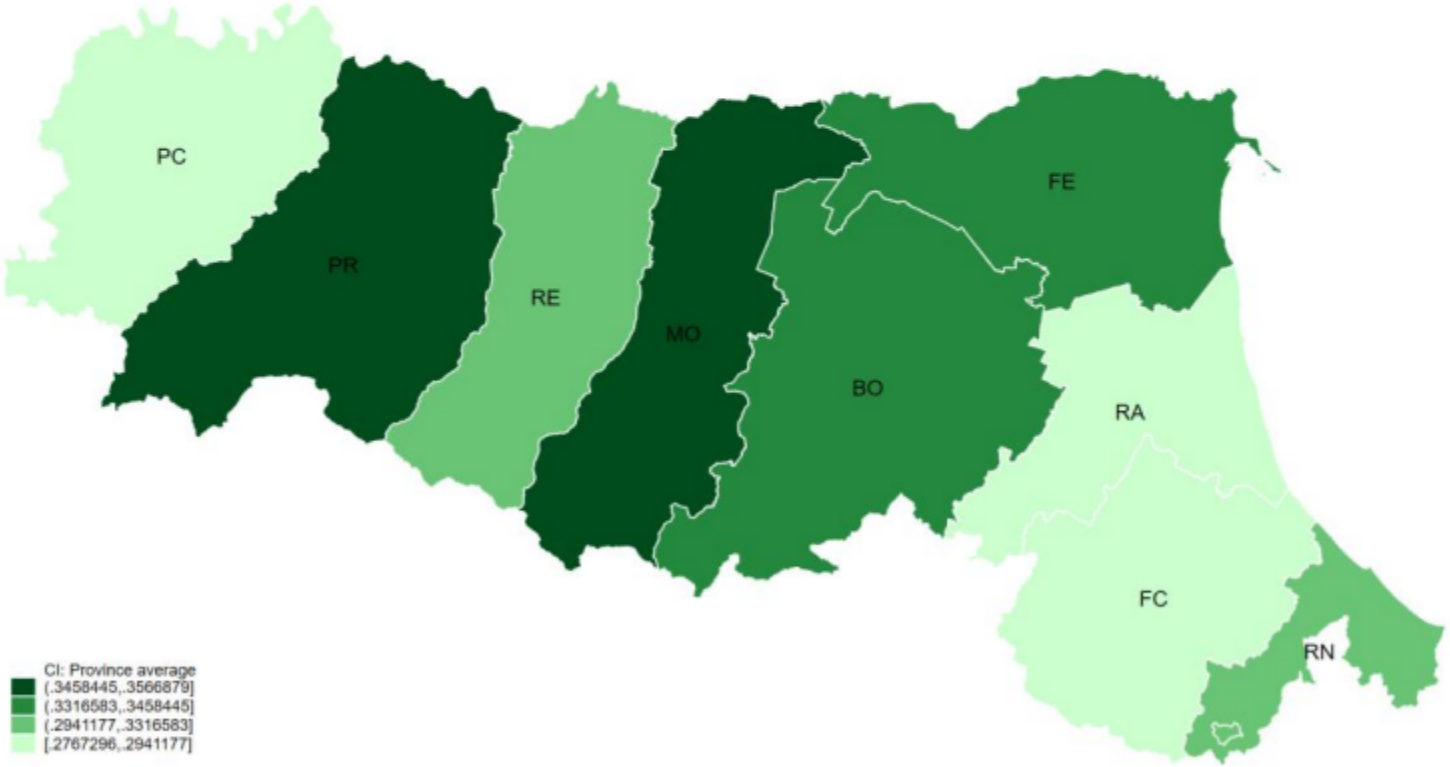
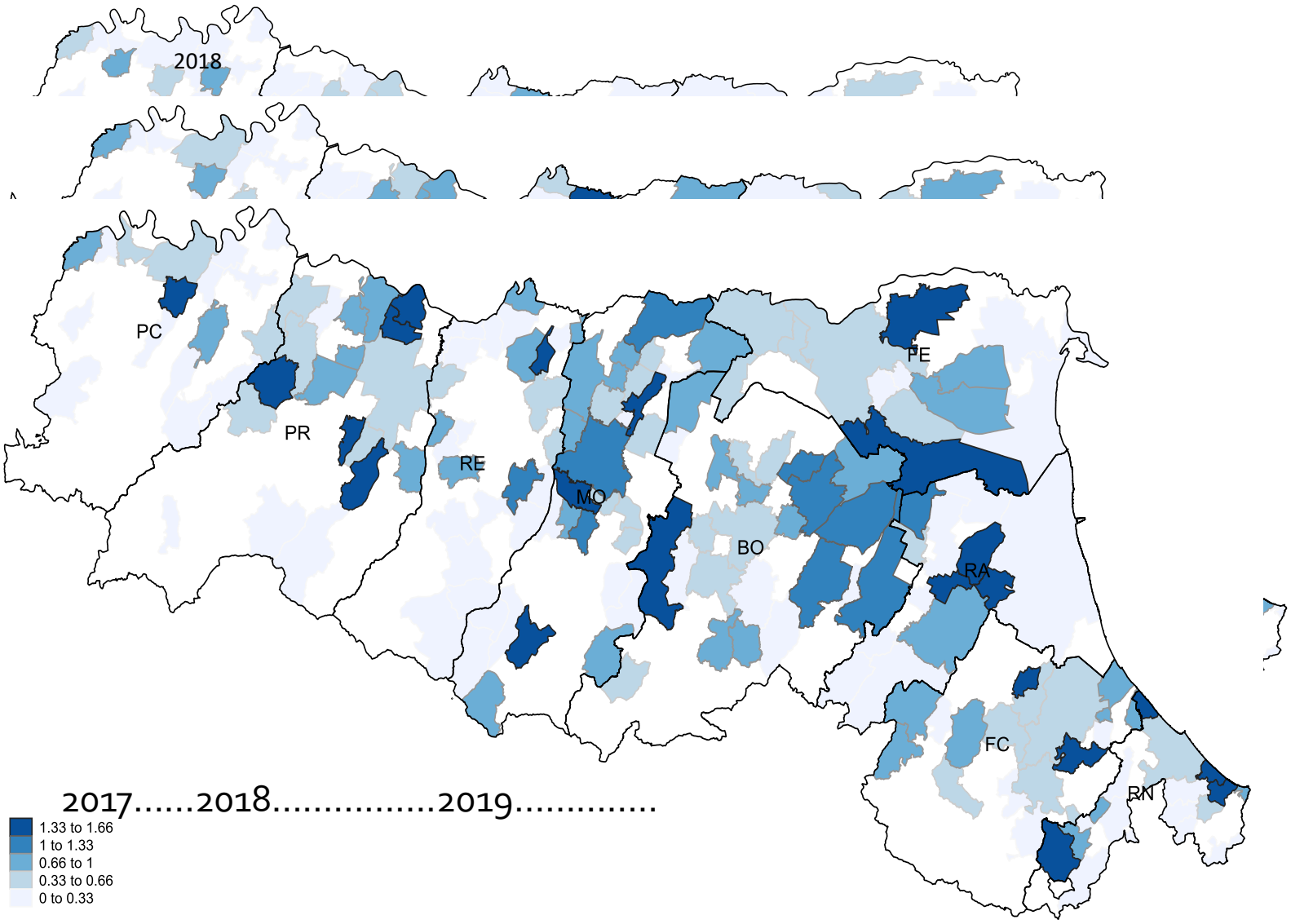


Figure 5. Distribution of circular innovation (CI) in the different provinces of Emilia-Romagna
Source: Regional Survey, Cercis, 2020


2018
PC
PR
RE
MO
BO
PE
RA
FC
RN
2017.....2018.....2019.....
1.33 to 1.66
1 to 1.33
0.66 to 1
0.33 to 0.66
0 to 0.33

February 2022

Working Paper

06.2022

Adoption of Eco and Circular Economy-Innovation in Italy: exploring different firm profiles

Massimiliano Mazzanti, Francesco Nicolli, Stefano Pareglio, Marco Quatrosi

February 2022

Working Paper

07.2022

Innovation, Circular economy practices and organisational settings: empirical evidence from Italy

Davide Antonioli, Claudia Ghisetti, Stefano Pareglio, Marco Quatrosi

RESEARCH ARTICLE

Business Strategy and the Environment

WILEY

Sustainable production: The economic returns of circular economy practices

Davide Antonioli[1,2] | Claudia Ghisetti[2,3] | Massimiliano Mazzanti[1,2] | Francesco Nicolli[2,4]

[1]Department of Economics and Management, University of Ferrara and SEEDS—Centre for Sustainability, Environmental Economics and Dynamics Studies, Ferrara, Italy

[2]Fondazione Eni Enrico Mattei (FEEM), Milan, Italy

[3]Università degli Studi di Milano Bicocca, Milan, Italy

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Email: francesco.nicolli@unife.it

Abstract

Assessing the economic consequences of sustainable production choices aimed at reducing negative environmental externalities is crucial for policy making, in light of the increasing interest and awareness experienced in recent EU policy packages. This assessment is one of the goals of the current work, which tries to provide new empirical evidence on the economic returns of circular economy practices, drawing on previous literature on the underlying determinants of greener production choices, which are stated to differ from standard technological innovations as they are subject to a knowledge and an environmental externality. Using an original dataset on approximately 3000 Italian manufacturing firms, we provide evidence on the relations among innovations related to the circular economy concept and economic outcome in the short run. The evidence shows that in the short run, it is difficult to obtain economic gains from circular economy related innovations when taken in isolation, especially for Small and medium-sized enterprises (SMEs), who may also experience negative returns.