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THE INTERNATIONAL INSTITUTE FOR
INDUSTRIAL ENVIRONMENTAL ECONOMICS

Policy intervention for a competitive green energy economy

IIIEE/LUND UNIVERSITY



Main policy recommendations to realise a competitive green energy economy

- High policy ambitions are needed. This is particularly important when it comes to objectives such as reduced greenhouse gas emission, improved energy efficiency, and an increased share of renewable energy in the energy supply mix.
- Effective and long term green economy strategies are crucial to realise processes of change. Policy instruments need to be coordinated, complement each other, and the mix of policy instruments may need to change over time. Governments need to be flexible and responsive to market reactions and technological developments. Green economy strategies need to strengthen institutional capacity and financial aspects.
- Policy strategies need to be designed to cover more than the traditional scope, for example the implementation aspects of new technologies and the transaction costs faced by market actors.
- Policy experimentation must be closely combined with policy evaluation to improve policy design, and to verify results, withdraw inefficient policies or provide the corrections needed.
- International cooperation is important as major discrepancies exist with regard to institutional capacity, finance and policy frameworks. The prospects of moving towards a green economy are varied and international cooperation can provide essential learning opportunities. ■

” Greater ambition, finance and better policy integration is needed to deliver a powerful transformation.



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PROJECT: Policy intervention for a competitive green energy economy

INSTITUTION: International Institute for Industrial Environmental Economics (IIIEE) at Lund University

FUNDING AGENCY: Swedish Energy Agency (Energimyndigheten)

TIME FRAME: 2011–2015

The project

The term green economy has received increasing policy, research and media attention in the aftermath of the 2008–2009 global financial crisis. The crisis led to numerous high level meetings and policy discussions aimed to reinvigorate the economic system by leading it to a path much less damaging to the environment and society.

It was argued that the financial crisis provided an important and unique opportunity to move towards a green economy, and thus create so-called green jobs, improve resource efficiency, encourage low-carbon energy technologies, reduce greenhouse gas emissions, decrease fossil fuel dependency, increase investments in natural capital, and diminish economic inequalities – among several other goals.

Are we making progress transitioning towards a green energy economy?

This is the underlying research question that the project *Policy intervention for a competitive green energy economy* aims to answer. The project, which is carried out by the IIIIE, has the objective to evaluate the performance of policy instruments

targeting clean energy technologies, such as energy efficiency and renewable energy.

The project will further advance our knowledge on how to succeed on our path towards a green economy and to learn more about the success and failure of various policy strategies and barriers to and drivers of technological change.

To achieve the objective, the project has applied and further deployed a number of methodological tools to analyse the evaluation of policy performance. These methods include: decomposition analysis, econometric assessment, input-and-output analysis, green economy indicators, innovation system analysis, learning curves, policy evaluation criteria (e.g. transaction costs, environmental effectiveness, relevance), review analysis, comparative meta-analysis, etc.

From a geographical point of view, the project has focused the analysis on countries including New Zealand, China, South Korea, Germany, Japan, USA, Chile, the UK and Sweden, as well as regions of the world such as OECD North America, OECD Europe, Latin America, and Africa. ■



Calling for courage

The project Policy intervention for a competitive green energy economy has provided interesting results and exposed numerous examples of learning opportunities and recommendations of how to be more successful in policy intervention towards a green economy. The project also calls for reflection. Why is it that decision-makers fail and do not take the path towards a more sustainable future? My own reflection is that three things can be improved.

Courage – Since the 1970s policy instruments have been introduced to generate a more sustainable future. Research shows that the ambition is often low, the policy instruments are poorly aligned, and the results are rarely evaluated. In addition, the industrial initiatives towards sustainability are few and do not provide mainstream sustainable solutions. Why are decision-makers so reluctant? In the future, we need decision-makers with courage, who have decided to make a difference.

Implementation – We all know about the problems and risks associated with climate change, and there are solutions in the form of, for example, new energy technologies. Less focus has been placed on the implementation of new solutions that

are actually available. Still, we can see that knowledge related to implementation is crucial if we are to make progress. More focus is needed to advance knowledge on implementation.

Financing – Massive financial resources are available around the world but they are going in the wrong direction and are used to support fossil-based energy systems and unsustainable consumption. There is a great need and a potential to align the financial system to policies supporting a competitive green energy economy.



Professor Lena Neij, Director of the IIIIEE





Lena Neij.

Photo: Gunnar Menander

” Less focus has been placed on the implementation of new solutions that are actually available.

LENA NEIJ

Professor Lena Neij is Director of the International Institute for Industrial Environmental Economics at Lund University (Sweden). Her research is focused on the dynamics of the energy system and the analysis of governance and policies for more sustainable development. She holds a UNESCO Chair in Education for Sustainable Development and has served as a Lead Author for the Global Energy Assessment.



Green economy – definition

Green economy is a term increasingly used among economists, policymakers and researchers. What does it mean? IIEE researcher Luis Mundaca explains.

BY SARA BERNSTRUP NILSSON

The term green economy has a variety of conceptual and political definitions that have varied over time. “The term itself, however, is not new and was initially linked to agricultural economics during the so-called green revolution in agriculture that occurred between 1940 and 1970”, says Luis Mundaca, associate professor at IIEE.

When the environmental revolution took place in the mid-to-late 1960s, early work on economic answers to environmental problems supported the use of the term green economics for analysing environmental problems and the management of natural resources from an economic point of view.

“Since then, the understanding of the term green economy has covered a wide spectrum, from larger aspects of sustainability on the one hand, to narrow concerns about the reduction of CO₂ emissions on the other. The term builds upon several schools

of economics, such as welfare economics, natural resource economics, energy economics and environmental economics.”

When the global financial crisis started in 2008, the need for a more sustainable economy – socially and ecologically – returned to the policy agenda, slightly re-framed and re-branded.

“Still, there is no consensus about its definition, but there seems to be agreement on what a green economy should address. And this includes job creation, increasing resource efficiency, reduction of greenhouse gas emissions, investments in natural capital, and improvements in human wellbeing”, says Luis Mundaca.

In the project *Policy intervention for a competitive green energy economy*, the term green economy was defined as an economic system that can bring together economic, environmental, social, and technological aspects through the rapid expansion of low-carbon energy systems. ■





Luis Mundaca.

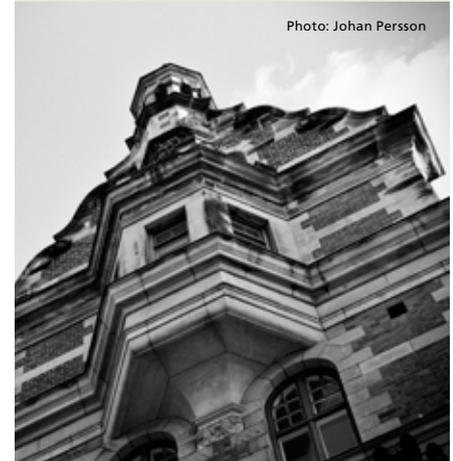
Photo: Sara Bernstrup Nilsson

” Still, there is no consensus about its definition, but there seems to be agreement on what a green economy should address.

LUIS MUNDACA

Luis Mundaca is Associate Professor at the International Institute for Industrial Environmental Economics at Lund University (Sweden). He is an environmental economist who is interested in climate change, energy, resource efficiency and development. He has served as a Lead Author for the 5th IPCC Assessment Report on Climate Change Mitigation (Working Group III) and the Global Energy Assessment.

Photo: Johan Persson

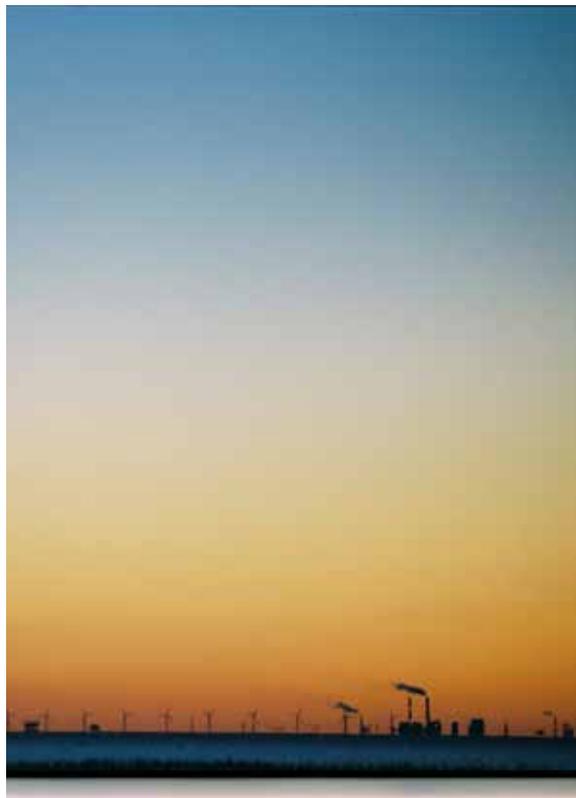


Main findings

General lessons for policy choice and public policy initiatives towards a green economy

- Low-carbon energy technology policies have spread rapidly since the 2000s.
- There is a stronger policy emphasis on the supply side of energy systems compared to the demand side.
- Economic incentives dominate in many countries or regions, highlighting the need for market-based and cost-effective solutions in policymaking.
- Research, development and demonstration are fundamental but not sufficient to achieve technological change.
- Governmental policy initiatives are important, but the private sector also needs to scale up and re-direct investments towards low-carbon energy systems.
- Policy instruments need to be combined and strategically coordinated.
- The cost of implementing renewable energy technologies, such as solar cells, can be a substantial part of the total investment costs.

” Policy instruments ought to be strategically coordinated.





Key impacts of policy instruments analysed

- Gradual or limited improvements in energy intensity and carbon intensity are identified, but these are unable to offset CO₂ emissions resulting from economic growth and increased use of fossil fuels.
- From an macro-economic perspective, short term analyses show that per capita income growth and, to a lesser extent, population growth are the main obstacles to the transition towards a GEE transformation.
- In some countries – such as New Zealand and Chile – policy initiatives fall far short of what is needed to deliver on the promises of a green economy.
- However, well-targeted stimulus packages have had a positive impact on the renewable energy market in some countries, such as Germany, China, Japan and the US.
- Consistent and long-term policies have been instrumental in offering opportunities for learning and significant cost reductions in certain countries and sectors.

LESSONS FROM GERMANY

Since the early 1990s Germany has implemented a wide range of policy programmes, supporting both renewable energy technologies and energy efficiency. In particular, the support for renewable energies has engaged numerous actors and citizens and created arenas for interaction,

knowledge building and information sharing. The long term and relatively consistent design of the policies have also enabled technological developments and reduced costs. As a result, new energy technologies have spread considerably and are today broadly accepted and legitimated by the public.

Key barriers to future progress

- Weak political environments prevent the formulation of a clear, long-term message to the private sector. In fact, uncertain policy frameworks conflict with free-market policy priorities. Progress is also constrained by fossil fuel subsidies, which remain a significant barrier to a green energy economy in some countries.
- Furthermore, many sources of transaction costs affect both the implementation of low-carbon technologies and the effect of policies. Some of them arise directly from existing legislation, governance structures, and policy frameworks specifically designed to support low-carbon energy technologies. Transaction costs for small-scale energy technologies can be up to 30 percent of the investment costs.
- The policy initiatives analysed confronted unavoidable policy trade-offs during policy development (e.g. environmental effectiveness or relevance vs. political feasibility). This seriously affected the potential benefits or expected results of the implemented policies.

” The policy initiatives analysed confronted unavoidable policy trade-offs.





Key drivers for future progress

- Ambitious policy support will be essential to achieve further cost reductions in new emerging energy technologies. Experience in the implementation of new technologies – through for example deployment policy support – will allow additional cost reductions.
- The implementation of emerging energy technologies highlights the importance of local learning and policy support. Business models, in line with national policy strategies, can be important tools to support the deployment of new energy technologies.
- Behavioural-based policy instruments are urgently needed to steer sustainable consumption patterns on the demand side (individuals, households, communities).
- The alignment of the global financial system and low-carbon energy technology investments will be key to realising the transformational potential of a green energy economy. ■

LESSONS FROM NEW ZEALAND

An emissions trading scheme (ETS) was implemented in New Zealand in 2008 as a way to combat climate change and encourage a resilient economy. The ETS aims to limit greenhouse gas emissions and thus provide incentives for afforestation and investments in low-carbon energy technologies.

The scheme allows unlimited access, trading and banking of so-called

Kyoto carbon units (at least until May 2015) in addition to New Zealand's domestic carbon credits units. As a result, New Zealand's market has been flooded by international Kyoto carbon credits since the system was introduced. Carbon prices have fallen and incentives to provide clean energy technologies in the country have failed. In addition, and to the surprise of many, the New Zealand scheme does not have a formal cap on emissions.

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