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The Price of Renewable Energy Policy Risk: An empirical analysis based on choice experiments with international wind and solar energy investors

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The project at hand is undertaken by the Institute for Economy and the Environment (IWOe) of the University of St. Gallen on behalf of the International Energy Agency (IEA). This analysis forms part of a larger ongoing IEA project, the Global Renewable Energy Markets and Policies Program (GREMPP). The GREMPP focuses on gathering and analyzing data on policy and market conditions development that drive the diffusion of renewable energy technologies (RETs). The objective of this research program is to increase understanding on policy conditions under which renewable energy technologies can achieve full competitiveness with conventional technologies.

Findings of GREMPP Phase I and other IEA work suggest that specifically non-economic factors such as administrative hurdles (e.g. planning delays and restrictions, lack of co-ordination between different authorities, long lead times in obtaining authorizations), grid access, electricity market design, and social acceptance constitute significant barriers in scaling up the contribution of renewables to a future sustainable energy mix. This corresponds with the results of other research work. In Switzerland for instance, the Swiss Federal Research Program 'Wind' has identified a lack of acceptance for new wind energy sites as one of the key bottlenecks for technology deployment in this growing sector (Swiss Federal Office of Energy, 2005). Analyzing the situation in Germany, Spain and Greece, Lüthi and Wüstenhagen (2009a) revealed that the level of return fails to explain the level of installed photovoltaic capacities and highlighted the importance of policy risk.

The objective of the project that is conducted by the Institute for Economy and the Environment (IWOe) and embedded in Phase II of the GREMPP program is to empirically measure the relative importance of such non-economic barriers in private and public renewable energy investment decisions. The overarching goal is to generate conclusions on the price of the non-economic barriers from an investor's point of view in order to give specific recommendations for the design of effective policy measures and frameworks in general but especially in the following countries: Brazil, Chile, China, Egypt, India, Kenya, Morocco, Thailand, Tunisia, Vietnam. These countries were chosen because of their high future potential in the international renewables market.

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As each renewable energy source has its own characteristics and as market conditions vary considerably among each technology this study only concentrates on two predefined types of renewable energy technologies that fulfill specific criteria such as the possibility to be installed in all countries in scope or future market potential - wind energy and solar photovoltaics.

More specifically, we aim to answer the following research questions:

- How important are various non-economic barriers in influencing the decision of investors to invest in wind energy/photovoltaics? How do investors trade these barriers off?
- What is the investors' willingness-to-accept a specific non-economic barrier?
- What is the 'price' or 'premium' that investors request in order to take the burden of a certain barrier?
- What are the actual policy frameworks in the countries of scope?
- How does the change of a specific factor influence the investors' likelihood to invest in a given country?

The project at hand is organized in three parts or modules: The first module comprises qualitative expert interviews on the decision process of international wind and solar energy investors (public and private) and on policy designs in the markets in scope. Module 2 includes a stated choice survey in form of an adaptive conjoint analysis (ACA) and module 3 contains the simulation of the investment likelihood in country-specific policy designs.

keywords	renewable energy technology, renewable energy policy, investment decisions, institutional investors, wind energy, photovoltaic, conjoint analysis
type	applied research project
status	completed
start of project	2009
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principal	IEA, International Energy Agency
topics	renewable energy technology, renewable energy policy, investment decisions, institutional investors, wind energy, photovoltaic, conjoint analysis
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