

THE USE OF RENEWABLE ENERGY COOPERATION MECHANISM: EVIDENCE FROM HYDROPOWER PROJECTS IN NORWAY

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Overview

We examine the barriers against realization of planned hydropower projects in Norway under the common market for green certificates in Sweden and Norway. This scheme was launched in 2012 and is the first example of the use of cooperation mechanism in the EU Directive 2009/28/EC on the promotion of the use of energy from renewable sources. The scheme meets many of the requirements of cost-effectiveness; generators are entitled to sell one certificate for each additional MWh of renewable electricity produced for 15 years, and there is no restriction on which country the new capacity is located in or which technology is used. However, Norwegian authorities have set an absolute deadline 31.12.2020 within which the plant should be operating in order to be entitled to sell certificates. Therefore, internal and external factors that delay the process may prevent the project from being realized within the scheme period.

Methods

Based on a survey of 446 planned hydropower projects in Norway, we examine the potential for and barriers against Norwegian hydropower within the joint Swedish-Norwegian market for green certificates. The survey reveals each investor's expectation on whether his or her individual project will be operating within the deadline set by the green certificate scheme.

The survey was sent to all investors who were considering investing in a hydropower plant the summer of 2012. The regulatory authorities and energy associations helped us produce an address list which included all kind of investors and all kind of projects as well as pre-testing the survey. The survey was carried out by a professional marketing firm in close cooperation with us.

In the survey, we ask:

1. Will any barriers prevent your project from being realized within the end of 2020?
2. If yes, which barrier(s) will prevent your project from being realized within the end of 2020?
3. How likely or unlikely is it that your project will be realized within the end of 2020?

We use logistic regression models for binary, multinomial and ordinal outcomes to examine the responses to each of these questions. The explanatory variables are investor, project and process characteristics.

Results

We find that for current market prices 90 % of these projects are profitable according to the traditional investment rules. However, investors in 60 % of these projects expect one or more barriers to prevent their project from being realized within 2020. Based on the responses to the survey, we group the barriers into four broad categories of barriers:

- economic (electricity and certificate prices and investment costs),
- capacity (access to the transmission net, to components and to entrepreneurial services),
- process (external stakeholders/ factors influencing the process from planning to implementation) and
- overall risk.

Investors respond that economic and risk barriers are important. This indicates that although a majority of the projects are profitable at current market prices, uncertainty about the future development in these prices makes

investor hesitate. Unexperienced investors or investors in project with high investment costs are (all else equal) more concerned with economic barriers as compared with capacity barriers. And, for project at the later stages of the process, investors are significantly more concerned with overall risk and economic barriers as compared with capacity barriers.

Also capacity barriers are expected to prevent projects from being realized within 2020. This concern is especially important for experienced investors, for projects with low investment costs and for projects at an early stage in the process.

Investors are concerned that the process from planning to implementation of the project may prevent their project from being realized within 2020. Barriers related to process are significantly more important as compared with economic barriers for power plants with a high installed capacity or high expected production volume.

We find that unexperienced and experienced investors have significantly different expectations. All else equal, unexperienced investors are more optimistic with respect to the possibility of realizing a project within 2020. Still, characteristics with the projects controlled by unexperienced investors make these investors less enthusiastic with respect to the future.

Conclusions

We end the paper by discussing how future cooperation mechanism should be designed to reduce non-economic barriers and ensure cost effectiveness.