

Summary of IEA RD&D Wind – 47th Topical Expert Meeting on
**METHODOLOGIES FOR ESTIMATION OF COST OF WIND ENERGY
AND THE METHODOLOGIES TO ESTIMATE THE IMPACT OF RESEARCH ON THE COST**

November 2005, Paris, IEA Headquarters
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Background

The cost of wind-generated electricity may be estimated in a variety of ways. Additionally, there are a number of different reasons for the development of cost data, for example:

- Showing technical advancements
- Comparing different technology options
- Determining research focus areas

A macro economic approach requires methods that are different from those needed for a private financial analyst and would possibly generate cost of energy figures not suitable for comparison.

Also, including the effects of noise, visual impact or environmental influence would yield results not comparable with other estimations that do not include such external factors.

Furthermore, even analyses intended for the same purpose may have different ways of estimating the cost of energy, and thus care should be taken whenever comparing energy cost figures to ensure that the same analysis methods have been used.

Objective

The objective of the 47th Topical Expert Meeting was to review and evaluate the status of research, experiences and activities concerning cost modelling in relation to wind energy development.

Furthermore, the meeting aims were to review and discuss the different methodologies used to evaluate and quantify the effect of research on the cost of (wind) electricity.

Questions relevant to the meeting:

- Is it useful to update the Recommended Practice for cost modelling?
- Should common elements, guiding principles and recommendations be formulated for models to quantify the effect of research on cost reductions?
- Is it useful to develop a standard methodology for evaluating RD&D proposals?

Participants/Presentations

A total of 11 participants attended this meeting with representatives from Denmark, Germany, Ireland, Italy, the Netherlands, the UK, the US and Sweden. The participants represented National Research Centres, Investor & Developer Organisations, Consultancy companies and Utilities.

A total of 13 presentations were given on the following topics:

1. Methodologies for Estimating the Cost of Wind Energy – An Irish Perspective
2. U.S. DOE WHTP Wind Energy Cost of Energy Calculation
3. Minimizing Costs in the Electricity Generation Mix With High Shares of Wind Energy at the Long-scale
4. Basic Cost and Profitability Calculation Model for Wind Power Projects
5. Calculating the Financial Gap of Offshore Wind
6. The Cost of Offshore Wind Energy
7. Important Considerations for Developing a Support Scheme
8. How Does R&D Reduce the Cost of Wind Energy?
9. Thoughts on Where to Look for Improved Financials
10. Defining Technology Goals and Tracking Wind R&D Progress
11. Wind Farm O&M Costs
12. Methodologies for Estimation of Cost of Wind Energy
13. Social Cost-Benefit Analysis of 6000 MW Offshore Wind at the North Sea

Discussion

A discussion was held on two topics:

- Should IEA update the recommended practice on Estimation of Cost?
- How should the cost benefit of R&D proposals/projects be estimated?

Should IEA update their recommended practice on Estimation of Cost?

Cost analyses intended for the same purpose may have different ways of estimating the cost of energy. Including or excluding external factors would yield different results, as would parameter variations of life length, discount rate, including/excluding the cost of the export cable, etc.

With this background, the IEA Recommended Practice entitled “Estimation of Cost of Energy from Wind Energy Systems” was put together, the second edition being published in 1994.

There still exists great difficulty in answering the question of what the cost of wind power really is. Going offshore has added a new dimension of uncertainty in how to answer this question. By updating the recommended practice, it is certain that the meeting results are distributed to all IEA member countries and do not stay within the walls of this meeting.

However, the vast amount of effort required for an update should be taken into consideration, and the Recommended Practice should not be updated unless enough benefits from doing so are seen.

The most significant benefits from updating the Recommended Practice are found to be:

- Using an update as a way of sharing the results of this expert meeting with others
- Being able to determine what the cost of wind power really is

The issue of modelling the cost of wind energy can be split into two separate issues:

- Modelling of the COE in general
- Wind power specific issues

An idea would be to raise the modelling of COE to a higher level than the Wind RD&D working group, allowing input from other energy sources as well. This would enable the IEA RD&D Wind group to focus on the wind specific issues, and the result of this workshop and

the aftermath would not be an update of the Recommended Practice but an entirely new document.

As few significant benefits are found as a consequence of updating the recommended practice, the recommendations to the Executive Committee are:

- Not to update the recommended practice on cost modelling
 - Instead allow the writing of a new document about the cost of wind power in a broader sense
 - Input on what such a paper would include is to be gathered afterwards by circulating a document among the attendants of this meeting
 - Instead prioritise a new annex for evaluating the cost benefits from RD&D programs/projects

Cost Benefits of R&D proposals

Wind power generation has come to a “historical” point where investment cost per MW, and hence the cost per generated kWh, is increasing for new wind turbines. Some reasons for this increase are believed to be:

- The increasing price of raw material, especially for steel
- Turbine manufacturers’ focus on meeting order stocks rather than on cost performance (lack of competition)

Current signals on the US market indicate possibilities of future onshore investment levels around 1800 \$/kW.

National support systems with a fixed high tariff or increasing quotas for RES are driving higher cost for the end consumer since the quotas are currently not being met. The high revenue levels for producers of renewable energy are believed not to encourage focus on cost performance for the manufacturers of wind turbines, and as a consequence, the production costs are unlikely to drop in the near future.

Since cost reductions in the immediate to near future may be discouraged by the current support systems in combination with the lack of competition among turbine manufacturers, there is an increased need to focus on:

- RD&D programs for the cost reduction possibilities of components other than turbines
 - Foundations, grid connection, export cable, etc.
 - These cost components make up half the investment cost and are potentially a source of future cost reduction.
- Evaluating the cost benefits of RD&D programs
 - Despite the imminent need for cost reduction, not all countries seem to take this parameter into consideration when evaluating RD&D proposals.
 - A well developed methodology to evaluate RD&D proposals on their ability to contribute to overall wind power cost reduction should yield much more effective RD&D in terms of reducing cost.
 - Inviting turbine manufacturers to take part in the working group may yield insights on where the greatest potential can be found.

As the value of evaluating RD&D proposals is significant, the question may be better dealt with within the framework of a new annex. An annex is a good way of investigating the issue further, due to its simplicity, speed and its way of operating around a specific theme. The annex members will have to find funding themselves - joining the annex is a commitment to supporting and financing the Operating Agent of the Annex.

A list of bullet points will be circulated and a working group will type up a proposal for an annex. The working group will consist of:

- Ian Baring-Gould, National Wind Technology Center, U.S.A.
- Tomas Björnsson, SwedPower AB, Sweden
- Niels Erik Clausen, RISØ National Laboratory Wind Energy Department, Denmark
- Hage deVries, ECN Policy Studies, the Netherlands

The result of the working group will be a 3 – 5 page proposal submitted to the Executive Committee. The future of the Wind RD&D cost benefit annex will be discussed at the next Executive Committee meeting.

- The process may be accelerated if the proposal is sent out ahead of the Executive Committee meeting in March.
 - All present at this workshop will get a circulating document and will be able to make comments. Everyone is encouraged to contact their country representative to discuss the matter beforehand.
 - Mid-February – document ready

The recommendations for the Executive Committee are to:

- Take into consideration the starting of an annex with focus on how to evaluate the cost benefits of RD&D programs.
- Include representatives from WTG manufacturers and industry organisations, such as EWEA, in the working group.

Continuation

A paper will be circulated among the group participants in order to ensure that everyone gets a chance to comment on the recommendations for the Executive Committee and the content of the proposal.



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