**IEA Implementing Agreement for Co-operation in the Research and Development of Wind Turbine System**

# Work Programme

# New Task Proposal

# Development and Deployment of Small Wind Turbine Quality Labelling

## April 7, 2008


## CIEMAT
## INETI

# Task 27 Proposal:
# Development and Deployment of Small Wind Turbine Quality Labelling

6th draft 2008-03-07



## Preamble

It is this task objective to develop a system of consumer's quality labelling for small wind turbines having as final outcome the production and edition of an international sector guide in the form of the IEA Recommended Practices, to be tentatively named in this case Recommended Practises for Quality Labelling of Small Wind Turbines. This task will be time limited to three years and during this time the scientific and technical work will be partly funded by the participating member countries through the IEA Programme for Research, Development and Deployment of Wind Energy Conversion Systems.
The Operating Agent (or agents) of this Task will set-up and update a website that will contain all the information specified in the Recommended Practice for Quality Labelling of Small Wind Turbines. The website will be primarily for use of the participants of the Task 27, but having in mind the reduced amount of reliable information for this sector of the wind industry, an effort will be made on the disclosure of public information whenever it is already considered mature by the majority of the participants.

Thus, having in mind the strong actual development of this sector, it is also the objective of this Taks to provide publicly available valuable information for anyone interested in buying a small wind turbine, such as recommended methodologies and independent test reports on:

- SWT Power performance curves
- Noise
- Endurance

Reliable 3rd party testers already exist (and more are expected to emerge over time), and the Operating Agent of this Task may direct interested wind turbine manufacturers seeking to label their products to these groups. It should be noted that the actual testing of the wind turbines is out of the scope of this Task.

A primary goal is to build up a critical mass of involvement, as regards wind turbine manufacturers and 3rd party testers such as national laboratories, universities, and certification entities, but also to provide private companies with a commonly accepted methodology that enables them to enter or remain in this economic sector.

## Description of technical sector

The small scale wind power sector is defined as relating to wind turbines with a swept area not exceeding 200 $m^2$ according to the only standard developed to this sector, IEC 61400-2 2nd Ed:2006 [***]

Small wind turbines (SWTs) have played an important role for many years and decades in off-grid projects, where they can provide a relatively economical power supply in windy locations when compared with alternatives like diesel generators or photovoltaic units that have high fuel and/or investment costs. Wind pumping systems they are used in a similar way for more than a century to supply water. In the past, all wind pumps were mechanical but nowadays wind-electric pumping systems are also available, using electricity-producing wind turbines to drive an electric pump, often in systems without batteries. An emergent application is the use of small wind turbines in urban and inhabited areas as distributed generation systems (DGS) connected to the main power grid. The reason is often that small wind turbines can be connected on the consumer's side of their electricity meter, thus reducing the amount of expensive electricity purchased or taking advantage of the new tariffs already applied in same European countries (e.g. Germany, Portugal and U.K.) for domestic micro-generation. Small wind turbines can also be part of grid-backup systems in the future, safeguarding electrical power supply during power outages on the grid, being that one of the goals of the European Platform Smartgrids.

A clear view of this sector is given by the American writer Paul Gipe on his web-page www.wind-works.org, where he describes the small wind turbine industry this way: "*There are more than 50 different manufacturers of small wind turbines worldwide, not including those in China. These manufacturers build more than 125 different models of small wind turbines. Most if not all of these products have had repeated problems with mechanical and electrical reliability in actual use. Nearly all of these manufacturers are small with limited financial resources. The industry is very unstable and product development is often simply a matter of trying to correct defects that have appeared after the product was introduced.*" Although the previous text was written in 1997 and some improvements have taken place since then, much of it is still true.

Internationally accepted IEC standards relevant for the small wind turbine industry already exist (IEC 61400-2: 2nd Ed:2006), although its application is still scarce and its scope only the design safety parameters of SWTs. The intention of this task is therefore to increase the use of common methodologies for testing small wind turbines that in the near future may provide feedback and know-how to develop international standards in the area of quality and performance of these equipments. The suggested "Recommended Practice" will intend to provide systematic testing procedures of SWTs and a condensed way to display the results of tests carried out according to the methodologies to be developed within this IEA Wind Task

## Objectives

The primary goal of this new Task is to give incentives to this industrial sector to improve the technical reliability of small wind turbines and therefore their performance. By enabling the sector to use common methodologies of testing the equipments and to display the results of those tests in a form known by the majority of the potential domestic consumers, this Task is expected to have a large impact on raising the small scale wind power sector to a higher maturity level as well as give a decisive contribution for the positive differentiation of the good SWT's manufacturers that these days battle to survive among outdated technologies also available in the market. But mostly, the outcome of this Task will be of large benefit for potential buyers, the installers and the official energy entities that are giving permits to connect these equipments to the electric grid..

To accomplish this, partial goals are:

- Build up a critical mass of involvement in the development of methodologies for testing and presenting the results as well as labelling classification, by including government agencies, wind turbine manufacturers, and third party testers (such as primarily universities, national laboratories and institutes, and companies with large experience in the test of wind power devices). This critical mass should provide the necessary basis for the wide use in the small scale wind power sector of the "IEA Recommended Practises" that are to be developed..
- Test the labelling and testing methods in practice on a number of small wind turbines, to provide a feedback to the continued work with updating of methodologies in this area.
- Strongly increase consumer and official entities awareness.

An important reason for the entire wind energy sector to support the labelling initiative, is to reduce the risk of accidents with small wind turbines as well as minimize deceptive investments in less than optimum equipments.

## Tasks in broad overview break out as follows

Hold task meetings with participants in task and an initial "summit" with all the interested parties.

***A) Definition of the state of art regarding SWT's testing and reporting:***

i. Identification of relevant existing testing standards, procedures and methodologies.

ii. Identification of potential 3rd party testers of SWTs.
iii. Identification of the existing (and relevant) SWT's manufacturers.
iv. Involvement of SWT's manufacturers and 3rd party testers in the Task 27 activities.

***B) Coordination between the Operating Agent(s) and other participants in task regarding the use of "IEA Recommended Practises".***

i. Gathering and review of existing testing procedures.
ii. Local promotion and interpretation of the testing methodologies and procedures for the presentation of results.
iii. Definition of classes for quality labelling and their weighted input parameters.

***C) Contribution for the development of SWT's quality labelling***

Involvement in the development of IEC standards, to provide input and know-how from the practical experience of recommended practises for quality testing and labelling.

Assessment of the necessity for the settlement of an international association for permanent hosting/funding of the quality labelling secretariat, until IEC standards are available in this area.

***D) Increase of public awareness for SWT quality and its labelling.***

Publication of the IEA SWT Recommended Practises for quality labelling as a pre-normative document.

Creation, promotion and updating of the Task 27 – SWT Quality Labelling Website.

Participation in (at least) two international selected wind energy events, as conferences and exhibitions, in order to promote quality labelling on a global scale.

## Results expected

A base document in a pre-normative form to guide and aid manufacturers, independent organizations acting as SWT's testers, public entities and investors in the development and selection and licensing of wind turbines.

A gradually expanding list of manufacturers that have submitted their equipments to 3rd party tests according to the IEA SWT RP.

A gradually expanding list of 3rd party testers according to IEA SWT RP.
Within 3 years convey the work to IEC/CEI to initiate the procedures to develop an international standard and/or establishing a more permanent hosting/funding of the

secretariat that is perhaps self funding through the contributions of the manufacturers seeking future labelling.

To contribute to a higher consumer awareness regarding small wind turbines, resulting in the use of better equipment.
Improve the range and awareness of IEC standards in this area.

### Time schedule and Chronogram

Start-up of task in July 2008.
Contacts and summit held within 4 months.
Website to go live within 6 months of startup.

| | 1Y | | | | 2Y | | | | 3Y | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Task | 1Q | 2Q | 3Q | 4Q | 1Q | 2Q | 3Q | 4Q | 1Q | 2Q | 3Q | 4Q |
| A | | | | | | | | | | | | |
| B | | | | | | | | | | | | |
| C | | | | | | | | | | | | |
| D | | | | | | | | | | | | |

### Specific obligations and responsibilities of participants

The participants shall

- Contribute with their experience and know-how for the formulation of the RP
- Contribute for the definition and classification of the quality labels.
- Participate in the task meetings.

### Specific obligations and responsibilities of the operating agent

The operating agent shall

- Host the secretariat of the Task.
- Carry out the work according to this proposal and decisions made on the task meetings.

### Funding

The Task will be run in a cost-shared basis, where funding for the Operating Agent(s) activities are to be provided by the countries participating in this Annex to the IEA Wind Implementing Agreement.
This would need to cover one full time position and one part time position at the secretariat, as well as modest software development and licensing costs. It will also cover travelling costs for the Operating Agent(s) staff and their participation in two major wind energy event per year.

Each specific participant shall bear its own costs for carrying out the scientific work, including reporting and travel expenses

The total costs of the Operating Agent for coordination, management and reporting will be 98,000 Euros in total for three years and may not exceed such level except with the unanimous agreement of the Participants acting in the ExCo.
The costs of the Operating Agent have been estimated assuming the next activity:

1) 4 man/month are required for task administration, finances meetings and workshops organisation.
2) 1,5 man/month is necessary to develop the website and maintenance
3) 1 man/month per year is needed for reporting (state of art of SWT, standards applied, recommendations, label definition and final report).
4) Travel cost assume 2 trips to ExCo meetings per year and 2 to 4 additional trips to attend tasks meetings

Operating's Agent's Budget

| | 3 years | Per year |
|---|---|---|
| | [Euro] | [Euro/year] |
| Meetings, Administration, Finances, incl workshops | 36,000 | 12,000 |
| Website | 12,000 | 4,000 |
| Reports (State of art, guidelines, recommendations.label definition.) | 26,000 | 8,666 |
| Reporting | 12,000 | 4,000 |
| Travel costs | 12,000 | 4,000 |
| TOTAL | 98,000 | 34,000 |

## Proposed Operating Agent

The following organization has shown a preliminary interest to be the operating agent of the task and host the secretariat:

Centro de Investigaciones Energéticas, Mediambientales y Tecnológicas (CIEMAT)
Avenida Complutense 22
28040 Madrid
SPAIN
Contact person: Mr Ignacio Cruz
Email: ignacio.cruz@ciemat.es
Phone: +34 91 3466254

CIEMAT has a qualified staff and long experience of wind energy, where they provide courses in the subject and host a windpower information centre.

## Information and intellectual property rights

The independent body testing a wind turbine is responsible for protecting the intellectual property of information submitted by the wind turbine manufacturer in question.

## Potential participants in task

The following organizations have shown a preliminary interest to participate in the task:

Japan Electrical Manufactures' Association (JEMA)
17-4, Ichibancho, Chiyoda-ku
Tokyo 102-0082
Japan
Contact person: Mr. Susumu Ogawa
E-mail: susumu_ogawa@jema-net.or.jp
Phone: +81 3 3556 5888

Institut für Solare Energieversorgungstechnik (ISET)
Königstor 59
D-34119 Kassel
Germany
Contact person: Mr. Paul Kühn
E-mail: pkuehn@iset.uni-kassel.de
Phone: +49 561 7294 351

Association of Irish Energy Agencies
c/o Galway City Hall
College Road
Galway
Ireland
Contact person: Mr. Peter Keavney
E-mail: pkeavney@galwaycity.ie
Phone: +353 91 566954.

Italy
Switzerland
US?
Canada?
UK?
Netherlands

etc…

More countries are of course welcome to join the task.