

Project Kick-off Meeting of ASEAN Wind 2005
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**wind energy status and developments
in Vietnam**

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Summary

I. Summary of Rural Electrification in Vietnam

II. Potential of Wind Energy

III. Policy on Renewable Energy

IV. Current status of Wind Energy Development

V. Future Plan for the wind energy Development

VI. The major barriers of renewable energy development

I. Summary of Rural Electrification in Vietnam:

At present all districts of Vietnam have been electrified with **94.33%** of communes and **87.39%** of households are reached by power network.

The aim of Rural electrification Master Plan up to the year 2010, **97%** of communes and **95%** of households will be supplied with electricity.

Total installed capacity of power plants at the end of 2004: 10,182 MW

Power Production of 2004 is 46,24 million kWh

II. Potential of Wind Energy.

- In general, Vietnam has average wind energy potential in comparison with countries in the world and in the region.
- In some inland areas with land wind speed of 5-6 m/s such as Tay Trang (Lai Chau province), Hoang Lien Son mountainous area the wind turbine-generators with various capacities can be applied.
- With above 3000km of coastal line of the country area, wind - power potential is good enough.
- Using data taken from meteorological stations is limited because their sites area not suitable for wind power plants and their gauges are not regularly calibrated. One study carried out by Institute of Energy on 9 islands indicated that average wind speeds are in range of 4.5 to 8.0 m/s.

Table 3. Average wind speeds in some localities

Unit (m/s)

Location	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year
Mong cai	5.7	6.3	6.3	6.1	6.0	5.7	5.9	5.5	5.8	5.9	5.7	5.5	5.7
Lao Cai	5.4	6.7	5.9	5.1	3.8	3.9	3.3	2.8	2.9	3.3	3.1	4.5	4.2
Ly Son	6.5	6.4	5.3	5.5	5.4	4.4	4.1	4.8	6.8	6.8	6.9	7.0	5.8
Co To	4.5	4.3	3.8	3.2	3.5	3.5	4.7	3.7	4.3	4.9	5.0	4.8	4.3
Van Ly	5.7	5.7	5.5	5.8	6.2	6.1	6.4	5.3	5.0	5.7	6.6	5.6	5.6
Bach Long Vi	8.0	7.7	5.5	5.9	6.5	6.8	7.7	5.9	6.6	7.7	8.2	7.8	7.1
Hon Dau	4.8	3.6	4.4	4.7	5.6	5.7	6.0	4.7	4.6	5.0	4.9	4.7	5.0
Hon Ngu	4.0	4.9	4.2	4.2	4.1	4.3	4.2	4.5	4.0	4.6	4.4	4.3	4.3
Khe Sanh	3.4	3.5	3.2	2.6	2.7	3.1	3.7	3.2	1.8	2.6	3.6	3.4	3.0
Hon Tre	5.5	5.4	4.0	4.6	4.3	3.8	4.0	3.9	4.0	4.7	4.8	5.1	4.5
Truong Sa	8.3	6.7	5.3	3.7	3.4	5.7	5.8	7.4	5.4	4.9	6.1	8.3	5.9
Playcu	3.1	3.2	2.8	2.2	2.1	3.1	2.9	3.5	1.9	2.1	3.2	3.4	2.8
Ban Me Thuat	5.6	5.6	4.4	3.2	2.1	1.9	1.7	1.8	1.5	2.5	3.9	5.4	3.3
Phu Quy	8.6	6.0	4.5	5.3	5.1	6.7	7.2	8.9	5.3	6.3	6.4	8.8	6.8
Vung Tau	3.2	4.6	4.7	3.8	2.7	3.2	2.8	2.9	2.3	2.0	2.4	2.1	3.1
TP HCM	2.3	3.1	3.0	3.3	2.5	2.7	2.9	3.8	2.7	2.2	2.2	2.0	2.8
Con co	4.4	4.0	4.3	4.2	4.5	4.4	5.6	5.9	4.4	4.6	4.2	4.4	4.4

➤ Using wind energy for generation of electricity at large scale connected to the national or local power grids is popular in the world. Cost of wind power is competitive to the conventional electricity. In Vietnam, there are many sites along the coastal line and islands have good wind conditions suitable for construction of large power wind farms, which can be connected to the national power grids. Some international agencies have studied wind power projects in Vietnam. It is anticipated that a number of large wind power projects will be developed in the near future.

III. Policy on Renewable Energy

Renewable energy development ought to be derived from objectives of economics, society, environment and intellection for each ecological agriculture and forestry region.

The government may give financial support for renewable projects based on the average income of household in rural and mountainous areas.

- Exempt 100% tax for import of renewable energy technologies and equipment.

- Focus on researching applications of renewable energy technology to regions, which are unable to connect to the national power network due to the difficult terrain or costly investment.

Encourage using hybrid system on solar energy and wind energy or wind power generation and diesel generation in remote areas and islands.

Government will support the budget for researching, investigating, planning, manufacturing equipment, training workers for small power projects of renewable energy sources

iv. Current status of Wind Energy Development in Vietnam

By the end of the 80's and the beginning of the 90's, stand alone wind turbines for power generation with low capacity of 150-500W were disseminated intensively. IE is entrusted by Ministry of Electricity (now MOI) to review the implementation of wind turbines for power generation with the purpose of installing them on islands, remote from grid connected areas as part of the state electrification.

To meet the electricity demand of remote households in areas with no grid, types of wind turbines with low capacity of 150W named IE-1700 have been developed and manufactured by IE. This model is rather complete in comparison with pre-models, hereby, the model is very suitable for households.

iv. Current status of Wind Energy Development in Vietnam

Each wind turbine could be used for lighting from 3-4 fluorescent lamps with capacity of 15W for each lamp, using radio or TV (black and white). Until now, there have been installed 30 wind turbines of the type IE-1700. They were installed and bring good effect in the social-economy sector. Lately,

Technical University of Hanoi have disseminated some models of wind turbines for households with the following capacity: 25 wind turbines with a capacity of 150 for each; 5 wind turbines have a capacity of 500W.

About 70% of the installed wind turbines is still operating. Institute of Mechanical Design has undertaken research and manufacturing of power generating wind turbines with capacities from 0,5 to 5 kW for many years. A lot of types were installed for test, but the most of it was not successful due to high costs and easy damage by storms.

Iv. Current status of Wind Energy Development in Vietnam

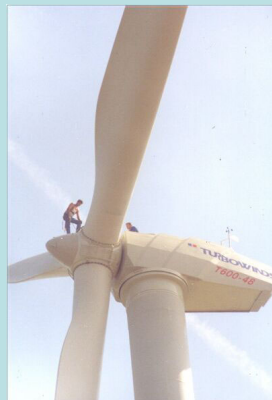
In the southern region, Research Centre for Thermal Equipment and Renewable Energy affiliated to Technical University of HCM City is high ranked institution in the field of applications of wind turbines with small capacity. This institution has the largest quantity of wind turbines in the whole country. Three villages were supplied with wind turbines provided by the university. Two villages in the province of Khanh Hoa, each village have about 50 wind turbines. One village Can Gio were provided with 50 wind turbines. The total quantity of installed wind turbines by the university is about 900. Most of them have a capacity of 200-300W. At the moment 80% of them are still operating.

Iv. Current status of Wind Energy Development in Vietnam

A Hybrid system on Solar PV Generation and Wind power Generation having capacity of 15kW (10 kW from PV and 5 kW form Wind Power) supplies electricity for one minorities' village (40 households). The project has been granted by TOHOKU Company - Japan and implemented by IoE.

Wind power project in Bach Long Vi Island:

The Capacity of wind generator is 800 kW. The capital of the project is financed by VN Government. Made Technology S.A (from Spain) is a supplier for wind turbine. IoE is technical consulting organization for the Project. The project has been implemented completely at Nov. 2004. It is running well now.



V. Future Plan for the wind energy Development.

The wind project with installation capacity of 2 MW in Ly son Island has been made completely feasibility study (FS) by Institute of Energy. The Power Sector of Vietnam is investor

The wind Farm Project with installation capacity of 15MW is making completely FS by PHUONG MAI Company in Binh Dinh. province. It is opening the tender for equipment supply.

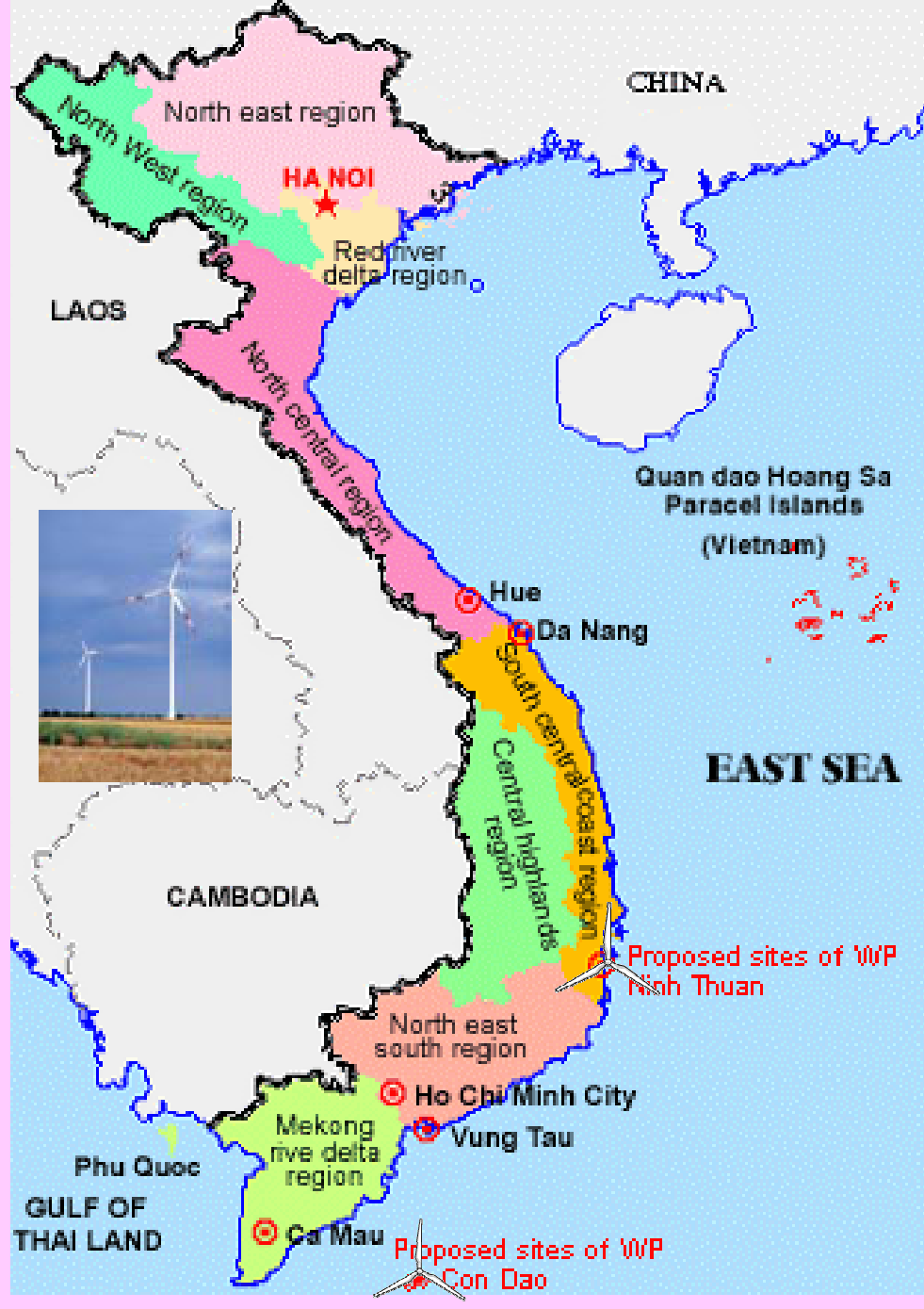
- The Wind power Project financing by Indian Government and Power Sector of Vietnam (EVN) in Ninh Thuan province. The FS of the project is made completely by IoE

- The Wind power Project in Phuong Mai has the total capacity of 84 MW. Grabowski Renewable Energy Company No.1 LTD (from Germany) investor. The FS of this project is made completely .

The wind project with installation capacity of 2,5 MW in Phu quoc Island is making FS

The wind Farm project with installation capacity of 15 MW in Phu Yen province has been making the feasibility study by IoE. The owner of the project is VINACONEX.

The wind project with installation capacity of 2,5 MW in Co Dao Island is making FS by IoE



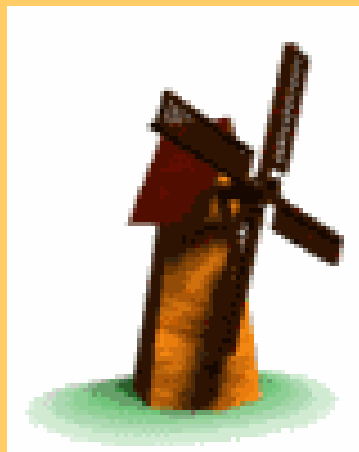
VI. The major barriers of renewable energy development.

Lack of necessary and reliable database for the study to develop and apply for each type of renewable energy (biogas, micro-hydropower, wind energy...) indifferent areas of the country.

Lacking access to financial sources for investment

Missing concrete policy on renewable energy by the Government. More attention should be given to this issue.

Missing advanced and appropriate technologies of Vietnam, the imported equipment's are still expensive in comparison with people's income.



VI. The major barriers of renewable energy development.

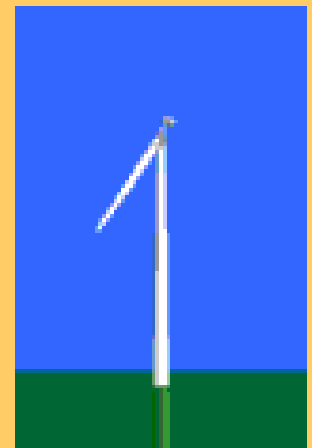
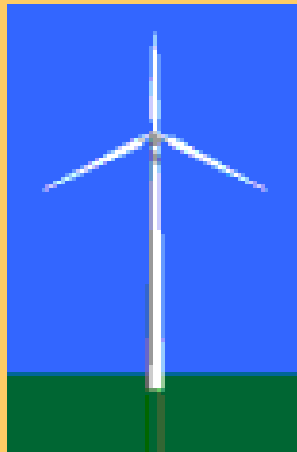
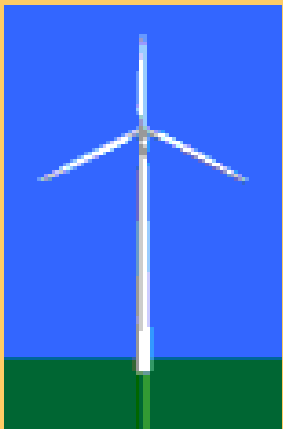
Low income and lack of education for the people in remote areas

Lack of information available for users of renewable energy

Lack of wider international cooperation

There are no private funds available for user access

Lack of the propaganda and advertisement on renewable energy technologies for customers.



VI. Conclusion

As it was mentioned above, Vietnam has good potential of renewable energy, especially wind energy along coastal line. The exploitation wind energy source for power generation bring about important economic-socio-political implications as well as it contribute reducing the green house emission.

**Thank you for your
kind attention**