Feasibility Studies with the Aim of Developing
a Joint Crediting Mechanism FY2013

Studies for Project Development and Organization

Wind power project applying Japanese technology for hill area in Vietnam

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”Wind power project applying Japanese technology for hill area in Vietnam”

（Study for project development）Proposed by：Kanematsu Corp., Hitachi Ltd.

（meaning of study）Chronic electricity shortage is serious problem in Vietnam and improvement of the power supply is an important issue. “Down-wind” system of wind power plant has been developed to fit to the topography and climate of Japan and the feasibility study is carried out to research the application of the system to hill areas of Vietnam and make it popular there. Vietnam government just starts the support of the renewable energy projects and a group that got into the business later has a chance to penetrate into the market. JCM might help the Japanese company's penetration to the market, as well as contribution of power supply and environmental improvement in Vietnam.

Survey in Summary

In order to promote CO2 emission reduction projects in Vietnam by applying “Down-wind” system of wind power and stable power system interconnection technology of Japan, project plan, business feasibility, finance scheme and CO2 emission reduction potential are studied.

Survey Items

① Power supply reinforcement and study of CO2 emission reduction potential
② Analysis of grid capacity and power storage system
③ Differentiation of technology and competence of logistics
④ Development of MRV methodology
⑤ Study of business model to apply the technology to hill area in Vietnam

Partner / Site

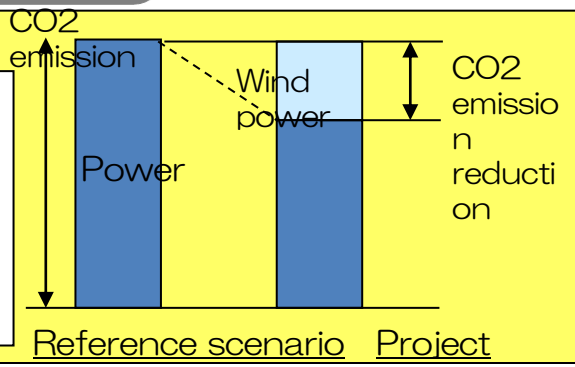
（Host Country Counterpart）
- ○ Carbon Resource Management, Vietnam
- ○ Local government of Lam Dong, Vietnam

Estimated Reduction amount

Reduction amount；around 40,000tCO2/y

Reference scenario

Emission factor of Vietnam grid in 2010 is 0.5408 t-CO2/MWh and emission factor to apply for the project is estimated as 0.5118 t-CO2/MWh by considering the transmission loss.

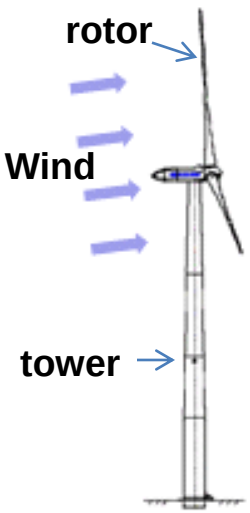


Emission reductions by project

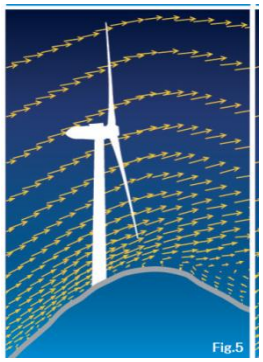
Power generation is estimated as 5256MWh under the condition of 7.2m/sec wind speed. Then CO2 emission reduction is 2,690 tonCO2/year for one unit of wind power and total 40,350 tonCO2/year emission reduction will be expected by the introduction of 15 units as the first investment,

Summary of Introduced Technology

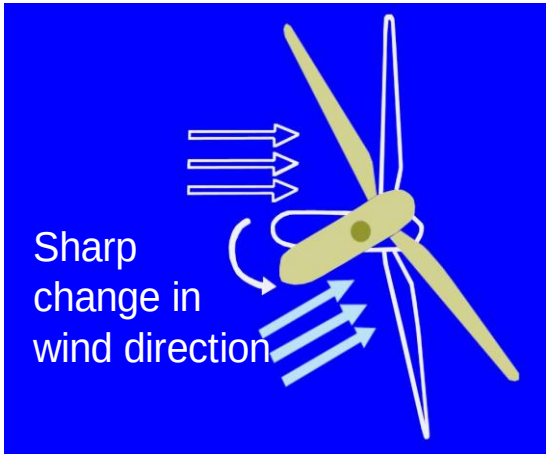
Downwind rotor WTS (Wind Turbine System)



The rotor is on the Downwind side of the tower



■**Weathercock effect**



●The downwind rotor WTS

1. 2MW WTS
   largest capacity as downwind rotor WTS for onshore market in the world
2. This WTS can perform better on hills and terrain (such cases are often seen in Japan)

■Higher efficiency with blowing-up wind

As the rotor leans forward, this downwind rotor WTS toward blowing-up wind can generate power 2 – 8% more than upwind rotor WTS (conventional type) with the same length of blades

■Weathercock effect on sharp change in wind direction

As this system can monitor such direction change more precisely and quickly, it can contribute to better keep generating efficiency under such wind conditions

■No.1 market share in Japan for the year 2012 as an onshore wind power system

(remarks: installation base)

Summary of Introduced Technology

Analysis of acceptance capacity of related power grid for wind power

■Sometimes, output fluctuation of wind power annoys power grid operation when its acceptance capacity of wind power is not enough.

■Through this F/S, we will study the tolerance of wind power acceptance of the related grid to this project by using our simulation software.

★For such analysis, we would like to ask EVN to provide related information such as

a) grid code (safety standard)
b) power grid map
c) demand & supply information (various kinds)
d) existing power generation and investment plan in the related grid to this F/S

■According to the simulation, we might review the capacity of wind power station to be proposed in this F/S or study the value of introducing optimal second battery system, if necessary.