

Issues on the development of Wind Energy System in Indonesia

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Background

- The development of renewable energy has been a global commitment with the goal (a) *sustainable support /availability of energy resources* and (b) *to minimize environmental pollution*.
- Energy for sustainable development can be achieved by providing access to a cost-effective mix of energy resources compatible with different needs and requirements of various regions.
- Wind energy is the fastest growing energy solution in the world with more than 12% annual growth.
- Wind energy potential in Indonesia is estimated around 9.5 GW, however Indonesia is lagging behind, with installed capacity of less than 1 MW.
- Promotion of wind energy should be done in collaborative way among the stake holders, i.e., between government, business, and research institution as well as international partners.

IWES

- IWES (Indonesian Wind Energy Society) is an organization intended to promote the utilization of wind energy technology as one of the energy solutions for Indonesia and to facilitate communication among wind energy stakeholder.
- IWES is founded on 23 July 2008.
- IWES – is participating in promoting the workshop to find a working model/ example of wind energy application.
- Soe – West Timor was selected due to its good wind potential and has sufficient (electricity) demand for a pilot project.

The Objectives

- The objectives are,
 - To exchange experiences in wind energy development.
 - To find a model for wind energy cooperation (technical as well as business).
 - To be learning vehicle of the wind energy stake holder.

Status of Wind Energy application in Indonesia

- Wind energy has been studied since 1970s by universities & research organization (such as, ITB and LAPAN) in small / laboratory scale (1 kW to 10 kW) projects for demonstration and educational purposes.
- Currently more institutions participate in the wind energy application: BPPT, private & government.
- Pilot project in Nusa Penida, Bali since 2006, to install 4 x 80 kW wind turbine.
- Various development centers: Baron (BPPT & LAPAN), Malimping (LIPI) - hybrid.
- Total capacity built/installed is around 0.5 – 1.0 MW.
- There is not yet clear specific strategy available for wind energy application.

Major issues in Wind Energy Development

- The fossil based fuel used to be abundant, there was no economic motivation to develop wind energy other than academic purpose.
- The concept of wind energy is not so simple. It has a lot to do with wind characteristics (intermittency, irregularity, etc).
- There is general policy on renewable energy, but no specific policy yet to promote wind energy.
- There is no sufficiently comprehensive wind potential data in Indonesia for the basis of strategic outlook.
- There are few areas in Indonesia which have sufficient wind potential, the wind characteristics is moonson which varies for time to time.

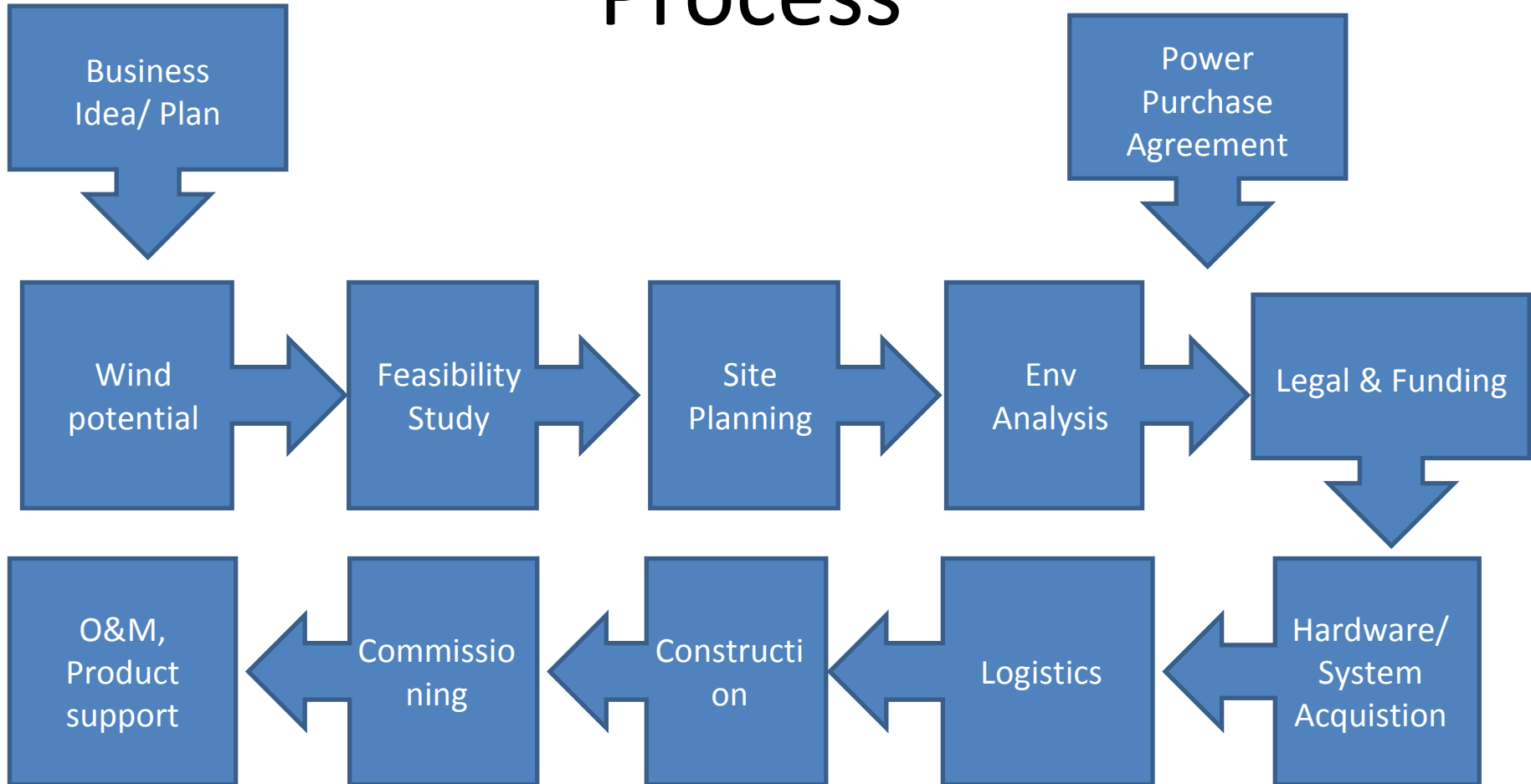
Wind Energy Prospect

- Wind is available, in certain areas in Indonesia, the wind potential is sufficient for electricity.
- Environmentally friendly.
- Wind energy is part of energy mix.
- Wind energy is an industry which creates job for medium/ high technology expertise.
- Wind energy is part of the future energy security.

Wind Energy Prospect (2)

- Wind is cheaper alternative to diesel for remote areas.
- Smaller turbine (< 100 kW) is beneficial to location which is small, isolated and less populated area.
- Area connected to a grid may have large windfarms, provided there is sufficient infrastructure (ports, roads).
- Wind-diesel combination can be feasible for optimizing guarantee of supply, low cost energy and less pollution impact.
- For remote areas, hybrid of *wind-photovoltaic-hydrogen electrolysis / fuel cell* shows promising results [Ref. LIPI].

Process



Challenges

- Regulation covering short and long term goals, must be developed among stake holder.
- Knowledge basis must be established, including specifically wind map to allow strategic outlook for wind energy
- Financial support policy for renewable energy and specifically for wind
- Technology in operation & maintenance, product spec which meets condition in Indonesia (low speed wind), cost optimization, local production, international cooperation, etc.
- Cooperation among stake holders: central/ local government, business, universities, research, financial institutions and participation of local people.

Conclusion

- Wind energy is an opportunity that has to be worked out.
- Wind energy is part of energy mix strategy and an investment for the future (energy, environment & economic benefit)
- Wind potential mapping, especially east Indonesia, must be developed to allow planning for the stake holder.
- Policy recommended: optimizing the solution for current (*low cost energy, reliability*) and future (*learning process*).
- Collaboration should be made between government, business, academics and research institution to have a viable and integrated approach to overcome the problem.
- More/ additional working examples with various capacity are needed to improve common understanding among stake holder to achieve better effectiveness and efficiency in developing wind turbine application.

Thank you very much for attention
wassalamualaikum w.w.