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Blowing the Wind Energy in Indonesia

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Abstract

Wind power generation is no longer a new issue in the world. However, the market in Indonesia is remaining “un-developed”. Barriers had been identified. One of the main constraints is the low of confident level on the wind availability itself. So many researches had been conducted, however up to present the installed capacity of wind power generation is only around 1.6 MW out of 9.29GW total capacity predicted.

Hence, an intensive promotional program should be conducted to promote wind power generation as an alternative for a more sustainable energy. “Commitment” is all what it takes to save the future’s energy.

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Nomenclature

BMKG	Badan Meteorologi, Klimatologi dan Geofisika (Indonesian Agency for Meteorology, Climatology and Geophysics)
DIY	Daerah Istimewa Yogyakarta
DKI Jakarta	Daerah Khusus Ibukota Jakarta
EVN	Electricity of Vietnam Group
GW	Gigawatt
GWh	Gigawatt hour
GWEA	Global Wind Energy Association

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kW	Kilowatt
LAPAN	Lembaga Penerbangan dan Antariksa Nasional (National Institute of Aeronautics and Space)
m/s	meter per second
MEMR	Ministry of Energy and Mineral Resources
MW	Megawatt
NTT	Nusa Tenggara Timur (East Nusa Tenggara)
PLN	Perusahaan Listrik Negara (State Electricity Company)
WECS	Wind Energy Conversion System
WHyPGen	Wind Hybrid Power Generation
WRA	Wind Resources Assessment

1. Introduction

1.1 Background

Indonesia is the world's largest archipelago, which consist of more than 17,000 islands and only about 5,700 islands is inhabited. Indonesia coastal line is more than 81,000 km. The characteristics of small island is poor for resources such as limited freshwater and electricity supply. To built the installation of freshwater and electricity are very expensive and the maintenance and operation are difficult. Beside that, the energy consumption is still dominated by the costly of fossil fuel. However the energy consumption is growing as the increased number of the population. The fossil fuel demand increases continuously, while the oil resources are depleting which caused fuel shortage in many islands. This can effects the continuity of electricity supply for the people, which then raise burden and lead to a high economical cost of the supply.

Wind energy as a one of renewable energy is clean and free for all, however, its kinetic potential energy should change to fulfill the need energy consumption by using Wind Energy Conversion System (WECS) to generate electricity or other mechanical energy such for pumping system. Tor realize these, many activity related to wind energy should be done as wind data resources assessment, research and development (R and D) on wind turbine technology and also introducing and disseminating of using wind energy at several site selection with good enough wind velocity.

The objective of wind energy development and utilization in Indonesia is to establish a wind energy power generation system as part of the rural electrifications program at various rural and isolated areas in Indonesia, by developing the capability and mastering the science and technology of WECS, the utilizations and dissemination of technology through private sector and local manufacture supports.

1.2 Utilization of wind energy world wide

Compare to 2011, the global wind power market grew more than 10% in 2012, and nearly 45 GW is a new wind power plant. The total of wind power plant at the end of 2012 was 282.5 GW, representing cumulative market growth of more than 19%. It is an excellent growth rate, even though it is lower than the annual average growth rate over the last 10 years of about 22% [1].

At the end of 2011, the expectations for wind power market growth were uncertain, as the economic slowdown continues in Europe and the political uncertainty in the US made it difficult to make projections for 2012. Nevertheless, 2012 turned to be a great year for wind power installations in the traditional markets of North America and Europe.

Conversely, China the largest market for wind since 2009 showed a slower market development, which meant that the US regained the top spot in 2012. Market consolidation and rationalisation in China, and a lapse in policy in India were the main reasons for the significant slowdown in Asia in 2012, but these conditions are expected to be short-lived, and Asian dominance of global wind markets is expected to continue. Canada, Brazil and Mexico are expected to have strong years in 2013, and a few hundred megawatts from sub-Saharan Africa will come online for the first time: in South Africa, Ethiopia and possibly Kenya; and global installations will be further augmented by new projects coming on line in Mongolia, Pakistan, the Philippines and Thailand. In Figure 1 and Table 1 show 10

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