

## **Wind Power Generation System Market in Japan: Key Findings 2009**

**~ Expected to grow to 109.7 billion Yen market by 2015 ~**

### **Research Outline**

**Yano Research Institute has conducted a study on the wind power generation system market in Japan based on the following research outline.**

1. Research period: From August to November 2009
2. Research targets: Wind power generation system manufactures in Japan for the small sized and the middle and large sized systems, electricity producers, trading firms, etc.
3. Research methodologies:  
Face-to-face interviews and interviews via telephone and e-mail by our specialized researchers and literature research

#### **<What is the wind power generation system market?>**

In this study, the wind power generation systems are classified into two categories, the small systems and the middle and large sized systems. Each size of systems is further classified into several subcategories based on the rated output. There are "20kW or higher but lower than 500kW", "500kW or higher but lower than 1MW", "1MW or higher but lower than 2MW" and "2MW and over" for the middle and large sized systems. For small sized systems, there are "lower than 500W", "500W or higher but lower than 1kW" and "1kW or higher but lower than 20kW".

### **Key Findings**

- ◆ **Market size of the wind power generation systems in Japan in 2009 is projected to be 26.96 billion JPY and 148.9MW.**

The market size of the wind power generation systems in Japan in 2008 was 29.16 billion yen in terms of shipment value, 27.6 % larger than the previous year, and 179.6MW in terms of power capacity, 3.3 % smaller than the previous year. In 2009, the market size is projected to be 26.96 billion yen in value, 7.6 % year-on-year growth and 148.9MW in power capacity, 17.1 % year-on-year decrease.

- ◆ **Mainstreams are "2MW or higher" for middle and large sized systems and "1kW or higher" for small sized systems.**

The wind farms that have ten or more windmills have been becoming more and more popular as they could minimize the risk of power generation failure with the wind power generation that is frequently affected by the weather and as they could reduce the construction cost, and the windmills with 2MW or higher power capacity are mainly used in the wind farms. The 1kW is the most popular capacity for the small systems and majority of demands used to come from corporate users and municipal governments in the past. Recently, however, the demands from private households have been explored and new products that enable power system interconnection were started to be launched in view of electricity selling to be started in future.

- ◆ **Market size in 2015 is forecasted to grow to 109.69 billion JPY in terms of shipment value, 3.8 times larger than 2008.**

Renewable energies including wind power generation have to be utilized in order to achieve the Japan's goal of 25 % reduction of greenhouse gases from the level of 1990 amid serious global discussion about the global environmental issues. Based on the situation just described above, we forecast that the wind power generation system market in Japan to be 966.5MW in 2015 in terms of power capacity (approx. 5.4 times larger than 2008) and 109.69 billion yen in terms of shipment value (approx. 3.8 times larger than 2008), supposing that the feed-in tariff for the renewable energies start in 2011 as committed in the manifesto of the Hatoyama government.

## ➤ **Report format:**

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## ➤ **Research Summary**

### **1. Overview and forecast of the market**

The wind power generation system market in 2008 was influenced by several factors including the escalated material prices, change in exchange rates, etc. and ended in 29.16 billion yen in shipment value, 27.6 % year-on-year increase, and 179.6MW in power capacity, 3.3 % year-on-year decrease. The market in 2009 is projected to be 26.96 billion yen in value, 7.6 % year-on-year decrease, and 148.9MW in power capacity, 17.1 % year-on-year decrease.

The Hatoyama government of Japan officially announced the Japan's goal of reducing the greenhouse gases by 25 % compared to the level in 1990 amid serious global discussion about the global environmental issues. While not any clear visions how this goal could be achieved have not been presented yet, according to the estimate made by National Institute for Environmental Studies\*, power generation systems equivalent to 11,000MW of accumulated power capacity has to be installed as for the wind power generation as one of the renewable energies, supposing that the greenhouse gas output is reduced only within Japan. Based on the above estimation, we forecast that the wind power generation system market in Japan to be 966.5MW in terms of power capacity (approx. 5.4 times larger than 2008) and 109.69 billion yen in terms of shipment value (approx. 3.8 times larger than 2008) in 2015, supposing that the feed-in tariff for the renewable energies start in 2011 as committed in the manifesto of the Hatoyama government.

It is necessary, we believe, to provide with some infrastructures to introduce large amount of wind power generation systems in Japan, the systems whose power output is largely dependent on the weather conditions, such as the power grid that could adjust the variation of power output by other natural energies complementary to the wind force, the transmission grid to send green electricity from the areas rich in wind power (such as Hokkaido and Tohoku where there is strong wind and large amount of wind power is easily available while the population density is thin and the demand for electricity is low) to urban areas with high electricity demand (where there are few places suitable to build wind power generation systems), etc.

\*Note: In this study, the estimate by the institute was made based on the assumption that the domestic reduction ratio is 15% compared to the level of 1990 as a technology model (Large scale hydraulic power generation is included in renewable energies.) and that the carbon tax or the emission trading systems via 100 % auction method has been introduced as a economic model in Japan.

### **2. Market trends by power capacity of systems**

#### **2-1. Middle and large sized systems**

The market for the middle and large sized systems in 2008 was 27.49 billion yen in shipment value and 178.5MW in power capacity. The breakdown of the market by power capacity shows that "1MW or higher but lower than 2MW" accounts for 56 %, and respectively, "2MW and over" for 43 % and "500kW or higher but lower than 1MW" for 1 %.

Recently, the demand for "2MW and over" has been increasing, which was fueled by necessity to increase power generation in view of the buyback system of electricity to be implemented in near future. The collective wind power generation plants called "wind farms" that have ten or more windmills with 2MW or higher power capacity have been becoming more and more popular as they could minimize the risk of power generation failure with the wind power generation that is frequently affected by the weather and as

they could reduce the construction cost. In addition, an unprecedented type of wind power generation system that has storage batteries to reduce output power fluctuation has been emerging.

The major factors for the stagnant growth of the Japanese domestic market have been said to include that 1) design standard of the windmills were improved as highly as that of high-rise buildings by the revised Building Standard Act, 2) quota for windmill introduction in the areas with favorable wind conditions are small and there is the bidding systems managed by electric power corporations, 3) it is hard to secure profitability in a short period of time since the selling price of electricity has been decreasing in spite of increase of power generation costs due to the decrease of suitable sites and strengthened design standard, etc., and overseas manufactures has stayed away from operating in Japanese market aggressively in one hand. On the other hand, Japanese manufactures and newly participated manufacturers have been increasing their market share by introducing wind power generation systems with high operation rate even though the unit price is high.

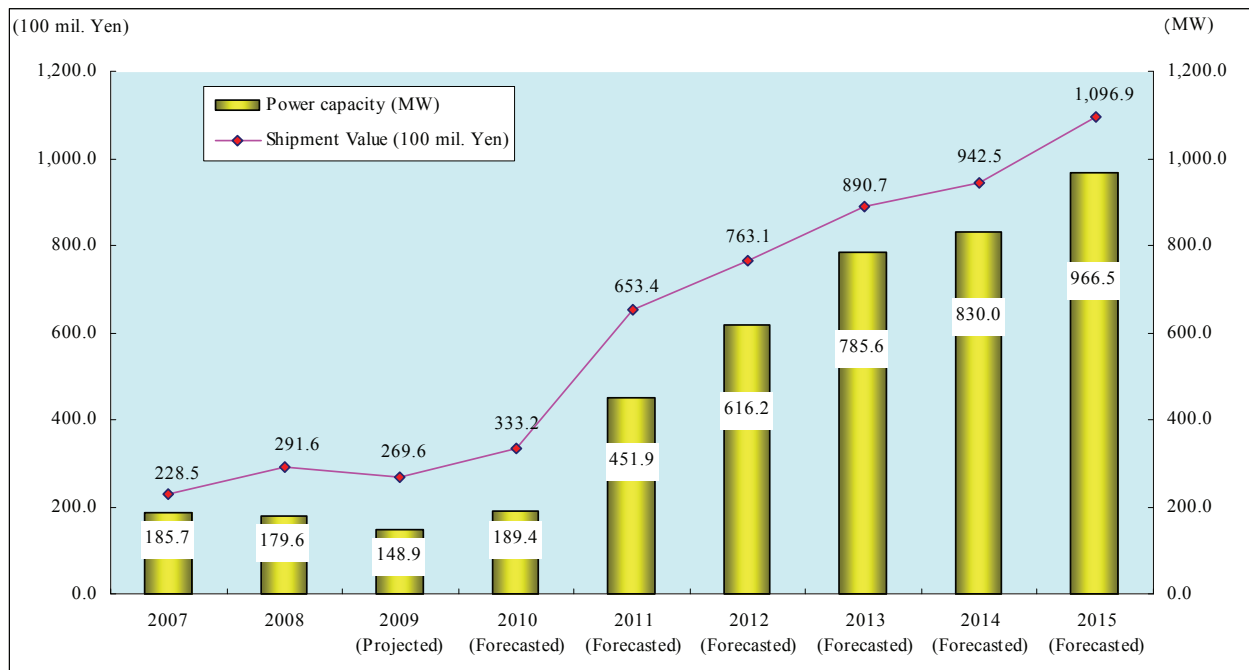
## **2-2. Small sized systems**

The market for the small sized systems in 2008 was 1.68 billion yen in shipment value and 1,146kW in power capacity. The breakdown of the market by power capacity shows that 60% was generated by "1kW and over", and respectively, 34% by "less than 500W" and 6% by "500W or higher but less than 1kW". In the past, the small sized wind power generation systems in Japan were normally used as the hybrid lamps (with less than 500W) powered by the wind power in combination with solar power and installed at the parks or along the streets. Recently, however, the demand for "the less than 500W" has been slowing down as the demands for the hybrid street lamps have been almost satisfied. The small sized wind power generation systems are frequently installed on the purpose of demonstrating the high level of interest in environmental issues, and the demands for the larger systems than "the less than 500W" such as the systems with "1kW and over" are mainly from the factories that had obtained ISO14001 certification and from municipal governments, and started to rise around 2006 and 2007, backed by the favorable economic condition. After that, however, the market experienced downturn as private companies and municipal governments have cut their environmental funds due to the economic slump after the Lehman Shock.

Some manufactures started to add new products that enable power system interconnection to their lineups in view of future electricity selling in addition that they have explored the demand for the products with 1kW capacity for general households. On the other hand, some other manufactures have started to seek for opportunities in overseas markets such as U.S. market led by the surplus electricity buyback system\* started in November 2009 that may have some negative effects to popularization of the small sized wind power generation systems.

\*Note: While the selling price of electricity generated solely by solar power systems installed at general residential housing is 48 yen/kWh, the electricity generated by the combination of small-sized wind power generation systems and solar power generation systems is as low as 39 yen/kWh.

**Figure/ Table 1. Wind Power Generation System Market: Market Size Transition and Forecast**



Estimated by Yano Research Institute

	2007	2008	2009 (Projected)	2010 (Forecasted)	2011 (Forecasted)	2012 (Forecasted)	2013 (Forecasted)	2014 (Forecasted)	2015 (Forecasted)
Power capacity (MW)	185.7	179.6	148.9	189.4	451.9	616.2	785.6	830.0	966.5
Shipment Value (100 mil. Yen)	228.5	291.6	269.6	333.2	653.4	763.1	890.7	942.5	1,096.9
Year-on-year ratio	50.7%	127.6%	92.4%	123.6%	196.1%	116.8%	116.7%	105.8%	116.4%

Estimated by Yano Research Institute

NOTE: The market size is based on shipment from manufacturers.

**Table 2. Wind Power Generation System Market by System Size: Market Size Transition and Forecast**

		2008	2009 (Projected)	2012 (Forecasted)	2015 (Forecasted)
Middle and large sized systems	Power capacity (MW)	178.5	147.6	614.0	963.0
	Shipment value (100 mil. Yen)	274.9	250.9	736.8	1,059.3
Small sized systems	Power capacity (MW)	1,146	1,338	2,208	3,514
	Shipment value (100 mil. Yen)	16.8	18.7	26.3	37.6
Total	Power capacity (MW)	179.6	148.9	616.2	966.5
	Shipment value (100 mil. Yen)	291.6	269.6	763.1	1,096.9

Estimated by Yano Research Institute

NOTE: The market size is based on shipment from manufacturers.