

REvision2013

Wind Power Business in Japan - Before and After the FIT -

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Tetsuro NAGATA

Executive Advisor

Eurus Energy Holdings Corporation

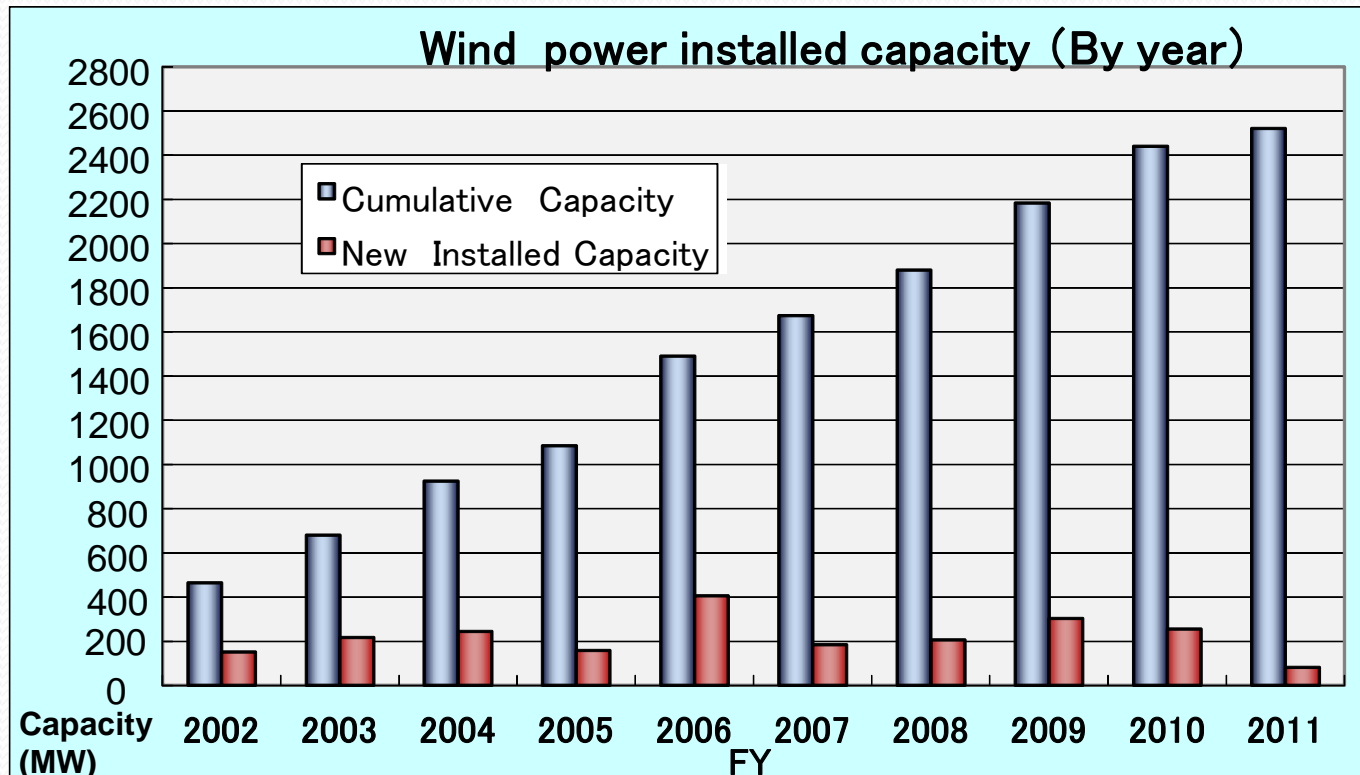
<http://eurus-energy.com>

Japan's Wind Power Installations

- FY2011: **2,557MW, 1,855 turbines, 424 facilities**

Minimal growth of **3.4%** from 2010

- FY2010 -11: Expectation of transition from RPS to FIT held back growth



* Source : NEDO, JWPA

2.47GW, did not reach the National target, 3GW, in 2010

Effectiveness of the FIT

- **Minimum level for economic viability: 22 yen / kWh over 20 years (valid for already-operating facilities as well), but premium tariff for the first 3 years**
- **Possibility of negative impact by environmental impact assessment, power curtailment by utilities, and so on**
- **Tariff for off-shore wind not yet introduced**
- **To secure and expand the grid connection, more flexible grid rules and policies for the infrastructure improvement are necessary**

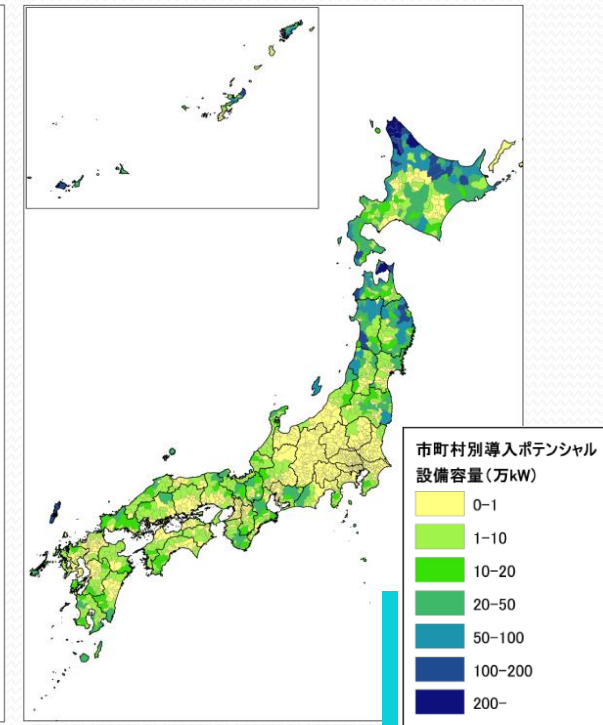
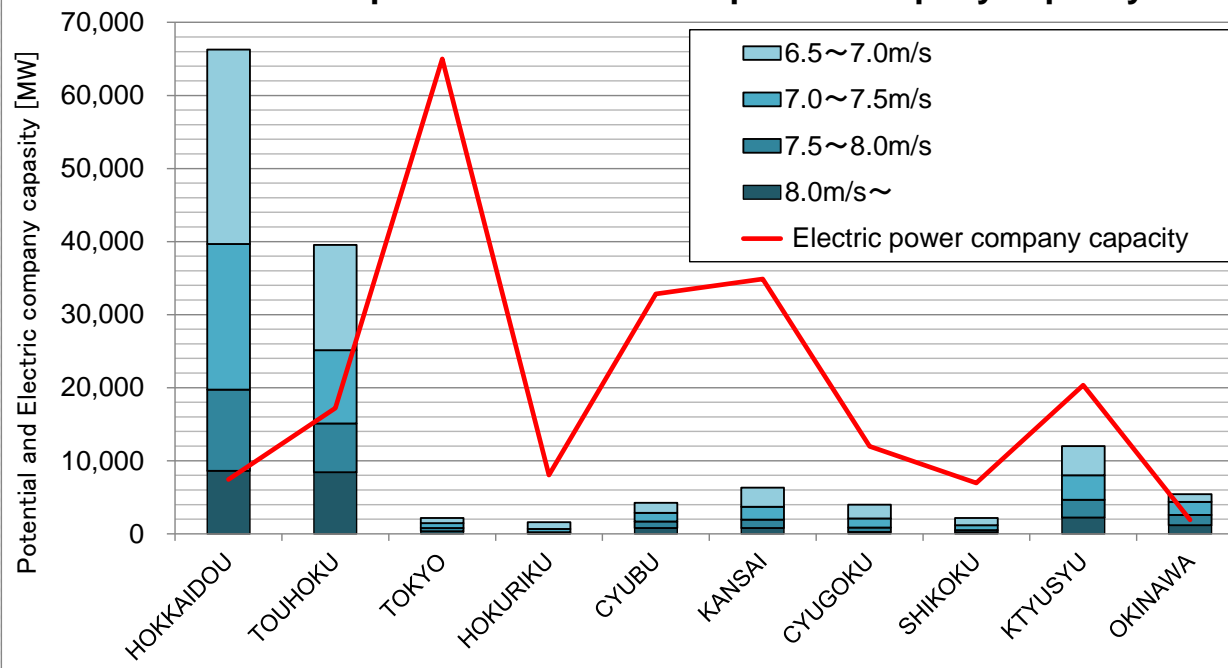
		Purchase rate(Yen/kWh)									
		16	17	18	19	20	21	22	23	24	25
Purchase period (Year)	15	-0.3%	0.7%	1.7%	2.7%	3.7%	4.6%	5.4%	6.3%	7.1%	7.9%
	16	0.5%	1.5%	2.5%	3.4%	4.3%	5.2%	6.1%	6.9%	7.7%	8.5%
	17	1.1%	2.1%	3.1%	4.0%	4.9%	5.7%	6.6%	7.4%	8.2%	8.9%
	18	1.7%	2.7%	3.6%	4.5%	5.4%	6.2%	7.0%	7.8%	8.6%	9.3%
	19	2.2%	3.2%	4.1%	4.9%	5.8%	6.6%	7.4%	8.1%	8.9%	9.6%
	20	2.7%	3.6%	4.5%	5.3%	6.1%	6.9%	7.7%	8.4%	9.2%	9.9%

Wind Energy Potential : On-shore

- Average wind speed > 6.5m/s at 80m height
- Potential (available wind energy) = 143.8GW
- Minimum selection (potential and electric power company capacity) = 59.1GW

$$59.1\text{GW}/2 \div 30\text{GW}$$

On shore potential and electric power company capacity

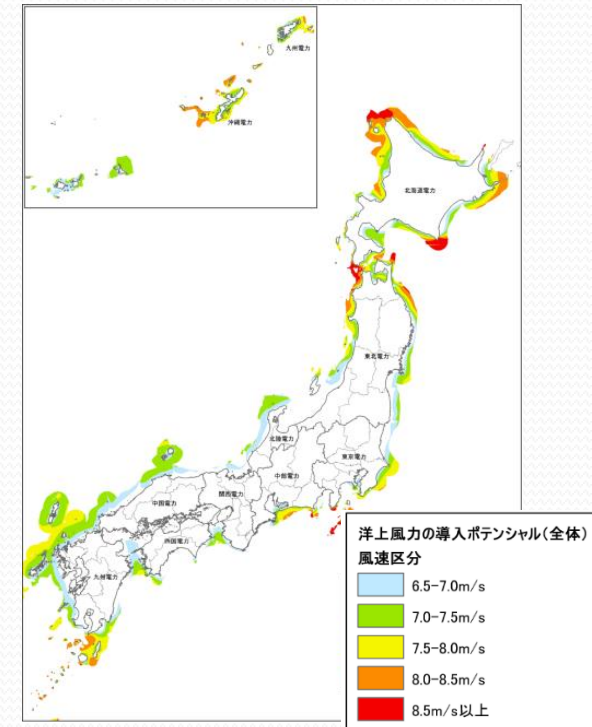
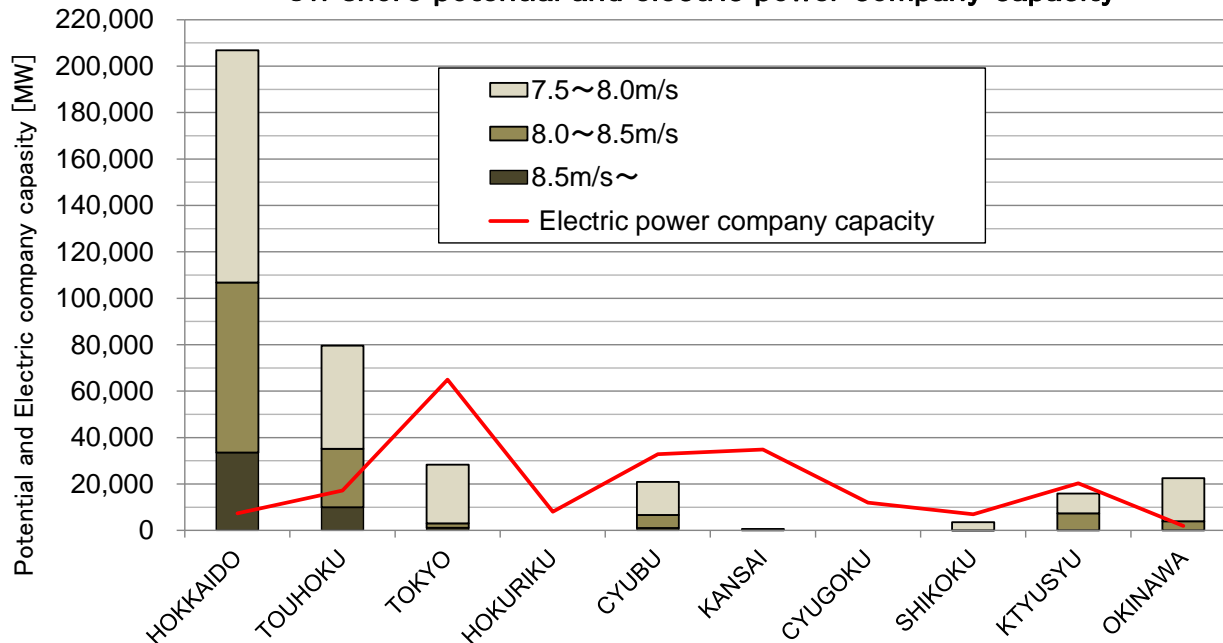


Wind Energy Potential : Off-shore

- Average wind speed > 7.5m/s at 80m height
distance to shore < 30km, water depth < 200m
- Potential (available wind energy) = 378.3GW
- Minimum selection (potential and electric power company capacity) = 96.0GW

$$96.0\text{GW} / 3 \div 30\text{GW}$$

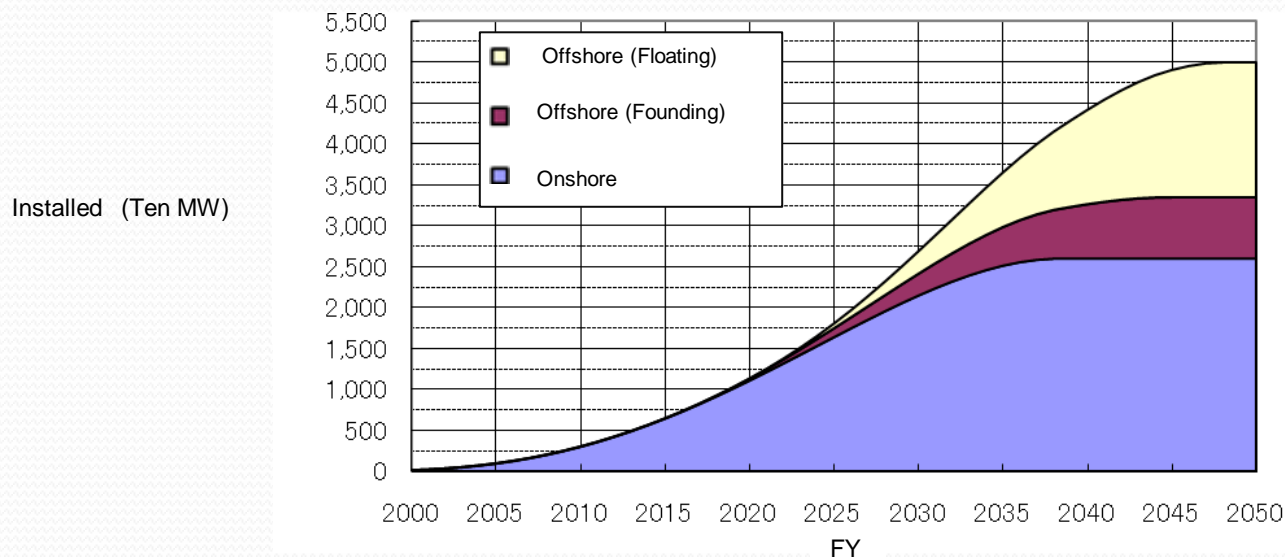
Off shore potential and electric power company capacity



Middle & Long Term Target of Wind Power

Source : JWPA

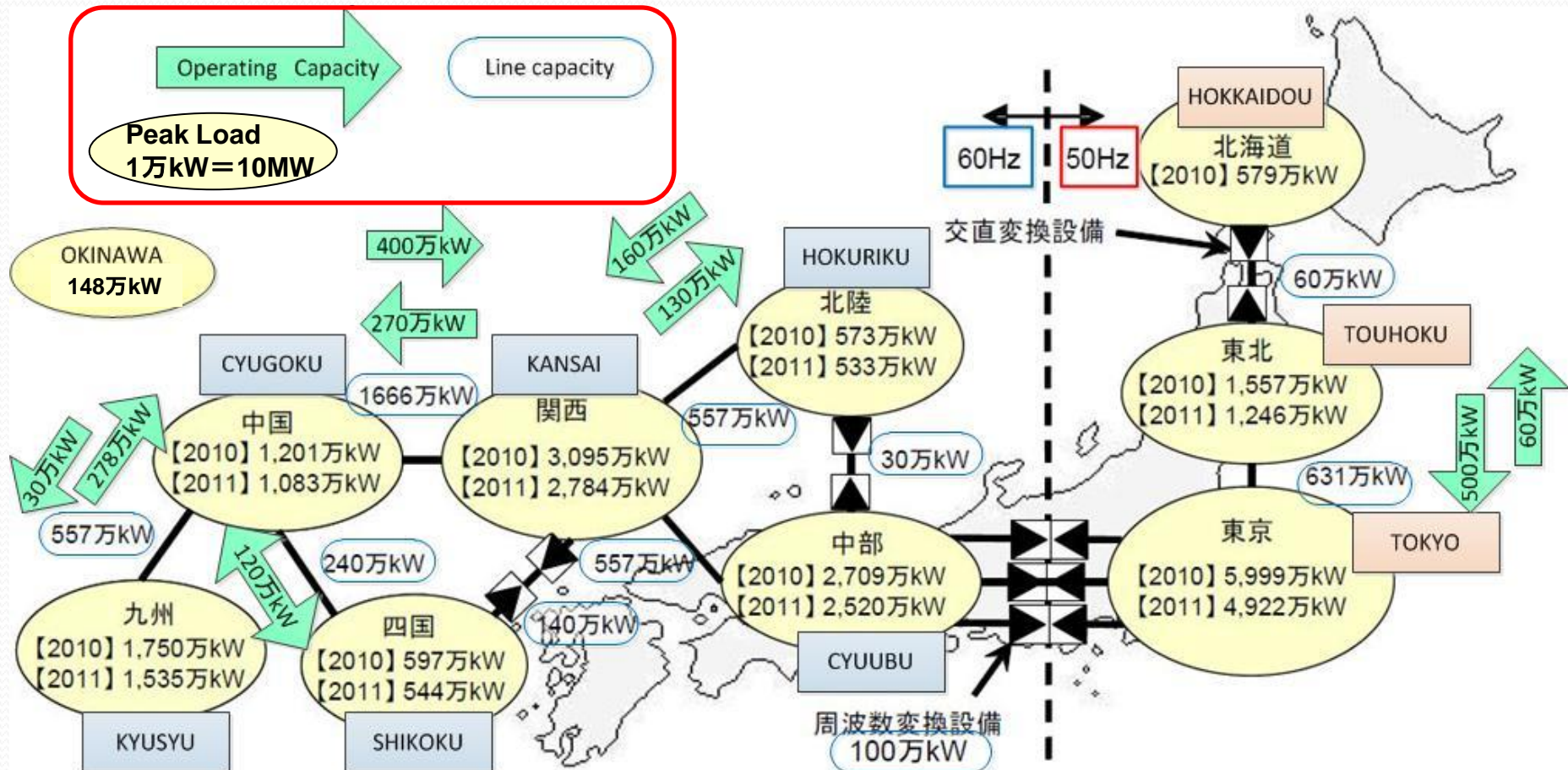
- Middle and Long Term Target of JWPA:
 - 2020: more than 11GW
 - 2030: more than 27GW
 - 2050: more than 50GW, 10% of Domestic demand



National Target makes it easier for investors and manufacturers to plan and invest more

Japanese Grid System : change is needed

- More flexible rule/operation maximizing current TL capacity
- Infrastructure improvement within and across utilities
- Grid-side battery, operation with weather forecast etc



Source: JWPA

Aspiration for De-regulation

Regulation	Current issues
Environmental Impact Assessment Act	Since Oct 2012 this act is applied to wind power development as well, thus demanding 3 or 4 more years and additional cost.
Agricultural Land Act	Taking land out of active use for agriculture is very difficult, even where wind farm makes some contribution to regional economy.
Building Codes	Same code as skyscraper is applied to wind mill over 60 meters.
Forest Act	Release of forest conservation for wind power is very difficult and varies with each local authority.
Natural Parks Act	Wind mill installation in Natural Park is severely restricted, while landscape code is ambiguous.