



Global Wind Power 2008 | China Wind Power 2008

Navigating the Chinese Market Place - Manufacturers

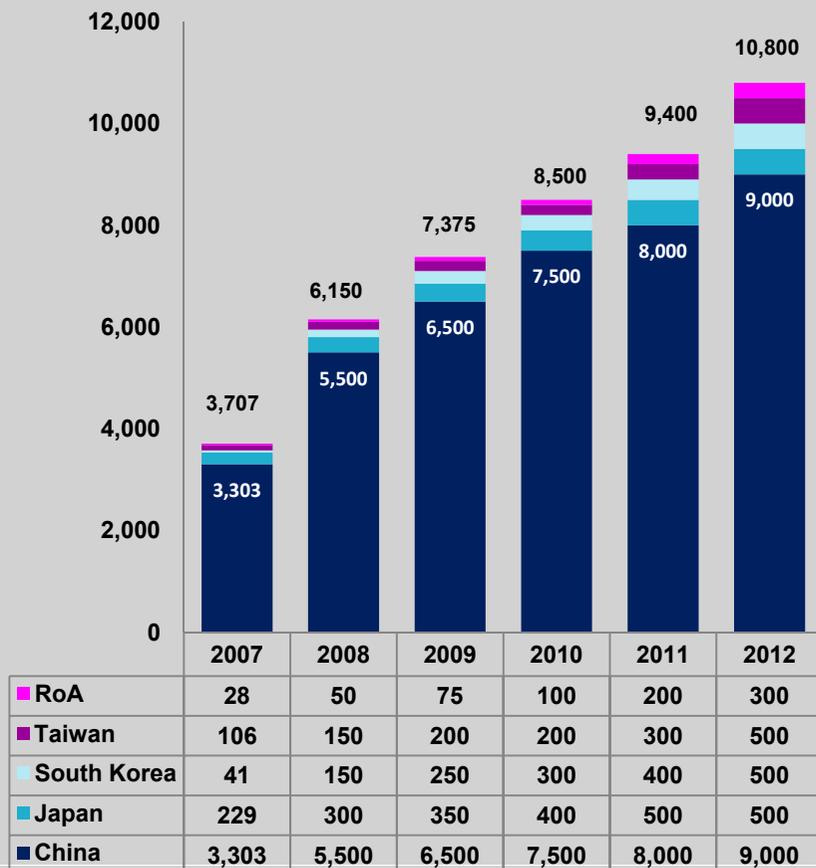
Paulo Fernando Soares
Chief Executive Officer
Suzlon Energy Ltd

Beijing
Oct 30, 2008

Market Development East Asia Region

Growth Forecast [MW]

BTM Market Forecast 2008-12 Total [MW]



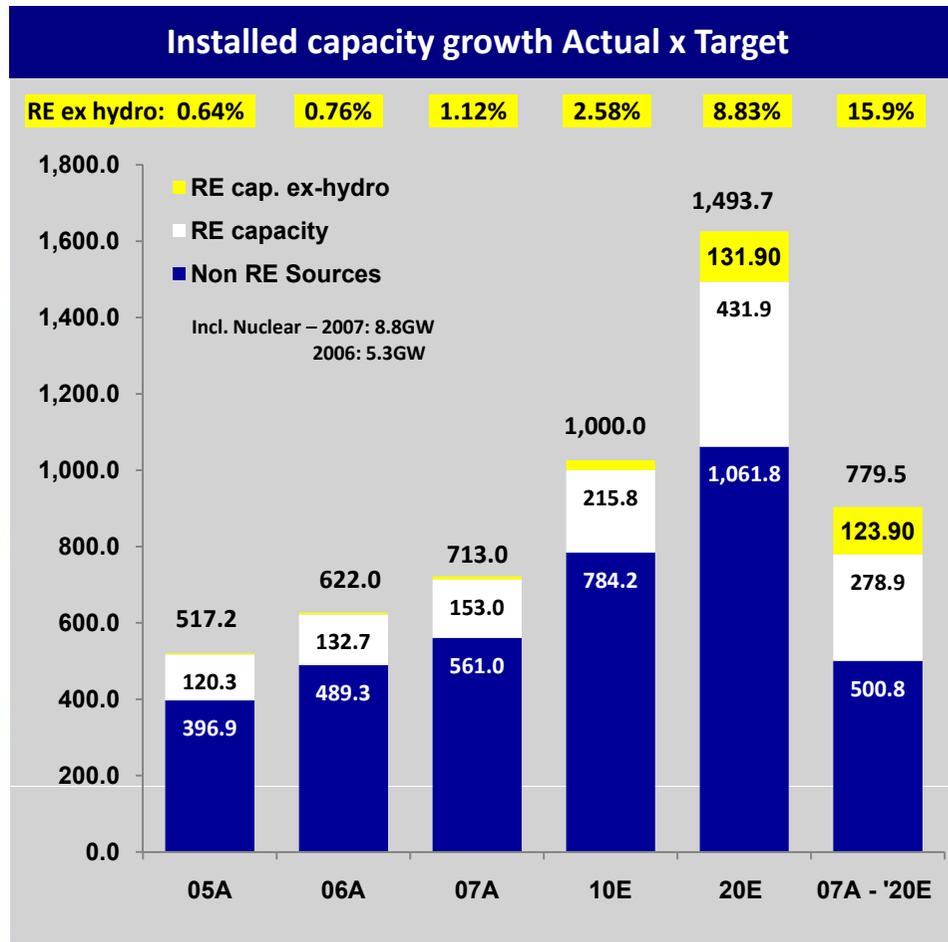
Analysis

- China (app 87%) will be the most important market in the East Asian region. All other countries combines will account for only 13% of the total additions;
- Development in Countries such as Philippines (especially), Vietnam and Thailand is starting to accelerate; however level of development of the grid, weather conditions (typhoon area in Vietnam and Philippines and lack of wind in Thailand), might affect market potential;

China will be the backbone of the development of Wind Business in the East Asia region; however, competition has become very developed, rapid growth of the local companies and preferred policies toward local companies

Power Capacity Development

Actual 2007 x Target in 2010 and 2020



Analysis

- Despite the fact that the government has set ambitious targets for 2010 and 2020, it is important to define whether Large Hydro is part of the target:

Inst. Capacity	%RE - Incl. Hydro	%RE - Excl. Hydro
2006 A	21.33%	0.76%
2007 A	21.43%	1.12%
2010 E	21.58%	2.58%
2020 F	28.91%	8.83%

- Considering the electricity generation profile in 07:

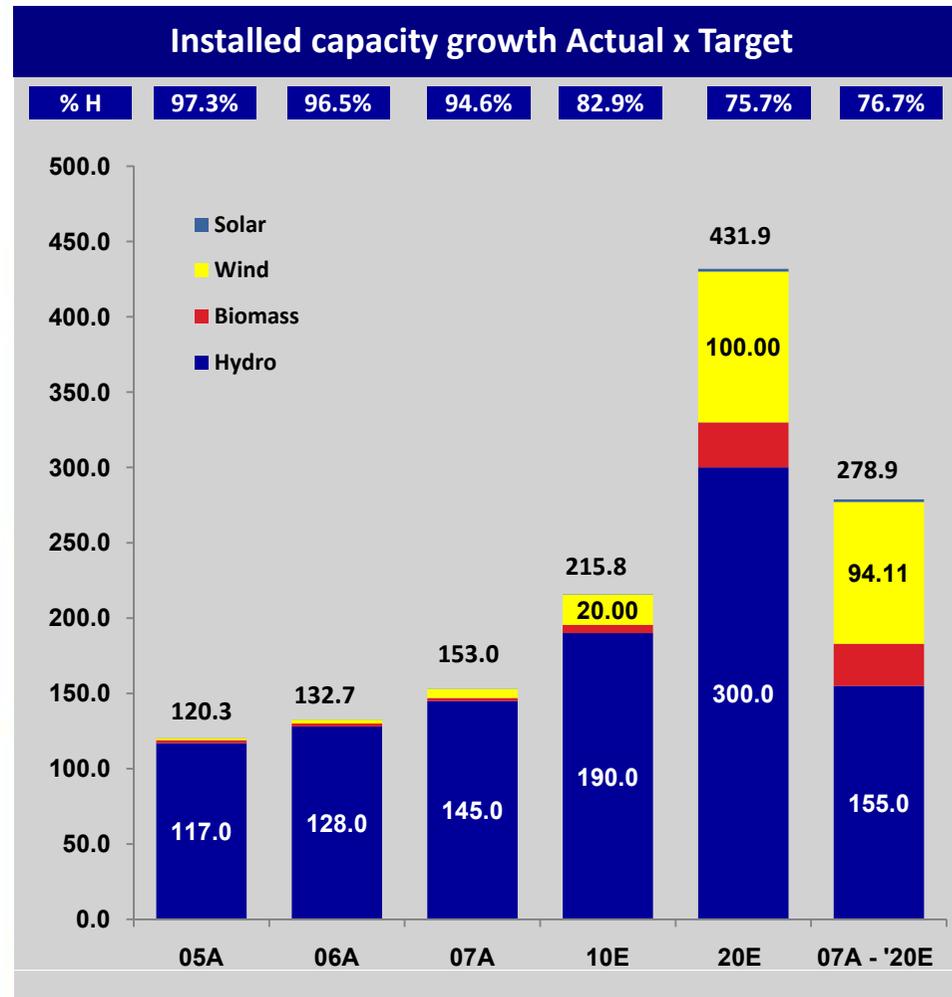
Power Generation 2007	Installed capacity		Power Generation	
	GW	[%]	TWh	[%]
Thermal	554.0	77.59	2,698.0	82.86
Hydro	145.0	20.31	486.7	14.95
Nuclear	8.8	1.23	62.6	1.92
Wind	5.9	0.83	5.6	0.17
Others	---	---	3.0	0.09
Total	714.0	100.0	3,255.9	100.0

The targets for RE (excluding Large Hydro) must be reviewed to more realistic numbers considering the current development of the industry.

Source: National Development & Reform Commission; "Renewable Energy Sources Medium to Long Term Development Plan" report published August 2007, released 4 September 2007. National capacity = Merrill Lynch AsiaPac Utilities Research Estimates

Power Capacity Development

Renewable Energy Sources – Actual x Targets



Analysis

- If we analyze the breakdown of the different Renewable Energy sources and its development forecast, we will clearly see that Large Hydro will be the main player, attracting the bulk of the investments.
- The breakdown figures (in GW) for hydro is as follows:

Hydro Capacity	2006A	2007A	2010F	2020F
Large Hydro	72.0	NA	140.0	225.0
Pumped Storage	7.0	NA	NA	NA
Small Hydro	38.0	NA	50.0	75.0
Total	117.0	145.0	190.0	300.0

- Renewable energy sources not derived from Large Hydro schemes should have development priority in order to avoid the repetition of the 2007 situation, when droughts in the south pushed the consumption of electricity generated by coal fired thermo power plants

Source: National Development & Reform Commission; "Renewable Energy Sources Medium to Long Term Development Plan" report published August 2007, released 4 September 2007. National capacity = Merrill Lynch AsiaPac Utilities Research Estimates

Wind Power Development

Renewable Portfolio Standard

Renewable Portfolio Standard Guidelines

Language directing the mechanism for a Renewables Portfolio Standard (RPS) was published in “Mid & Long-term RE Implementation Plan (Jul 07). The formulation includes two sets of requirements - one being generation & grid based, the other being a capacity-based requirement levied on power producers. The requirements are listed below:

- **The share of non-hydro Renewables should reach 1% of total power generation by 2010 and 3% by 2020 for regions served by centralized power grids.**
- **Any power producer with cap > 5GW must increase its actual ownership of power capacity from non-hydro Renewables to 3% by 2010 and 8% by 2020**

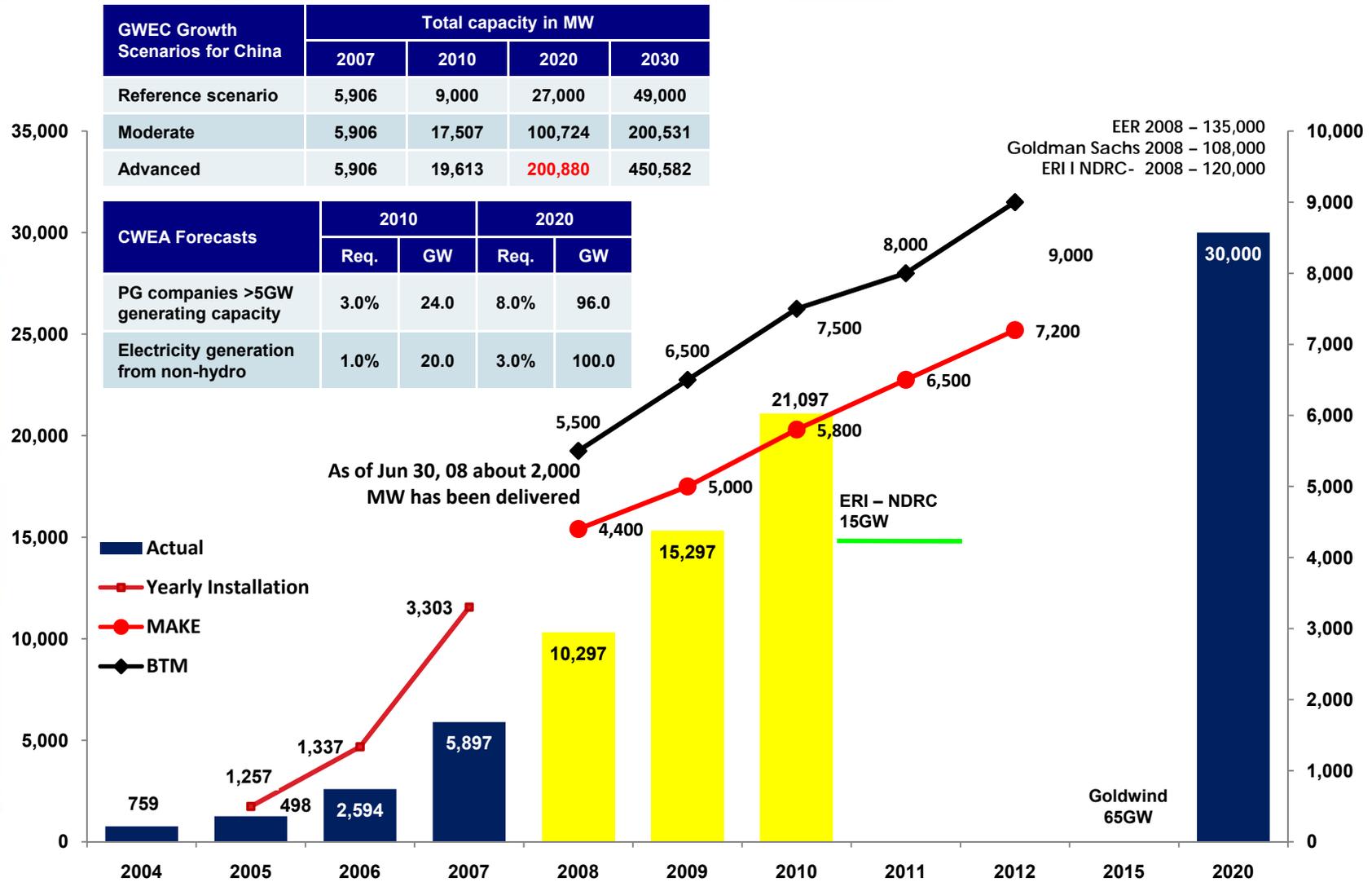
First of all, the requirements apply to non-hydro Renewables. This exclusion of small hydro means that the RPS effectively applies only to wind, biomass, and solar generation and capacity. Of these technologies, wind will be the predominant means of meeting requirements for reasons of scale and cost.

- Development targets at various levels: NDRC 10GW 2010, and 30GW 2020; announced provincial targets summing to over 24GW by 2010.
- Power generation companies establishing aggressive targets for wind, in-line with RPS requirements, and actively developing pipelines (2010 targets and pipelines sum to over 16GW, and the new national capacity targets sum to 15.5GW (10GW wind, 5.5GW biomass thermal) of “non-hydro” renewable power generation capacity.
- National concession and policy-directed projects now totaling 7.9GW of which 1GW installed primarily for the benefit of domestic companies.
- Within the 35GW of incremental near-term development, we find that SOE companies represent some 75% of pipeline and 88% of the ordered portion. Domestic private and international interests remain a small but potentially growing customer base.

Existing wind pipeline identified suggests that most companies are reasonably well positioned already, in terms of development pipeline to meet both the 2010 and 2020 requirements.

Market Development in China

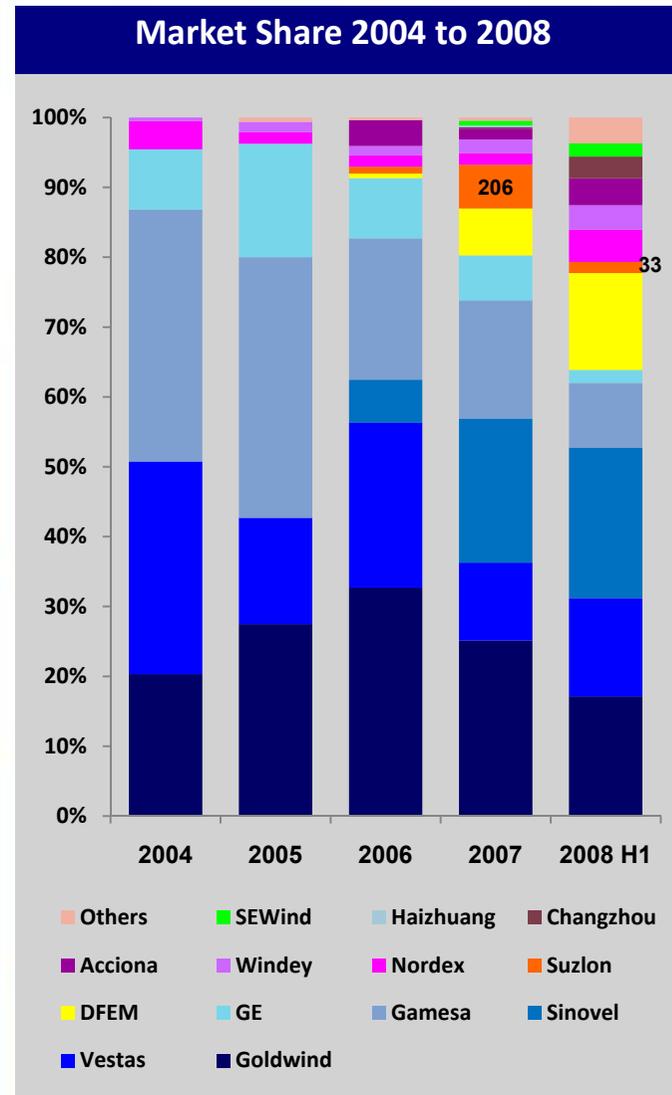
Growth Forecast [MW]



Source: Azure Suzlon Proprietary Report / Azure International - CWEA statistics / Energy Research Institute from the NDRC

Market Development China

Market Share – 2004 to 2008H1



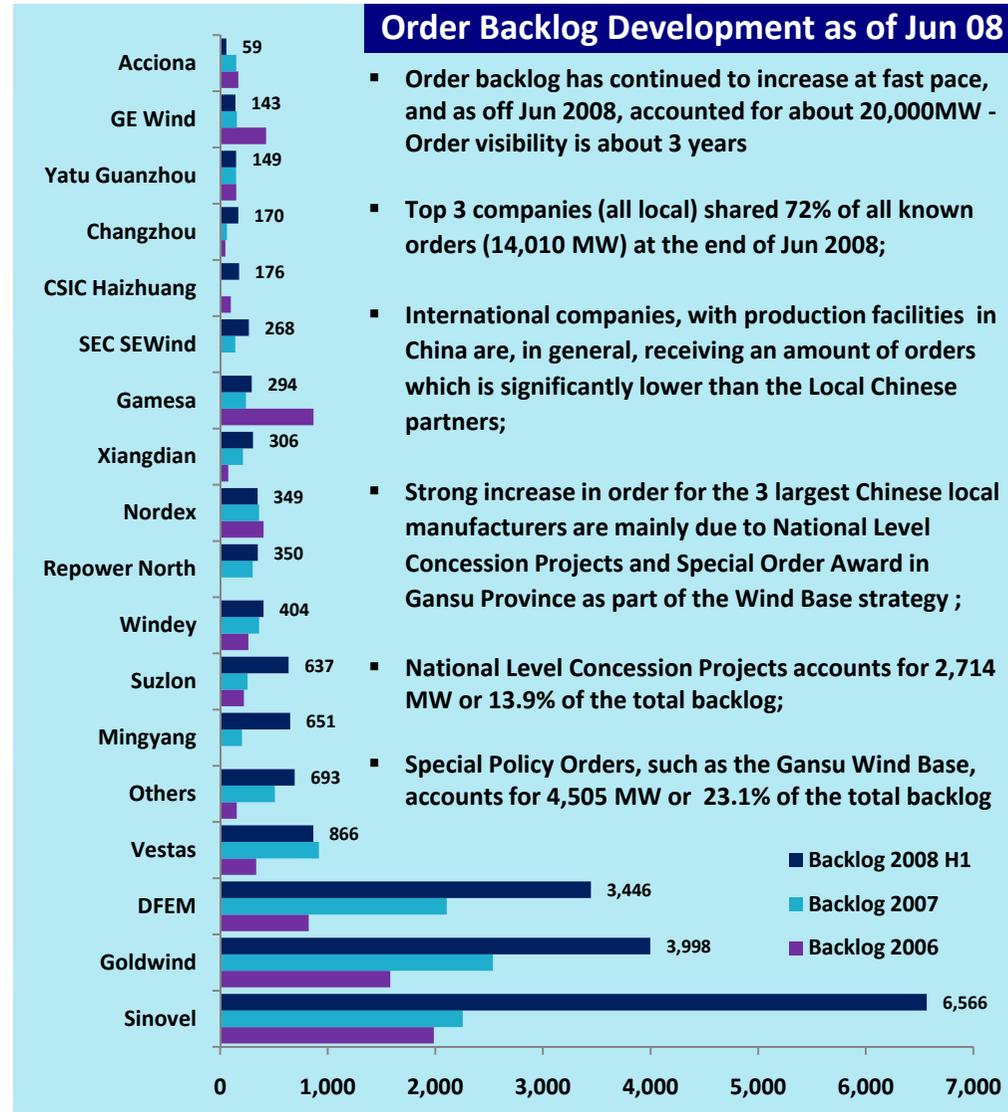
Suppliers	2004		2005		2006		2007		2008 H1		Total 04-08	
	MW	%	MW	%	MW	%	MW	%	MW	%	MW	%
Sinovel	0	0%	0	0%	83	6%	680	21%	446	22%	1,208	16%
Goldwind	40	20%	132	27%	441	33%	830	25%	354	17%	1,797	24%
Vestas	60	31%	73	15%	318	24%	369	11%	291	14%	1,112	15%
DFEM	0	0%	6	1%	9	1%	222	7%	287	14%	524	7%
Gamesa	71	36%	179	37%	273	20%	560	17%	190	9%	1,274	17%
Nordex	8	4%	8	2%	22	2%	56	2%	96	5%	190	3%
Acciona	0	0%	0	0%	50	4%	51	2%	80	4%	180	2%
Others	0	0%	3	1%	5	0%	15	0%	77	4%	99	1%
Windey	1	0%	7	1%	18	1%	65	2%	72	3%	163	2%
Changzhou	0	0%	0	0%	0	0%	9	0%	65	3%	74	1%
GE	17	8%	78	16%	116	9%	213	6%	39	2%	462	6%
SEC	0	0%	0	0%	0	0%	23	1%	39	2%	61	1%
Suzlon	0	0%	0	0%	13	1%	206	6%	33	2%	251	3%
Haizhuang	0	0%	0	0%	0	0%	6	0%	-	0%	6	0%
Total	197	100%	488	100%	1,347	100%	3,303	100%	2,066	100%	7,400	100%

Suppliers	2004		2005		2006		2007		2008 H1		Total 04-08	
	MW	%	MW	%	MW	%	MW	%	MW	%	MW	%
International	157	80%	339	70%	791	59%	1,454	44%	729	35%	3,469	47%
Locals	40	20%	149	30%	556	41%	1,849	56%	1,338	65%	3,931	53%
Total	197	100%	488	100%	1,347	100%	3,303	100%	2,066	63%	7,400	100%

Source: Azure International

Market Development in China

Orders Backlog Development 2008 H1



Order Backlog Development as of Jun 08

- Order backlog has continued to increase at fast pace, and as off Jun 2008, accounted for about 20,000MW - Order visibility is about 3 years
- Top 3 companies (all local) shared 72% of all known orders (14,010 MW) at the end of Jun 2008;
- International companies, with production facilities in China are, in general, receiving an amount of orders which is significantly lower than the Local Chinese partners;
- Strong increase in order for the 3 largest Chinese local manufacturers are mainly due to National Level Concession Projects and Special Order Award in Gansu Province as part of the Wind Base strategy ;
- National Level Concession Projects accounts for 2,714 MW or 13.9% of the total backlog;
- Special Policy Orders, such as the Gansu Wind Base, accounts for 4,505 MW or 23.1% of the total backlog

Rank	WTG Manufacturer	2008 H1 Backlog	
		MW	%
1	Sinovel	6,566.40	33.6%
2	Goldwind	3,998.20	20.5%
3	DFEM	3,445.50	17.6%
4	Vestas	865.60	4.4%
5	Others	693.00	3.5%
6	Mingyang	651.00	3.3%
7	Suzlon	636.50	3.3%
8	Windey	404.00	2.1%
9	Repower North	350.00	1.8%
10	Nordex	348.70	1.8%
11	Xiangdian	306.00	1.6%
12	Gamesa	294.10	1.5%
13	SEC SEWind	267.50	1.4%
14	CSIC Haizhuang	176.00	0.9%
15	Changzhou	169.50	0.9%
16	Yatu Guanzhou	148.50	0.8%
17	GE Wind	142.50	0.7%
18	Acciona	58.50	0.3%
TOTAL		19,521	100.0%

Source: Azure International

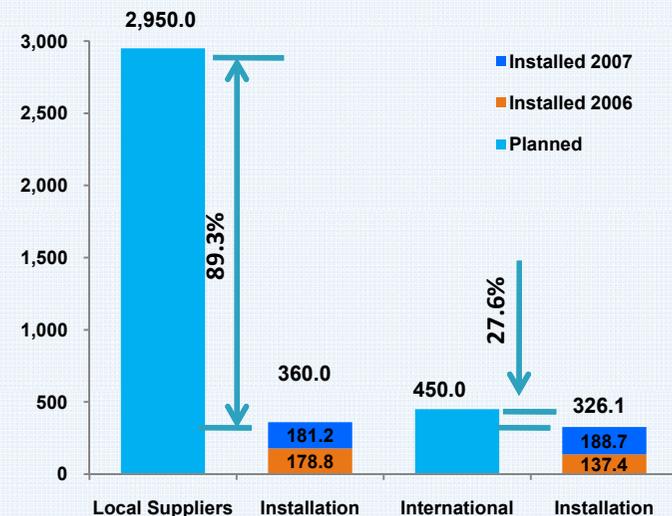
Market Development China

National Level Concession Projects

Project	PPA RMB/kWh	WTG Supplier	Planned Capacity (MW)	Installed Capacity (MW)			
				until 2006	%	Until 2007	%
2004	0.4917		850.0	316.2	37.2%	553.1	65.1%
Huilai Shibeishan	0.50	Goldwind	100.0	100.0	100.0%	100.0	100.0%
Rudong I	0.44	Vestas	100.0	30.0	30.0%	100.0	100.0%
Rudong II	0.52	GE	150.0	87.0	58.0%	127.5	85.0%
Tongyu	0.51	Sinovel	200.0	22.5	11.3%	27.0	14.0%
Tongyu	0.51	Gamesa	200.0	20.4	10.2%	98.6	49.3%
Hutengxile	0.43	Goldwind	100.0	56.3	70.3%	100.0	100.0%
2005	0.5021		600.0	0.0	0.0%	133.0	22.17%
Dafeng	0.49	Goldwind	200.0	0.0	0.0%	0.0	0.0%
Anxi	0.46	Goldwind	100.0	0.0	0.0%	100.0	100.0%
Dongtai	0.49	Sinovel	200.0	0.0	0.0%	33.0	16.0%
Jimo	0.60	Sinovel	100.0	0.0	0.0%	0.0	0.0%
2006	0.4409		1,000.0	0.0	0.0%	0.0	0.0%
Baotou Bayin	0.47	Goldwind	200.0	0.0	0.0%	0.0	0.0%
Danjing	0.50	Windey	200.0	0.0	0.0%	0.0	0.0%
Huitengliang I	0.41	Dongfang	300.0	0.0	0.0%	0.0	0.0%
Huitengliang II	0.42	Sinovel	300.0	0.0	0.0%	0.0	0.0%
2007	0.5153		950.0	0.0	0.0%	0.0	0.0%
Wulangyiligeng	0.47	Goldwind	300.0	---	---	0.0	0.0%
Tongliao Beiqinghe	0.52	Sinovel	300.0	---	---	0.0	0.0%
Yodaokou	0.55	Sinovel	150.0	---	---	0.0	0.0%
Yumen Changma	0.52	Dongfang	200.0	---	---	0.0	0.0%
Total	0.4916		3,400.0	316.2	10.7%	686.1	20.2%

Source: Azure International / Suzlon market research

- Low bidding with focus on acquiring pipeline ahead of profitability has been a noted problem with national level concession projects until 2007. This has happened despite the fact that selection criteria have officially shifted to lower weighting on price.
- In 2005 concessions, the grid price was weighted at 40% of the full evaluation criteria, and for 2006 this was reduced to 25%. In 2007, the criteria was to select that tariff closest to the average
- All projects awarded before 2007 had a 3 year window for construction, and the projects awarded in 2007, has a 4 year construction window.



Order from Special NDRC Policies

Gansu Jiuquan 10 GW Wind Base

- In early May, the NDRC approved ‘Gansu Jiuquan 10 GW Wind Base Plan’ and the pre-feasibility study for the first 3.8GW slated for development. By May 19 the NDRC approved “11th Five-Year Construction Plan of Gansu Jiuquan Wind Base (DR Energy [2008]1135)” but the document has not been publicly released. On May 22 Gansu Provincial Government held a press conference in Beijing in which the wind base was presented for the benefit of interested WTG manufacturers.
- The 3.8GW first phase project consist of twenty adjacent 100-200MW projects to be developed by 2010. If successfully built and operating this should be the world’s largest “wind farm.

Features of Gansu Jiuquan wind base development:

1. The wind farm developers were not chosen through open public bidding.
2. No mention of wind resource measurement data available for WTG selection and micrositing.
3. With one exception, no other private or non state or provincial government owned companies will participate in development.
4. A single feed-in tariff, set at RMB 0.5206 per kWh has been applied as per the latest Gansu National Concession project.
Other basic conditions per the Gansu Yumen Changma
5. The Gansu provincial DRC organized this development. On 16 March, the Gansu Provincial Government forbade lower-level governments from participating in or approving wind farm developments signaling the province’s intention to manage its wind resource with a strong centralized approach.
6. At the press conference, the Jiuquan Governor stated that turbine manufacturers with production in Gansu will be preferred as equipment suppliers. On 19 May, Jiuquan government signed an agreement with Sinovel to establish a manufacturing facility in Jiuquan. Goldwind already signed a similar contract in 2007 and already started constructing an assembly facility early this year to be completed by year-end. Several other companies including Huiteng (blades), Sany (WTG), Dongjia, Huayi, are planning to locate in the vicinity according to the Jiuquan Government press release.

Order from Special NDRC Policies

Gansu Jiuquan 10 GW Wind Base - Project Award Distribution

No	Project	Project Owner	Project Capacity kW	Awarded Volumes kW			
				Sinovel 1.5MW	DFEM 1.5MW	Goldwind 1.5MW	Haizhuang 2MW
1	Yumen Changma No.1	Datang	201,000	201,000			
2	Yumen Changma No.2	CNOOC	199,500		199,500		
3	Yumen Changma No.3	CECIC	199,500		199,500		
4	Guazhou Beidaqiao No.1	China Hydropower Engineering Consulting	199,500	100,500		99,000	
5	Guazhou Beidaqiao No.2	SDIC Huajing	199,500		199,500		
6	Guazhou Beidaqiao No.3	Longyuan	201,000	201,000			
7	Guazhou Beidaqiao No.4	Huining (Gansu) New Energy	201,000			201,000	
8	Guazhou Beidaqiao No.5	China Power International	201,000	201,000			
9	Guazhou Ganhekou No.1	Guangdong (China) Nuclear Power	199,500		199,500		
10	Guazhou Ganhekou No.2	Huaneng Power international	199,500		199,500		
11	Guazhou Ganhekou No.3	State Grid Xin Yuan & Northwest Power	201,000	201,000			
12	Guazhou Ganhekou No.4	Sinohydro Corporation	199,500	90,000		109,500	
13	Guazhou Ganhekou No.5	Gansu Power Investment Group	201,000	150,000		51,000	
14	Guazhou Ganhekou No.6	China Power International & Xinmao	201,000			201,000	
15	Guazhou Ganhekou No.7	Huadian New Energy	201,000	201,000			
16	Guazhou Ganhekou No.8	Guohua Energy Investment	201,000	201,000			
17	Guazhou Qiaowan No.1	China Resources Power	201,000		150,000	51,000	
18	Guazhou Qiaowan No.2	Huaneng Renewable Energy	201,000	201,000			
19	Guazhou Qiaowan No.3	North Longyuan	101,000	51,000			50,000
20	Guazhou Qiaowan No.3	Golden Concord	99,000			99,000	
Total			3,807,500	1,798,500	1,147,500	811,500	50,000
[%] of the total orders available				47.2%	30.1%	21.3%	1.3%

Source: Azure International

Order from Special NDRC Policies

Gansu Jiuquan 10 GW Wind Base – Turbine Prices

No	Project	Project Owner	Project Capacity kW	Awarded Prices RMB/kW			
				Sinovel 1.5 MW	DFEM 1.5MW	Goldwind 1.5MW	Haizhuang 2MW
1	Yumen Changma No.1	Datang	201,000	5,898			
2	Yumen Changma No.2	CNOOC	199,500		6,179		
3	Yumen Changma No.3	CECIC	199,500		6,179		
4	Guazhou Beidaqiao No.1	China Hydropower Engineering Consulting	199,500	5,898		6,398	
5	Guazhou Beidaqiao No.2	SDIC Huajing	199,500		6,179		
6	Guazhou Beidaqiao No.3	Longyuan	201,000	5,898			
7	Guazhou Beidaqiao No.4	Huineng (Gansu) New Energy	201,000			6,398	
8	Guazhou Beidaqiao No.5	China Power International	201,000	5,898			
9	Guazhou Ganhekou No.1	Guangdong (China) Nuclear Power	199,500		6,149		
10	Guazhou Ganhekou No.2	Huaneng Power international	199,500		6,179		
11	Guazhou Ganhekou No.3	State Grid Xin Yuan & Northwest Power	201,000	5,898			
12	Guazhou Ganhekou No.4	Sinohydro Corporation	199,500	5,898		6,398	
13	Guazhou Ganhekou No.5	Gansu Power Investment Group	201,000	5,898		6,398	
14	Guazhou Ganhekou No.6	China Power International & Xinmao	201,000			6,398	
15	Guazhou Ganhekou No.7	Huadian New Energy	201,000	5,898			
16	Guazhou Ganhekou No.8	Guohua Energy Investment	201,000	5,898			
17	Guazhou Qiaowan No.1	China Resources Power	201,000		6,179	6,398	
18	Guazhou Qiaowan No.2	Huaneng Renewable Energy	201,000	5,898			
19	Guazhou Qiaowan No.3	North Longyuan	101,000	5,912			6,450
20	Guazhou Qiaowan No.3	Golden Concord	99,000			6,413	
Total			3,807,500				

Source: Azure International

Order from Special NDRC Policies

The Wind Base Concept and its potential implications

The 'wind base' concept is meaningful in the scheme of continued Chinese wind project development. The concept of large 'wind bases' in regions with solid resources and planned grid interconnection has appeared in key pieces of legislation related to the roll-out of wind in China.

- The 'Mid and Long-term RE Implementation Plan' from Jun 07, 07 planned for 3 x 1-GW wind bases in Jiangsu, Hebei and IMAR by 2010. By 2020, 6 x 1-GW wind bases are planned to be constructed in Xinjiang Dabancheng, Gansu Yumen, Jiangsu-Shanghai coast, IMAR Huitengxile, Hebei Zhangbei and Jilin Baicheng, and other areas of proven wind resources.
- More recently, the '11th Five-year RE Development Plan' (Mar 03, 08) adjusted the 2010 wind target to 10GW mentioning 5 x 1-GW wind bases in Hebei, IMAR, Gansu, Jilin and Liaoning.

Implications for Project Developers

- For non-SOE project wind project developers, this development sets a negative precedent. A similar approach may be adopted in the future development of Hebei, Liaoning, Jilin and IMAR which are also slated to have 'wind bases'. By extension further wind bases could also adopt conditions set via national concession projects.
- The 'wind base' mechanism does not appear to be a policy tool for provincial DRCs to catch-up planning targets. Gansu was on the way to achieve its 1GW target before the 'wind base' plan emerged. After publishing a 1GW by 2010 target in 2006, 376.6MW had been installed by year-end 2007, with a further 669 MW of non wind-base 'near term' pipeline existing.

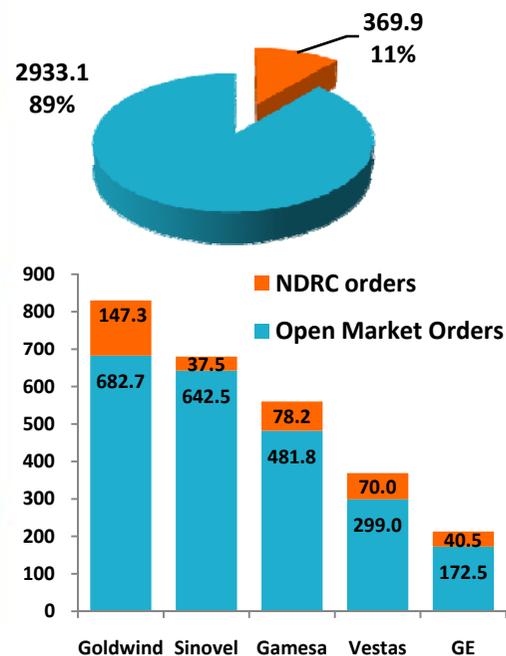
Implications for WTG manufacturers

- For WTG manufacturers, the wind bases will likely bring pressure to localize regionally. Governments in key wind provinces will all eye local manufacturing investment and jobs as a benefit not to be missed. Domestic WTG manufacturers are responding with de-centralized assembly. For example, Goldwind is in the process or has already established manufacturing bases in Beijing, Hebei Chengde, Guangdong Huilai, Gansu Jiuquan (under construction), Xinjiang (under construction), IMAR Baotou (under construction), and Ningxia – closely following future likely wind base developments.

Order Book Breakdown – 2008 H1

Order Breakdown	Sinovel	Goldwind	DFEM	Vestas	Ming Yang	Suzlon	Gamesa	Windey	REpower	Nordex	Others	Total
Order Book as of Jun 30, 08	6,716	3,968	3,446	816	681	637	491	404	350	349	1,953	19,811
NDRC Concession Projects	1,190	700	500	0	0	0	101.5	200	0		22.5	2,714
NDRC Special Policies	1,914	1,146	1,400	0	0	0	0	12	0	33	0	4,505
Orders on Open Market	3,613	2,123	1,547	816	681	637	389.5	192	350	316	1,930	12,592
% Open Market	53.8%	53.5%	44.9%	100.0%	100.0%	100.0%	79.3%	47.5%	100.0%	90.5%	98.8%	63.5%

Installations 2007



- In 2007, 11% of all installations (369.9 MW out of 3,303 MW) where National Level Concession Projects, and International suppliers installations accounted for 188.7MW of this total; however, in the future this figures are going to be much lower as the current existing backlog of those order in the International Company's books is only 123.9 MW;
- On the other hand, the amount of installations by Local Companies coming from National Level concession projects and Special Policy Orders will increase substantially.

Installation Visibility	2008 ⁽¹⁾	2009	2010 ⁽²⁾	2011 ⁽³⁾	Total
NDRC Concession Projects	764	1,000	950	1,000	3,714
Special Policy Orders	350	831	1,662	1,662	4,505
Total	1,114	1,831	2,612	2,662	8,219

Remarks:

1. NDRC concession projects with expired window construction awarded in 2004 and those expiring in 2008
2. For Special Policy Orders, we have assumed orders dated at the defined date (350MW), and for others (4,155 MW Incl. Gansu) we have considered 20% in 2009, 40% in 2010 and 40% 2011
3. For NDRC concession projects in 2011, we have considered the same historic level which has been awarded in 2006 and 2007, or 1,000MW

Source: Azure International / CWEA statistics 2007/ Suzlon market research

Market Development China

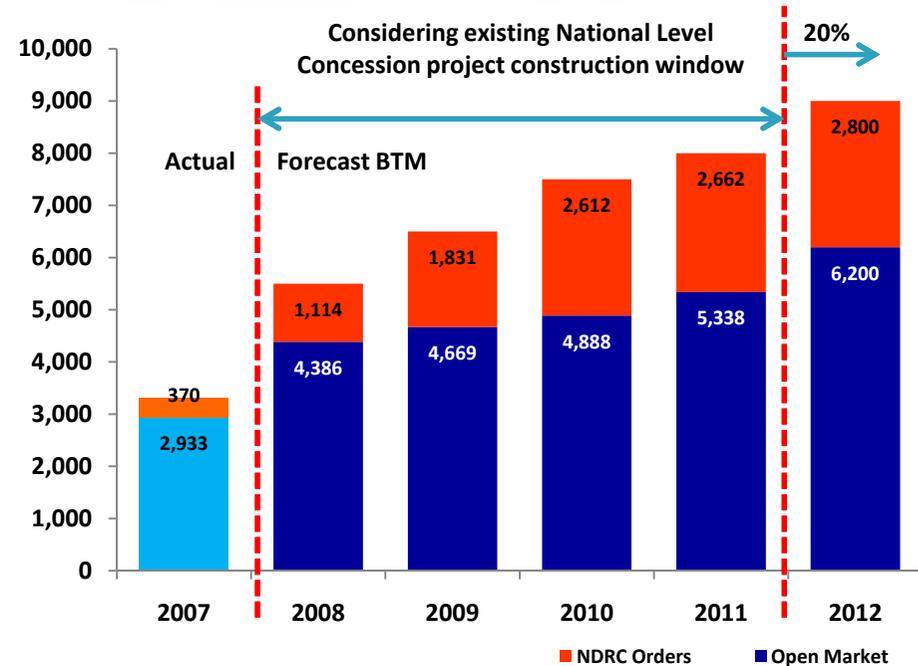
Addressable Market Share – Excluding NDRC Concession Projects and Special Policy Orders

- The addressable market for International Turbine suppliers is significantly smaller than that of the existing forecast, since those companies do not have fair access to all orders in the Market.
- If the construction window of the National Level concession projects and Special Policy Orders (such as Wind Bases) is respected (it was not for contracts awarded in 2004) we can assume that the following Installations will need to be made:

Addressable Market	2008	2009	2010	2011	2012 ⁽¹⁾
BTM Forecast	5,500	6,500	7,500	8,000	9,000
Special Policy Orders	1,114	1,831	2,612	2,662	2,800
Total	4,386	4,669	4,888	5,338	6,200
Market volume (%)	79.8	71.2	65.2	66.8	68.8

Remarks:

- For 2012 we have considered that:
 - Orders from national level concession projects will be at the same level of that awarded in 2006 and 2007, or 1,000MW;
 - Order from special policies will account to about 1,800 MW, or about the same level we have for orders already awarded.

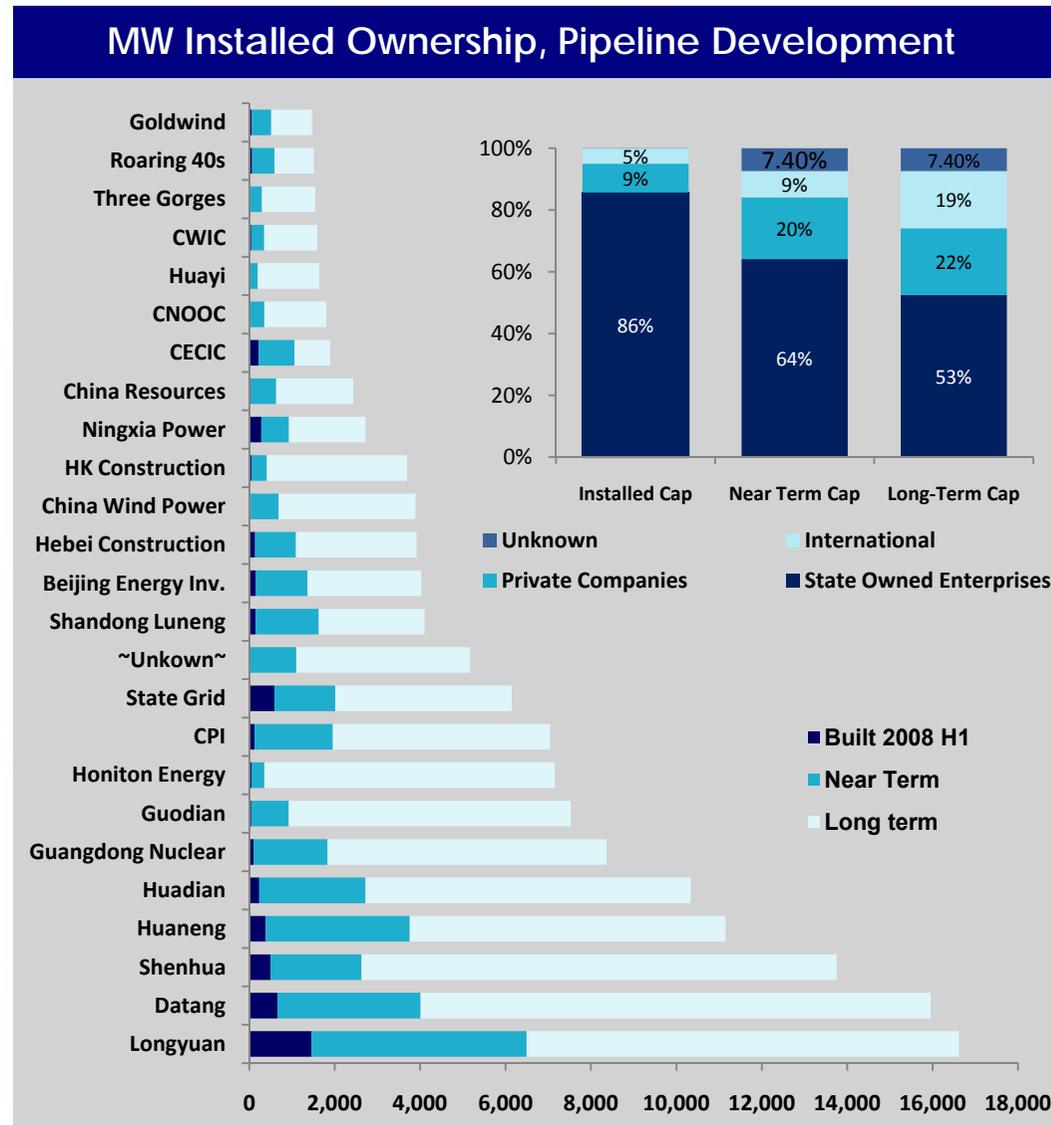


- All the figures suggests that in future , most likely, no International company producing in China will be able to reach 20% market share level, since a significant amount of the installations will be made of orders already placed by the government to Local suppliers;
- According to our estimates, no more than 70% of the total market will be addressable to international companies producing in in China and from this total, Local companies with local brands, will still play an important role;

Source: Azure International / CWEA statistics 2007/ Suzlon market research

Market Environment Project

Development of Wind Farm Ownership



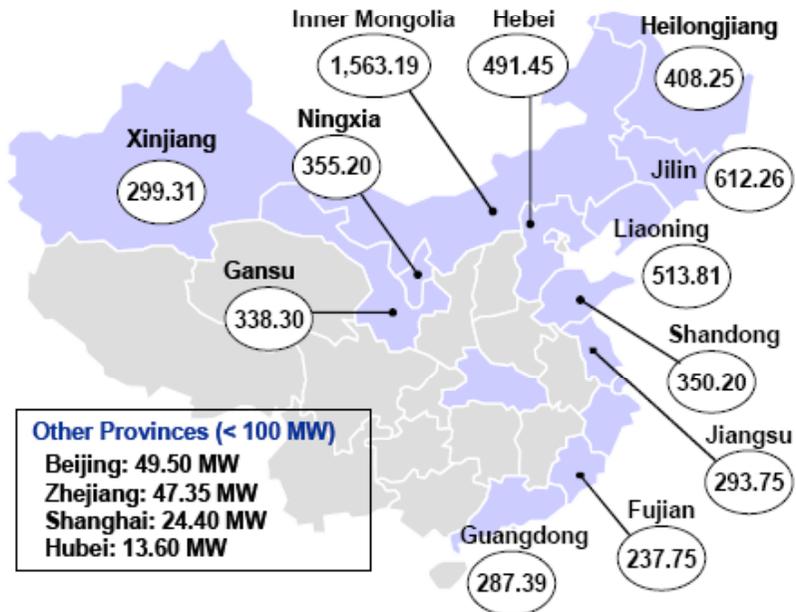
- There are about 200 players currently operating as developers in the wind business in China
- The top 25 companies in China have a total of 5,382 MW installed capacity, which represents 91% of the total installations. They are responsible for 76.4% of the Near Term development (32,478 MW of 42,490 MW), and 73.1% of the Long Term Development (107,586 MW of 147,139 MW)
- Among the top 25 developers there is an current order backlog of about 16,594 MW; however, 15,8840 MW worth of installations on a near term basis are still to be ordered!
- Government agencies / utilities will continue to be the biggest customer base but their domination will subside

Traditional Players will still be the dominant force in the development of the windbusiness in China; however, there is an increasing number of Foreginer players actively looking for options to participate in the market!

Source: Azure International

China Wind Power Development footprint

Key Province 2007 Wind Additions (MW)

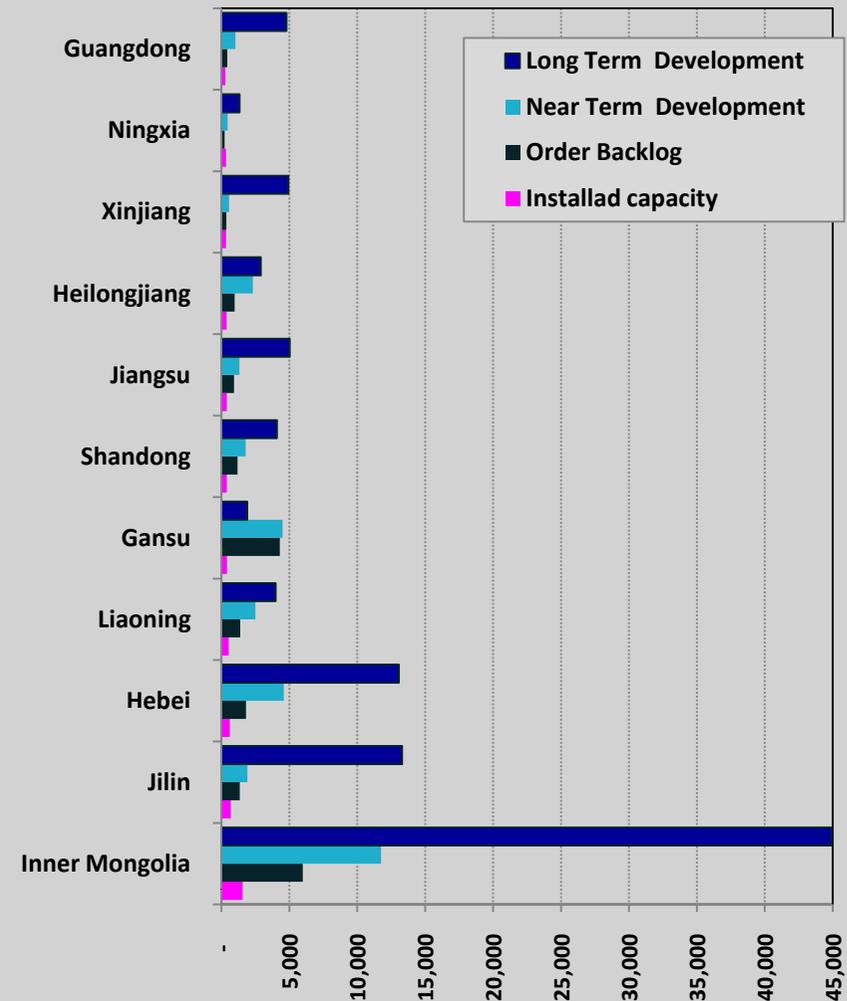


Analysis

The top 11 provinces in China in terms of Windpower development account for 93% of all installations and 98% of the future pipeline; however:

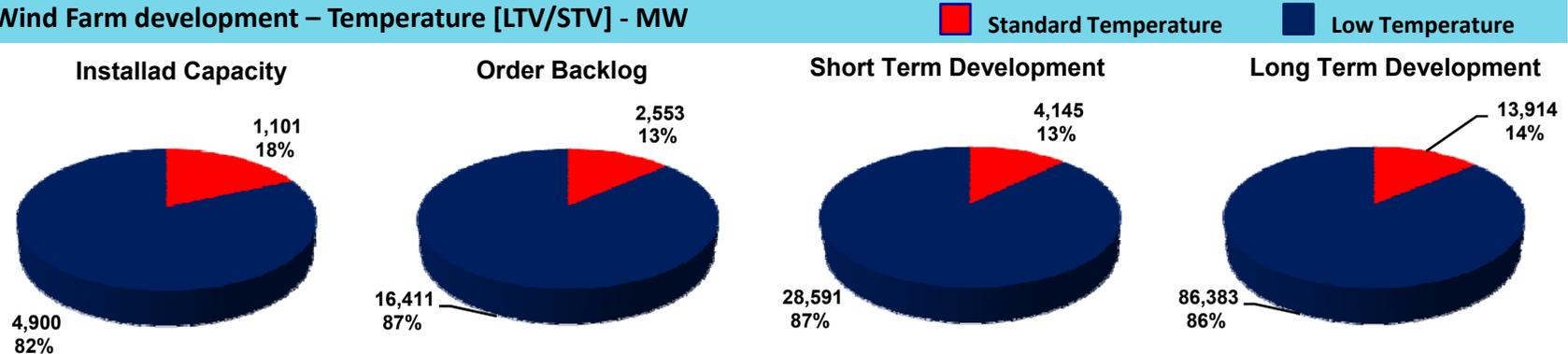
- Inner Mongolia accounts for 43% of all future developments;
- The top three provinces (Inner Mongolia, Jilin and Hebei, where Beijing and Tianjin are located) accounts for 68% of the future project developments;
- Balance between Low and Standard temperature machines will become more difficult as STV areas represents only 14% of long term developments.

Wind Farm development footprint / province [MW]

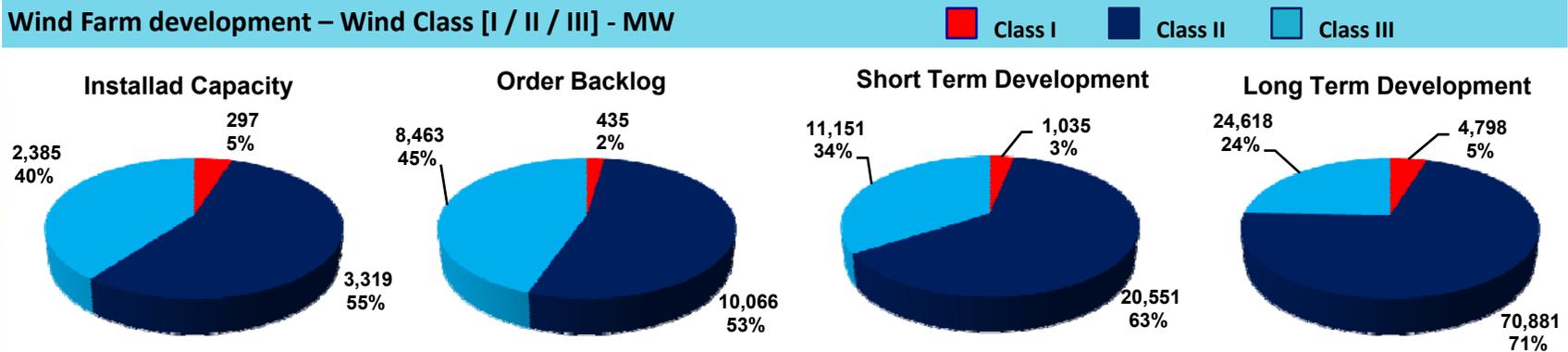


China Wind Power Development footprint

Wind Farm development – Temperature [LTV/STV] - MW



Wind Farm development – Wind Class [I / II / III] - MW



The Chinese Wind power business is clearly a Class II/III LTV predominant Market, and the future tendency shows an increased importance in LTV/Class II, for what we will need larger and more competitive machines in terms RMB/MWh. Our current product portfolio is not sustainable on a medium/long term, and action must be taken immediately

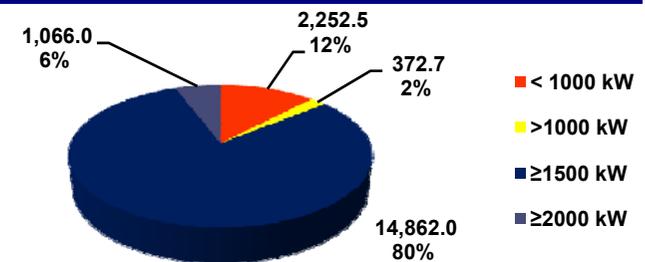
Competition Product Capabilities China

Companies		750		800		850		1250		1300		1500		2000		Total
		MW	[%]	MW	[%]	MW	[%]	MW	[%]	MW	[%]	MW	[%]	MW	[%]	MW
International Brands	Suzlon							100.0	15.7%			535.5	84.3%			635.5
	Vestas					455.6	52.6%							410.0	47.4%	865.6
	Repower													350.0	100.0%	350.0
	Nordex									5.2	1.5%	343.5	98.5%			348.7
	Acciona											58.5	100.0%			58.5
	GE Wind											142.5	100.0%			142.5
	Gamesa					294.1	100.0%									294.1
Total		-	0.0%	-	0.0%	749.7	27.8%	100.0	3.7%	5.2	0.2%	1,080.0	40.1%	760.0	28.2%	2,694.9
Domestic Established	Sinovel											6,565.5	100.0%			6,565.5
	DEC											3,445.5	100.0%			3,445.5
	Windey	244.5	60.5%	80.0								79.5	19.7%			404.0
	Goldwind	1,178.3	29.5%									2,820.0	70.5%			3,998.3
Total		1,422.8	9.9%	80.0	0.6%	-	0.0%	-	0.0%	-	0.0%	12,910.5	89.6%	-	0.0%	14,413.3
New Entrants	Mingyang											651.0	100.0%			651.0
	Xiangdian													306.0	100.0%	306.0
	SEC							267.5	100.0%							267.5
	China Creative											220.5	100.0%			220.5
Total		-	0.0%	-	0.0%	-	0.0%	267.5	18.5%	-	0.0%	871.5	60.3%	306.0	21.2%	1,445.0
Grand Total		1,422.8	7.7%	80.0	0.4%	749.7	4.0%	367.5	2.0%	5.2	0.0%	14,862.0	80.1%	1,066.0	5.7%	18,553.2

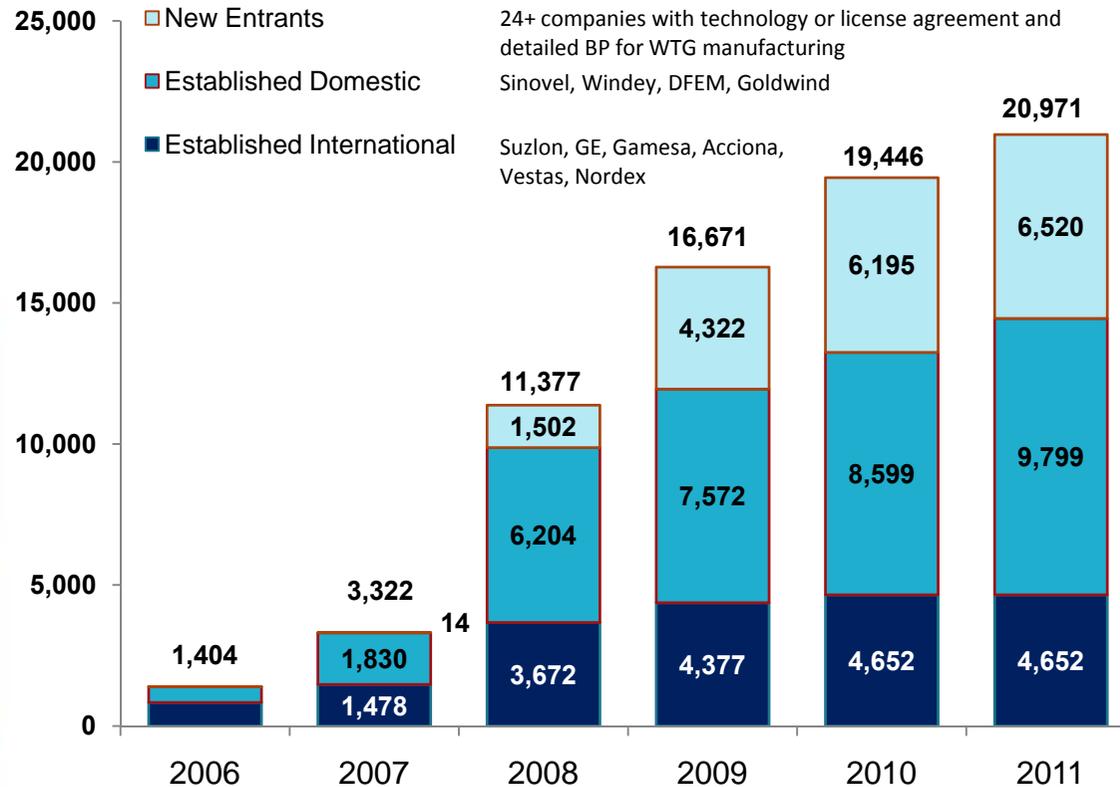
Analysis

- 85% of all exiting orders are for machines ≥ 1500 kW, and with exception of Gamesa, all suppliers have a product available ≥ 1500 kW
- International Customers are starting to source WTGs from local suppliers, provided there is a qualified license provider and WTG is cost effective (Mingyang has a 400MW order with Datang Jilin/R40s);
- SEC is in discussions with Siemens to form a New JV in China, but they already have two other license agreements with Dewind (1250KW) and Aerodyn (2000 K)

WTG Size distribution – Order Book



Competition: Manufacturing Buildup – Industry Plans



Analysis

- There is a significant mismatch between capacity build-up and market forecast
- If plans are fully implemented, local companies will be able, alone, to handle the market
- Foreigner players will face a very stiff price competition and will need to develop export plans
- Capacity is supposed to be even higher, if smaller players are considered

Of late, there has been a trend of Large Chinese Power getting into Wind turbine manufacturing. This may take away significant volume from the open market and further intensifies the competition

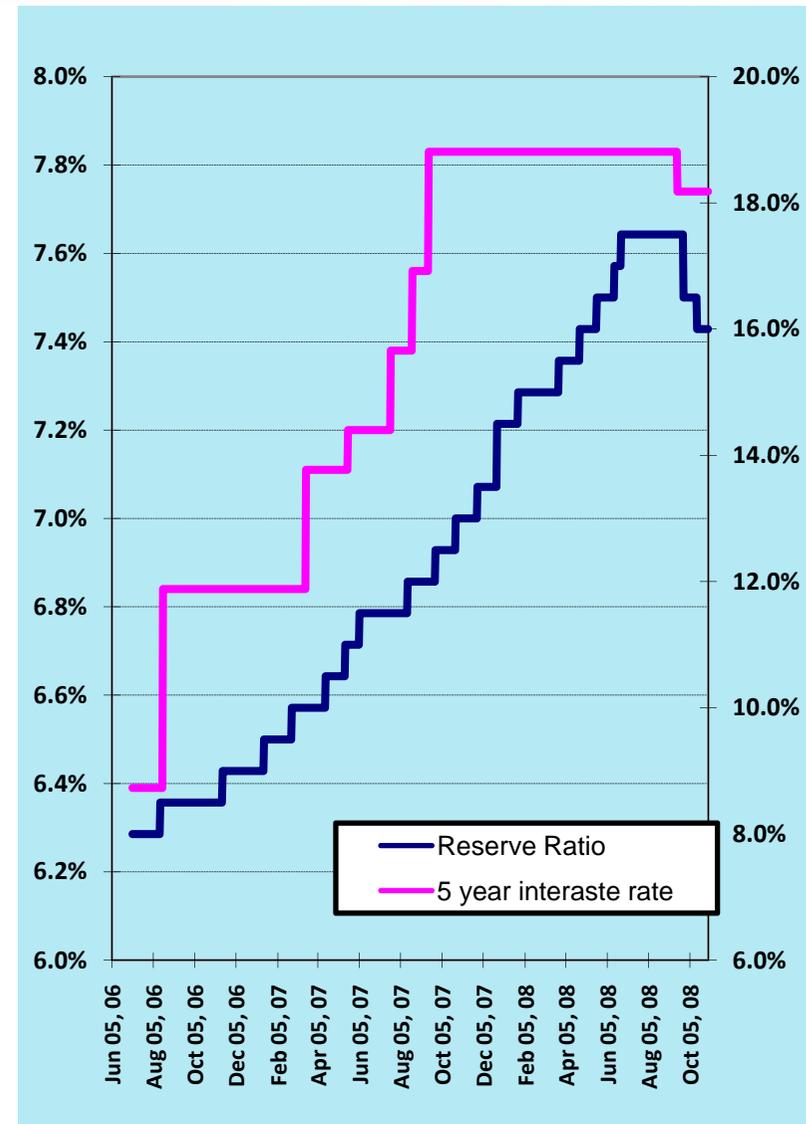


Macro Economic Conditions

Macro Economic Indicators

Banking Condition in China

- In June 2008, China's central bank announced that the commercial bank reserve requirement ratio would be raised by 100 basis point to 17.5%. (in year 2006 RRR was 7.5% & in Q1 2007 it was 10%). This requirement was reduced on Oct 15 to 16.0%; however, reserve ratio levels are still at historic highs
- Early reports which stated that the RRR could reach to 19% by the end of 2008, are no longer correct due to the current global and Chinese financial situation.
- Bank's lending reduced by quarterly limits (Quota) imposed by Central bank this year. It aimed to cap new Yuan lending in 2008 at about last year's level of RMB 3.63 trillion.
- Drastic liquidity change since late 2007 – especially driven by USD liquidity issues since Central Bank requires all the reserve by banks to be made in USD
- Banks funding cost is much higher than 2007. Inter-bank rates increased sharply in the first 9 months of 2008. However, this tendency has been somewhat reversed when The People's Bank of China reduced the benchmark one-year lending interest rate by 27 basis points to 7.2 percent with effect from September 16. This is understood to help spur the sentiment in real estate market as well as cut some real estate developers' financing costs
- In the increasing credit market tightening, banks are more cautious which makes financing difficult for the developers and delays in the project.



Source: Azure International

Renewable Energy Financing

New guidelines have been introduced for the approval process

- Detailed project review process is in place, linking the disbursements to specific projects. This eliminates flexibility for the developers to use the funding for other projects.
- Banks take greater responsibility for the due diligence

Investment Considerations

- Only Chinese majority owned JV is entitled for CDM registration
- 51% Chinese shareholding critical for CER revenues

Debt/Equity ratio

- Chinese companies 80:20
- Foreign companies maximum 2:1

Foreign developers to be adversely effected

- Regulations restrict carbon credit revenues

Case Study: Huaneng Fuxin Gaoshanzhi

Project Name:	Huaneng Fuxin Gaoshanzhi I
Capacity:	100MW
Location:	Liaoning
Borrower:	Huaneng New Energy
Debt Provider:	China Development Bank
Equity Provider:	Huaneng Group (Parent)
Data of Financing Closure:	Mar 2008
Total Project Cost:	USD 145 .0 million
Total Debt	USD 115.9 million
Total Equity:	USD 29.1 million
Gearing:	80% (as % total project cost)
Debt Interest:	6.84 % per year
Loan Term:	N/A
Project Lifetime:	21 years

Description: Huaneng is building a 100.5 MW windfarm in Liaoning province due for completion in Sep 2008. The 1.5MW WTGs will be supplied by Sinovel. The project is applying for CDM and it is expected to achieve an IRR of 8.85% with CDM credits

Wind Power Development in China

Conclusions

- **The Financial Crisis we are facing at the moment may slow down the development of the market, but the installed capacity will still be higher than that of 2007; however, bottleneck issues are not fully solved**
 - ▶ **Supply Chain (which also plays an important role in the global business);**
 - ▶ **Qualified personnel – The established companies will have problems to build-up capability, especially in the technical side.**

- **Furthermore:**
 - ▶ **All indications show that there will be overcapacity in manufacturing of wind turbines; however current financial environment may delay expansion plan from small players;**

 - ▶ **Price pressure will most likely increase, specially for the international suppliers (due to low PPAs, competition from local players, and overcapacity);**

 - ▶ **International project developers and turbine suppliers established in China must be granted access to compete on equal terms with local players on National Level Concession Projects and NDRC special policy projects (such as the Wind base scheme);**

 - ▶ **Intention of local project developers to produce its own WTG**

 - ▶ **Establishment of a “Chinese certification requirement”, when there is an already existing and worldwide recognized certification in place.**



Suzlon Manufacturing Facilities

Suzlon Manufacturing Facility – Tianjin

Aerial View

Total Area: 250,000 m²
Total Built Area: 58,500 m²



Suzlon Energy Tianjin Ltd

Manufacturing Capabilities



Weihai Rongcheng Wind Farm – Guohua I R40s
Shandong Province
39 x S66 1.25 MW

Suzlon Energy Tianjin Ltd

Beijing Office

Employees : 125

Sales, PM, Site installation and OMS, Financial Services

Tianjin Factory:

Employees: 1,100

Manufacturing Capabilities

- **Rotor Blade Unit (RBU)**
- **Nacelle Cover Unit (NCU)**
- **Wind Turbine Generator Unit (WTG)**
- **Control Panel Unit (CPU)**
- **Generator Unit**
- **Support Infrastructure and facilities**
- **Center for Research & Development**
- **Training Center**

Deliveries in 2007: 206 MW



Thank you

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