emerging energy research

Asia Pacific Wind Energy Advisory

ID# APW 975-081031

China Wind Power Markets and Strategies:
中国风电市场及战略

Building a Pillar of Industry Growth

产业增长的支柱

Global WindPower 2008
2008 北京国际风能大会

31 October 2008
Beijing, China

Caitlin Pollock
Asia Pacific Wind Energy Analyst
+34 93 272 6753
cpollock@emerging-energy.com

Overview
概论

- China is on track to lead the global wind market in annual installations by 2011 with an estimated 10 GW per year, supported by strong political will, improving incentives, and vast natural and industrial resources

  到2011年，中国将成为全球风电市场的领先者，装机容量将达到10GW。这将依赖于强烈的政治意愿，不断改善的激励政策，巨大的自然禀赋和产业资源

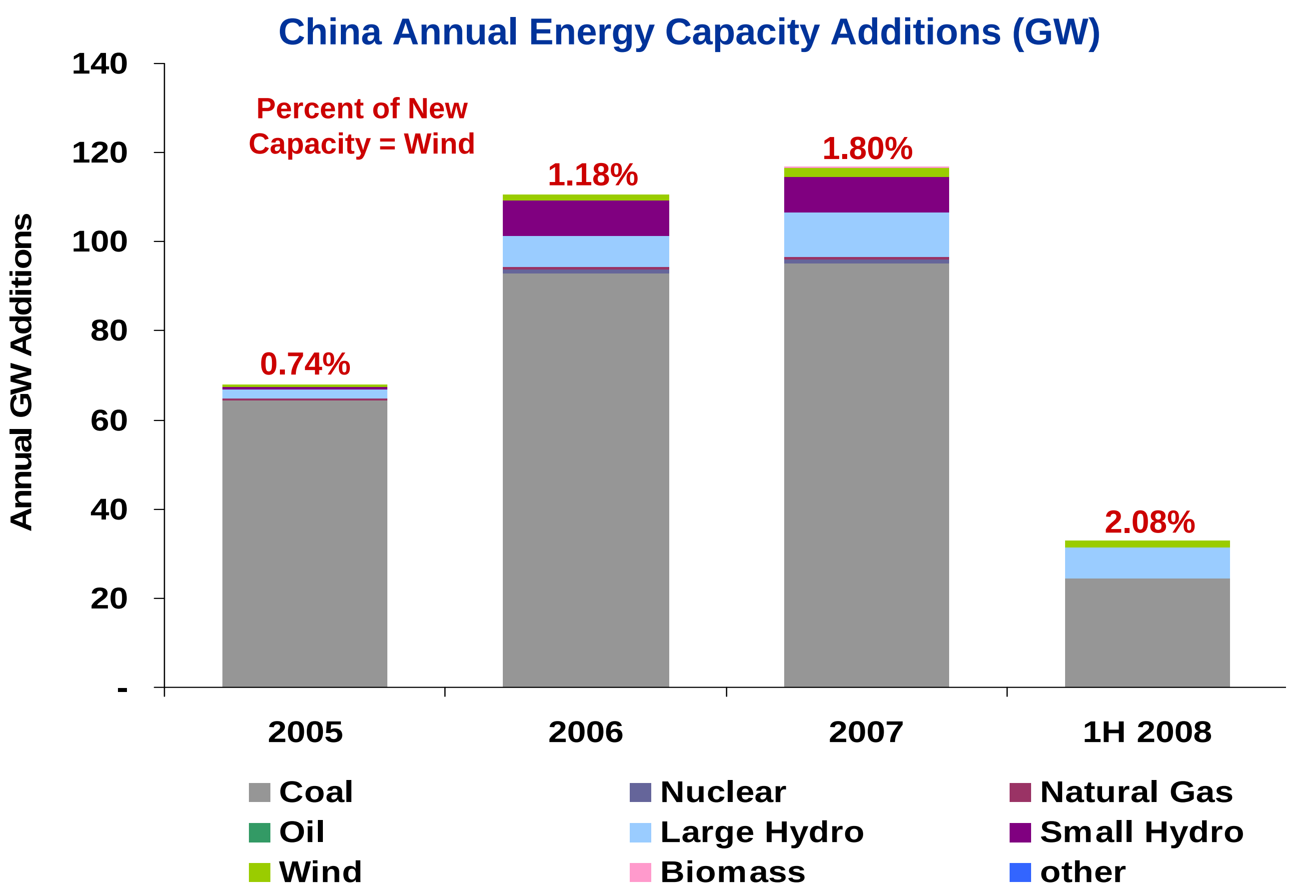
- China's wind development value chain is evolving with major state generators consolidating their presence, while IPPs and foreign entrants seize opportunities as project owners, operators, and technical consultants

  中国的风电价值链将发展为：大型国有电力企业进一步巩固其地位，同时独立发电企业和新进入的外国公司也将成为项目所有者、经营者和提供技术咨询

- Wind turbine and component manufacturers are stepping up to meet burgeoning demand, striking a balance between quality, cost, production capacity, and local content

  风机及风机装备制造商逐步满足新兴的需求，并努力在质量、成本、产能和本土化之间找到平衡

Wind Entering China's Power Mix
风电开始在中国的能源结构中占有一席之地



- ✓China's electricity demand growth (9% to 10% annually) has created a capacity gap
- ✓While energy sector growth plans remain centered around coal, additional technologies are entering the mix
- ✓Wind is evolving as one of China's top four technology options for new capacity
- ✓With coal-fired electricity prices rising, wind is becoming more cost-competitive

Source: Energy Information Administration, Japan Energy Statistics Institute, China Electricity Council, Emerging Energy Research

Wind is beginning to play a small but noticeable role in China's energy mix

风电开始在中国的能源结构中占有一席之地，虽然很小但不容忽视

Policy, Supply Diversity, Development Initiatives Driving Growth
政策、多样的供给和发展意愿驱动的增长

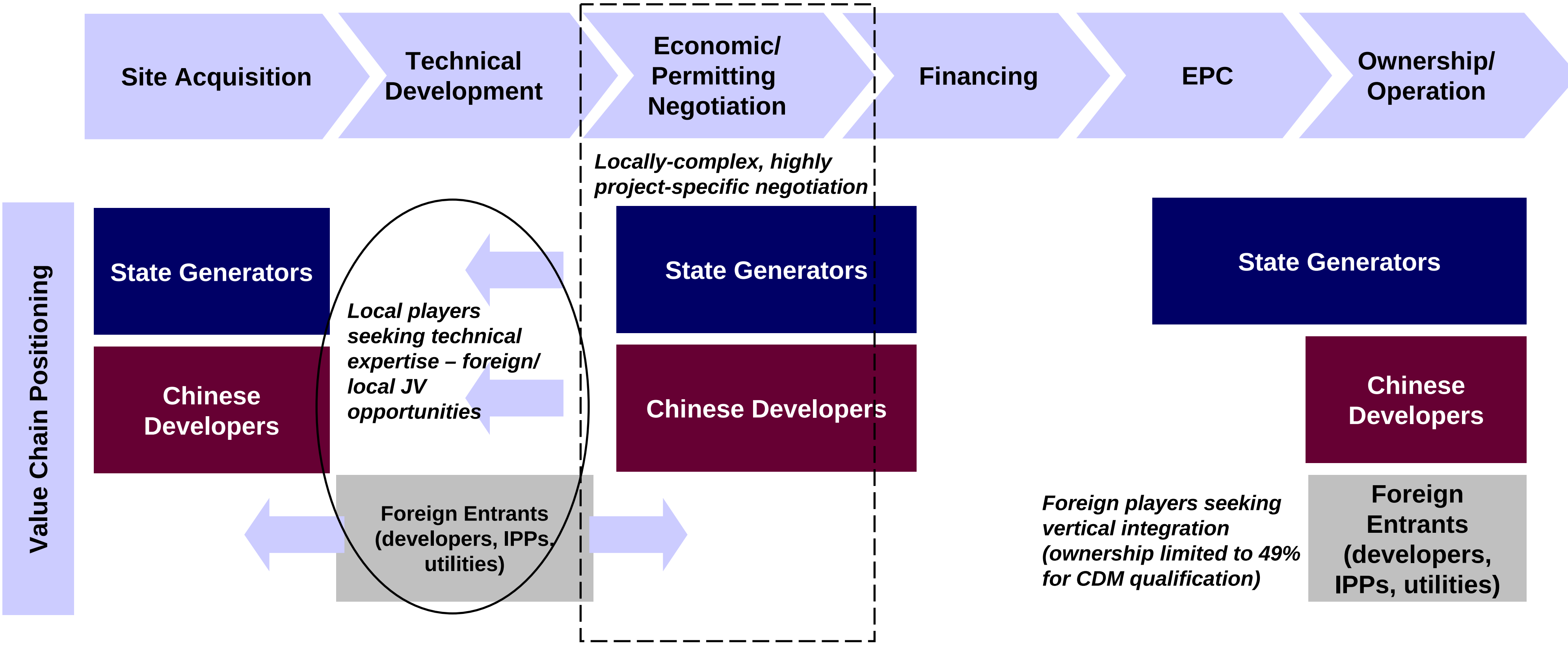
Market Component	Energy Mix	Policy	Development	Supply
Core Assumptions	• Coal-fired generation will dominate China's new capacity additions through 2020 • Secondary capacity additions through 2020 estimated at 200 GW of large hydro, and up to 53 GW of nuclear power • Wind emerging as nation's central renewable energy option	• 2006 Renewable Energy Law (mandating 15% RE-sourced electricity by 2020) applied with wide variation by province • Provinces to increasingly pursue wind resource exploitation with a mix of support measures	• Central government increasingly initiating and approving large groupings of projects • 'Wind power base' approach becoming integrated, driving phased gigawatt-size project execution • Greater foreign participation, domestic competition expected as market scales	• China to see rapid increase in turbine supply options and component providers • Chinese OEMs to dominate supply market in the long term • Component bottlenecks will be eased temporarily with imports, then steadily alleviated through 2012
2008–2010				
2011–2015				
2016–2020				

Driver | Limited Impact

Political will, investment plans, and capacity build-out are fueling a sustained growth period in China of unseen magnitude in the global wind energy industry

中国正在经历一场积极的政策意愿，投资规划和能力建设共同支撑的风电发展历程，这将为世界风能无法完全预见的可持续增长期添砖加瓦。

Project Development Value Chain Evolving with Fluid Model
项目发展价值链



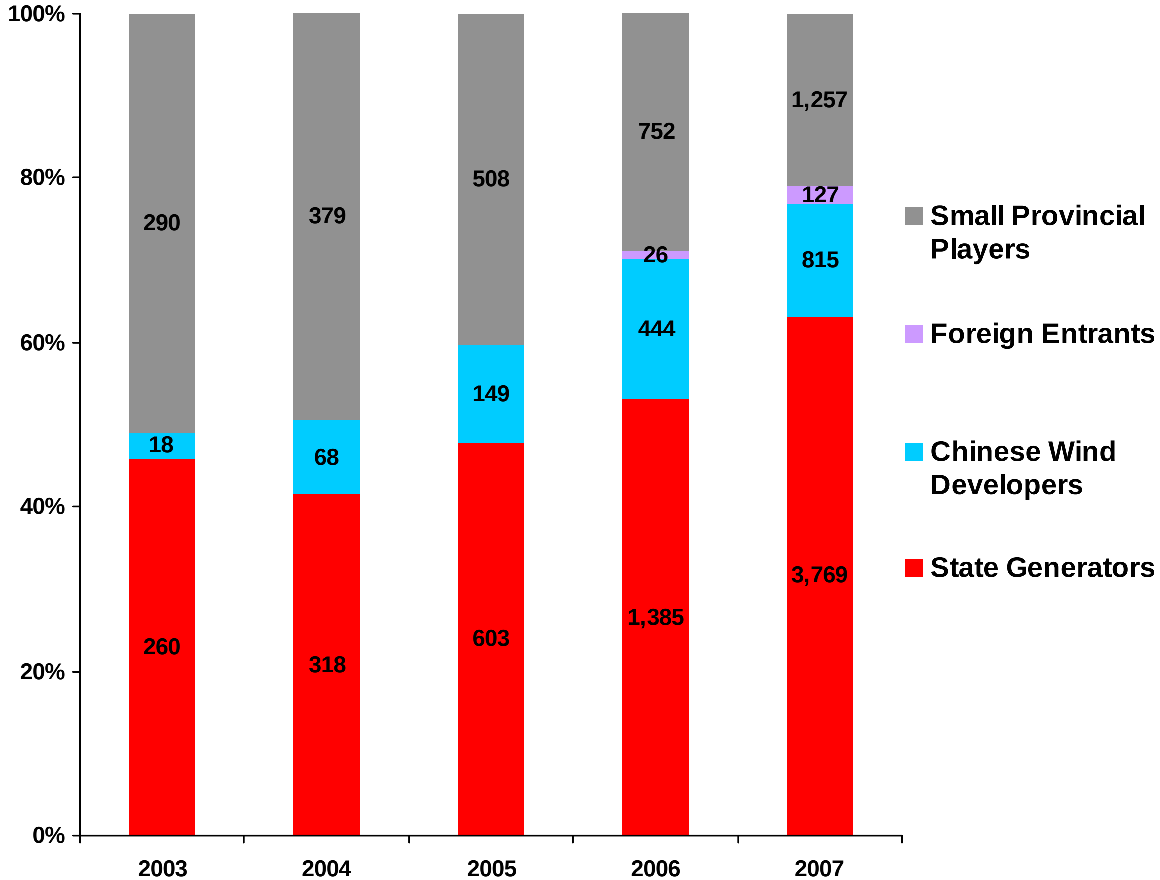
Source: Emerging Energy Research

Projects are executed through state generator, developer, and foreign entrant interaction across the value chain

在交叉的价值链上，国有电力企业、电力开发商和国外电力企业都将进行项目执行

Market Structure Consolidates Around State Generators
国有电力企业将继续巩固其市场地位

China Total MW Ownership by Type of Developer, 2003–2007

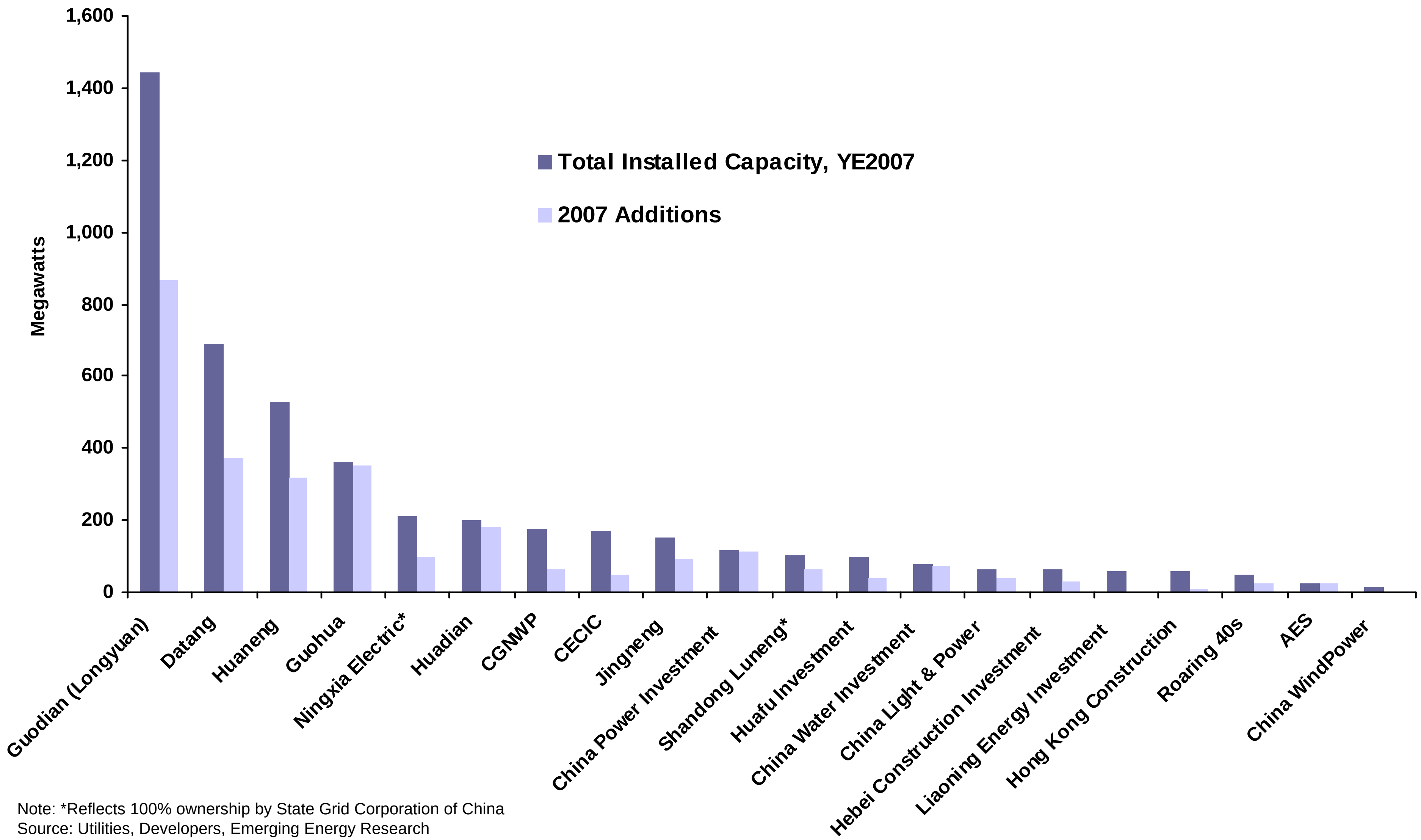


Source: Emerging Energy Research

- ✓State generators are consolidating majority market share over time
- ✓Chinese wind developers from diverse backgrounds are scaling ownership positions
- ✓Foreign entrants are seeking a foothold through near-term partnerships, with exploration targeting longer-term pipeline activations
- ✓Smaller provincial players are increasingly eclipsed as wind scales

State generators have rapidly consolidated their positions as leading wind project owners
国有电力企业将加速巩固其作为风电项目所有者的地位

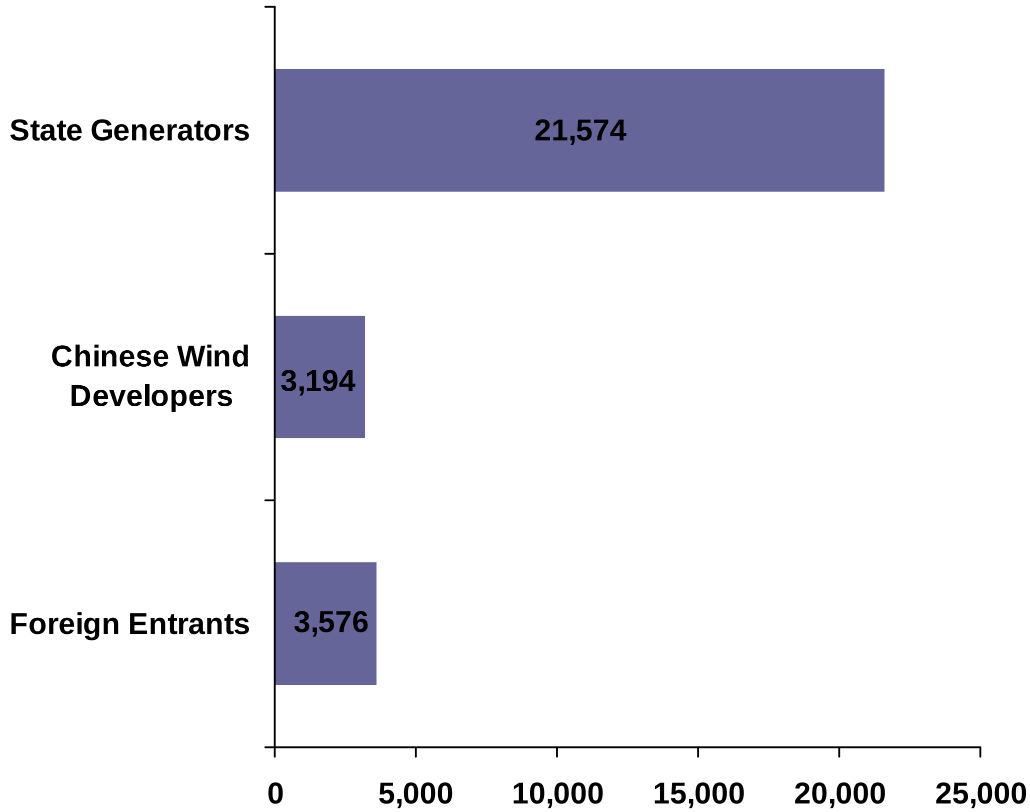
Wind Market Ownership Ranking by Company, Year-end 2007
2007年风电市场所有权排行



Note: *Reflects 100% ownership by State Grid Corporation of China
Source: Utilities, Developers, Emerging Energy Research

Developer Pipelines Reflect State-Owned Project Growth Model
在开发项目显示出国有企业项目主导的发展模式

China Leading Developer Pipelines (MW), 2008–2010



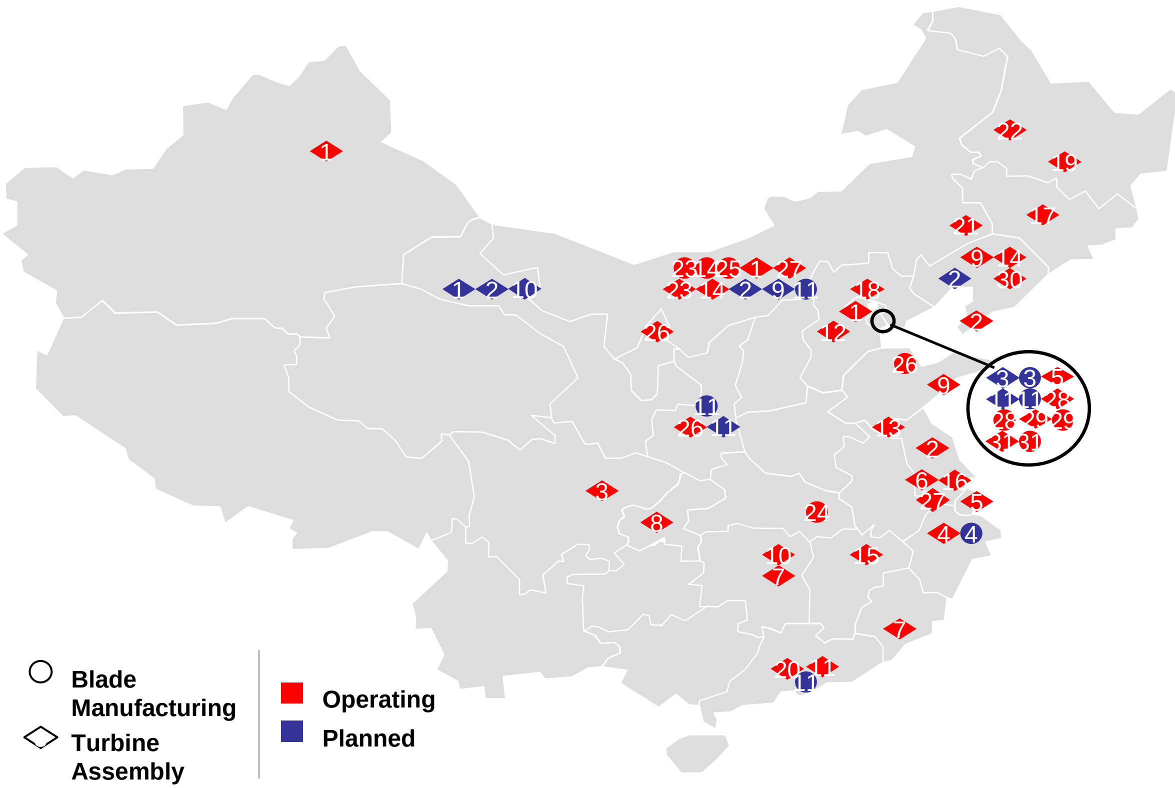
Source: Emerging Energy Research

- ✓With ambitious wind targets, state generators are harnessing strong capacity and political will to carry the market forward
- ✓Chinese wind developers are frequently sidelined in state bidding initiatives; companies leveraging small-scale pipelines will retain marginal market share
- ✓Foreign entrants are gaining momentum through joint venture project implementation, with select wholly-owned initiatives granted long-awaited grid connection

Serving as a vehicle for government wind base execution, Chinese state generators will capture the lion's share of wind growth going forward

作为政府风电基地的执行方，中国的国有电力企业将成为未来风电发展的最大赢家

Turbine Supply Proliferation Underway, Paralleling Regional Growth Trends
风机供给正在扩大，同时部分地区增长趋势明显



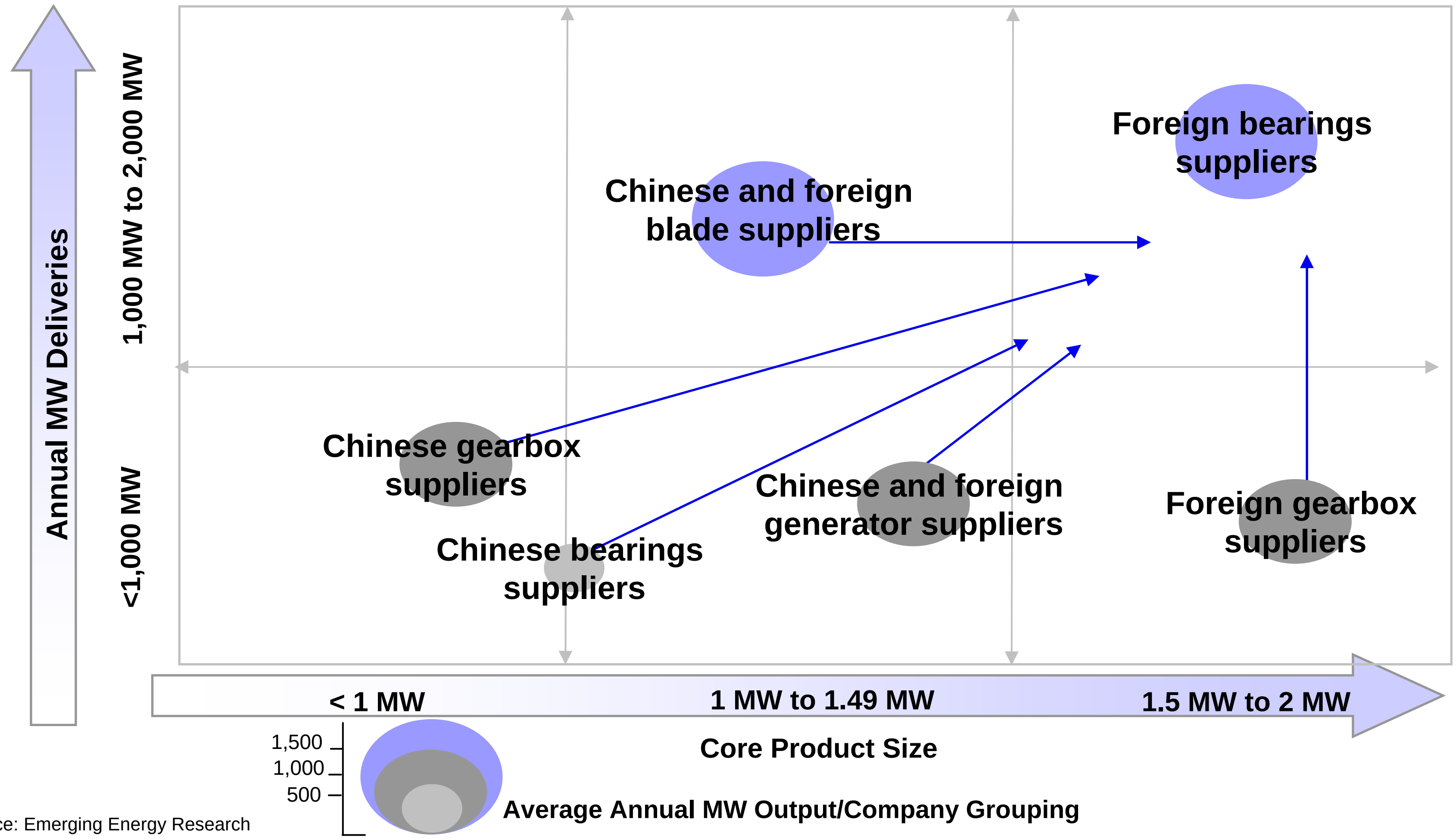
- ✓Since 2005, a flood of manufacturing investments have targeted many previously unexploited regions
- ✓Anticipation of future wind growth regions is fueling strategic placement of new assembly and blade facilities
- ✓Proximity to high-load regions and strong infrastructure is bolstering manufacturing presence along the coast and in select special economic zones

Source: Emerging Energy Research

China's wind equipment production networks are expanding, with regional manufacturing bases taking shape

中国的风电设备生产网络在扩张，部分区域性的生产基地逐步成型。

Chinese Component Supply Landscape and Expansionary Trends
中国风机零部件供给的前景和扩张趋势

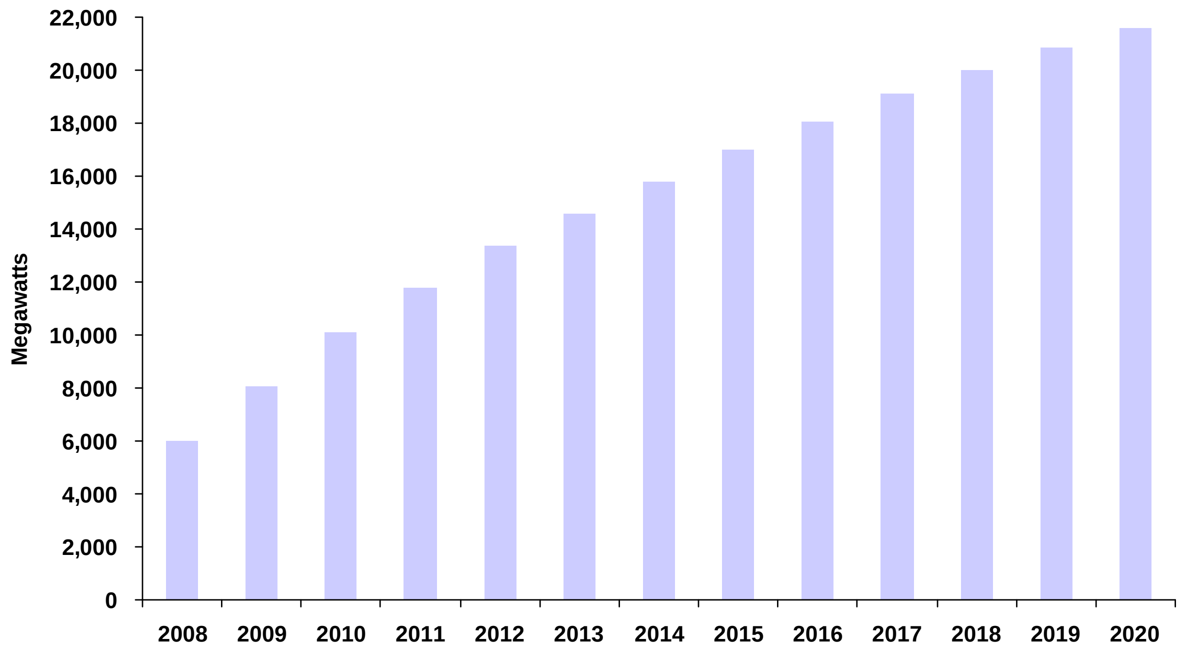


Source: Emerging Energy Research

China's component manufacturing network is maturing and moving toward production of larger models, with a heavy near-term reliance on foreign gearboxes and bearings

中国的风机零部件的供给短期内将严重依赖于国外的齿轮箱和轴承，特别是大型零部件；国内生产商在努力在兆瓦级及兆瓦以上级的风机零部件上摆脱国外生产商的阴影。

Total Turbine Market Headed Toward US$78 Billion by 2015
2015 年风机市场将达到780亿美元



Source: Emerging Energy Research

- ✓**More than 70 active OEMs and component manufacturers identified in 2008**
- ✓**Stimulated by government targets and subsidies, production capacity growth will promote economies of scale through 2010**
- ✓**Government prioritization of wind and a maturing industry will perpetuate steady demand**
- ✓**2010 assembly capacity capable of exceeding 15 GW**

EER anticipates US$78 billion in available turbine sales revenues in 2008–2015; consequent competition among OEMs for market share, order books will intensify throughout the period
我们预期，2008年-2015年风机销售收入将达到780亿美元；同期贴牌生产商和订单的竞争会更加激烈，

Emerging Energy Research

Emerging Energy Research provides analyst-directed advisory services on an annual subscription basis, providing market intelligence, competitive analysis and strategy advice in response to the specific needs of our clients. These services provide value-added support of clients' competitive and market strategies, and are intended to be interactive, offering clients direct access to EER experts.

Advisory service clients receive a stream of market and company briefs, ongoing market data and forecast support, telephone inquiry privileges, and regular analyst briefings. While much of the content is syndicated, clients also receive ongoing individual support of market assessment and strategy development needs.

For more information on EER's advisory services, please contact Marcel van Galen at mvangalen@emerging-energy.com, or contact one of our offices:

Cambridge

Emerging Energy Research
700 Technology Square
Cambridge, MA 02139 USA
Phone: +1 617 551 8480
Fax: +1 617 551 8481

Barcelona

Emerging Energy Research
Paseo de Gracia 47, 2
Barcelona 08007 Spain
Phone: +34 93 467 6750
Fax: +34 93 467 6754