



# Global Value Chain and Innovation Systems: Lessons from the Wind Energy Industry in the Basque Country

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# Motivation

- Wind power is an increasingly important source of energy: **in 2010 the total installed capacity was twice that of 2007;**
- Europe is the traditional leader in the wind power industry but demand and supply are rapidly moving to emerging markets, with **China becoming a global player;**
- **Spain** is the fourth country in the world (after China, USA and Germany) in terms of installed capacity;
- Two global players in the wind energy industry are **Gamesa** (a turbine manufacturer) and **Iberdrola** (a utility firms in deployment). They are both located in the **Basque Country**, a dynamic manufacturing region with a strong presence of specialized clusters supported by a very active industrial policy.

# Aim of the study

- To investigate the wind energy value chains of the two Basque lead global companies with a focus on their local linkages;
- To investigate their innovative links with a focus on the local innovation system;
- **Research Questions:**
  - How embedded are these two global leaders in the Basque local economic system?
  - How is the globalization of the industry affecting the spatial organization of their value chains?

# The changing global context

- **On the demand side**, the market is shifting from Europe to Asia, mainly to **China** (in 2010 accounting for half of the global market);
- **On the supply side**, European (Danish, German and Spanish) firms are still dominating the global market but they are steadily losing their position as **Chinese and Indian companies are entering the industry**: in 2010 there are 4 Chinese and 1 Indian companies among the top ten turbine manufacturers.

**Table 3.2 Global top ten turbine manufacturers 2003 and 2010 (world market shares)**

2003			2010		
Origin	Firm	Share	Origin	Firm	Share
EU	Vestas (DK)	21.80%	EU	Vestas (DK)	14.80%
US	GE Wind	18.00%	CN	Sinovel	11.10%
EU	Enercon (DE)	14.60%	US	GE Wind Energy	9.60%
EU	Gamesa (ES)	11.50%	CN	Goldwind	9.50%
EU	NEG Micon (DK)	10.30%	EU	Enercon (DE)	7.20%
EU	Bonus (DK)	6.60%	IN	Suzlon	6.90%
EU	REpower (DE)	3.50%	CN	Dongfang Electric	6.70%
EU	Nordex (DE)	2.90%	EU	Gamesa (ES)	6.60%
EU	Made (ES)	2.90%	EU	Siemens Wind Power (DK)	5.90%
JP	Mitsubishi	2.60%	CN	United Power	4.20%
	Others	5.30%		Others	17.5%

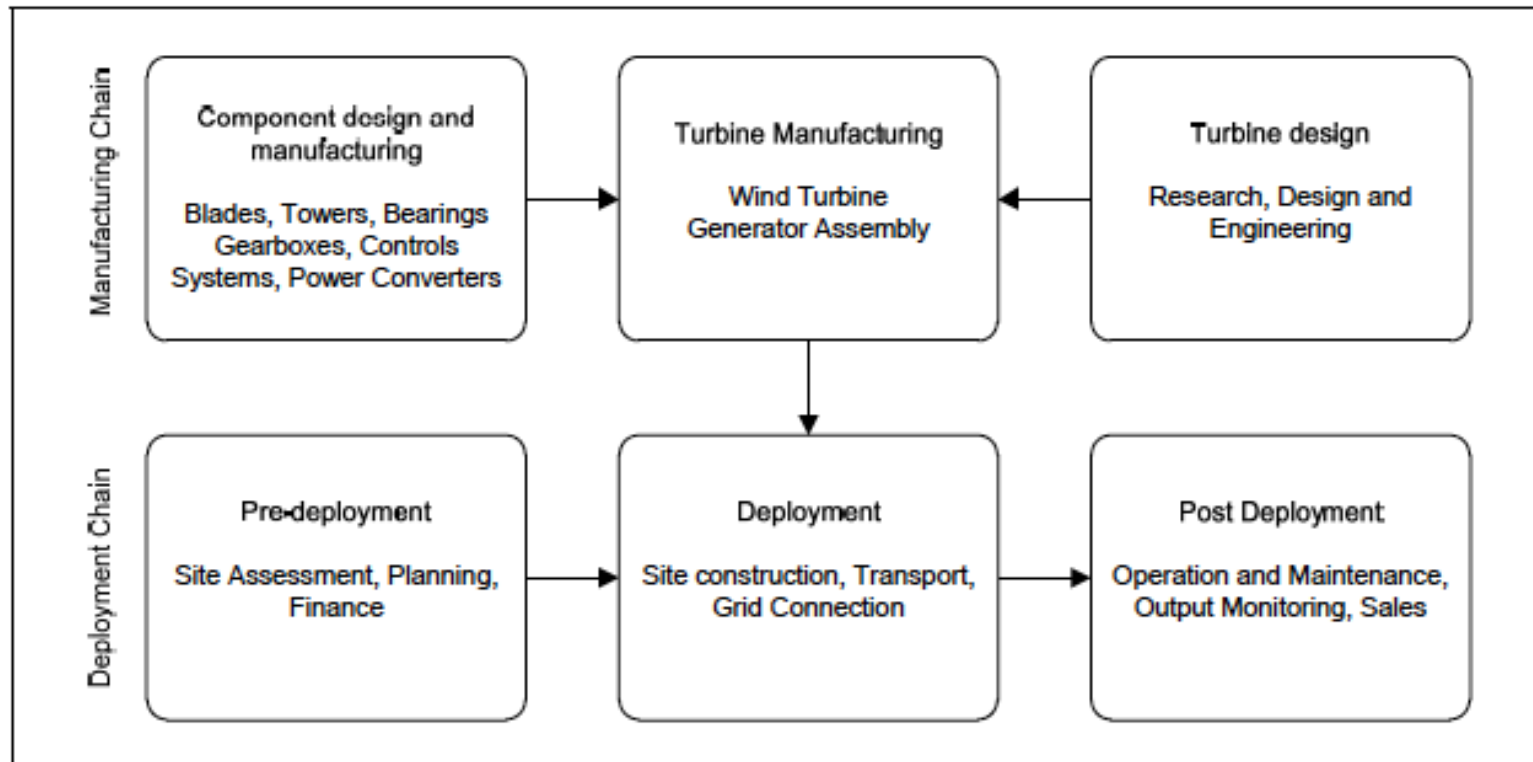
Source: BTM (2004; 2011). The locations of headquarters of European firms are noted in brackets.

# Why GVC analysis is a useful conceptual framework in this study?

- Unpacking the value chain and considering how the role played by the different stakeholders changes, it allows to investigate how **power relationships are evolving** because of:
  - **chain-internal reasons**: suppliers can gain capabilities;
  - **chain-external reasons**: the geography of global market can change over time.

# There are two value chains

Figure 2.1 Basic wind industry value chain



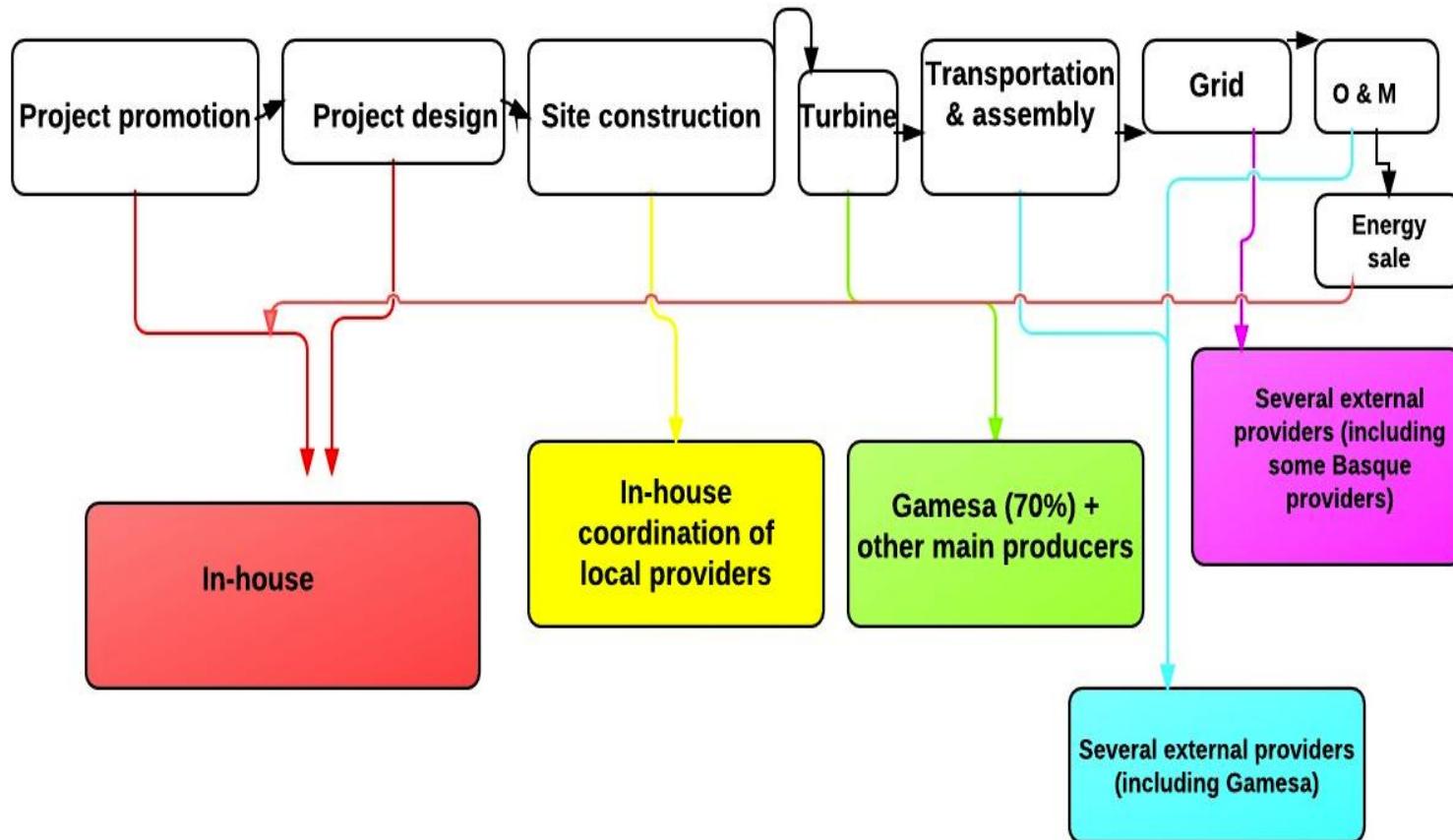
Sources: Drawing on Frost and Sullivan (2010); EWEA (2007); EAI (n.d.); CCB International (2011). Arrows indicate flows of goods and services between functions in the chain.

# Main determinants of GVC organization

- **Immobility** of the production of some parts of wind turbines such as nacelles, blades and towers and of wind park organization;
- **Onshore wind farms**: the technology is rather standardized and competition is mainly on **costs in emerging market** and **on productivity and reliability in the European market**;
- **Offshore wind farms**: the technology is still in its infancy and technological collaborations with suppliers are a key competitive driver in this segment of market.



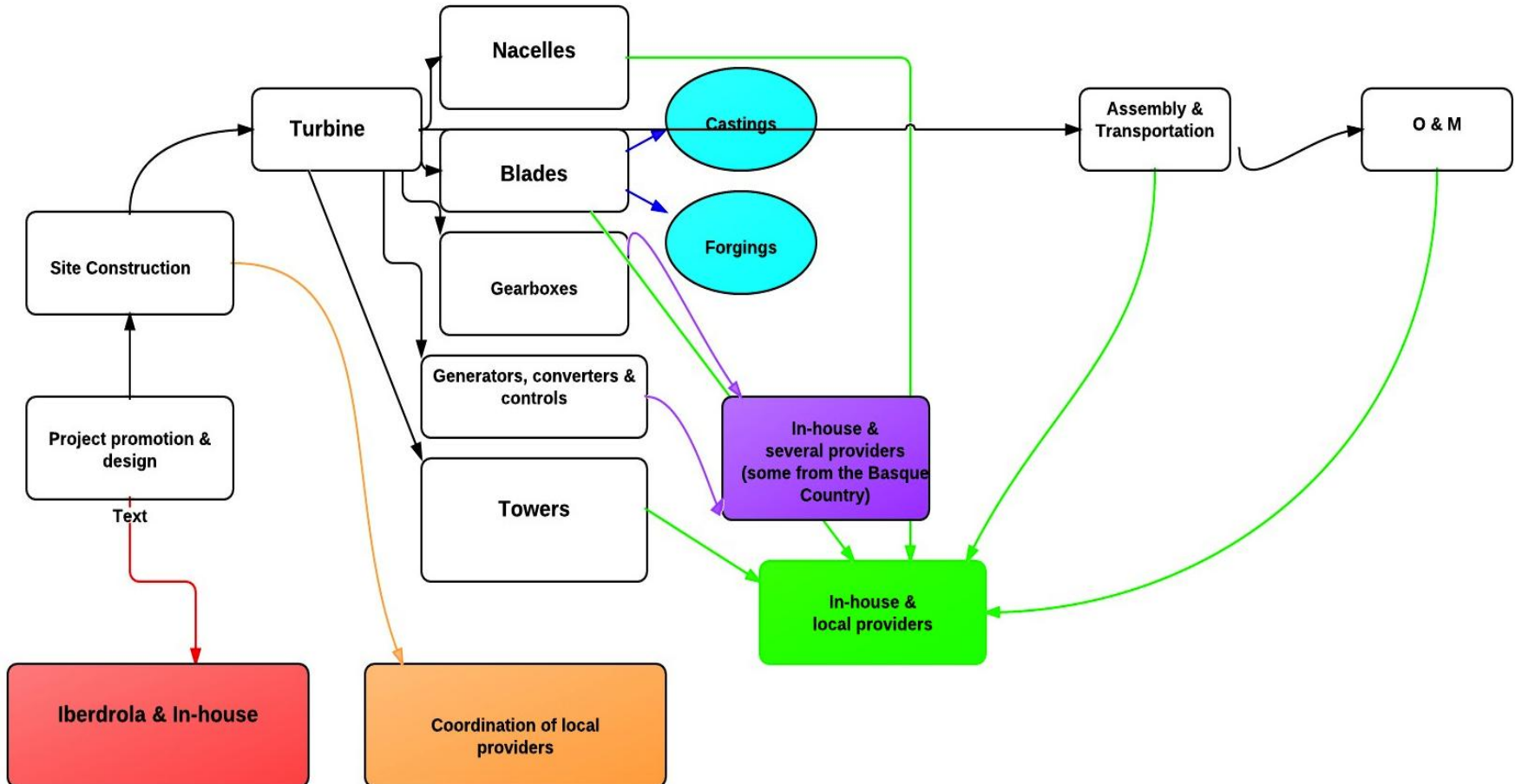
# Iberdrola value chain



# Iberdrola Value Chain

- Iberdrola is the world top park operator in terms of installed capacity;
- It is highly globalized with a presence in more 20 countries in Europe, in the US and in Latin America;
- It undertakes in-house the pre-deployment and deployment stages of the chain and the sales, which are high value added activities;
- It outsources the turbine manufacturing and the O&M to external suppliers such as Gamesa (70% of turbines);
- With suppliers, Iberdrola mainly maintains **modular** relationships when operating in **onshore** wind farms;
- When it operates in **offshore** wind farms it mainly has **relational** linkages with suppliers because services such as transportation and O&M are key and complementary knowledge and skills are needed in this new area.

# Gamesa Value Chain



# Gamesa Value Chain

- **High degree of vertical integration** with many components produced in-house to control productivity and reliability;
- **Relational** linkages with a small number of first-tier suppliers (many of them from the Basque country) **due to customization of components for each individual project in onshore wind farms and complexity of technology in offshore wind farms** ;
- With the globalization of the company (e.g. 6 plants in China):
  - **Less vertical integrated**;
  - **Modular** relations with component suppliers (cost-driven and mature technology);
  - Some of the European (and Basque) suppliers have followed Gamesa;
  - Host country component producers are increasingly involved in the chain;
- In the Basque Country, there are also a large number of second and third tier suppliers, which are suffering from the shift of the market outside Spain and Europe.

# The Innovation Networks

- In Europe, the technological leadership is in Denmark and Germany where the main R&D research centers as well as test centers, certification organizations and other related KIBS are located ;
- In the Basque Country there are non specialised technological centers (e.g. Tecnalia, IK4) involved in wind related R&D projects together with the lead companies and some suppliers;
- **Iberdrola** maintain strong domestic (and local) innovation linkages with various partners (suppliers, universities, technological centers and business associations);
- **Gamesa** has a very global R&D strategy with technology centers in Germany and Denmark to be close where the standards are set and to gain access to these specialized innovations system;
- As a whole, the lead companies and some of their local suppliers have strong **in-house technological capabilities at the firm level** but the local (and national) innovation system is rather weak if compared with the European competitors.

# Lessons for LAC

- In the next future, thanks to the increasing presence of China, wind energy is likely to become less expensive and more competitive with traditional sources, opening up **opportunities of investments in LAC**;
- For developing a market, public support programs are key and the **incentive structure** influences how the value chain is organized (Europe vs. China);
- There is space for collaboration with European lead companies that may be interested in **trading technology for market access in LAC** (e.g. Gamesa in Brazil). This strategy is already undertaken by China (joint design and R&D collaboration, overseas R&D units);
- There are important parts of the chain which are rather immobile and this means that there is **space for creating domestic capacity and employment bound to the local areas of investments**;
- There is a key role for policy to establish **favorable framework conditions** (e.g. standard settings; R&D investments, favourable investment framework).



# Thank you

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