



**ABEEólica**

Associação Brasileira  
de Energia Eólica

# Future of Wind Energy in Brazil: Market and Technology aspects

Elbia Melo  
Chief Executive Officer

**With the strong winds we go further**

*Feb 19th, 2013.*



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# WHO WE ARE



# WHO WE ARE



*The Brazilian Wind Power Association – ABEólica congregates, throughout Brazil, 88 companies which partakes the country's wind power production chain.*

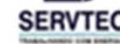
# 85 Members



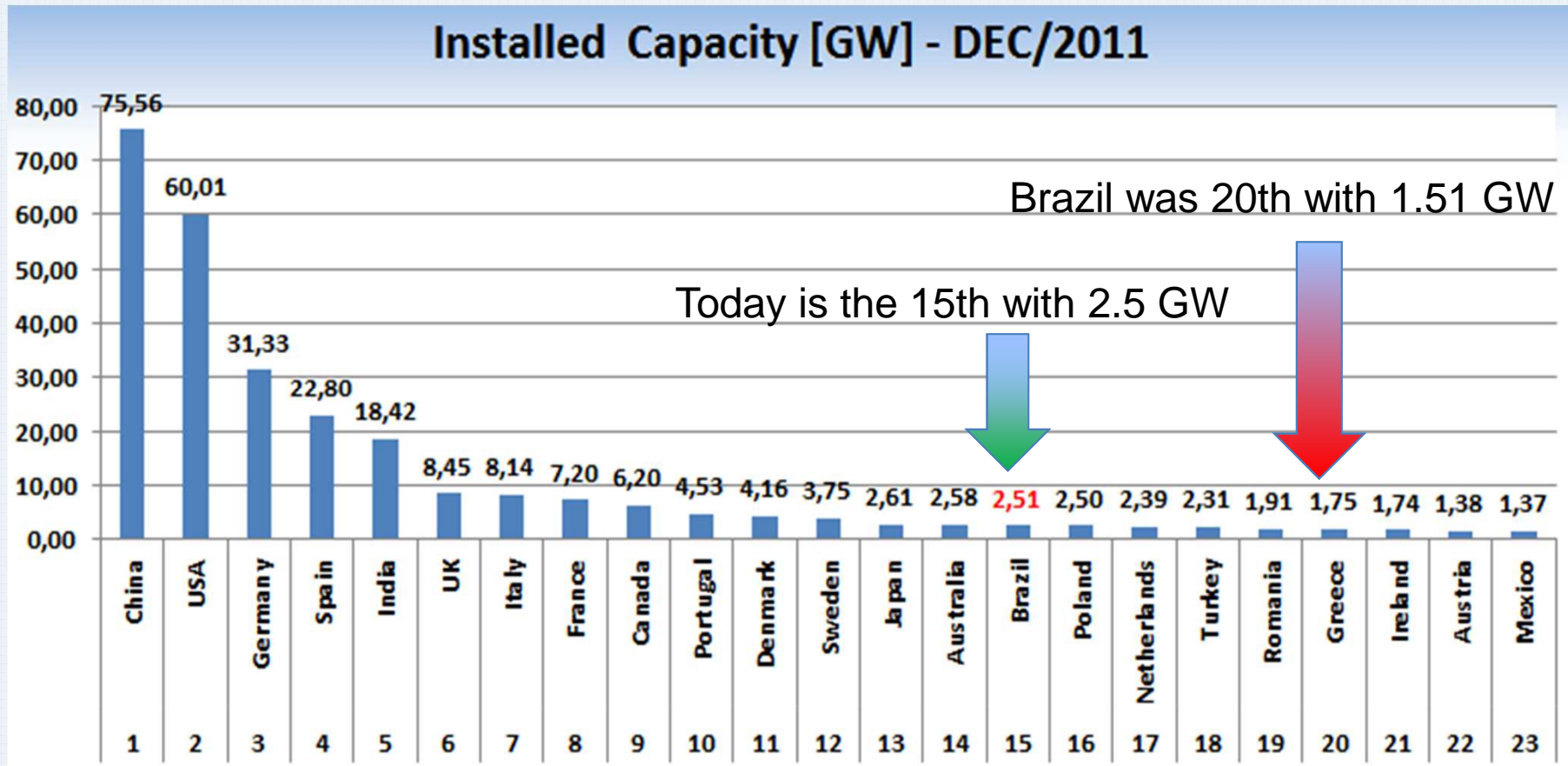
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# 85 Members



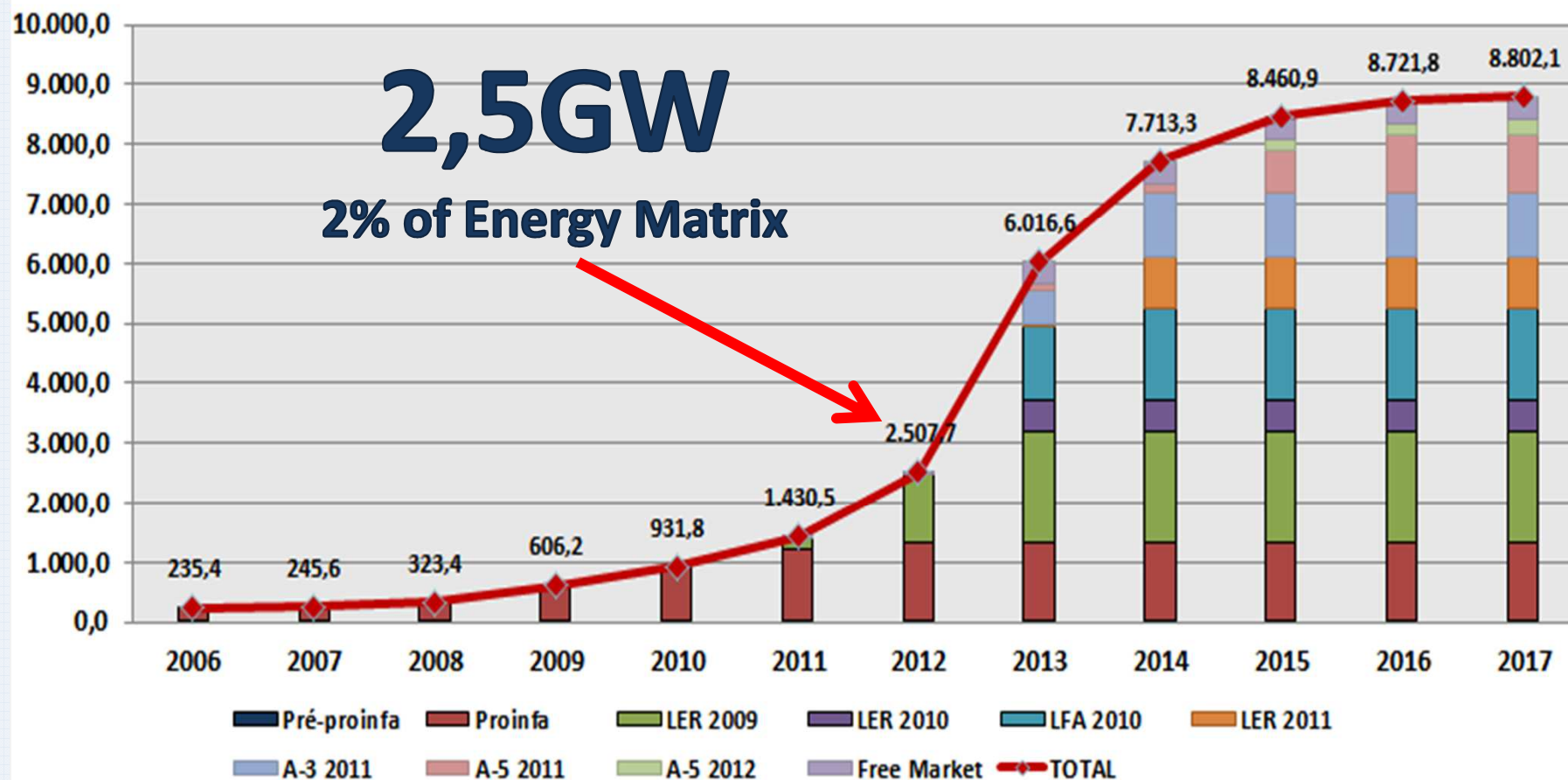
# Wind Power in the World (GW)



*In 2013, Brazil will be the 10th country in the ranking of the installed capacity of wind power!*

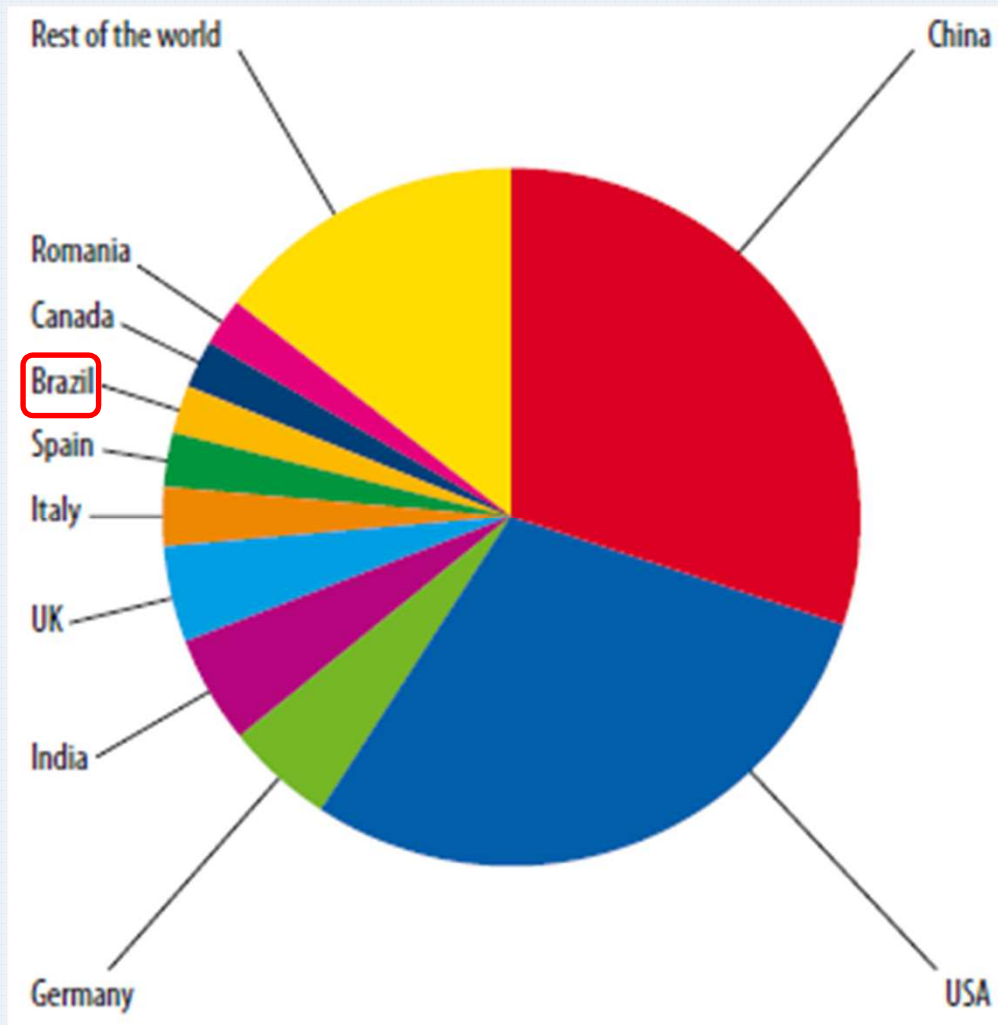
# Evolution of Installed Capacity in Brazil

Installed Capacity (MW) by Hiring



Source: ABEEólica/Aneel/CCEE

# Top 10 new Installed Capacity 2012



Country	MW	% SHARE
PR China**	13,200	30
USA	13,124	29
Germany	2,439	5
India	2,336	5
UK	1,897	4.2
Italy	1,273	2.8
Spain	1,122	2.5
Brazil	1,077	2.4
Canada	935	2.1
Romania	923	2.1
Rest of the world	6,385	14.3
<b>Total TOP 10</b>	<b>38,326</b>	<b>85.7</b>
<b>World Total</b>	<b>44,711</b>	<b>100.0</b>

Source: GWEC



# Industry Consolidation: R&D



- Need for investment in Research and Development and Innovation;
- Developing technologies adapted to weather and environmental brazilian conditions;
- Research Network Wind Energy
  - Integration of Research Centers
  - Technological Innovation
  - Certification of Wind Turbines
  - Field testing of wind turbines



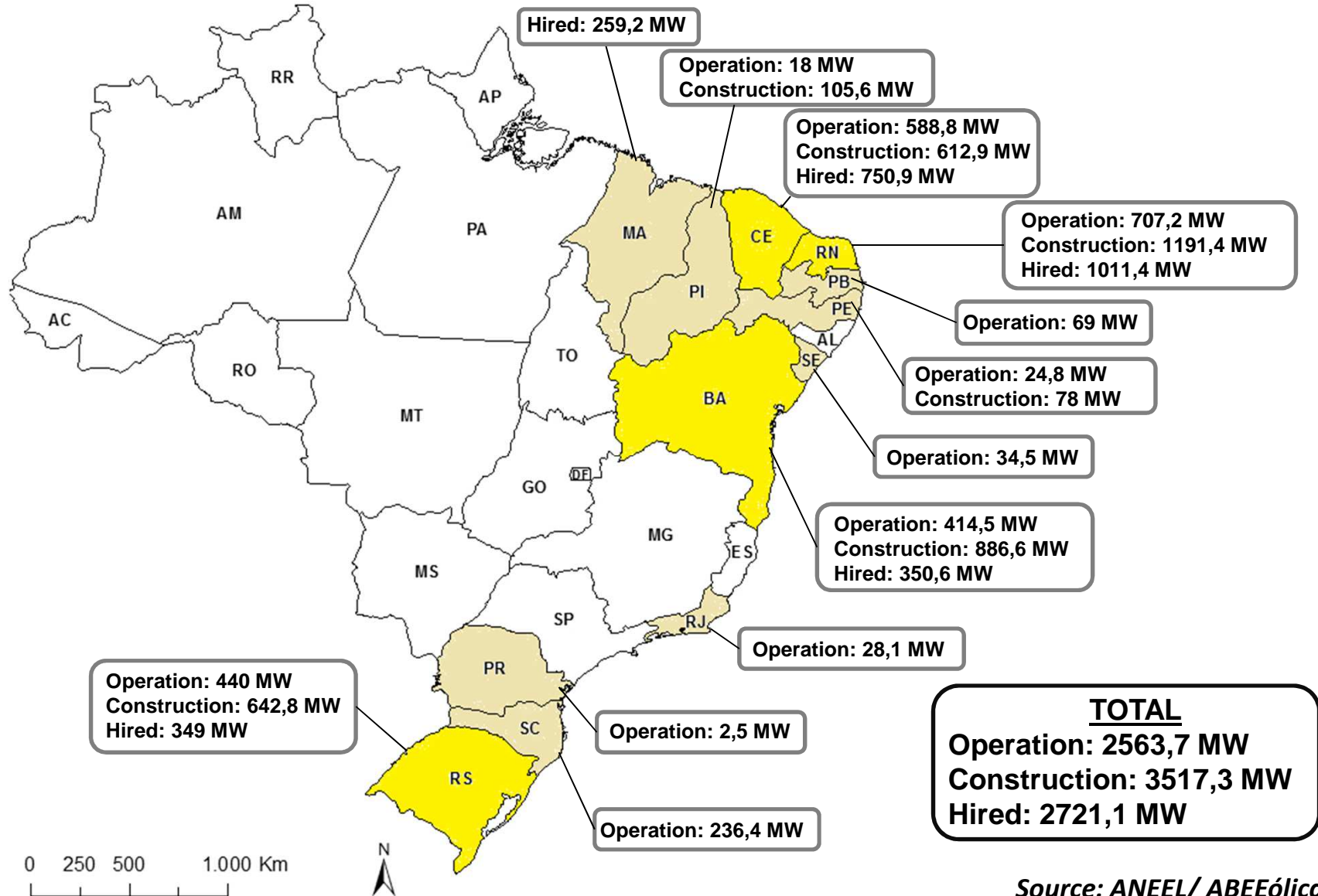
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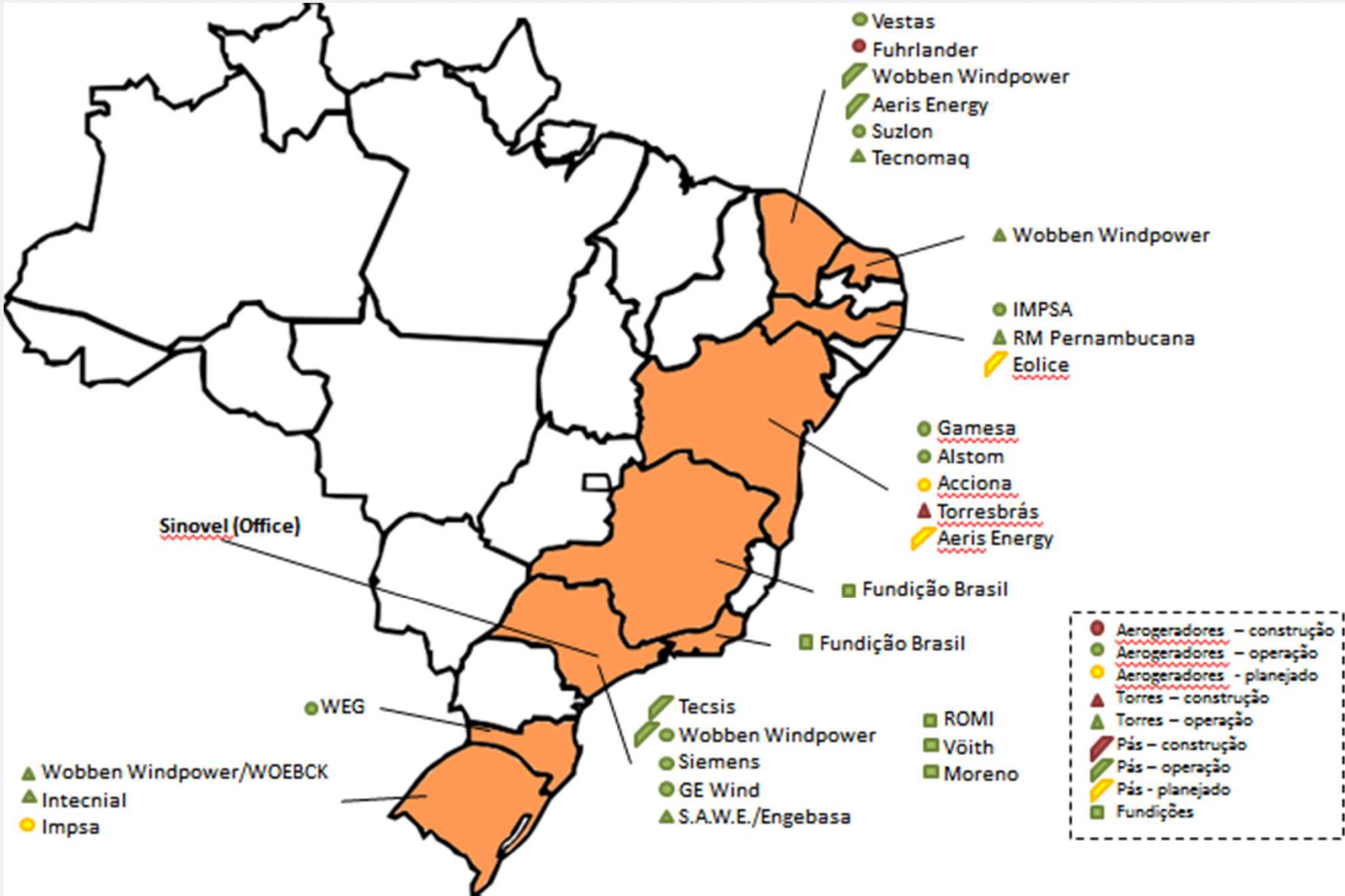
# Wind Energy in Brazil



# Location of Wind Farms

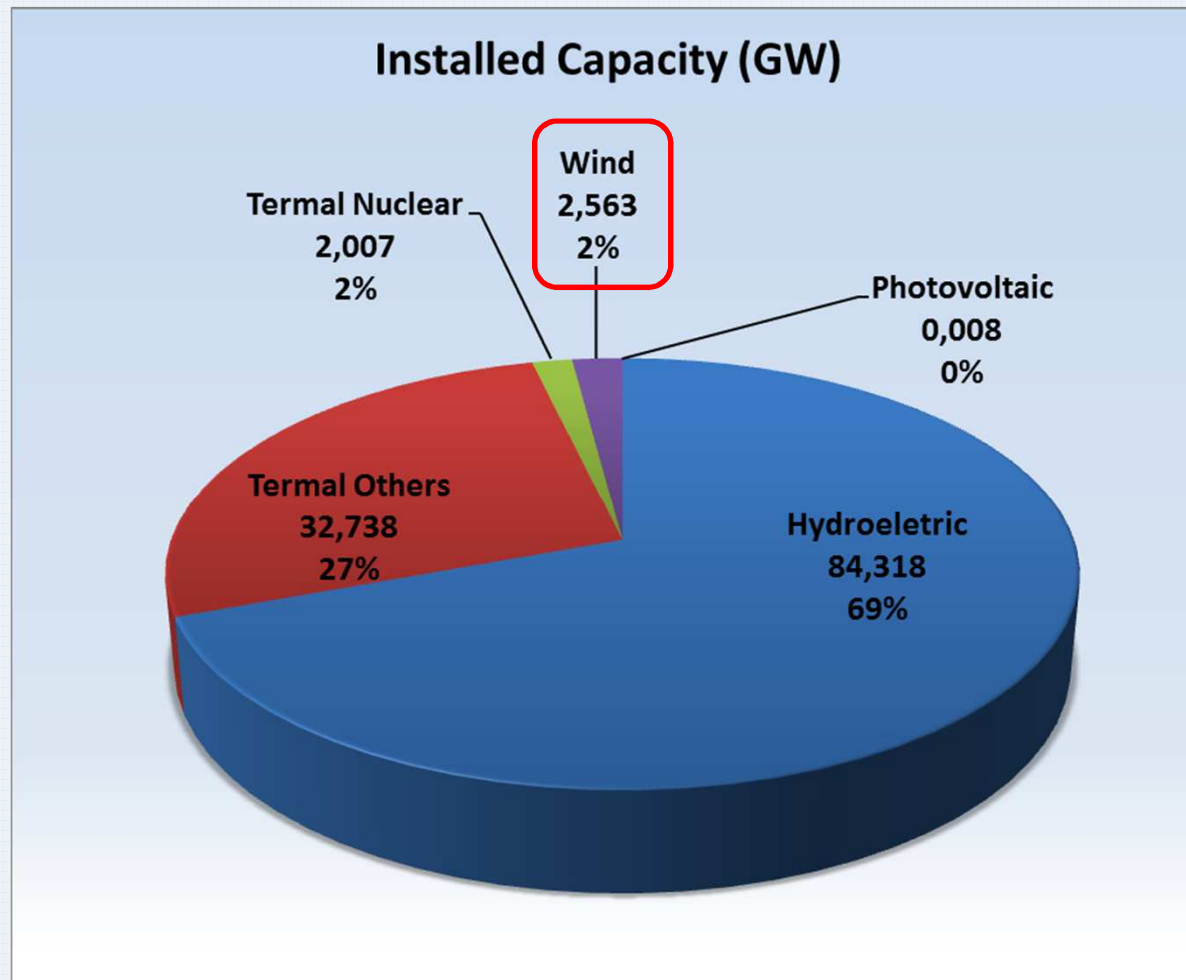


# Wind Industry in Brazil



# Energy Matrix of Brazil

- Sources for Electricity Generation



\*ICG: 622 MW

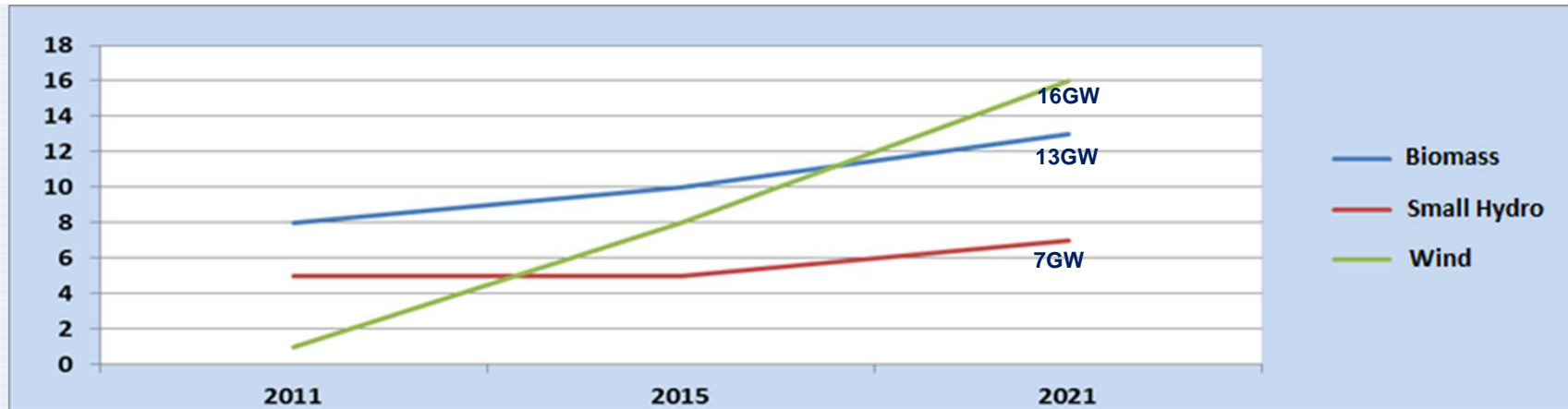
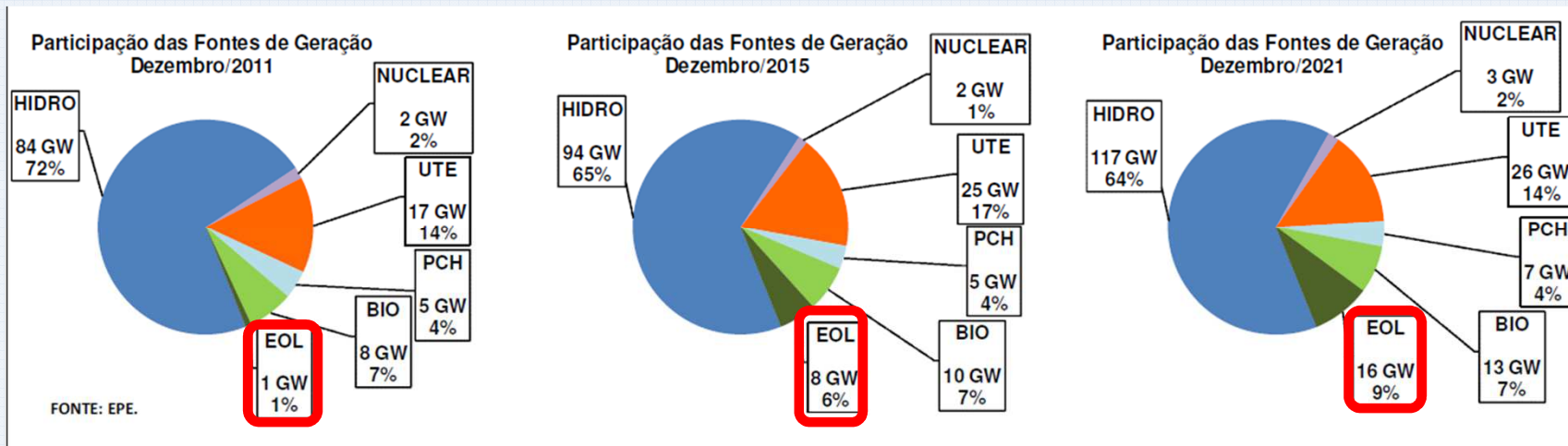
Source: ANEEL/ABE Eólica

# Opportunities

- Increasing energy demand in Brazil: Average annual growth of 6 GW of stall capacity, according to the Brazilian Energy Research Company (EPE).
- The government has been assigning priority for the inclusion of renewable energy sources, and the wind power is the second most important source for the energy matrix.
- Great potential of renewable energy sources: Hydro, wind, biomass and solar power.
- Perspectives of 20% in new renewable plants for 2021.
- According to the PDE 2021 (Decennial Energy Plan) the participation of wind energy matrix will reach 9% in 2021, with 16 GW of installed capacity.

# Planned Expansion 2012-2021

2021: 20% of electric Matrix Other Renewable Sources  
(Wind, Biomass and Small Hydro)



# Opportunity – Power Matrix Diversification

- Due to seasonality of the hydro power system, which is responsible for 90% of the energy offered in 2011, raises the need for energy supplementation.
- The reduced storage capacity of the future hydro environmental projects reinforces this necessity.
- It can be observed seasonality and complementarity among the hydro, wind and biomass power sources.
- The recent reduction in the level of the reservoirs of hydroelectric plants, caused by lack of rain, forced the firing of thermal plants.





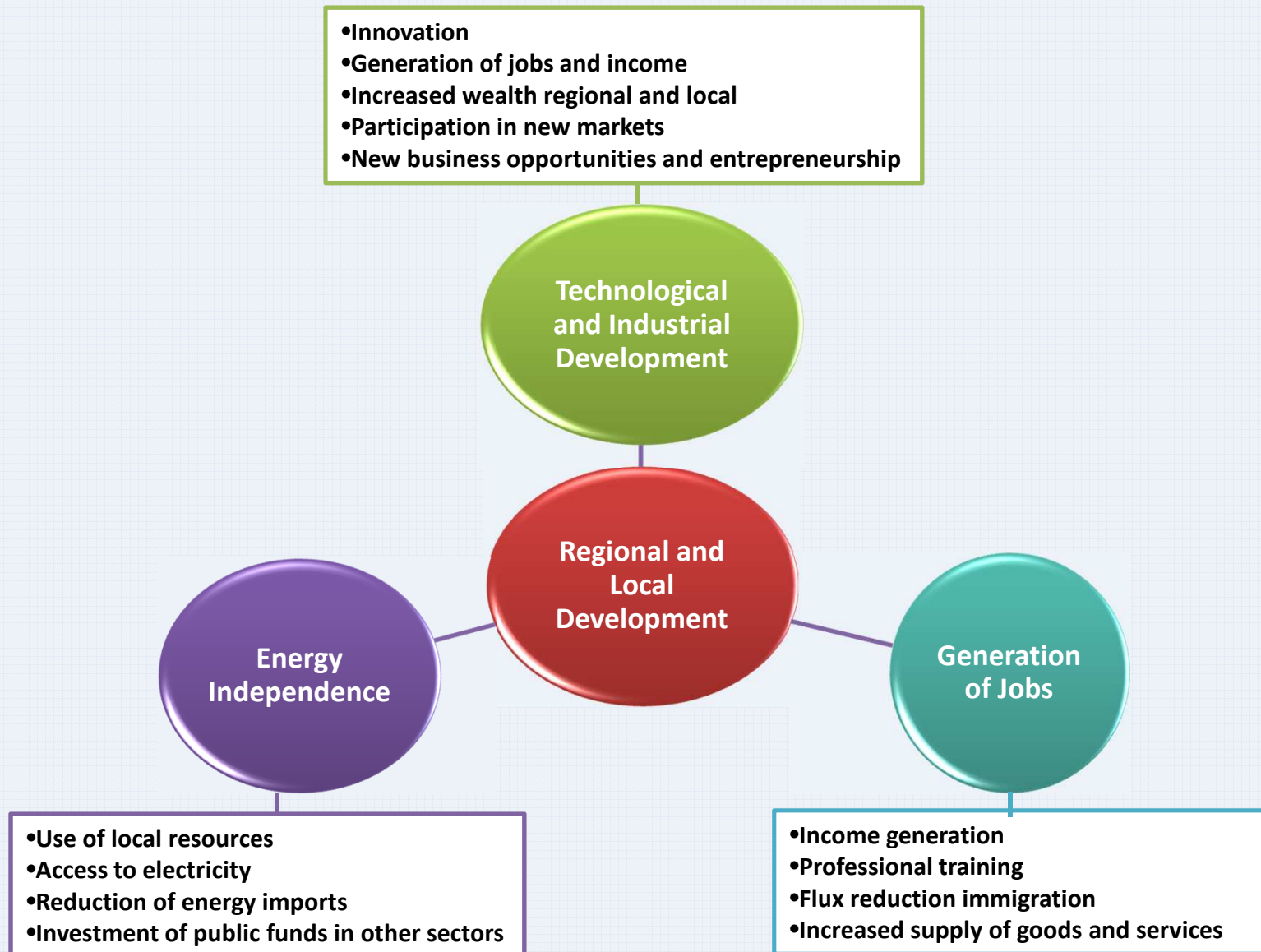
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# Socio-environmental aspects



# Social and Economic Development with Local Income Distribution



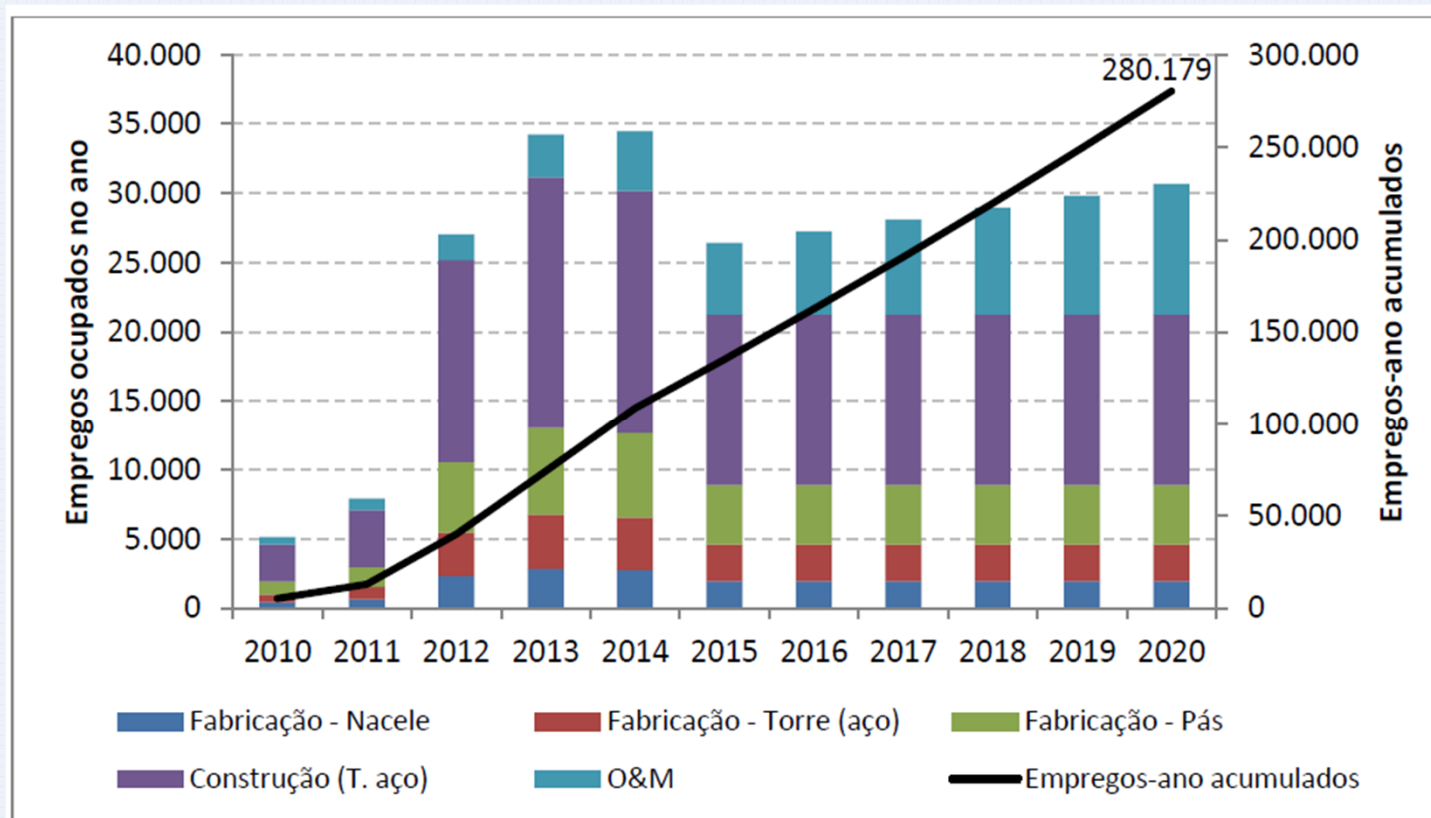
# Social Benefits

- Jobs: The wind industry today has over 12,000 jobs in the manufacturing of wind turbines
- Will be created around 40,000 direct jobs in the construction of wind farms by 2016, many of these jobs are local



# Creation of New Jobs - PDE 2020

- 280.179 accumulated direct and indirect jobs;
- Most of the construction phase of Wind Farms;
- 6.230 new permanent jobs in O&M.



## Energia eólica vira 'pré-sal do sertão' e atrai fabricantes para polo baiano

Francesa Alstom inicia nesta semana produção de aerogeradores; GE, Vestas e Torrebras devem ser as próximas a chegar ao Estado

*Estado de São Paulo, 28/11/2011*

### Os vendedores de vento do sertão

Pouco a pouco, uma vida nova se esboça para centenas de famílias do sertão nordestino. Castigados pelo clima e o árduo trabalho na roça que os fizeram brutos, mas também fortes, esses homens e mulheres vivem hoje da expectativa de que os ventos continuem soprando. Cabreiros pelo inusitado, mas decididos em realizar seus sonhos de que os filhos tenham uma vida diferente, esses sertanejos se tornaram, literalmente, vendedores de vento.



*Valor Econômico, 01/12/2011*

### Ventos que sopram mudanças

Instalação de parques eólicos transformam a paisagem de Parazinho e mudam a rotina de seus moradores



*Diário de Natal, 02/10/2011*

### Ventos brasileiros semeiam empregos verdes

*Terramérica, 07/11/2011*

## Energia eólica traz lucro a produtores rurais

Um único gerador pode garantir renda líquida mensal de cerca de R\$ 500

por Alana Fraga



Adão Reis, que cria gado de corte, aumentou em 50% c



## Instalação de aerogeradores traz renda extra

Conheça a história de pessoas que aumentaram a renda com o aluguel das terras para a construção dos pa  
29 de setembro de 2012 | 17h 24

• Notícia



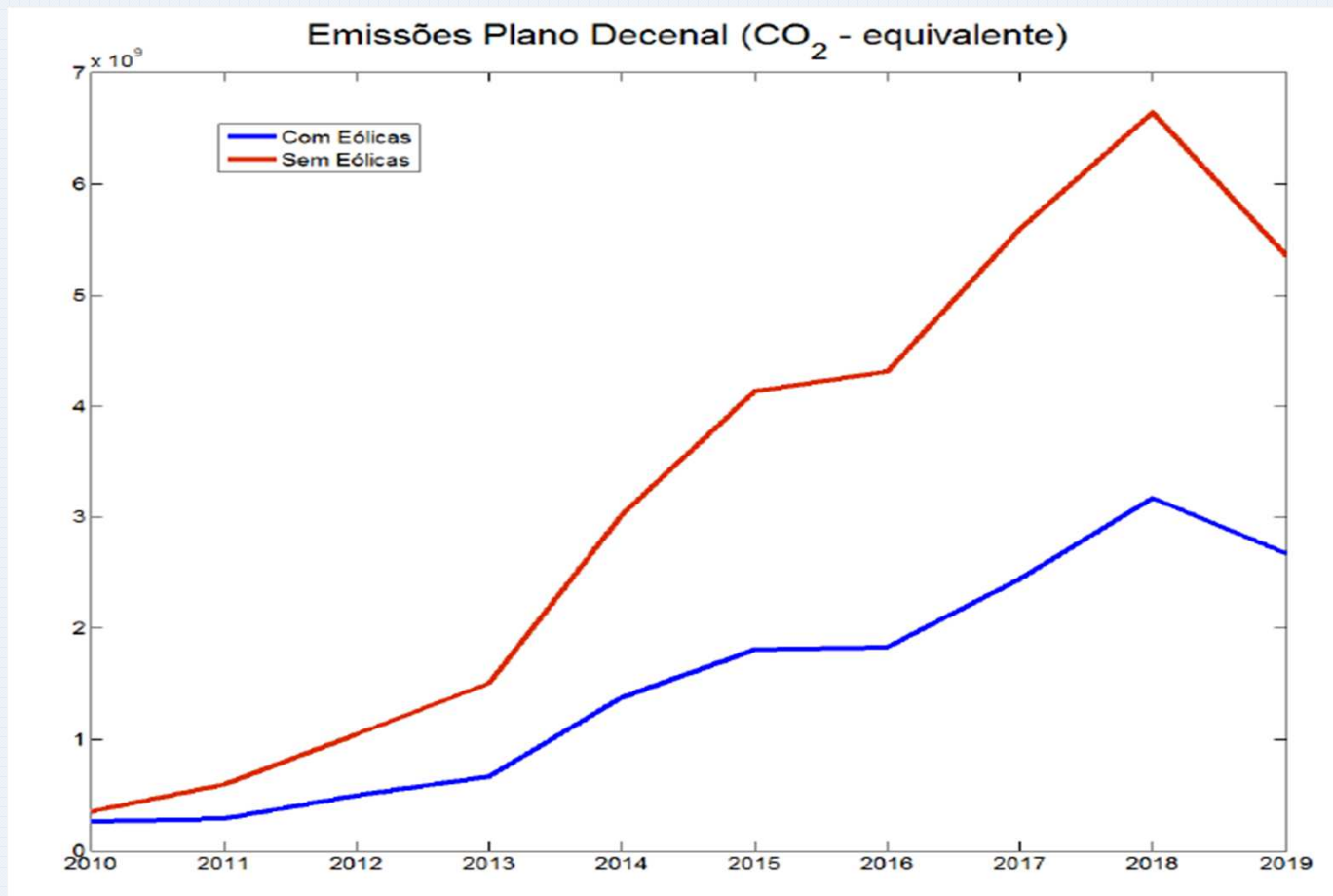
A+A-

• Assine a Newsletter



# Reduction of $CO_2$ Emission

- Economy average 17Mton of  $CO_2$  equivalent
- Simulation by removing coal plants and placing wind farms



Source: Engenho/2012



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# The Competitiveness of Wind Energy





# Kinds of ERNC Contracts

PROINFA

- Long-term contracts
- Regulated prices
- Low risk

Free Market

- Prices freely negotiated
- Short/Mid/Long-term contracts
- Medium/High risk

New Energy  
Auctions

- Long-term contracts
- Regulated prices
- Low risk

Reserve Energy  
Auctions

- Long-term contracts
- Regulated prices
- Low risk

# Presence in Auctions & Wind Average Prices

**2009**

- Registered 13GW
- Contracting 1,837MW

**2011**

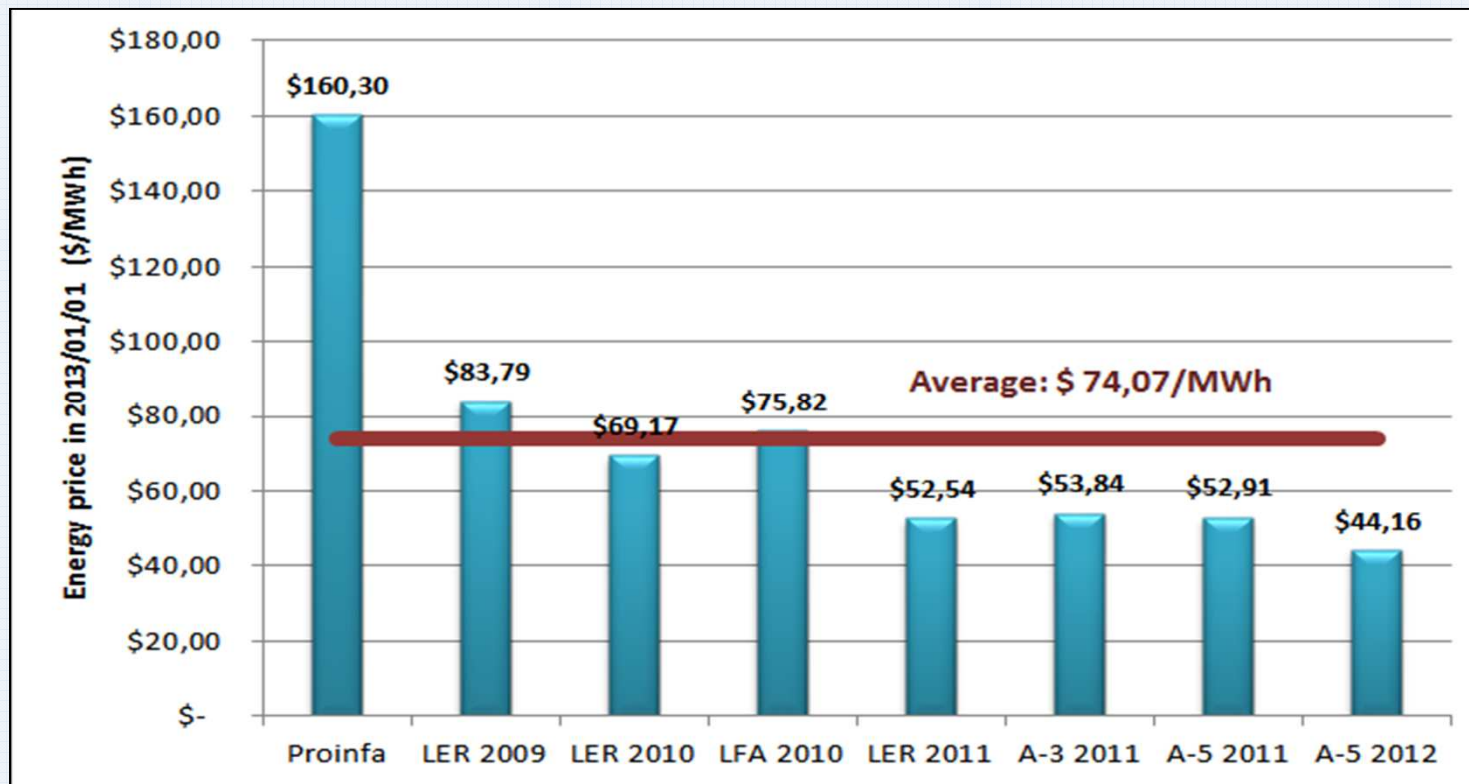
- Registered 18GW
- Contracting 2,0907MW

**2010**

- Registered 11GW
- Contracting 2,047MW

**2012**

- Registered 12GW
- Contracting 281.9MW



# Competitiveness Factors



## STRUCTURAL AND SHORT-TERM FACTORS

(which explain recent results)

### STRUCTURAL FACTORS (5)

- Industry Technical Progress – The Technological Path has been contributing to the reduction of production costs of the industry's production chain. Ex. Towers of 50m and 100m (11 months - technological changing term).
- Wind Favorable Conditions – Comparative Advantage of Brazil, which carries potential estimated at 300GW and wind feature much higher than Europe and the USA (high capacity factor).
- Auction and Contract Models (competitive auction with 20 year contracts corrected by the National Wide Consumer Price Index - IPCA (fixed income)).
- Financing Conditions.
- ICG Model.

# Competitiveness Factors

## STRUCTURAL AND SHORT-TERM FACTORS

(which explain recent results)

### SHORT-TERM FACTORS (6)

- Today, Brazil is a favorable environment for infrastructure investment in general.
- Crisis in Europe and the USA, Brazil is basically the only country investing in wind power in the world (it imports around 40% of goods).
  - China, the largest investor, has its own industry;
  - China is also a competitor in the Brazilian market;
  - The wind power goods industry has been progressively taking place in the country.

As the only investment locus in the segment, Brazil has been attracting increasing willingness to invest.

- Aggressive investing policy for goods and generators to gain ground in the market.
  - Trade dispute;
  - Simultaneous auctions of the production chain.

# Competitiveness Factors



## STRUCTURAL AND SHORT-TERM FACTORS

(which explain recent results)

- Exchange rate, the depreciation of the US dollar has brought a 30% reduction in imported component costs.
- The move back to local generator investments (market entry price).
- Investments released from Merchandise and Service Circulation Tax -ICMS and from Industrialized Product Tax - IPI.

# Wind farm consolidates as a landmark clean energy in Barra dos Coqueiros, Sergipe

*Plant will be capable to produce 34.5 MW.*

*Wind farm was opened on Tuesday (01/29) in the presence of the President Dillma Rousseff.*

- ❑ The State Government supported the initiative through the Industrial Development Program, providing an area of 300 hm<sup>2</sup>, adjacent to the Port of Sergipe. The total investment of the project is U.S. \$ 61 million.
- ❑ The project has received funding of U.S. \$ 56 million from China Development Bank (CDB). The operation was the first in form of 'project finance' held by the Chinese bank in the world.
- ❑ The wind farm is controlled by Desenvix, which has a partnership with engineering firm Jackson Ventures, Norway's SN Power and Funcef, foundation pension of employees of Caixa Econômica Federal Bank.
- ❑ This project took into consideration the strategy set up by the Federal Government to maintain renewable energy sources as 'reserve sazonalidade' for periods of drought.



Source: G1, 2013.

# Final Comments

- Brazil has, by nature, the most comparative advantage (natural resources) and, at this time, a strong competitive advantage (several structural and short-term factors) to invest in ERNC.
- The Brazilian Model for energy contracting this based in low prices, wind energy is growing in Brazil and has good future prospects because is competitive.
- The key factor in the growth of wind power in Brazil and its low cost occasioned by productivity gains and strong competition.
- **Competitiveness** is the **single** word.



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**Thank You!**

