Financing Wind Power Development in Brazil

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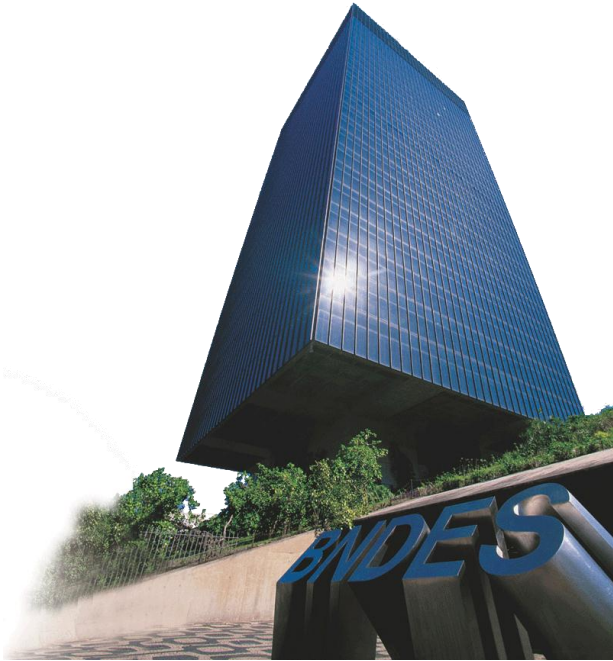
BNDES Brazilian development bank

AGENDA

- ✓ **The Energy Sector in Brazil: Overview**
- ✓ **Renewable Energy: evolution and perspectives**
- ✓ **The BNDES support for the energy sector:**

The Energy Sector in Brazil: Overview



Energy Sector in Brazil: Overview

The Brazilian constitution provides that the generation, transmission and distribution of electricity may be undertaken directly by the Brazilian government or indirectly through the granting of concessions, permissions or authorizations.

The Regulatory Framework

- ✓ Two parallel environments for energy trading and marketing:
- ✓ one for the distribution companies, known as the **Regulated Market (ACR)**;
- ✓ another **market for free consumers (ACL)** and energy trading firms, independent producers, imported energy agents, exporters and other generating agents, in which purchase and sale of electric energy is transacted freely among participants;
- ✓ Prohibition of self-dealing, not allowing distributors to contract energy from related parties, in order to ensure reasonable tariffs for users.

The Regulated Market (ACR)

- ✓ Distribution companies buy energy for captive consumers through public auctions regulated by ANEEL. Purchases of energy will be made through two types of contracts: (i) Contracts for Quantity of Energy, and (ii) Contracts for Availability of Energy.
- ✓ Under a Contract for Quantity of Energy, the generator undertakes to provide a certain quantity of energy and assumes the risk of the supply of energy being affected by hydrological conditions or low water levels of reservoirs.
- ✓ Under a Contract for Availability of Energy, the generator undertakes to provide buyers with a specific volume of capacity. In this case, the generator receive a guaranteed revenue and any hydrological risks are allocated to the consumers.

The Free Market (ACL)

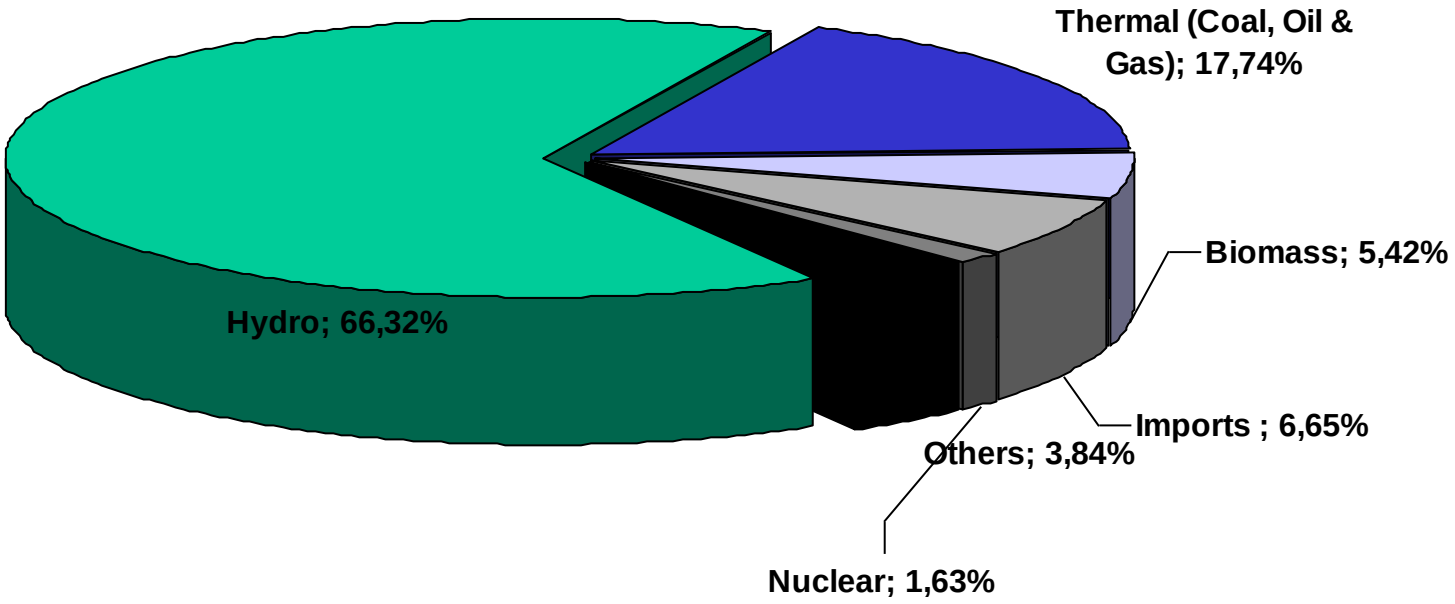
- ✓ Under the Free Market, electricity is traded between generation concessionaires, independent energy producers, self-producers, trading agents, importers of energy and free consumers.

- ✓ Potentially free consumers are those whose demand exceeds 3 MW at a voltage of 69 kV. In addition, consumers whose contracted demand is less than 500 kW may be served by suppliers other than their local distribution company, and may contract energy from alternative sources such as wind, biomass or SHPs.

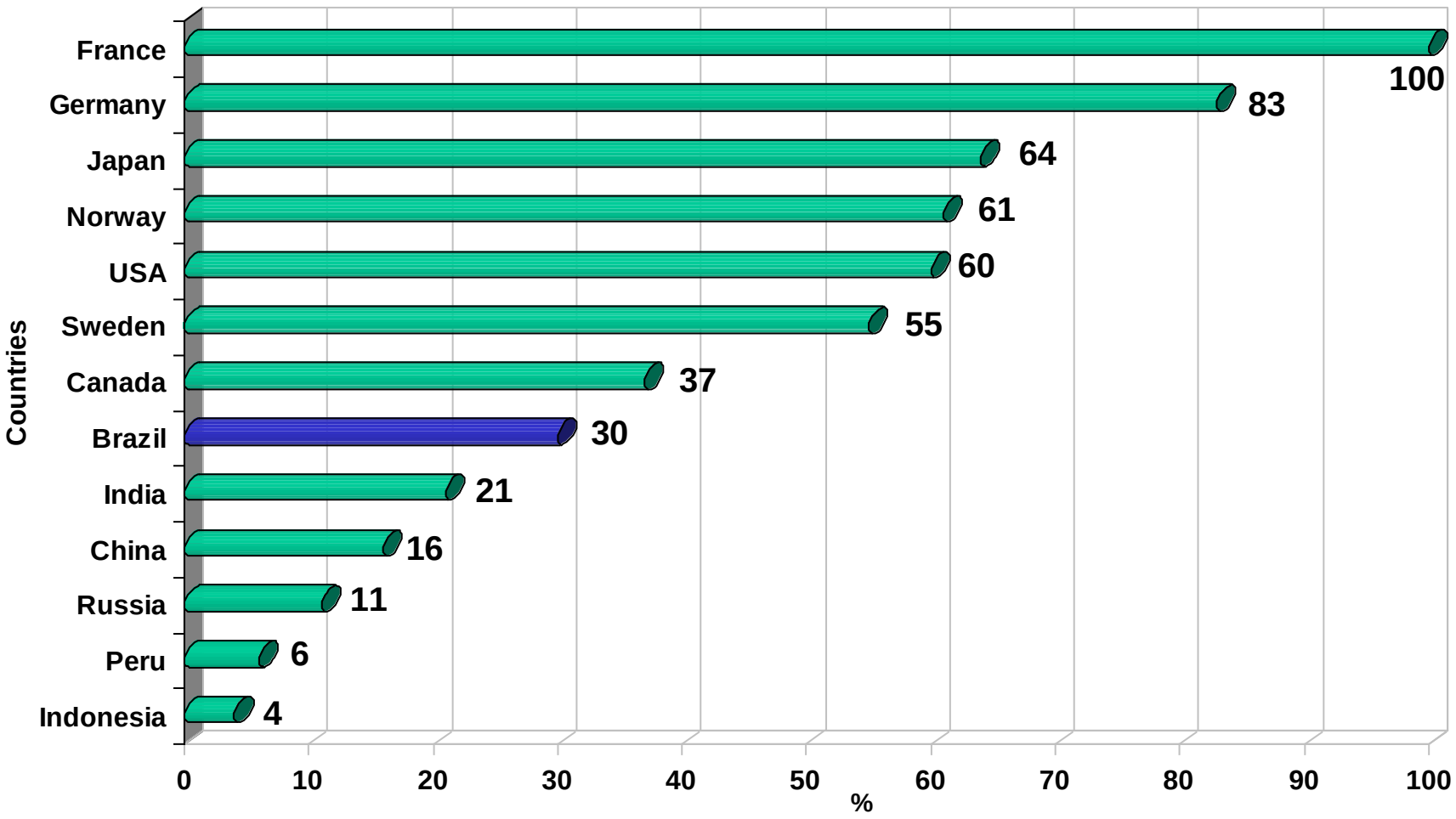
Wind Energy Perspective

Sources	Brazil	World
Renewables	80,6%	18,3%
Non-renewables	19,4%	81,7%

Brazil installed capacity: 122,8 GW



Hydroelectric Potential in the World (% of the potential in use)



Brazilian Grid

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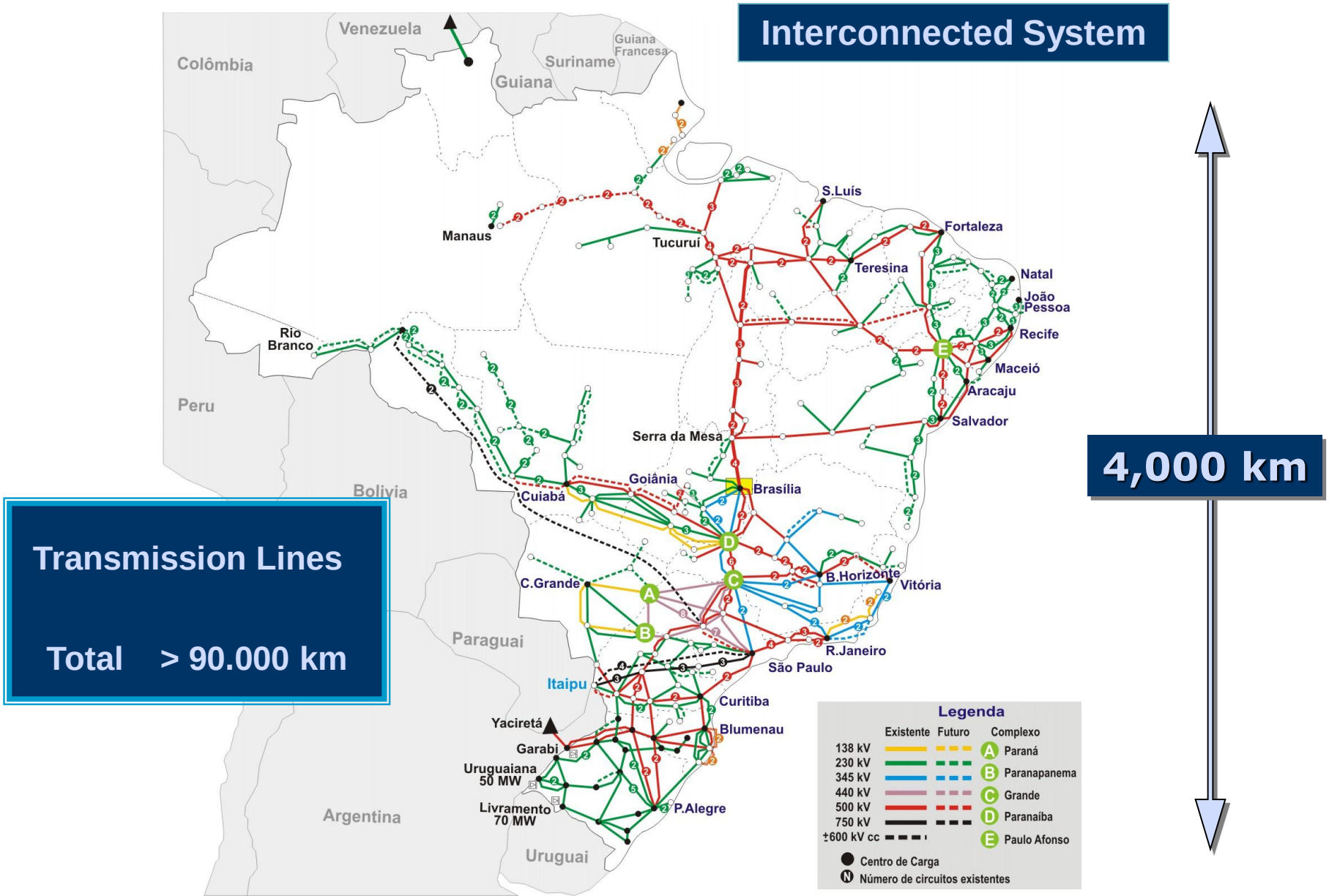
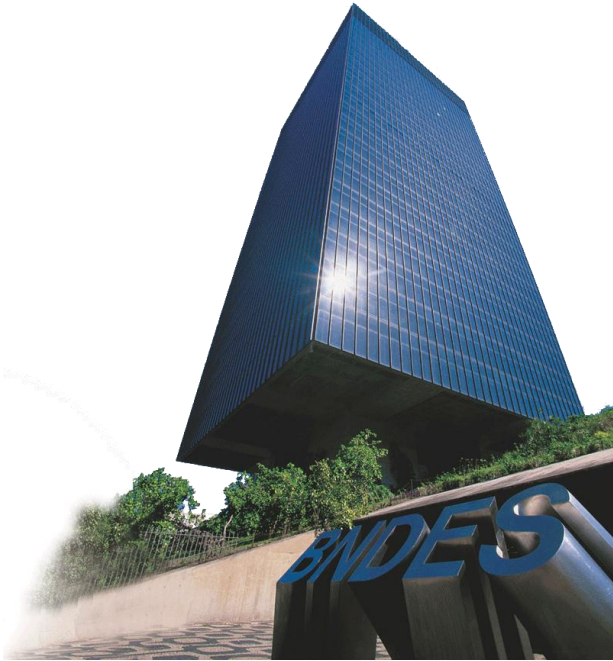


Transmission Lines

Total > 90.000 km

Renewable Energy: evolution and perspectives



Wind Energy Perspectives

- ✓ The global installed capacity of wind power already exceeds 200 GW, with 45 GW added in 2010. Wind energy is growing at an average rate of 32% p.a., doubling the capacity every three years.

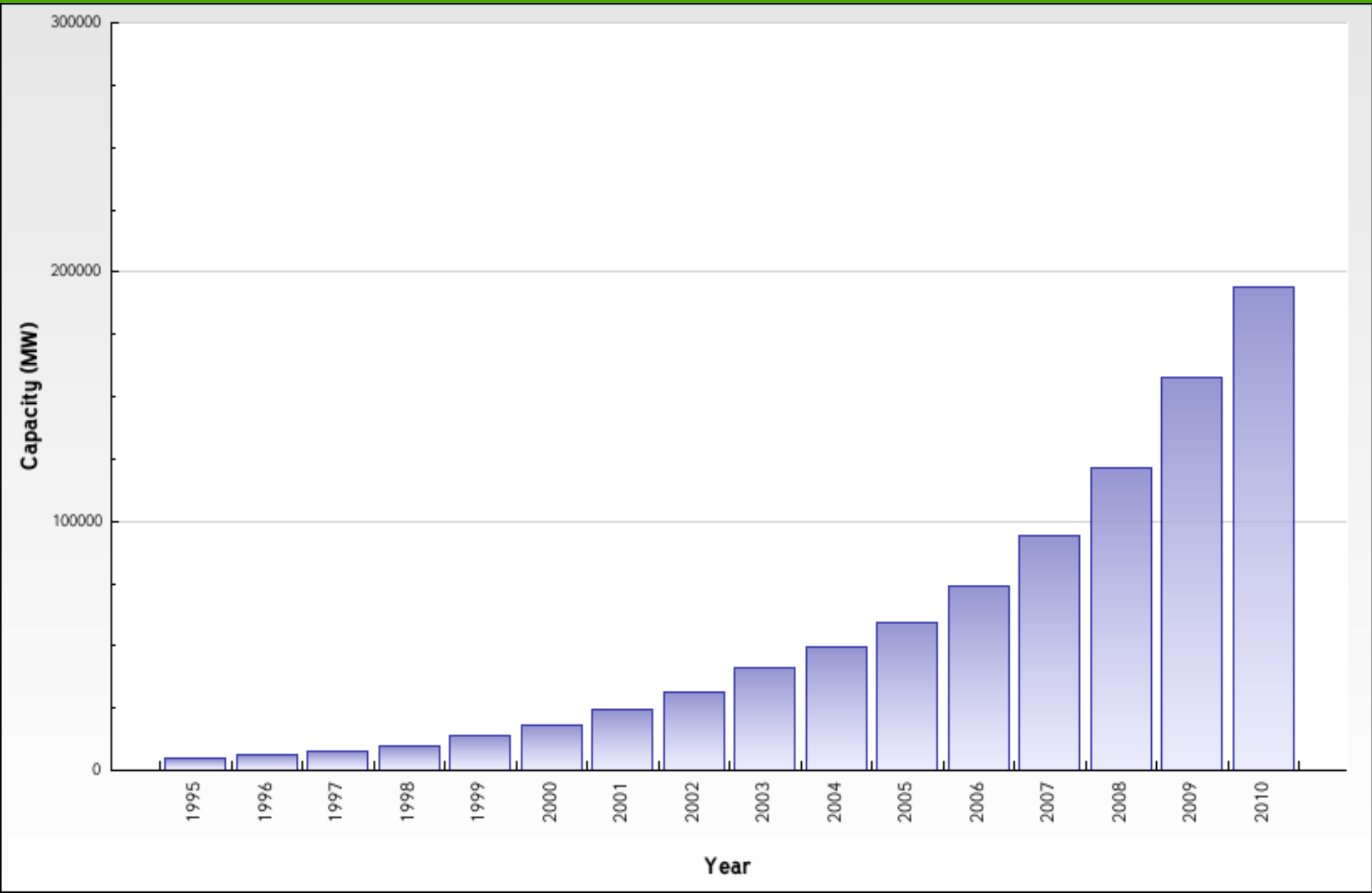
- ✓ The wind energy sector in 2010 had sales of over US$ 65 billion.

- ✓ The wind industry employs over 550,000 people around the world.

Wind Energy Perspective

- China alone added more than 15 GW in 2010.
- Asia represents most of the new wind farms (40%), followed by North America (28%) and Europe (27%).
- Latin America in 2010, showed robust growth, doubling its capacity, due mainly to Brazil and Mexico.
- The WWEA estimates that in 2020 the global installed capacity reaches 1,900 GW.

Wind Generation in the World



Wind Generation in the World

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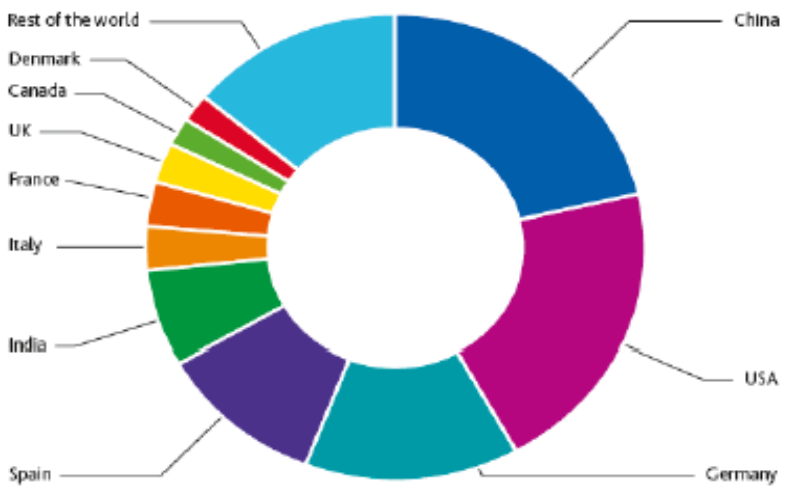
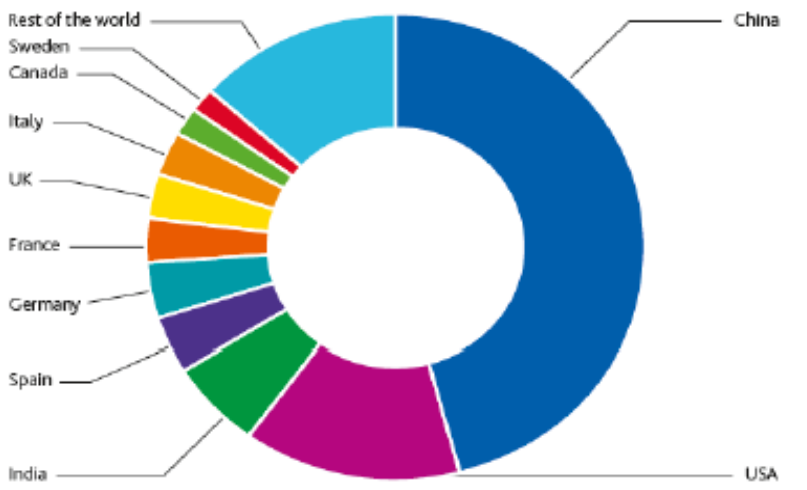
TOP 10 CUMULATIVE CAPACITY DEC 2010



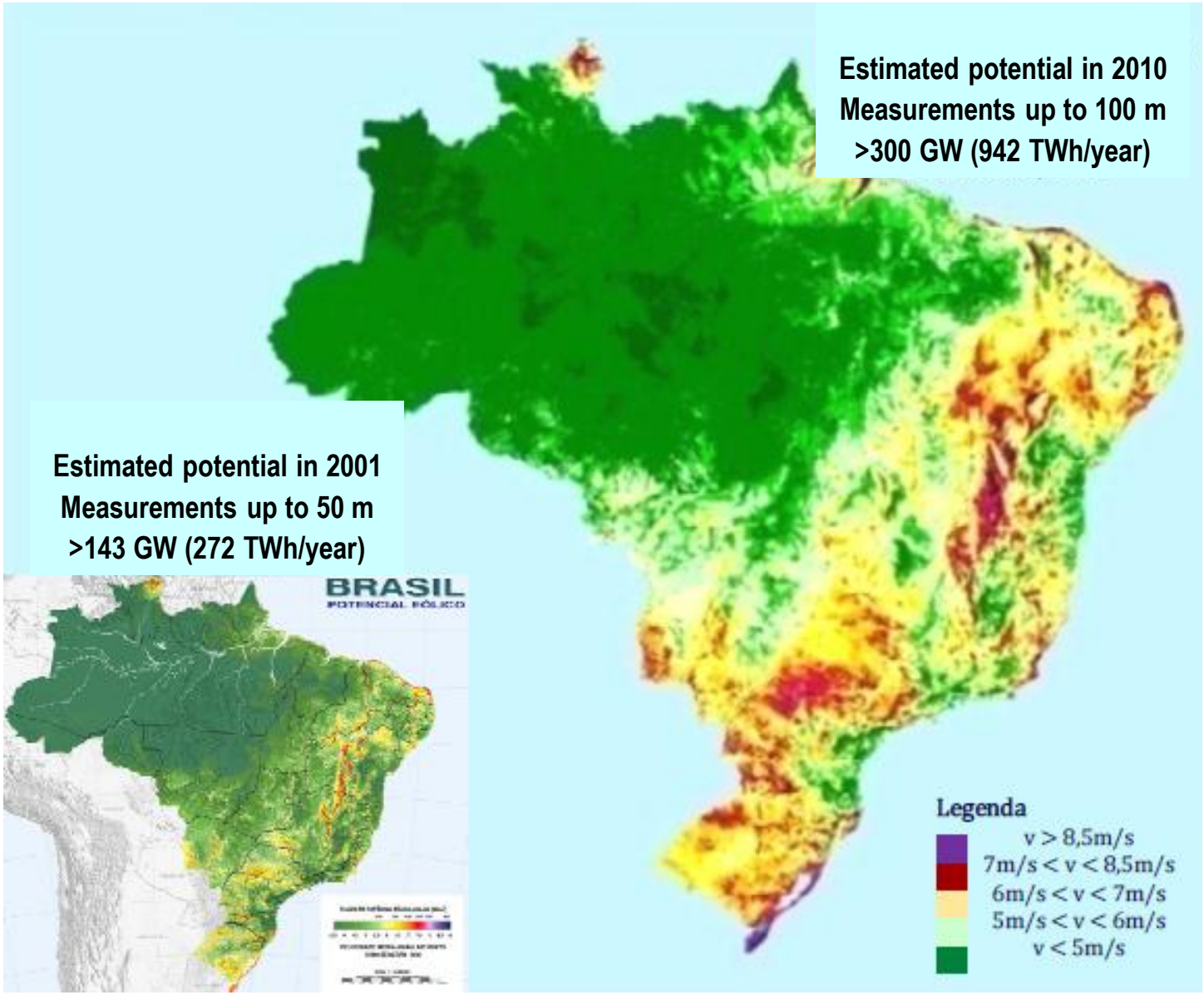
Country	MW	%
China	42,287	21.8
USA	40,180	20.7
Germany	27,214	14.0
Spain	20,676	10.6
India	13,065	6.7
Italy	5,797	3.0
France	5,660	2.9
UK	5,204	2.7
Canada	4,009	2.1
Denmark	3,752	1.9
Rest of the world	26,546	13.7
Total TOP 10	**167,844**	**86.3**
World Total	**194,390**	**100**

TOP 10 NEW INSTALLED CAPACITY JAN-DEC 2010



Country	MW	%
China	16,500	46.1
USA	5,115	14.3
India	2,139	6.0
Spain	1,516	4.2
Germany	1,493	4.2
France	1,086	3.0
UK	962	2.7
Italy	948	2.6
Canada	690	1.9
Sweden	603	1.7
Rest of the world	4,750	13.3
Total TOP 10	**31,052**	**86.3**
World Total	**35,802**	**100**

Wind Potential in Brazil



Wind-Hydro complementarity in Brazil

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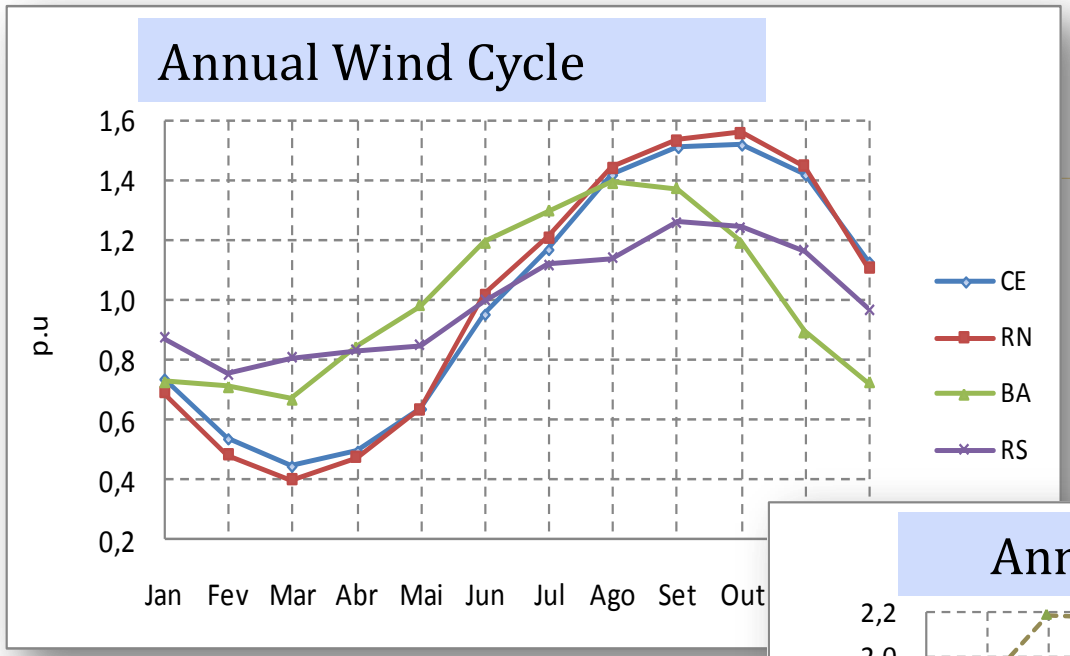
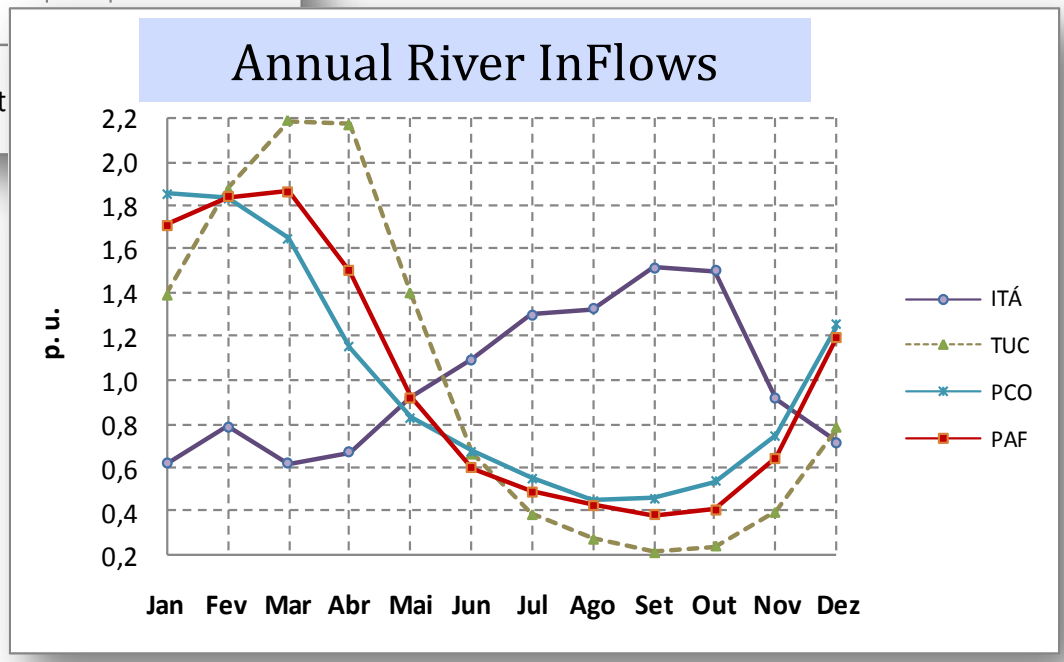


Wind and water cycles of are negatively correlated in the country: in general, there is more wind in the dry season and vice versa.



ITÁ: UHE Itá
TUC: UHE Tucurui
PCO: UHE Porto Colômbia
PAF: UHE Paulo Afonso

Wind Energy Auction Analysis

- ✓ On December 14th 2009, Brazil had its first wind auction, contracting 71 projects in five states (mostly in the NE region) totaling 1.806MW (753 avg. MW) at an average price of R$148.39/MWh to be delivered starting July, 2012;
- ✓ Wind availability and load factors, which were estimated taking into account a short period of measurements;
- ✓ Estimated IRRs of the auctioned projects are estimated to be between 8% - 12% (real terms);
- ✓ The strong availability of turbines from suppliers, due to a demand reduction as a consequence of the financial crisis, lead such suppliers to provide competitive conditions to entrepreneurs;

Wind Energy through Tenders

	POWER (MW)	Average MW	CAPACITY FACTOR
PROINFA	1.288,0	418,6	32,50%
LER (RESERVE ENERGY AUCTION) 2009	1.806,9	783,0	43,33%
LFA (ALTERNATIVE SOURCES AUCTION) 2010	1.584,6	695,0	43,85%
LER (RESERVE ENERGY AUCTION) 2010	528,6	266,8	50,5%
2010	2.113,2	961,8	45,51%
A-3 2011	1.067,6	484,2	45,35%
LER (RESERVE ENERGY AUCTION) 2011	861,1	428,8	49,80%
A-5 2011	976,5	478,5	49,00%
2011	2.905,2	1.391.5	47,80%
TOTAL	8.113,3	3.544,9	43,81%

Wind Energy Prices – Recent Evolution

PPA	Price Dec/ 2011 (R$/Mwh)	Δ%	CAPEX (R$/ installed kW)	Δ%	Average Capacity Factor P50	Δ%	BNDES Tenor (years)	Δ%
PROINFA	308,30		6.000		31,7%		12	
LER 2009	167,38	-46,2%	4.500	-25%	41,2%	30%	14	16%
LFA 2010	147,19	-12,0%	4.000	-12%	42,4%	2,9%	16	14%
LER 2010	134,25	-8,9%	4.000	-	51,0%	11,8%	16	-
A-3 2011	101,35	-19,1%	3.600	-10%	45,4%	-11%	16	-
LER 2011	101,56	-	3.600	-	49,8%	9,7%	16	-
A-5 2011	105,12	3,9%	3.300	-8,4%	49,0%	-1,7%	16	-

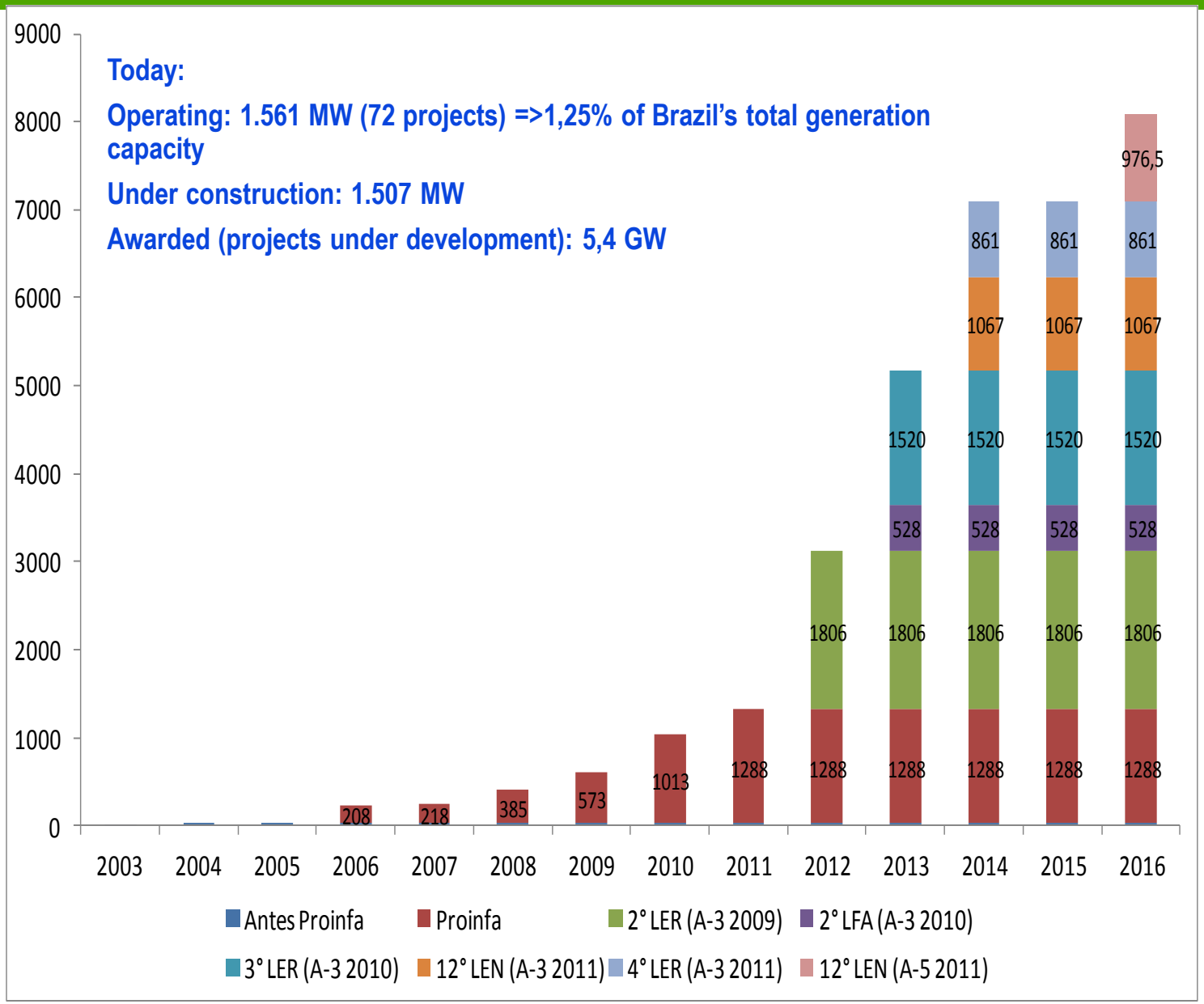
Wind Energy Installed Capacity Evolution

Today:

Operating: 1.561 MW (72 projects) =>1,25% of Brazil's total generation capacity

Under construction: 1.507 MW

Awarded (projects under development): 5,4 GW

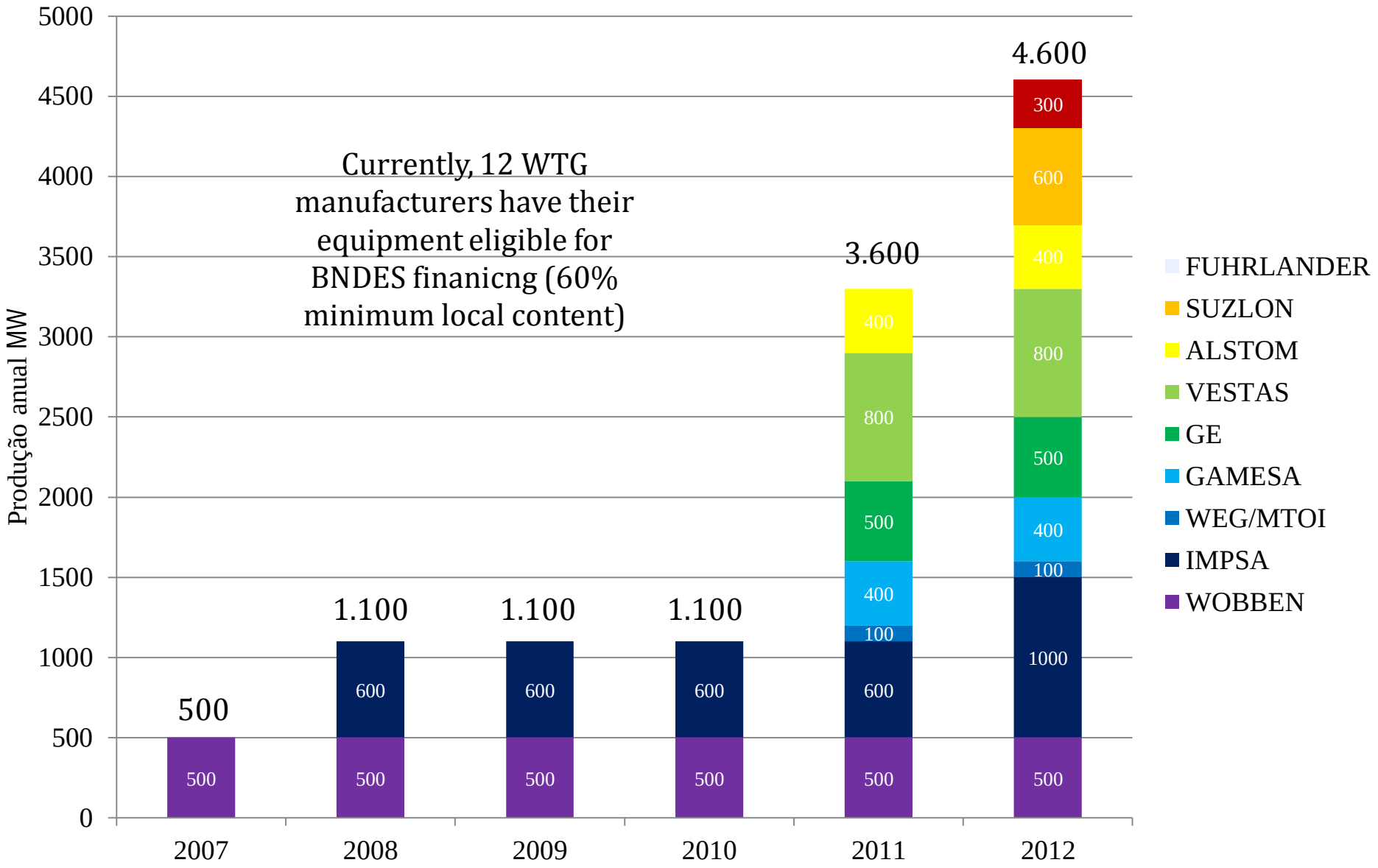


Dez/11	R$/MWh
Proinfa 2005	308,3
2009 Tenders	167,4
2010 Tenders	147,2 134,2
2011 Tenders	101,3 101,5 105,1

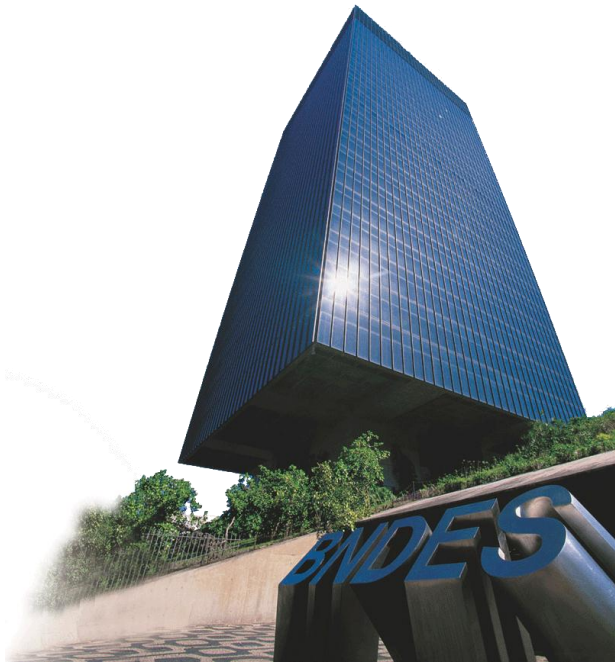
Major Players

- ✓ Renova (Brazil)
- ✓ IMPSA (Argentina/Brazil)
- ✓ CPFL-Renováveis (Brazil)
- ✓ Eletrosul (Brazil)
- ✓ Enel (Italy)
- ✓ Elecnor (Spain)
- ✓ Neoenergia/Iberdrola (Brazil/Spain)
- ✓ Contour Global (USA)

WTG Offer in Brazil



BNDES Wind Portfolio



BNDES Portfolio

Loans approved between 2005 and 2011:

- 2.374 MW installed capacity
- US$ 3,7 billions loans
- US$ 5,5 billions investiments
- US$ 2,2 billions disbursed

2011 approvals:

- 1.160 MW installed capacity
- US$ 1,9 b billions loans
- US$ 2,8 billions investiments
- US$ 1,2 billlions disbursed

BNDES Portfolio

Wind farms projects:

- 28 contracts => R$ 3.3 billions => 962 MW
- 10 approved => R$ 612 MM
- 9 under analysis => R$ 880 MM
- 35 framed => R$ 2.8 billions

Financial Terms

Segments	Amortization Schedule (up to) in years	Maximum Credit (%)	Financing Index	Basic Spread (% p.y.)
1. Generation				
Hydro Power Plants	20 (UHEs acima de 1.000MW) 16 (UHEs de 30MW a 1.000 MW) 14 (PCHs)	80	100% TJLP	0,9
Natural Gas Thermal Plants and Cogeneration	14	80	100% TJLP	0,9
Coal and Oil Thermal Plants	14	50 (+20) *	50% TJLP 50% TJ-462	1,8
Wind Power Plants & Other Renewables	**16**	**80**	**100% TJLP**	**0,9**
2. Transmission lines	14	70	100% TJLP	1,3
3. Power distribution	6	60 (+20) *	50% TJLP 50% TJ-462	1,3
4. Energy efficiency	6	80 a 100 **	100% TJLP	0,9

BNDES O banco nacional do desenvolvimento

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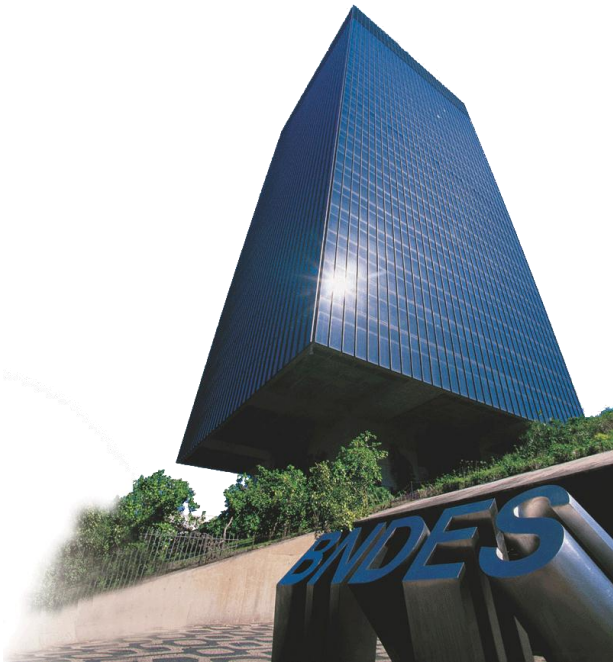
The BNDES support for the energy sector



Long Term Loans for Infrastructure

✓ ***Corporate Finance*** – collaterals driven to the company assets, bank warrants and/or shareholders

✓ ***Project Finance*** – Financing a specific project, not the company's business as a whole. Segregate the project costs, revenues and risks in a special proposed company (SPC)

Project Finance in Infrastructure

BNDES

Basic Assumptions

- Beneficiary: must be a SPC
- Sufficient cash flow to repay financing:

  - Debt Cover Ratio (DCR) greater or equal to 1.20;

  - DCR greater or equal to 1.30, for projects with IRR lower than 8% p.y.;
- All future revenues are pledged to the lenders
- Shareholders' capital compatible with the Project risk
- Equity support agreement (for over costs, mainly)

Project Finance in Infrastructure

Project risk is evaluated, considering:

- Receivables evaluation (PPA contract)
- Sponsors analysis;
- major contracts evaluation (EPC contract, etc);
- Participation of other lenders;
- Shared guarantees evaluation;
- Insurance framework (Completion and Performance Bond, etc)

Project Finance in Infrastructure

BNDES

Guarantees during the implementation period:

- ✓ Pledge of the SPC shares;
- ✓ Pledge of concession Rights;
- ✓ Corporate or bank personal guarantees;
- ✓ Equity support agreement;
- ✓ Insurance Basket: Completion, Performance Bond, etc
- ✓ Shareholder's equity contribution could be demanded as a previous condition for financing disbursements.

Guarantees during the operational period:

- ✓ Pledge of the SPC Shares;
- ✓ Pledge of the Concession Rights;
- ✓ Pledge of the PPAs receivables;
- ✓ Escrow Account with a minimum of 3 monthly payments.

BNDES' Interest rate - Direct Operation

Financial Cost

Funding Cost
- **TJLP**
- **TJ-462**
- **Currency Basket**
- **LIBOR**

+

BNDES Basic Spread

Margin to cover operational expenses
0.0 – 2.5% p.a.
(0,9% p.a. for SMEs)

+

Credit Risk Rate

Margin to cover non-performing loans
0.0 – 3.57% p.a.

=

Total Interest Rate

Project Portfolio in BNDES

Small hydro plants projects:

- 96 contracts worth R$ 5.9 billions => 1,919 MW
- 2 approved => R$ 58 MM
- 6 under analysis => R$ 369 MM
- 9 framed => R$ 952 MM

Wind Generation Growth in Brazil