



BRAZILIAN INFRASTRUCTURE FORUM 2013

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INVESTMENTS IN THE ELECTRICITY SECTOR

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President of the Energy Research Office (EPE)





ELECTRICITY GENERATION

Power Auctions

Modalities

- **New Energy Auctions A-3 and A-5 (three-year and five-year ahead) : servicing expected demand growth**
- **Reserve auctions: ensuring greater security of supply**
- **Structuring Project Auctions: special conditions**

Bidders

- **Public or private companies**
- **National or foreign companies**

Winners

- **The lowest bid**
- **Winners of the new energy auctions sign long-term contracts (15 to 30 years) with distributors and receive concessions (in the case of hydropower plants)**

Power Auctions

Indexation

- **IPCA**

Financing

- **Use of the PPA (Power Purchase Agreement) as collateral for project financing by the BNDES**

Risk Mitigation

- **Only projects with prior environmental licenses are auctioned off**

Power Auctions

Main technical requirements for participation

- A project's technical and environmental viability must be ensured to participate in the power auction.
- Several requirements must be met to prove viability, such as:

TYPE	ANEEL REGISTRY	PRIOR ENVIRONMENTAL LICENSE	ACCESS INFORMATION	ENERGY PRODUCTION CERTIFICATE	PROOF OF RIGHT OF LOCAL USE	PROOF OF AVAILABILITY	WATER USE GRANT
WIND POWER PLANT	X	X	X	X	X		
HYDROPOWER PLANT (HPP and Small Hydro)	X	X	X				X
THERMAL POWER PLANT (BIOMASS and FOSSIL)	X	X	X		X	X	X

Source: EPE

Power Auctions

Main financial requirements for participation and for signing power contracts

Bid guarantees due to ANEEL:

- For each project eligible to participate in the auction, bidders must submit bid guarantees due to ANEEL:
 - For Projects without grants: 1% of the investment value
 - For Projects with grants: US\$ 1,000 per lot of energy to be offered
(1 lot = 0.1 average MW)

Assurance of Faithful Execution of Contract:

- The auction winners must collect 5% of the investment value declared to the EPE
- The warranties will decrease in value as the construction phase of the power plant advances

Notes:

(1) In January 2013, the exchange rate was approximately US\$ 1 = R\$ 2.00

(2) Average MW – energy unit equivalent to 8,760 MWh over an yearly period

BNDES FINEM financing conditions for Power Plants

Hydro Power Plant	Thermal Power Plant	Wind, Biomass and Small Hydro
<ul style="list-style-type: none"> • Current credit conditions: <ul style="list-style-type: none"> ▪ Leverage: up to 70%; should observe DSCR * ≥ 1.2 ▪ Credit term: up to 25 years ▪ Grace period: up to 5 years ▪ Interest rate: TJLP**+0.9%+risk spread 	<ul style="list-style-type: none"> • Current credit conditions: <ul style="list-style-type: none"> ▪ Leverage: up to 70% (50% coal or oil); should observe DSCR * ≥ 1.2 ▪ Credit term: up to 18 years ▪ Grace period: up to 4 years ▪ Interest rate: TJLP**+0.9% (1.8% coal or oil) +risk spread 	<ul style="list-style-type: none"> • Current credit conditions: <ul style="list-style-type: none"> ▪ Leverage: up to 80%; should observe DSCR * ≥ 1.2 ▪ Credit term: up to 19 years ▪ Grace period: up to 3 years ▪ Interest rate: TJLP**+0.9%+risk spread

Source: BNDES – accessed in Jan/2013 (www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Areas_de_Atualizacao/Infraestrutura)

Notes:

* **DSCR: debt service coverage ratio**

****TJLP: Long Term Interest Tax, currently 5.0%**

Power Auctions

Main Results

Consolidated results of new energy auctions 2005 to 2012

NUMBER OF AUCTIONS	PROJECTS	CAPACITY (MW)	INVESTMENT (US\$ billion)
23	490	60,892	115

Source: EPE

Power Auctions

Main Results

December 2012 Auction

TYPE	BID CAPACITY (MW)	BID GUARANTEES	
		NUMBER OF PARTICIPANTS	TOTAL AMOUNT (US\$ Million)
WIND POWER PLANT	6,714	264	117
HPP	988	5	82
SMALL HYDRO	50	4	1
BIOMASS	300	2	5
GAS	368	2	6
TOTAL	8,420	277	211

Source: EPE

Notes:

(1) HPP – Hydro Power Plant

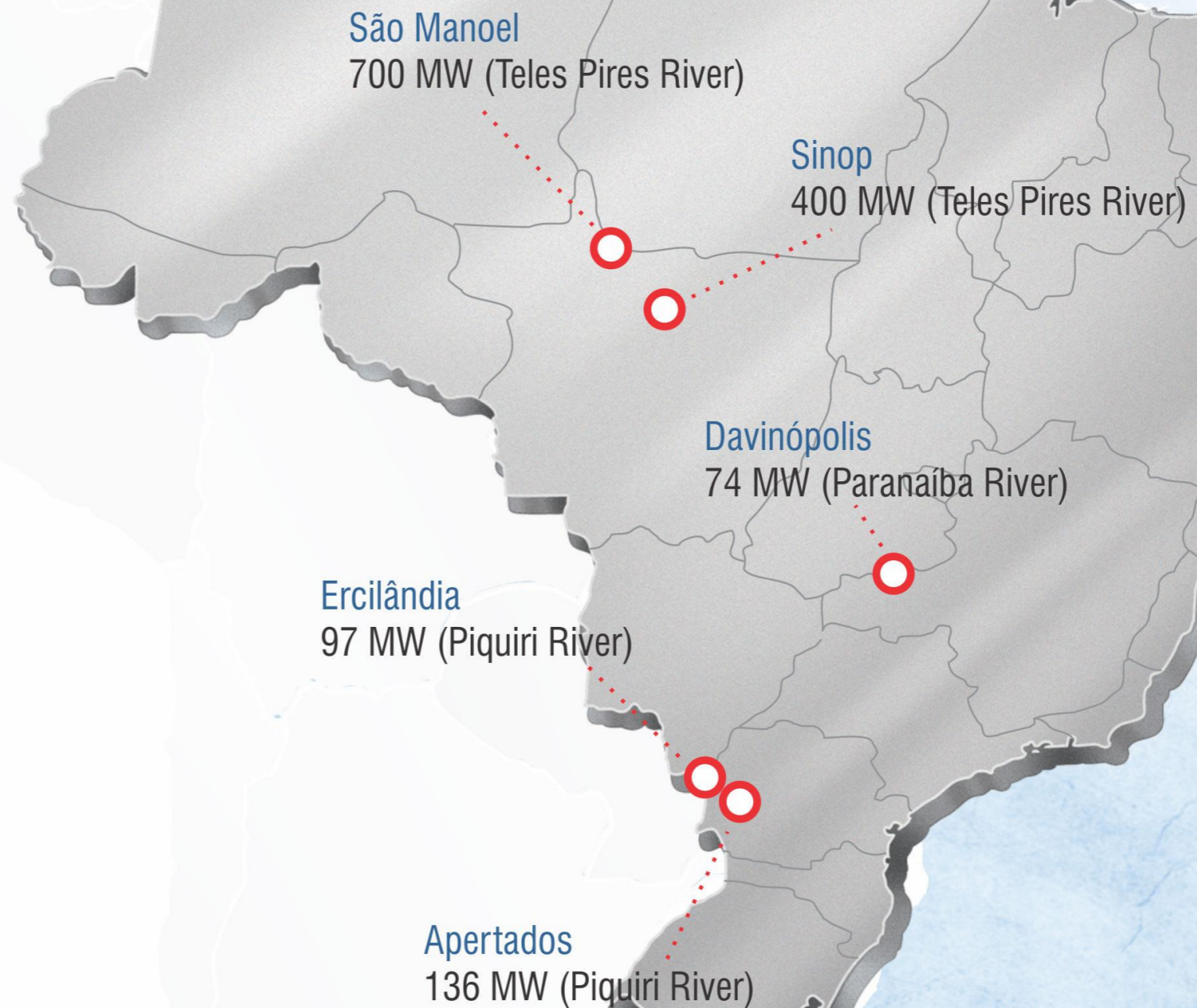
(2) TPP – Thermal Power Plant

Auction Year
2013

Capacity
1,407 mw

Estimated Investment
US\$ 3.1 billion

Source: EPE



Auction Year
2014

Capacity
7,241 mw

Estimated Investment
US\$ 12.2 billion

Source: EPE



Hydropower Expansion:

2013 to 2017 Auctions

Auction Year

2015

Capacity

3,249 mw

Estimated Investment

US\$ 6.2 billion

Source: EPE



Hydropower Expansion:

2013 to 2017 Auctions

Auction Year

2016

Capacity

1,117 mw

Estimated Investment

US\$ 2.7 billion

Source: EPE

Bem Querer
709 MW (Branco River)

Torixoréu
408 MW (Araguaia)

Hydropower Expansion:

2013 to 2017 Auctions

Auction Year

2017

Capacity

8,407 mw

Estimated Investment

US\$ 15.8 billion

Source: EPE



Hydropower Expansion:

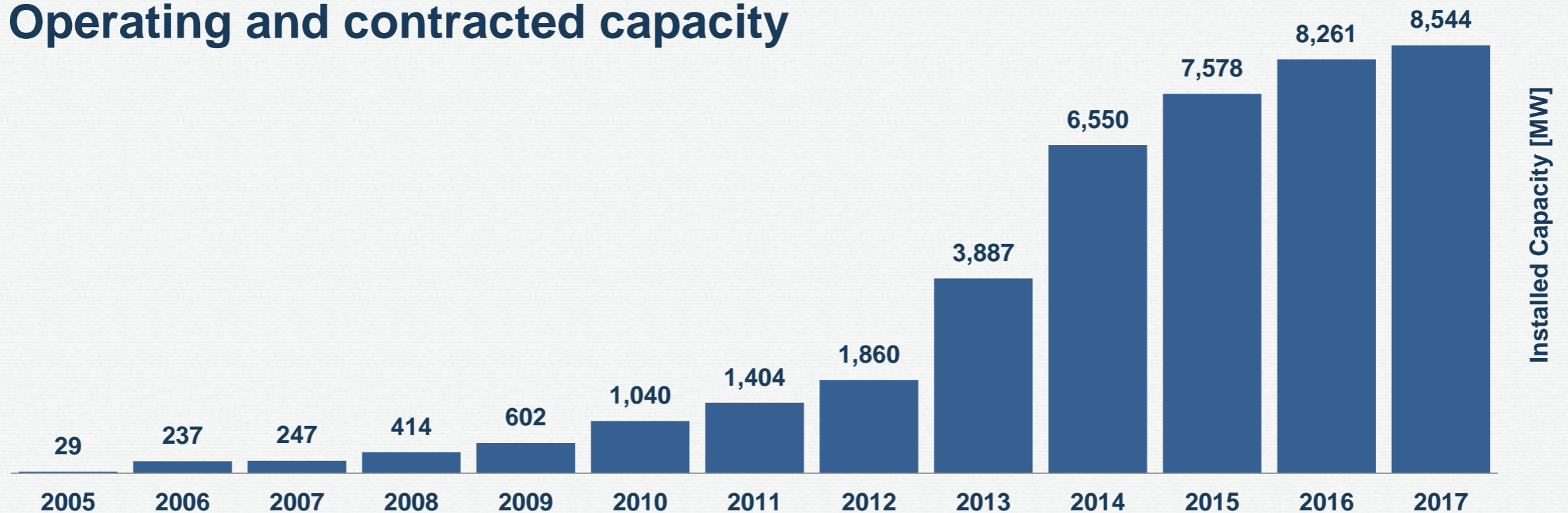
2013 to 2017 Auctions

Auction Year	Total Power (MW)	Total Investment (US\$ billion)
2013	1,407	3.1
2014	7,241	12.2
2015	3,249	6.2
2016	1,117	2.7
2017	8,407	15.8
Total	21,421	40.0



The Development of Wind Power in Brazil

Operating and contracted capacity



To be contracted in 2013-2017 auctions

Capacity (MW)

5,720

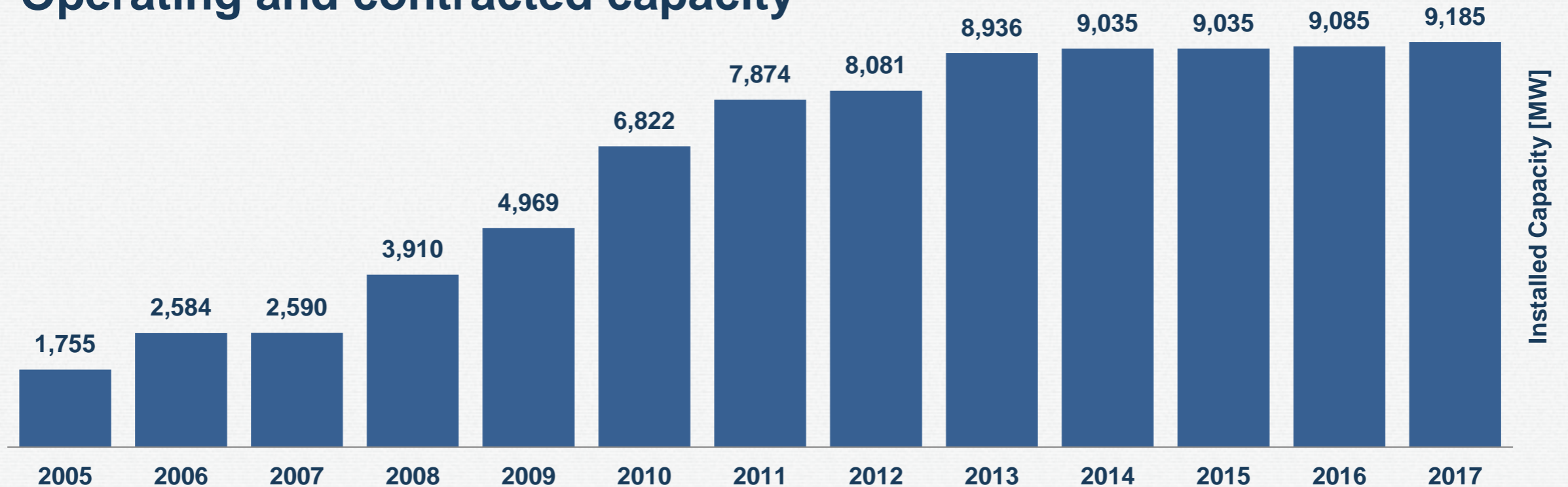
Investment (US\$ billion)

11.9

Source: EPE

The Development of Bioelectricity in Brazil

Operating and contracted capacity



To be contracted in 2013-2017 auctions

Capacity (MW)

3,160

Investment (US\$ billion)

3.5

Source: EPE

Other Energy Sources to be Contracted in 2013-2017 Auctions

Small Hydropower Plants

Capacity (MW)

1,170

Investment (US\$ billion)

3.6

Source: EPE

Thermal Power Plants

Capacity (MW)

1,500 *

Investment (US\$ billion)

1.5

Source: EPE

*It could be higher depending on the effective exploration of unconventional gas

Electricity Generation to be Contracted in 2013-2017 Auctions

Sources	Capacity (MW)	Investment (US\$ billion)
Hydropower	21,421	40.0
Other Renewable Sources (Wind, Biomass and Small Hydro)	10,050	19.0
Thermal power	1,500	1.5
TOTAL	32,971	60.5

Source: EPE



ELECTRICITY TRANSMISSION

Transmission Line Auctions

Bidders

- **Legal Entities: National or Foreign**
- **Equity Funds: alone or in a consortium**

Clearance

- **Clearance after auctions and publication of winning bids**

Winners

- **Bidder with the lowest Allowed Annual Revenue (RAP)**
- **Winners will sign long-term contracts (30 years)**

Transmission Line Auctions

Regulated Contracts

- Indexation by IPCA
- Contracts submitted to the Periodic Rate Reviews

Financing

- RAP as collateral for financing by the BNDES

Transmission Line Auctions

Sequence of Events

Public Notice of Auction

Auction application and bid guarantees due to ANEEL

Auction held at BM&FBOVESPA

ANEEL approval of technical capacity of the winners of the auction

Approval of Auction Results

TL Auction winners deliver documentation to ANEEL

Celebration of concession contract between winner and ANEEL

Accepted bid guarantee instruments: cash deposit, surety bond, bank guarantee, Brazilian Government Bonds (1% of estimated investment)

Replacement of bid guarantees with the guarantee of faithful execution of the contract (5% of estimated investment)

BNDES FINEM Conditions for Transmission Lines

- **Current credit conditions:**
 - **Leverage: up to 70%; should observe DSCR * ≥ 1.2**
 - **Credit term: up to 17 years**
 - **Grace period: up to 3 years**
 - **Interest rate: TJLP**+1.3%+risk spread**

Notes:

*** DSCR: debt service coverage ratio**

****TJLP: Long Term Interest Tax, currently 5.0%**

Source: BNDES – accessed in jan/2013 (www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Areas_de_Atualcao/Infraestrutura)

Transmission Line Past Auctions

Main Results

Consolidated Results of Auctions 2000 to 2012

NUMBER OF AUCTIONS	LENGTH (Km)	INVESTMENT (US\$ billion) *
24	51,000	16

(*) current values

Source: ANEEL

Transmission Line Auction of Dec, 2012: Main Results

- **Number of applicants: 15 (includes state-owned companies, private groups, 4 foreign groups and equity funds)**
- **Total TL tendered: 3,822 Km**
- **Estimated investment: US\$ 2 billion**
- **Average discount: 21.7%**
- **Stiff competition: for example, in “500 kV Estreito – Itabirito” transmission line auction, there were 305 bids that resulted in a 16.6% discount**

Main TL Projects to be Auctioned in 2013

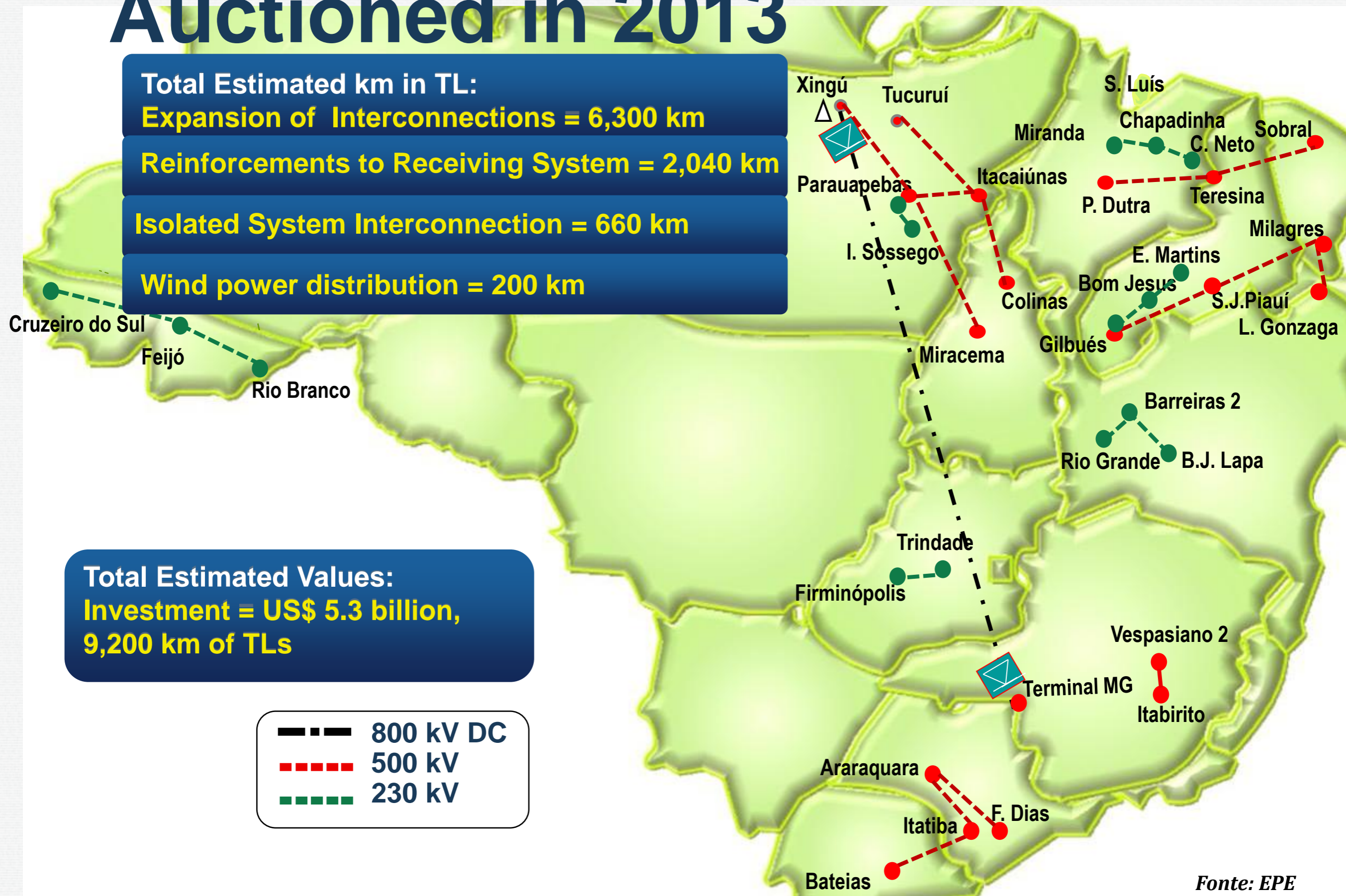
Total Estimated km in TL:

Expansion of Interconnections = 6,300 km

Reinforcements to Receiving System = 2,040 km

Isolated System Interconnection = 660 km

Wind power distribution = 200 km



Total Estimated Values:
Investment = US\$ 5.3 billion,
9,200 km of TLs

--- 800 kV DC
--- 500 kV
--- 230 kV

Main TL Projects to be Auctioned from 2014 to 2017

Total Estimated km in TL:

Expansion of Interconnections = 5,200 km

Reinforcements to Receiving System = 1,800 km

Distribution from HPPs = 2,500 km

Total Estimated Values:

Investment = US\$ 5.5 billion

9,500 km of TL

--- 800 kV DC
- - - 500 kV

Xingú

N

S. Luís

Miranda

Quixadá

Açu III

800 kV DC
2,575 km
Bipole 2

Paranaíta

Claudia

Paranatinga

Ribeirãozinho

NE

SE

Marimbondo 2

Estreito

Campinas

F. Dias

N. Iguaçú

Terminal RJ

Estimated Investments: Electricity Transmission Lines

AUCTION		LENGTH (km)	INVESTMENT (US\$ Billion)*
2013		9,130	5.3
2014-2017	Defined Projects	9,497	5.6
	Other Projects	4,573	3.0
TOTAL		23,200	13.9

(*) Includes estimated investment in substations

Source: EPE

Expected Investments in the Electricity Generation and Transmission Auctions - 2013-2017

	ESTIMATED EXPANSION	INVESTMENT (US\$ BILLION)
Generation	32,971 MW	60.5
Transmission	23,200 km	13.9
TOTAL		74.4

Source: EPE



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