

Jaguara and Miranda HPPs: operational, commercial and financial characteristics

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Summary

1. ENGIE worldwide

2. ENGIE Brasil Energia

3. Auction 01/2017

4. Jaguara and Miranda HPPs

5. Annex



1. ENGIE worldwide

ENGIE is the largest private energy producer, with a diversified portfolio...

ENGIE S.A. is the **largest independent energy** producer of the **globe**

Presence in **70 countries**

Market Cap: **€ 35.7 billion**[1]

Share price (ENGI): **€ 14.66**[1]

Revenue (2016): **€ 66.6 billion**

EBITDA (2016): **€ 10.7 billion**

Net Worth (2016): **€ 45.4 billion**

Net Debt/EBITDA (2016): **2.3x**

S&P Global Ratings

Rating Global Scale **A-**

1000 recharge stations for electric cars

112.7 GW of installed capacity

Management of more than **1.5 million** illumination points

Responsible for security systems in more than **60 cities**

Note:
[1] Based on Paris quotation as of 16/01/2018.
Source: ENGIE website

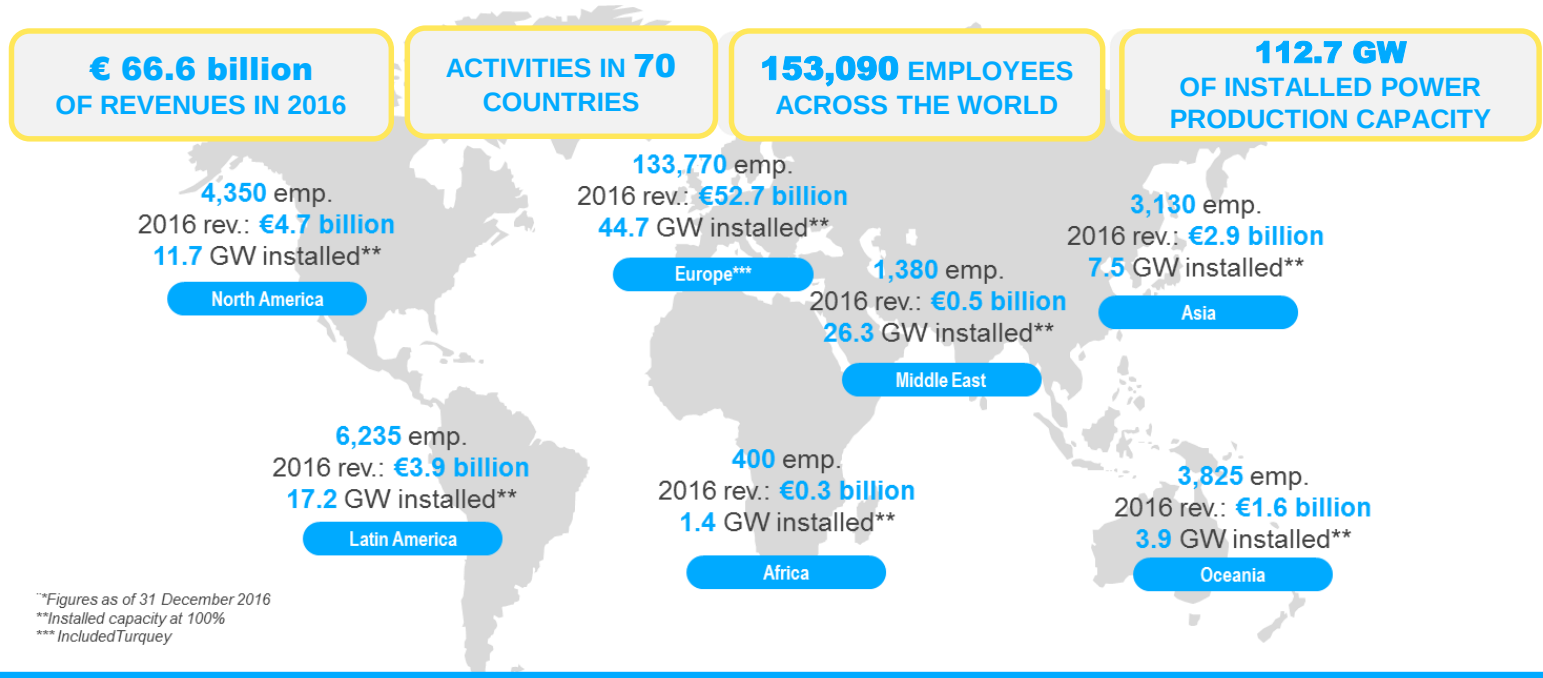
...across the globe

€ 66.6 billion
OF REVENUES IN 2016

ACTIVITIES IN **70** COUNTRIES

153,090 EMPLOYEES ACROSS THE WORLD

112.7 GW
OF INSTALLED POWER PRODUCTION CAPACITY



**Figures as of 31 December 2016*
***Installed capacity at 100%*
**** IncludedTurquey*

Building on its **wide expertise** and **strong international** positions in the fields of electricity, natural gas and energy services, **ENGIE focuses on three growth engines:**

LOW CO_2 POWER GENERATION

Generation of electricity mainly from low CO_2 sources (renewables, thermal contracted)

GLOBAL NETWORKS

Development and management of global infrastructure and networks (gas-electricity)

CUSTOMERS SOLUTIONS

Customer solutions and services for residentials, professionals, businesses, cities and territories

*December 31, 2016 numbers
**Installed capacity on 100%
Source: ENGIE website



2. ENGIE Brasil Energia

In Brazil, ENGIE holds a robust portfolio...

ENGIE Brasil Energia is the **largest private energy producer** in the country.

Market Cap:
R$ 23 billion[1]

Share price (EGIE3):
R$ 35.41[1]

Revenues (2016):
R$ 6.4 billion

Assets (2016):
R$ 6.6 billion

Rating (BR local)
AAA

31 plants

7,868 MW installed capacity

ENGIE Group is **#1** private generator of energy, representing **7.2%**[2] of the national capacity

87% of the installed capacity in the country is clean and/or renewable

Elected by *anuário Época Negócios 360°* as **best company of the country for corporate governance**

Shareholder Structure:

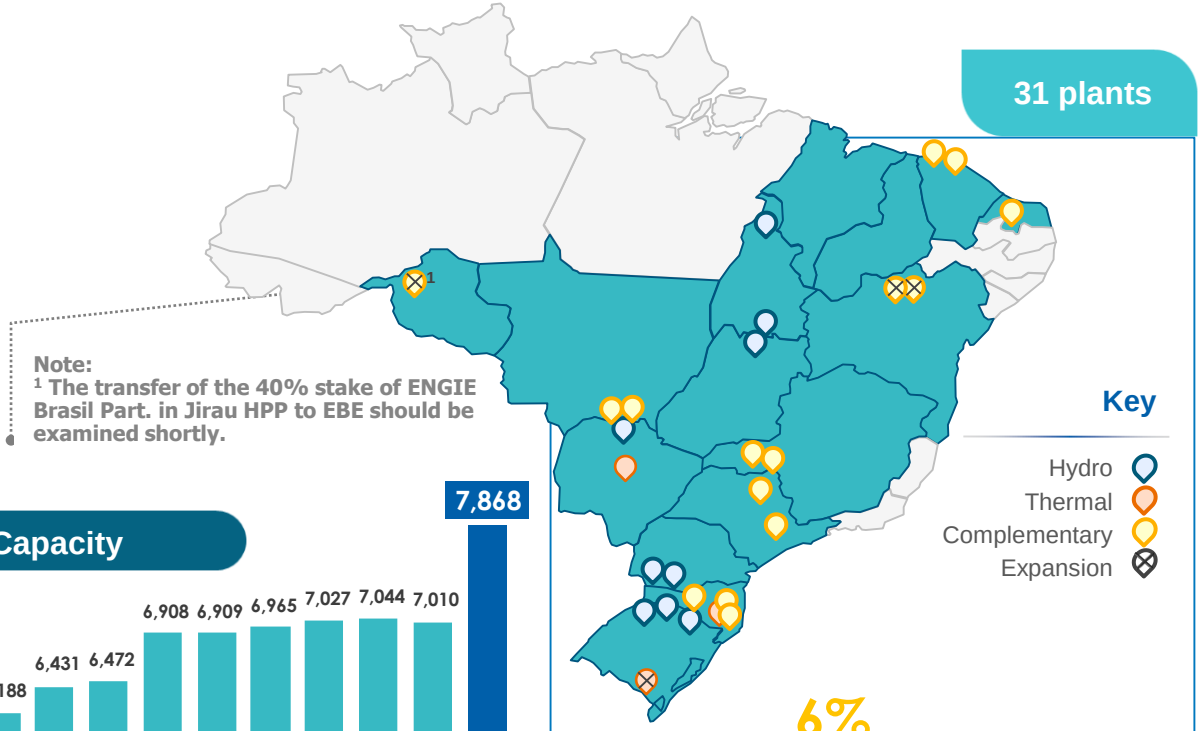


- ENGIE Brasil Participações LTDA – 68.7%
- *Free Float* – 21.3%
- Banco Clássico S.A – 10.0%

[1] Based on closing price of 01/16/2018
[2] Considering ENGIE group
Source: ENGIE

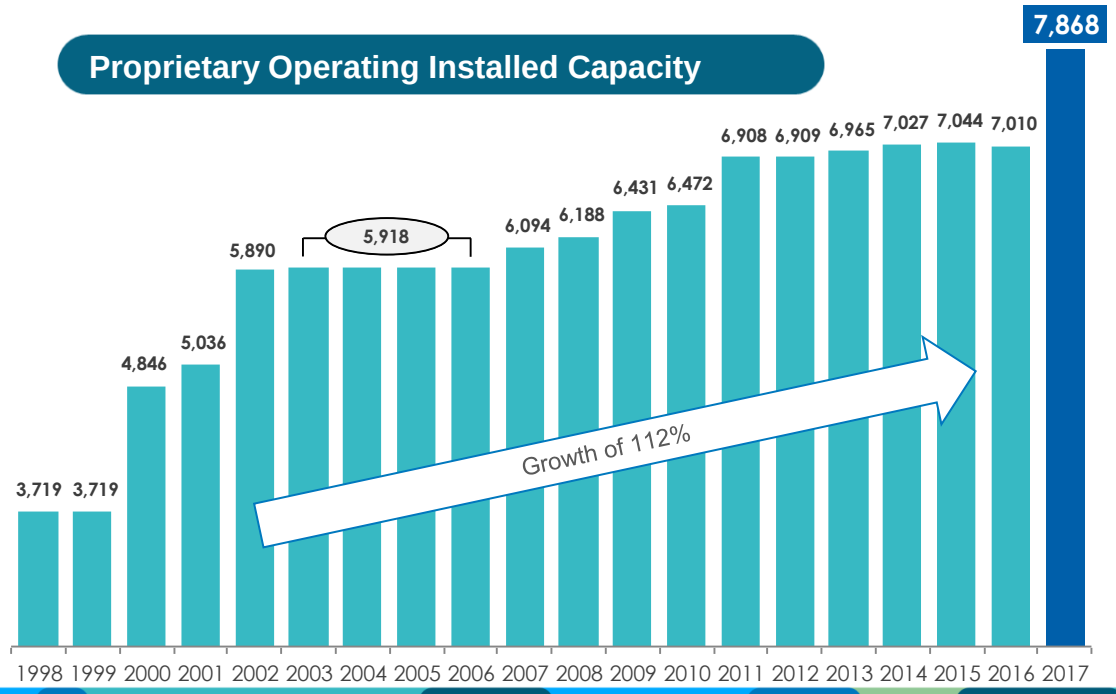
…and continues to grow in the energy sector…

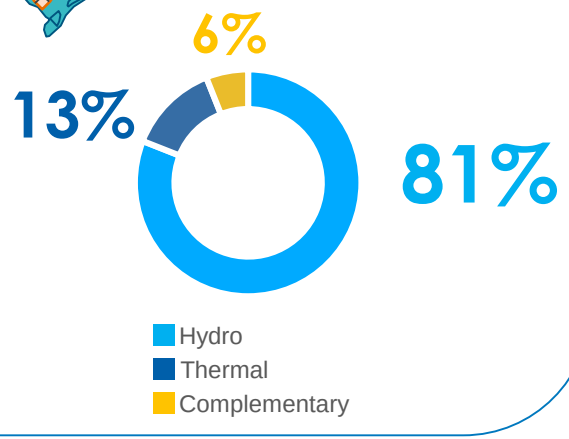
Own installed capacity of
7,868 MW
from 31 plants
operated by the Company



Note:
[1] The transfer of the 40% stake of ENGIE Brasil Part. in Jirau HPP to EBE should be examined shortly.

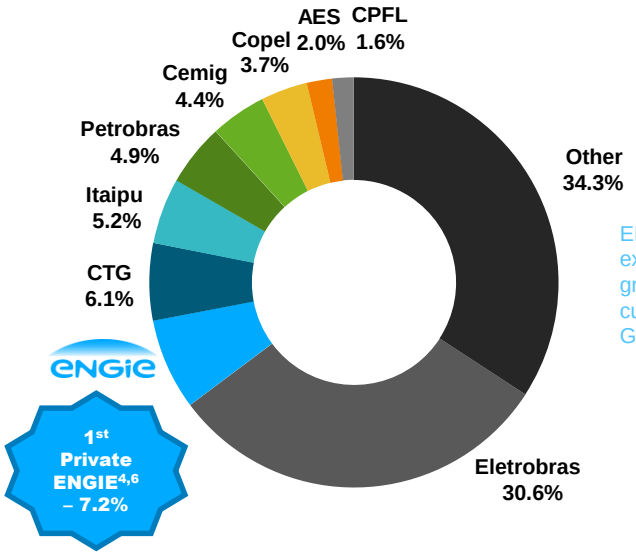
Proprietary Operating Installed Capacity



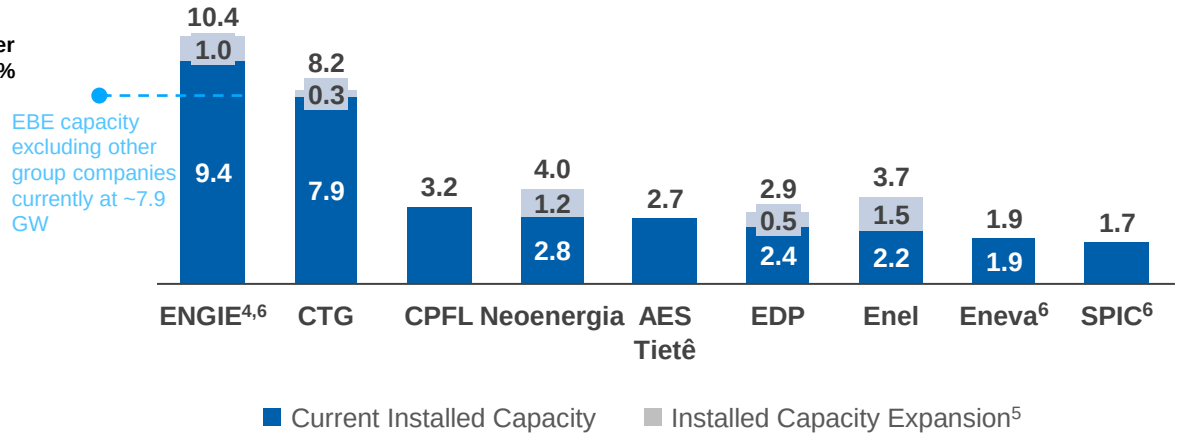


…thus guaranteeing its first position under the private energy producers nationally.

Installed Capacity – Brazil[1,2]



Installed Capacity[3] - Private Sector (GW)

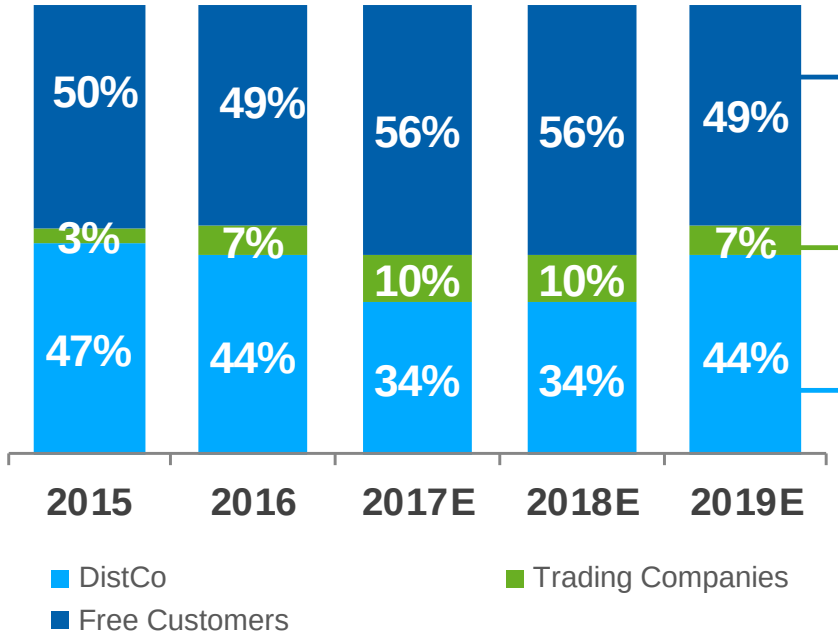


Source: Aneel, websites of the respective companies and internal studies

Notes:
[1] The sum is effected by rounding of the subcategories.
[2] Value corresponds to the Sistema Interligado Nacional (SIN)
[3] Including only the national proportion of Itaipu.
[4] Considering the consolidated capacity of group companies.
[5] Based on ANEEL, ONS and internal studies.
[6] Already including the result of the auctions in 2017 and the acquisition of the Umburanas complex.

Diversified portfolio, combined with flexibility and safety…

Contracted energy per type of client – Position as of 09/30/2017, yet, without contributions of HPP Jaguara and Miranda



Pioneering in attendance of clients in the free market...

- **Flexibility (prices, tenors and conditions)** → **Maximizing portfolio efficiency**
- **Contracts of opportunity (buy/sell)** → **Structuring of products**
- **Largest market**
- **Regulated and free market PPAs (contracted until 2024+)**

→ **Higher predictability of cash flows in the long-term**

…to minimize risks and maximize efficiency of the client's portfolio.

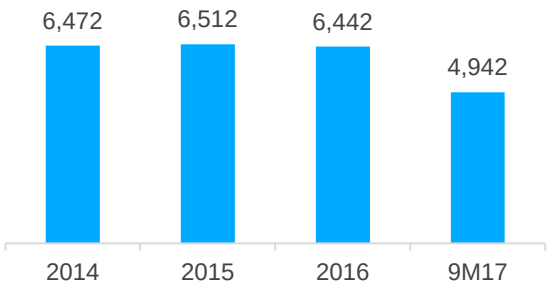
The contracted share of the EBE portfolio will increase with the inclusion of the newly acquired assets

Source: ENGIE DF

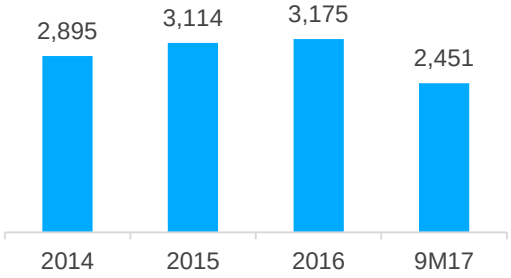
...resulting in a solid financial performance and value creation for shareholders

[1]In BRL millions

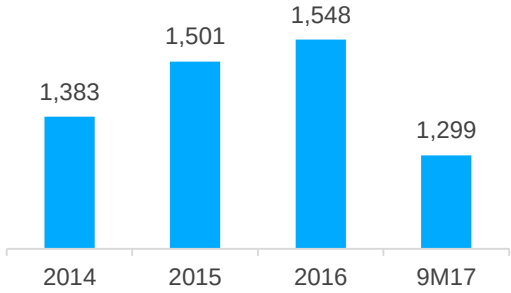
Net revenue[1]



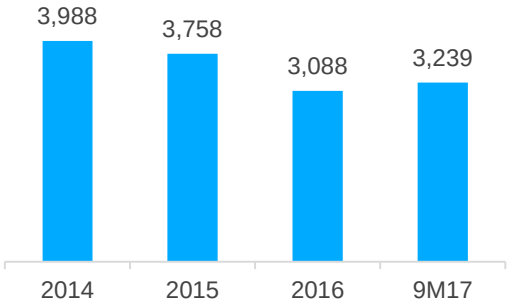
EBITDA[1]



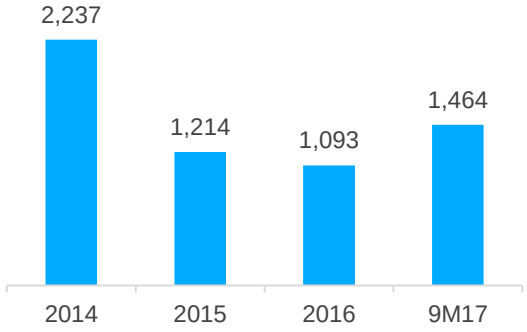
Net Profit[1]



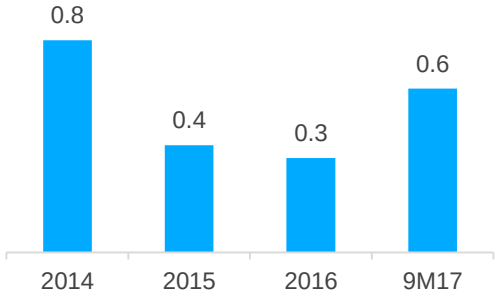
Gross Debt[1]



Net Debt[1]



Net Debt/EBITDA (times)



Note:
[1] All numbers based on Q3 results published by ENGIE Brasil Energia S.A. and audited by Deloitte Touche Tohmatsu.



3. Auction 01/2017

The 2017`s auction attracted large players but ENGIE won all lots for which a bid was placed

Auction Summary

Competitors of ENGIE:

State Power Invest. Corp. (SPIC)

Enel

Aliança Energia

Results:

Lote B	Jaguara HPP		
BO min. (R$ millions)	1,911.25		
Winning Bid (R$ millions)	2,171.00		
	Bid (R$ million)	**Premium**	**Delta**
ENGIE (Winner)	**2,171.00**	**13.59%**	**N.A**
SPIC	Declined	-	-
Aliança	Declined	-	-
Enel	1,917.85	0.35%	-11.7%

Lote C	Miranda HPP		
BO min. (R$ millions)	1,110.88		
Winning Bid (R$ millions)	1,360.00		
	Bid (R$ millions)	**Premium**	**Delta**
ENGIE (Winner)	**1,360.00**	**22.43%**	**N.A**
SPIC	Declined	-	-
Aliança	Declined	-	-
Enel	1,279.22	15.15%	-5.9%



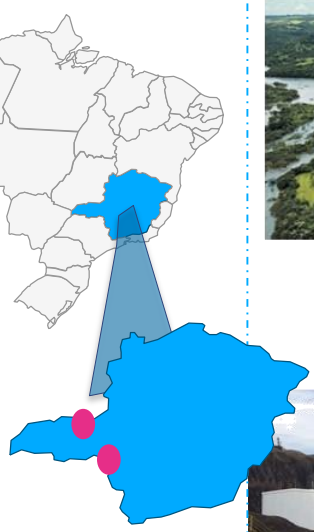
4. Jaguara and Miranda HPPs

Jaguara e Miranda HPPs are operational assets without construction risks…

With an overall investment of R$ 3.5 bi, the company increased its installed capacity of renewable energy be **832 MW**.

HPP Jaguara
Sacramento (MG) / Rifaina (SP)





HPP Miranda
Indianópolis (MG)



…with solid operational characteristics...

HPP Jaguara:

- **Rio Grande**
- **Municipalities:** Sacramento/MG and Rifaina/SP
- **Installed capacity:** 424 MW (4x106)
  Assured Energy: 341 MWav
- **SSs:** 13.8 / 345 kV (SS Jaguara – CEMIG T)
- **Contracted energy price in ACR:**
  R$ 107.51/MWh (May/2017)
  Annual Revenue ACR (70%): R$225 million
- **COD:** 1971
- **Operation:** Run of River
- **OEM[1] (Turbines/Generators):** Mitsubishi and Siemens
- **Environmental License:** IBAMA
  Validity: Oct/2023
- **Reservoir (length/area):** 75 km / 33 km²

HPP Miranda:

- **Rio Araguari**
- **Municipalities:** Indianópolis/MG
- **Installed capacity:** 408 MW (3x 136)
  Assured Energy: 198.2 MWav
- **SSs:** 16.5 / 138 kV (SS Miranda – CEMIG D)
- **Contracted energy price in ACR:**
  R$ 123.16 /MWh (May/2017)
  Annual Revenue ACR (70%): R$150 million
- **COD:** 1998
- **Operation:** Run of River
- **OEM[1] (Turbines/Generators):** Impsa
- **Environmental License:** COPAM/MG
  Validity : Feb/2012 (renewal process ongoing)
- **Reservoir (length/area):** 247 km / 52 km²

Note:
[1] OEM = *Original Equipment Manufacturer*

...and of relevant importance for ENGIE Brasil Energia



Commercialization:
- ✓ Energy driven to Free Market (30%) further completes EBE`s portfolio and creates room for new products creation
- ✓ First plants of EBE in the *cotas`* system *(no GSF risk)*
- ✓ PPA of 30 years indexed by inflation (*IPCA*)



Investment:
- ✓ Cash generation as of day 1
- ✓ Synergies with new regional operation
- ✓ Expertise in O&M will guarantee optimization of CAPEX and OPEX



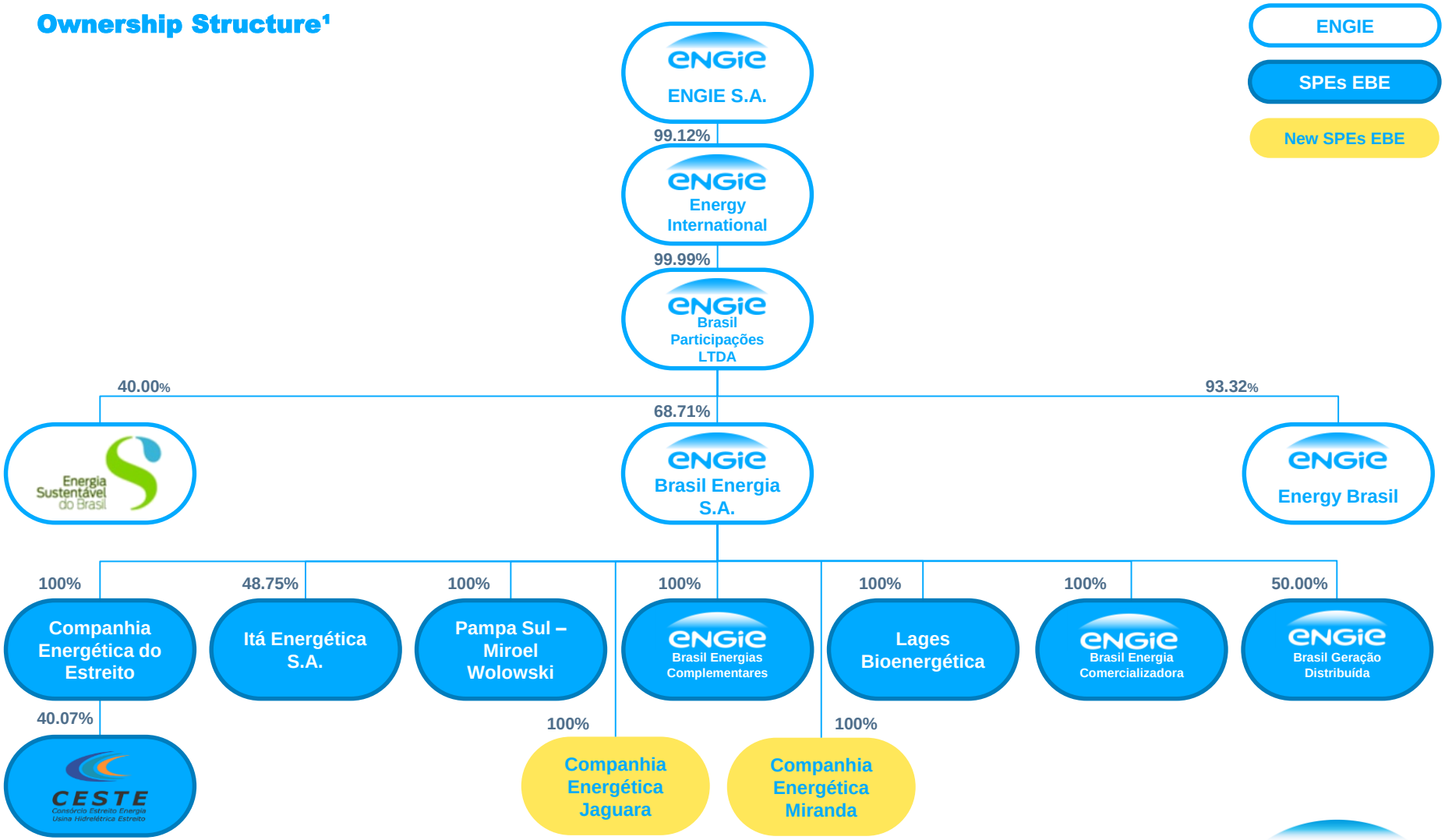
Location:
- ✓ Projects located in South-East, the main load center in Brazil



Financing:
- ✓ Fully financed in BRL
- ✓ Separate financing products for EBE and SPEs for the payment of the concession

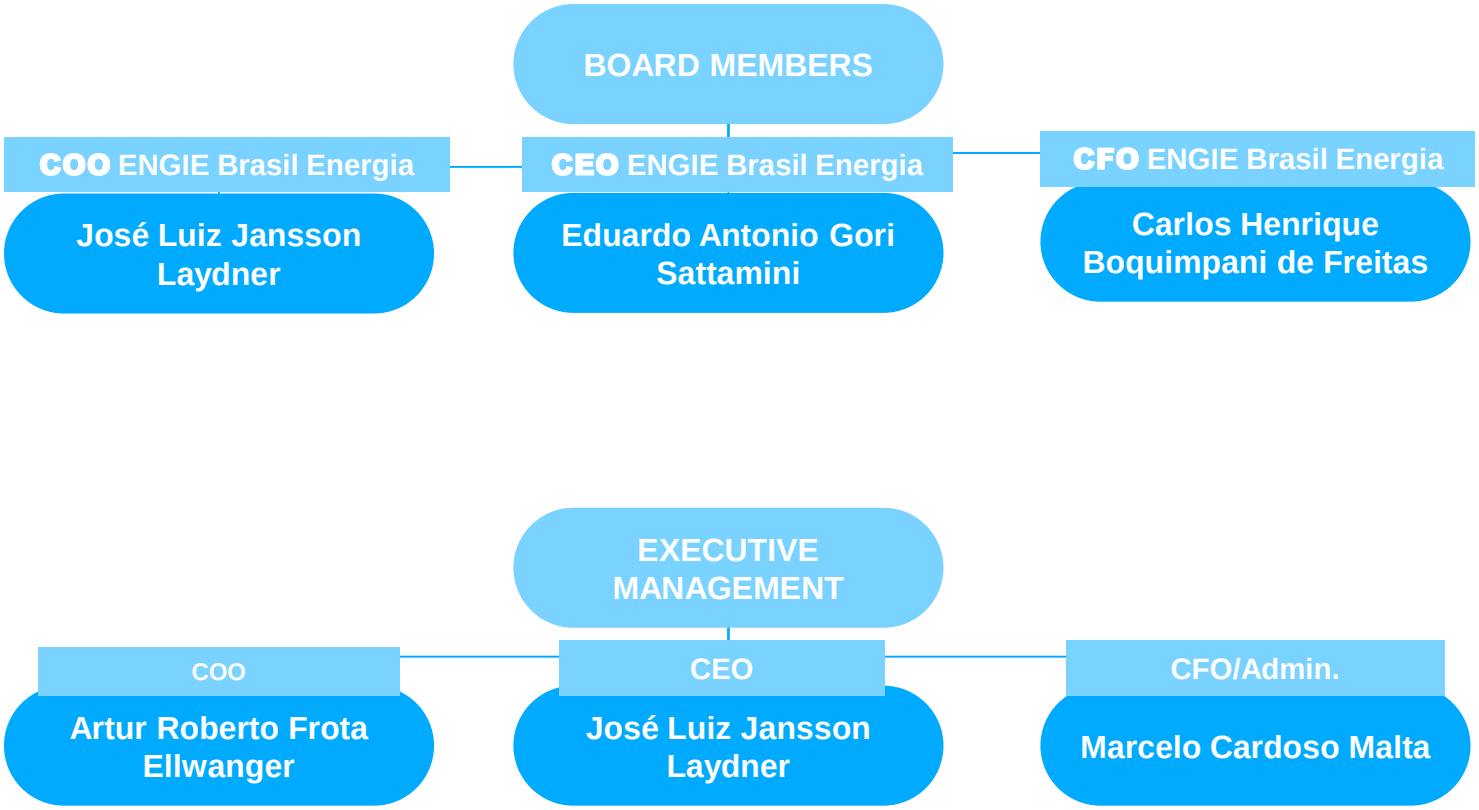
The HPPs are 100% controlled by ENGIE Brasil Energia…

Ownership Structure[1]



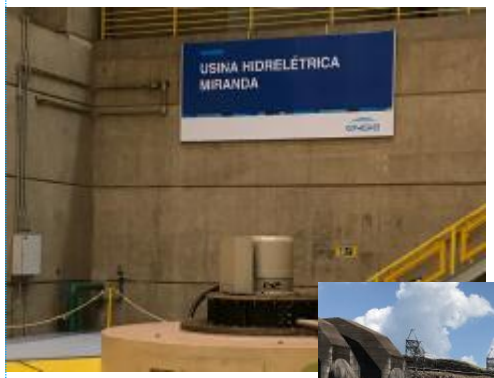
Note:
[1] Simplified version

…and they will be in focus of the top management of ENGIE Brasil Energia



ENGIE delivered the *takeover as planned and in budget*

Take over on 12/29/2017







Status of the activities 2018

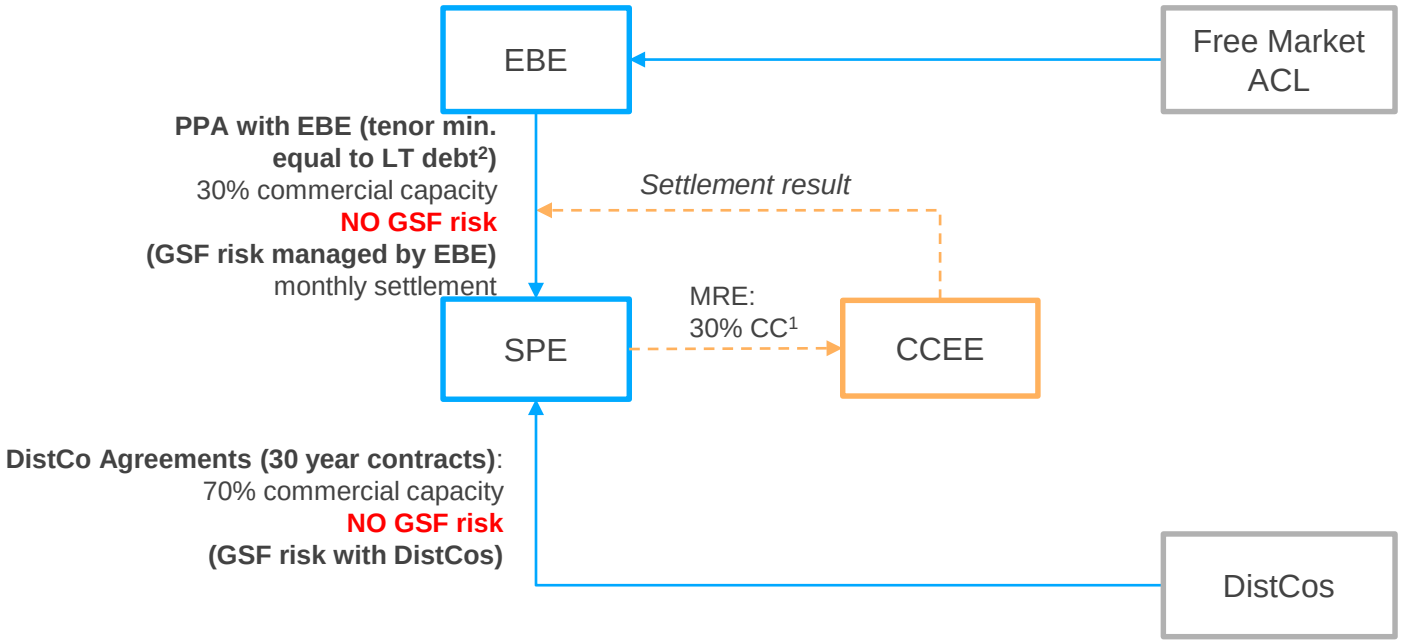
Transfer of connection contracts:
- Ongoing negotiations with DistCos and Transmission companies;
- Conclusion expected for Feb/2018 for both plants

Water usage authorization:
- Jaguara HPP: Process initiated at ANA. Conclusion expected for mid 2018;
- Miranda HPP: Authorities requested transfer of real estate as condition.

Transferal of Environmental License
- Jaguara HPP: process concluded;
- Miranda HPP: process has been initiated and first meeting was held.

Transferal of properties:
- To be implemented in each municipality.

The SPE's revenues will not be impacted by hydrological risks in both regulated and free market contracts



- **70% of SPE's commercial capacity:** sold to DistCos, where the off-taker bear the hydrological risk (GSF) with fixed volume and price;
- **30% of commercial capacity:** PPA between EBE and SPEs, where EBE takes 100% of the hydrological risk with fixed volume and price;
  - This 30% of commercial capacity will be subject to MRE mechanism, which it is a kind of "condominium" where all HPPs share the hydrological risk;
  - The result of MRE will be reported to the Energy Trading Chamber (CCEE) which will charge the SPEs regarding the GSF
  - The GSF costs will be reimbursed by EBE through the PPA scheme (on a monthly basis).

Notes:
[1] CC – Commercial Capacity
[2] with renewal option

The SPEs will benefit from an O&M agreement with the largest and most experienced operator in Brazil…

O&M Agreement between EBE and the SPEs

- The SPEs will reimburse the costs of personnel dedicated to the HPPs.
- Other contracts with third parties shall be directly formed by the SPEs.
- The duration of the O&M agreement must cover, at least, the period of the debt to be contracted.

EBE as O&M provider

- **EBE has 45 years of accumulated experience in** O&M of hydro power plants and currently operates a portfolio of 7 GW of installed capacity;
- The Company pioneers the remote operation and is currently expanding its center of operation and supervision;
- The Machadinho and Itá HPPs, both operated by EBE, feature the highest rates of availability of comparable (size) HPPs in the country;
- All EBE`s HPPs are evaluated as " Excellent" or "Good" by ANEEL, which involves: O&M management, Environmental compliance and management, Health and Safety and Performance;
- EBE has experience in implementation/construction of 8 HPPs and modernization of app. 13 generation units (majority with gains in efficiency and capacity / commercial capacity).
- Partnership with the main and most relevant suppliers in the Market (Alstom, Voith, GE, Andritz);
- Majority of plants are certified by ISO 9001 (quality), ISO 14001 (Environment) and OSHAS 18001 (SSO) standards;
- History of awards: *Prêmio Brasil Ambiental - Amcham Rio; Prêmio Fritzmuller – FATMA; Troféu Transparência – ANEFAC; Distinção Melhores no Brasil – Sextante Brasil; Prêmio ABRASCA de Criação de Valor; amongst others*;

Robust insurance is contracted with clear governance on regulation of potential losses

Principle scope

- Operational risks
  - Damage (material)
  - Loss of profit
- Civil responsibility
- Civil responsibility of administrators
- Political violence & Terrorism

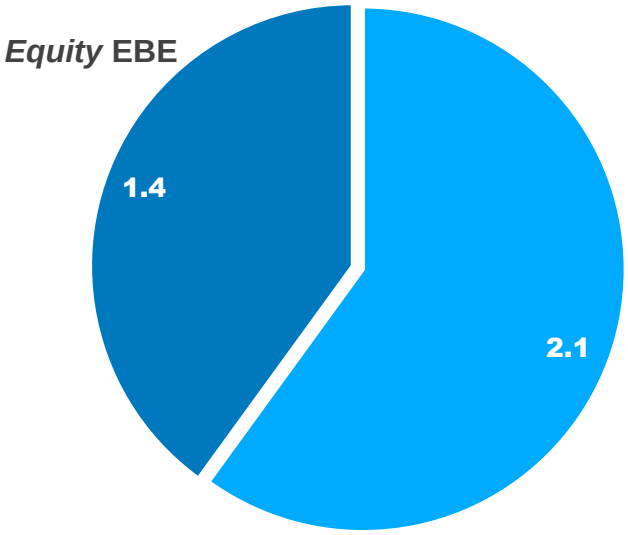
Details

- SPEs are co-insured within the umbrella policy of ENGIE BRASIL ENERGIA SA
  - O&M agreement: Beneficiary is each SPE
- Term: Yearly renovation
- Current Insurer: MAPFRE

Solid capital structure

Strategic Capital Structure

Overall capitalization: ~ R$ 3.5 billion



Objectives:

- Robust and solid capital structure
- Mature and stable projects, without construction risk
- Cash flows without GSF risks
- Strategy of financing to follow precedents of Project Finance in Brazil → i.e. non-recourse basis (as practiced by BNDES post completion)

Financial Indicators

Jaguara HPP - KPIs

KPIs

- **Initial Leverage =** 59%, reducing as per principal amortization
- **Debt Volume:** 1.320 MBRL
- **Cover Ratio *target*:** 1.2x – 1.4x
- **Net Debt/EBITDA**: ~4x (year 1), reducing as per principal amortization
- **CAPEX:** reduced necessity in early years

Miranda HPP - KPIs

KPIs

- **Initial Leverage =** 56%, reducing as per principal amortization
- **Debt Volume:** 780 MBRL
- **Cover Ratio *target*:** 1.2x – 1.4x
- **Net Debt/EBITDA**: ~4x (year 1), reducing as per principal amortization
- **CAPEX :** reduced necessity in early years



5. Annex

Takeover schedule

	September				October				November				December				January				February			
Auction				27																				
Qualificação Técnica (Habilitação)							17																	
Prêmio de leilão (Adjudicação)									7															
Signature of the concession contract									10															
Criação SPEs																								
Concession payment												30												
Estruturação de Capital																								
Financing																								
Take over EBE																								
Handover meeting					5																			
Encontro com conselho executivo CEMIG						10																		
Reunião com lideranças das UHEs							23	24																
Plano de Comunicação Stakeholders																								
Período de Transição - CEMIG																29								
Transição O&M - Consolidação da Equipe																								
Contrato de Pessoal Terceirizado de O&M																								
Contrato Spec. Tech																								
Infraestrutura/Telecom. TI																								
Registro e Comunicação NOS																								
Registro e Comunicação CCEE																								
Transf. CUST (D) / CCT (D)																								28
Autorização para uso de água																								2018+
Transf. Licença Ambiental																								2018+
Transf. De Propriedades																								2018+
Free energy available in the portfolio																								2018+

O&M scope of work

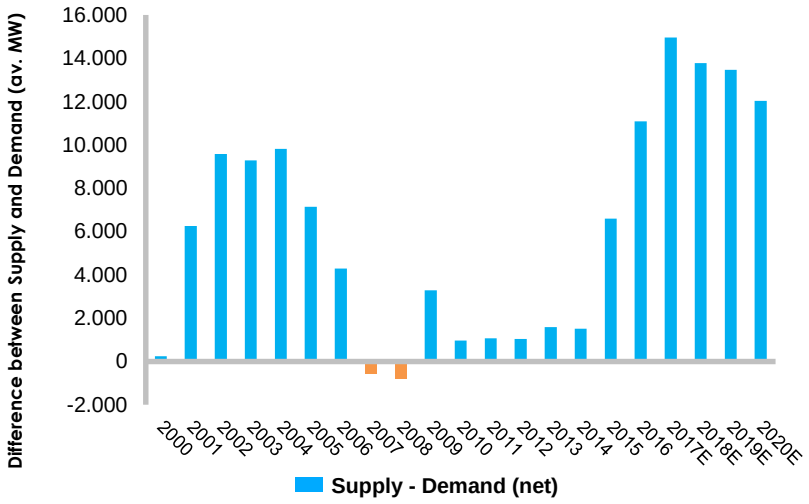
- *General operation of Plants (providing all necessary staff and sharing specialists from Headquarters)*
- *Routine maintenance of the Plants (predictive, preventive and corrective - providing all necessary staff and sharing specialists from Headquarters)*
- *Management, supervision and diligence of third party services, such as: cleaning, vigilance, execution of environmental conditions and plans*
- *Supply of consumables for execution of administrative services and equipment for individual safety of the staff*
- *General administration of Plants and Staff training*
- *Planning, scheduling and controling of generation and operation of Generating Units*
- *Planning, scheduling and controlling of maintenance*
- *Planning, scheduling and controlling of infrastructure to support the O&M of Plants*
- *Industrial area conservation*
- *Health & Safety of O&M and Administration staff*
- *Control of spare parts inventory and warehouse material*
- *Planning and execution of routine activities specified in the environmental and real estate management plans*
- *Administrative support of headquarters (human resources, accounting, financial, tax, legal, IT, telecom, health & safety)*
- *Periodic performance, maintenance and management reports of Plants.*

Brazilian energy matrix still depends on hydro power plants

- **Supply:** in the past, supplied by hydroelectric plants with reservoirs. Currently, a greater presence of thermoelectric and hydroelectric run-of-river plants and water shortages. Doubt about effective conclusion of new projects.
- **Demand:** economic downturn in the past two years but with the potential for recovery in the short term.

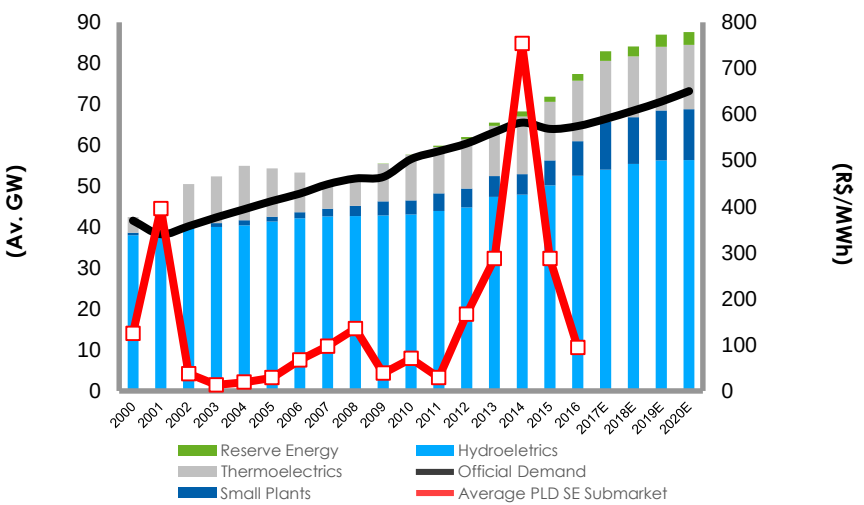
•Surplus of capacity in the short-medium term, with a scarcity of energy and storage
•Greater volatility of spot prices at a high level

Theoretical Supply x Demand (ignores GSF impact)



Source: ENGIE Brasil Energia internal study based on official sector documents.

Distribution of Supply by Source



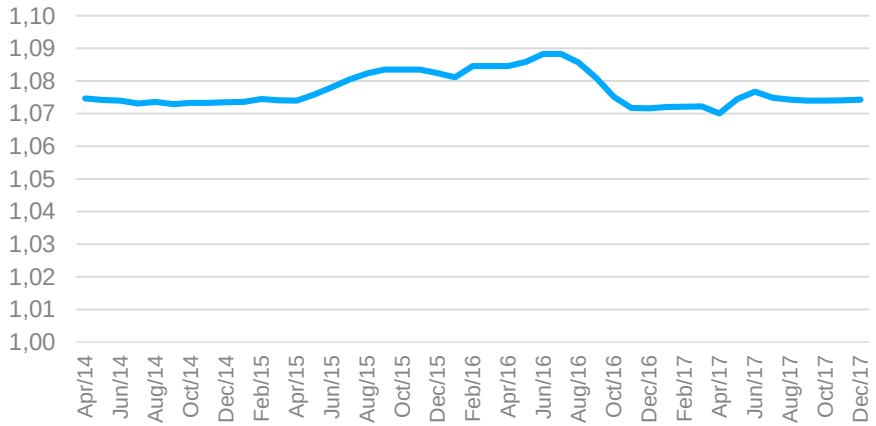
Source: Internal study based on Aneel and ONS data.

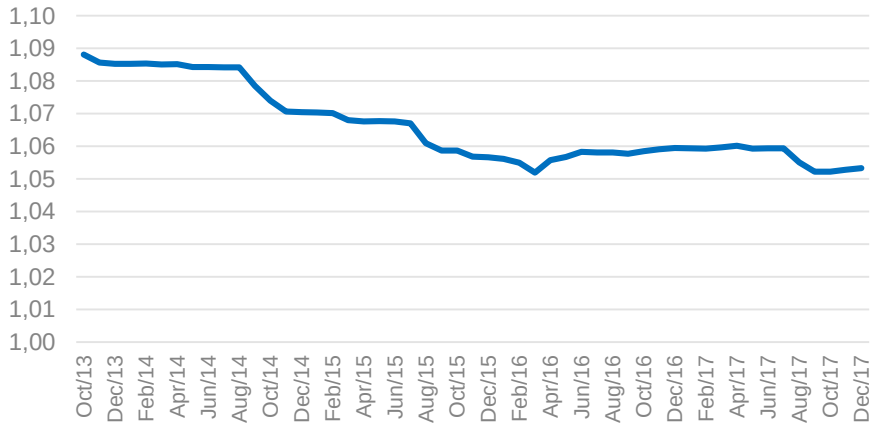
Great operational performance. In the past years, the assets showed a FID higher than one

Jaguara HPP

Miranda HPP

FID – Unavailability Factor





Active Energy of Net Generation (GWh)

