Brazilian Electricity Sector
Overview, Challenges & Opportunities

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Instituto Acende Brasil is a think tank aimed at developing activities and projects to increase the degree of Transparency and Sustainability of the Brazilian Electrical Sector.

Based on numbers and facts, we think and analyze the industry with a long-term perspective, seeking to inform the Brazilian and international societies about the most important economic, political and institutional dimensions that shape the Brazilian Electrical Sector.
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## Brazilian Electricity Sector
### Value Chain Analysis

<table>
<thead>
<tr>
<th>Generation (Competitive)</th>
<th>Transmission (Regulated)</th>
<th>Distribution (Regulated)</th>
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</thead>
<tbody>
<tr>
<td>(128 GW)</td>
<td>(110,000 km &gt; 138kV)</td>
<td>(63 DisCos)</td>
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- Movements to implement new auction rules (regional, by source)
- Auctions for concessions renewal of existing power plants
- Socio-environmental challenges for the expansion of generation capacity
- Generation Scale Factor (GSF) – Current challenge

- Delays in Transmission projects affect generation projects
- Inefficient Auctions
- Socio-environmental challenges for the expansion of transmission capacity
- Compensation for non-depreciated assets

- “Tariff realism“: addressing the 2014 deficit by an average tariff increase of 50%
- Possible consolidation moves and/or restructuring of DisCos under financial distress
- Privatization (6 Eletrobras’ DisCos)
- Concessions Renewal
The share of energy produced from each **generating source**:

- the share of **hydroelectric** generation should **decrease**;
- the share of **thermoelectric** generation should **increase**;
- the share of renewable sources (such as **biomass, solar and wind power**) should also increase by 2035.

**Brazil power generation by source**

- **2011**
  - Total: 532 TWh
  - 81% Hydro
  - 2% Coal
  - 6% Oil
  - 3% Nuclear
  - 1% Bioenergy
  - <1% Gas

- **2035**
  - Total: 1,085 TWh
  - 62% Wind and solar
  - 15% Bioenergy
  - 9% Oil
  - 3% Nuclear
  - 2% Coal
  - 1% Gas

Brazil indicative monthly variations in power generation by source

Note: Calculations of bioenergy, wind and solar generation in 2035 are based on projected installed capacity, biomass harvest cycles and historical generation profiles, while those for run-of-river generation are based on projected installed capacity and river flow variations at the sites of planned hydropower projects.

Hydropower and environmental and social issues

Hydroelectric potential of each water basin (MW)

A large part of the economically viable hydroelectric potential is located far from the consumption centers

And...

Out of the 19.673 MW projected in the “Plano Decenal de Energia 2021”, 16.089 MW (82%) are located in or near Indigenous Lands and/or protected areas

Indigenous Reservations or Conservation Areas


Source: MMA(2005)
One of the current bottlenecks for expansion of power production is access to natural gas supply.

Petrobras has a virtual monopoly on the supply and transportation of natural gas.

The Petrobras crisis accentuates the need for further liberalization of the gas market and increased private participation.

Regular rounds of new oil and gas concessions are needed to increase production and foster competition.

Alternative concession regime may be necessary to promote the exploration of unconventional reserves.
GHG emissions should not be a major barrier for the installation of new thermoelectric plants because their contribution to Brazilian emissions is very small.

Currently,

The generation of electricity:

- represents only 3.5% of Brazilian emissions, and
- emits only 97 tCO2e/GWh, while the world average is of 580 tCO2e/GWh

In 2035,

The generation of electricity:

- Represents 13.0% of Brazilian energy sector, and
- emits only 87 tCO2e/GWh, while the non-OECD average is of 435 tCO2e/GWh

The Brazilian economy may benefit from more coherent policies, the business environment and its institutions are more mature, the regulated auctions are stable, new energy sources are becoming feasible or receiving incentives, GHG effects are not critical for the sector.

Private players must be prepared to manage the challenges while, simultaneously, seizing the market opportunities that will arise.
O Instituto Acende Brasil é um Centro de Estudos que visa a aumentar o grau de Transparência e Sustentabilidade do Setor Elétrico Brasileiro. Para atingir este objetivo, adotamos a abordagem de Observatório do Setor Elétrico e estudamos as seguintes dimensões:

- Agências Reguladoras
- Tarifa e Regulação
- Governança Corporativa
- Rentabilidade
- Oferta de Energia
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