**INDUSTRY SIZE IN BRAZIL**

15.4 GW of installed capacity

619 wind farms

7,578 turbines in operation

**OPERATING IN 12 STATES**

AND HOW MANY ENERGY DO THEY GENERATE?

In 2018 wind generated a total of 48.4 TWh of wind energy.

This generation represents 8.6% of the entire generation injected into the National Interconnected System in the period.

It was perceived a grown of 14.6% in relation to the generation of the previous year (2017) compared to the 1.5% growth of the generation of the entire SIN generation (National Interconnected System).

Considering the auctions and contracts performed within the free market, Brazil will have approximately 21.5 GW of wind energy capacity installed until 2023.

**RECORDS**

**NORTHEAST**

On September 06th, 2019, **88.8%** of all energy used in the northeast came from wind farms operating at a 75.1% capacity factor and a generation of 8,675 MWmed.

**SOUTH**

On July 05th, 2019, **13.52%** of the energy used in the south came from wind farms operating at 77.3% capacity factor and generation of 1,543 MWmed.

**NORTH**

On October 28th, 2019, **6.88%** of energy used in north came from wind farm at a 93.9% capacity factor and generation of 400 MWmed.

On September 06th, 2019, **17%** of all energy used in the National Integrated System came from wind farms operating at a 75.5% capacity factor and generation of 10,677 MWmed.

**FAVORABLE WINDS IN BRAZIL**

42% was the Average Capacity Factor in Brazil in 2018.

The average capacity factor for wind farms worldwide is around 25%.

Why are winds in Brazil so good?

Same direction

Constant

Stable (Speed)

From July to November, the windy season, the capacity factor for Brazil can be higher than 60%.

Such winds are abundant in Brazil, especially in the northeast and south.
CONTRIBUTIONS TO WIND ENERGY IN BRAZIL

From 2011 to 2018 the investment in the sector was US$ 31.2 billion

Wind power is renewable, non-polluting, has low environmental impact and helps Brazil fulfill its Climate Agreement Goals.

Wind parks do not emit CO₂.

The best prices for energy offered at the December 2018 auctions came from wind farms.

Generates income and improve the quality of life of land-owners who lease their land for wind tower placement. There are now some 6,500 such towers in operation in Brazil. We believe some 4,000 families are receiving over R$ 10 million a month in total from leasing land for towers.

Enables land-owners to continue planting their crops or growing their animals.

Provides training and qualifications for local labor.

Every MW installed creates 15 jobs

Meaning wind energy has already created 200 thousand jobs.

Wind energy avoided the emission of about 21 million tons of CO₂ in 2018. This is equivalent to the annual emissions of some 16 million automobiles.

2018 = US$ 1.3 billion

INTERNATIONAL COMPARISONS

Brazil is ranked 8th in the World Ranking of wind energy installed capacity.

In 2012, Brazil was ranked 15th.

SOURCES OF ENERGY IN BRAZIL (GW)

61% Hydro

9% Wind

102.9 GW

15.3 GW

6.0 GW Small Hydro

14.9 GW Biomass

6% Natural Gas

1% Fuel Oil

2% 3.6 GW Nuclear

5% 8.9 GW Natural Gas

1% 2.5 GW Photovoltaic

1% 13.4 GW Fuel Oil

GROWTH OF INSTALLED CAPACITY (MW)

Built up charge

New

Farms

POTENCY (MW)

INSTALLED CAPACITY AND WIND FARMS BY STATE

<table>
<thead>
<tr>
<th>STATE</th>
<th>POTENCY (MW)</th>
<th>FARMS</th>
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<tr>
<td>PR</td>
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</tr>
<tr>
<td>Total</td>
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<td>619</td>
</tr>
</tbody>
</table>

* Projects related to auction A-6 2018, with supplying date in Jan / 24, were anticipated to previous years according to the implementation monitoring schedule.

Future data in the chart above comes from contracts already confirmed in auctions and transactions completed in the free market. New auctions will add further capacity in coming years.

MINERAL COAL

Nuclear

Biomass

Natural Gas

Fuel Oil

Small Hydro

Photovoltaic

2012

2018

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