

Wind Energy

Favorable winds in Brazil

INFOWIND 21

November 20 - 2021

Industry size in Brazil

20,10GW

of installed capacity

751

Wind Farms

8.820

Turbines in operation

12

States

There are others

965,89

in test operation, which should go into operation in the coming weeks

How many energy do they generate?

57,0TWh

of wind energy were generated in 2020

10,0%

of all the generation injected into the National Interconnected System in the period.

1,9%

growth over the previous year.

What represents this generation?

28,8Million

of households per month can be supplied

86,4Million

of benefited inhabitants



*Considering auctions already carried out and contracts signed in the free market

Contributions to wind energy in Brazil



US\$35.8Billion

Of investments from 2011 to 2020.

for each **MW** installed

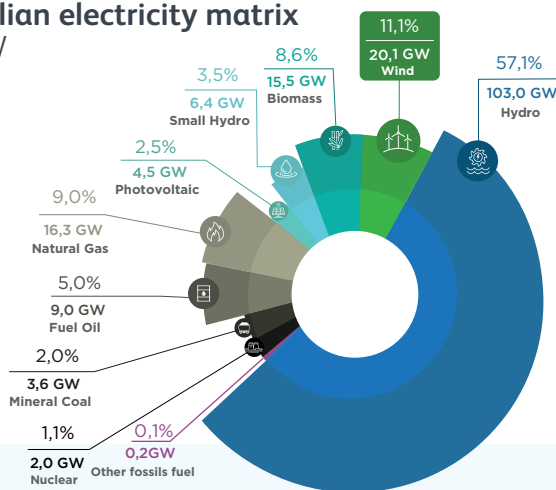
15 jobs are created.

21.2Million tons of CO₂ avoided in 2019



equivalent to the emission of about **20.9 million cars**.

Brazilian electricity matrix in GW



Benefits of Wind Energy



Generates income and improves life for landowners with lease for placement of towers



Enables land-owners to continue planting or growing their animals



It is renewable, it does not pollute, it contributes for Brazil to fulfill its objectives in the Climate Agreement



One of the best cost-effective energy tariffs



Wind parks do not emit CO₂



Provides training and qualifications for local labor

Through a comparison between a group of municipalities that have wind farms and another that does not, it was possible to conclude that in the municipalities where there are wind farms: to identify that in the municipalities that received their installation:



real GDP increased by **21.15%** (period 1999 to 2017)



the MHDH grew about **20%** (2000 to 2010 period)



Wind energy occupies little land, allowing the continuation of the creation of animals or plantations. Considering the space chosen for a wind farm, the turbines occupy about **8% of the area**, and can reach about **6%**.

The installation of wind farms contributes to increase in the Gross Domestic Product (GDP) and the Municipal Human Development Index (MHDH), as identified by a study by GO Associados.

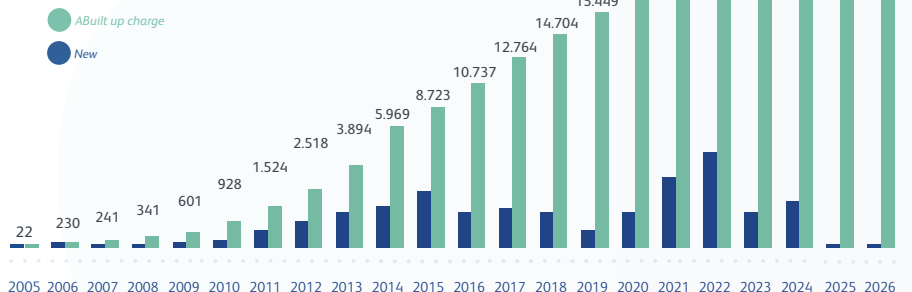
Capacity installed and Number of Wind Farms by State

NE S N SE SIN

State	Installed Capacity (MW)	Wind farms	Wind turbines
RN	6.082,825	201	2.571
BA	5.395,545	204	2.287
CE	2.438,14	94	1.107
PI	2.354,65	81	1.007
RS	1.835,89	80	830
PE	798,365	34	417
MA	426	15	172
PB	469,05	25	211
SC	238,499	14	173
SE	34,5	1	23
RJ	28,05	1	17
PR	2,5	1	5
TT	20.104,01	751	8.820

Wind farms in test operatios in MW = 988.6MW / Number of wind farms = 20 / Number of wind turbines: 242

Capacity installed Evolution in MW



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.

Records by area

NE 104.4%

of the energy consumed in Northeast subsystem came from wind farms, with generation of **11.680,00 MWmed.** (06/AUG/2020)

S 14.04%

the energy consumed in South subsystem came from wind farms, with a capacity factor of **87.77%** and generation of **1,755.79 MWmed.** (25/MAY/2020)

N 6.36%

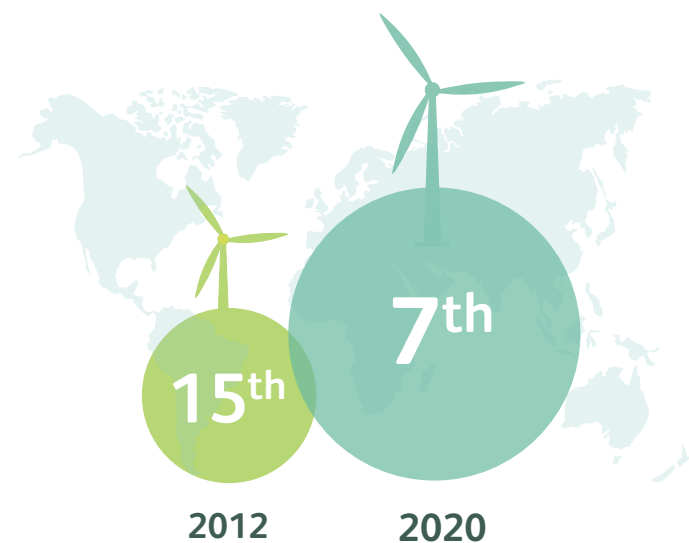
of the energy consumed in North subsystem came from wind farms, with a capacity factor of **95.98%** and generation of **408.87 MWmed.** (21/DEC/2019)

SIN 18.40%

of the energy consumed in National Interconnected System came from wind farms, with a capacity factor of **62.57%** and generation of **12,486.08 MWmed.** (08/APR/2019)

International comparisons GWEC

Brazil is ranked 7th in the World Ranking of wind energy installed capacity. In 2012, Brazil was ranked 15th.



Favorable winds in Brazil

Did you know?

80% of Brazilian wind farms are in the Northeast, a region that has one of the best winds in the world for producing wind energy.

The favorable winds for producing wind energy are more constant, have a stable speed and do not change direction frequently.

34%

is the Capacity Factor approx. global average.

40,6%

was the average Capacity Factor in Brazil in 2020.

59,1%

was the largest average monthly Capacity Factor that wind energy in Brazil achieved during the "Wind Harvest" period in 2020."