



# Can fossil fuels pave the way for renewables? A synergy case study in Brazil.



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## BACKGROUND

- Countries with abundant fossil fuel reserves, like the US and Brazil, will not stop investing in the oil and gas industry so soon, while it is still a profitable business for private companies and brings public benefits as jobs creation and taxes collection for government.
- But that does not mean renewable energy should not be pursued by authorities as the next generation main energy source

## OBJECTIVES

- This study will show that there is a synergy between both fossil fuels and renewable energy.
- This study shows it is possible, with the proper policies in place, to use fossil fuels rent to promote renewable energy adoption, by investing in infrastructure and subsidies that would foster large scale adoption of renewables.

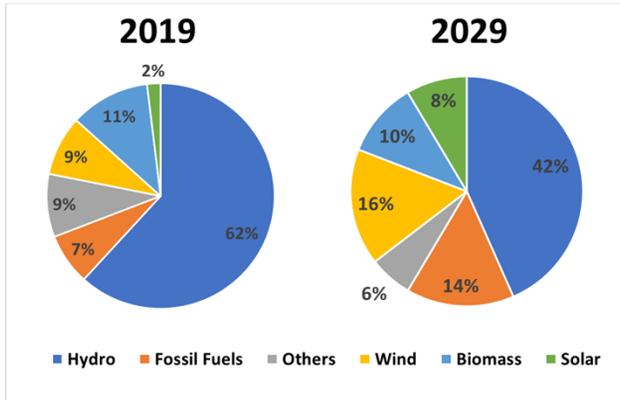
## METHODS

The following 4 steps were used in this study:

1. Forecast Brazil's oil production for the next 10 years, based on public estimates from Petrobras (the major oil company in the country) and ANP (national oil agency)
2. Forecast future oil price using a probabilistic approach, which in turn, enables figuring out the country's oil revenue generation
3. Account Brazilian government's share of the oil production revenue through royalties and other taxes, considering the fiscal systems in place
4. Assessment of the financial resources needed to promote energy innovation and solar power, and improve the security of liquid biofuels supply in the country.

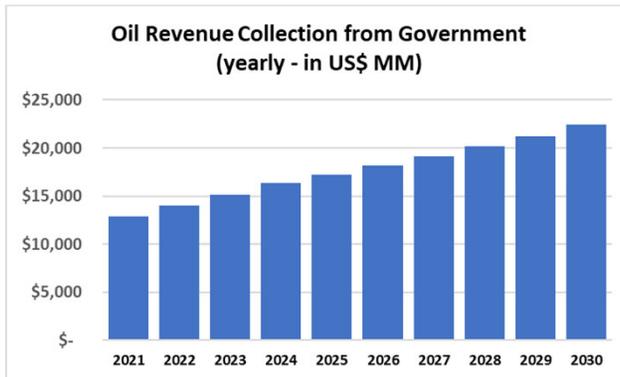
## RESULTS

### Power Generation Installed Capacity in Brazil



Brazil currently has 175 GW of power generation installed capacity, of which only 2% is based on solar energy. The country is mostly dependent on hydropower (62%), and also on fossil fuels (25%). According to its 10 Year Energy Expansion Plan<sup>2</sup>, the total installed capacity will grow to 251 GW in 2029, and the solar share will grow from 2 to 8%. This means additional 17GW solar capacity will be installed in the country

Past installation data from Brazil indicates that every 1 GW of solar power capacity costs around US\$5 billion<sup>2</sup>. Our conservative analysis will use this number and disregard any possible cost reduction derived from technology improvements.



After performing the three first steps indicated in our Methods section, our projection estimates a total of US\$ 177 billion collection in oil revenues for the Brazilian government during the 2021—2030 timeframe.

If the government can allocate 10% of its oil revenue to foster the solar energy development, that is almost \$18 billion – enough to finance 4 of the 17 additional GW that will be installed in the country for solar power during this period.

## CONCLUSIONS

- Our analysis indicate that Brazil's Federal government will collect around USD 180 billion throughout the next 10 years in oil production revenue.
- Currently, solar power installed capacity in Brazil is around 3 GW, with an expectation to grow to more than 20GW in 2029, therefore a 17GW new capacity will be installed.
- An investment of US\$ 18 billion, only 10% of the total oil revenue that will be generated, is enough to finance 4 GW of solar energy.
- Therefore, 10% of the oil revenue would be able to finance almost 25% of the target growth in solar power expansion.
- Such amount seems very reasonable and even conservative to be applied, if the proper policies are set in place.

## REFERENCES

- 1 ANP. Monthly Oil and Natural Gas Production Bulletin. Available at [www.anp.gov.br](http://www.anp.gov.br). Accessed on January 15th 2020.
- 2 EPE. 10 Year Energy Expansion Plan. Available at [www.epe.gov.br](http://www.epe.gov.br). Accessed on April 01st 2020.
- 3 Goldemberg et al. Oil and natural gas prospects in South America: Can the petroleum industry pave the way for renewables in Brazil? *Energy Policy* 2014; 64: 58-70
- 4 Petrobras. Strategic Plan 2020-2024 Available at [www.investidorpetrobras.com.br](http://www.investidorpetrobras.com.br). Accessed on January 15th 2020.

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