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How will Brazil's energy mix evolve?

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Hydropower generation has always dominated the Brazilian energy matrix. It stands out from other sources due to its low cost and intrinsic characteristics. But what does the future hold in a country that has developed nearly half of its hydropower potential?



Besides being a renewable source, hydropower generation presents important attributes for the system operation. Hydroelectric reservoirs allow the production of energy during periods when the energy is most needed. Their turbines are versatile, allowing their use in ancillary services.

In 2014, hydropower accounted for 67 per cent of installed capacity in Brazil. As much as 43 percent of the hydro potential has been developed and, by 2023, the official governmental projections estimate that the country will add over 14.7 GW of installed capacity, increasing the exploited potential to 46 per cent.

The development of the remaining hydro potential, much of which is in the Amazon, has been limited due to a number of reasons, including concerns about the indigenous people and the environmentally protected areas.



It is expected that by 2030 the most viable hydroelectric power plants will have already been developed, leaving only sites that are less viable or that pose considerably high levels of difficulty."

According to scenarios of the International Energy Agency (IEA), the installed capacity of hydropower will increase more than any other source (67 GW), reaching 151 GW in 2035. This implies that hydropower will remain the main source of power generation in Brazil, even though its share would fall to 58 per cent in 2035.

In other projections, such as the Platform Energy Scenario 2050, the forecast is that the share of hydroelectricity in

Brazil will reach 40 per cent in 2050.

Brazil still has a significant hydropower potential to be developed, but in the coming decades viable hydropower generation projects will become scarcer. It is expected that by 2030 the most viable hydroelectric power plants will have already been developed, leaving only sites that are less viable or that pose considerably high levels of difficulty in terms of development.

Thus, Brazil will need to rely on other sources to meet the growing demand for electricity. What will such sources be? What will the effects of the reduced participation on hydroelectric generation in the Brazilian energy matrix be?

What changes will be necessary to deal with this transition? What will the environmental challenges be? How will the planning and operation of the electrical system be affected? How will this new matrix affect the emissions of greenhouse gases? What will the impact on energy tariffs be?

These are questions that will be discussed by experts in [Brazil Energy Frontiers 2015](#) conference, to be held on 19 and 20 August in São Paulo, Brazil.



About the author

Alexandre Uhlig is the head of sustainable development issues at the Institute Acende Brasil since 2006. Previously, he managed the environmental department of Companhia Energética de São Paulo (CESP), where he led the conception and implementation of the company's social and environmental programs.

He obtained a B.Sc. in physics and an M.Sc. and a Ph.D. in energy from the University de São Paulo (USP). He acted as a consultant for the Food and Agriculture Organization of the United Nations (FAO) and for the International Energy Agency (IEA). He is a member of the Brazilian Climate Change Forum and the author of the book *Woodfuels in Brazil: Supply-Demand Balance and Methods for Consumption Estimation*.

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