

RENEWABLE ENERGY IN BRAZIL - PERSPECTIVES

Renewable energy can be defined as the energy derived from natural processes that are replenished constantly. Brazil is part of a privileged group of countries where the electricity production is predominantly originated from a renewable source, the hydroelectricity. The hydro plants correspond to approximately 77%¹ of the country's installed capacity but represent only 30%² of the developed potential, creating opportunities for new hydro projects. The dominance of hydroelectricity in the Brazilian matrix, however, brings some inconveniences which the Brazilian Government has been trying to overcome through diversification of energy sources. The biggest concern relates to security of the electricity supply which can be deeply compromised by the dependence of energy on seasonal conditions. Other disadvantages are related to environmental aspects and include the dislocation of people living where the reservoirs are planned, flooding of the reservoir with disruption of aquatic ecosystems and birdlife, adverse impacts on river environment, etc. Finally, more recently, sustainable growth has demanded that the expansion of the hydro system take into account other uses of water. For all these considerations, the traditional hydroelectric projects are now becoming more difficult to locate.

Therefore, the Brazilian Government, upon planning the long term expansion of the electricity system,³ even though it continues to rely on hydro generation as the primary source for expansion, is now privileging the implementation of small and medium size hydro projects as well as certain renewable sources. In the 2008/2017 expansion planning period, the Government is considering the expansion through thermal generation derived from sugarcane bagasse in light of this technology's competitiveness in Brazil.

In general, renewable markets only boom when cost efficiency attains parity with other competing energy sources. Other than market forces, the renewable energy industry often needs government sponsorship to help generate enough momentum in the market. Law No. 10,438, of April 26, 2002⁴, created an incentive program for renewable energy called PROINFA (*Programa de Incentivo às Fontes Alternativas de Energia*), aimed at stimulating the development of wind, biomass and small hydro plant projects in Brazil. Such program provided for the guarantee of energy purchases by the state-owned corporation Eletrobrás, under 20-years' power purchase agreements, at attractive prices and exemptions or discounts in the payment of certain power sector charges. At the same time, the Brazilian development bank - BNDES (*Banco Nacional de Desenvolvimento Social e Econômico*)⁵ and other financial institutions made available to these projects long-term credit facilities. PROINFA was originally conceived to include two phases, the first one having already taken place and increased the Brazilian installed capacity in 3,300MW, representing 144 renewable energy projects. It is estimated that PROINFA contributes to the reduction of greenhouse gas emissions at a level close to 2.8 million tons of CO₂ per year⁶.

PROINFA is considered a milestone in the regulatory framework applicable to renewables in Brazil. It provided for the diversification of Brazilian electricity generation through the inclusion of renewable sources other than hydroelectric. Picture 1 shows the Brazilian power matrix in 2007.

¹ Ministry of Mines and Energy, Energetic Matrix 2030.

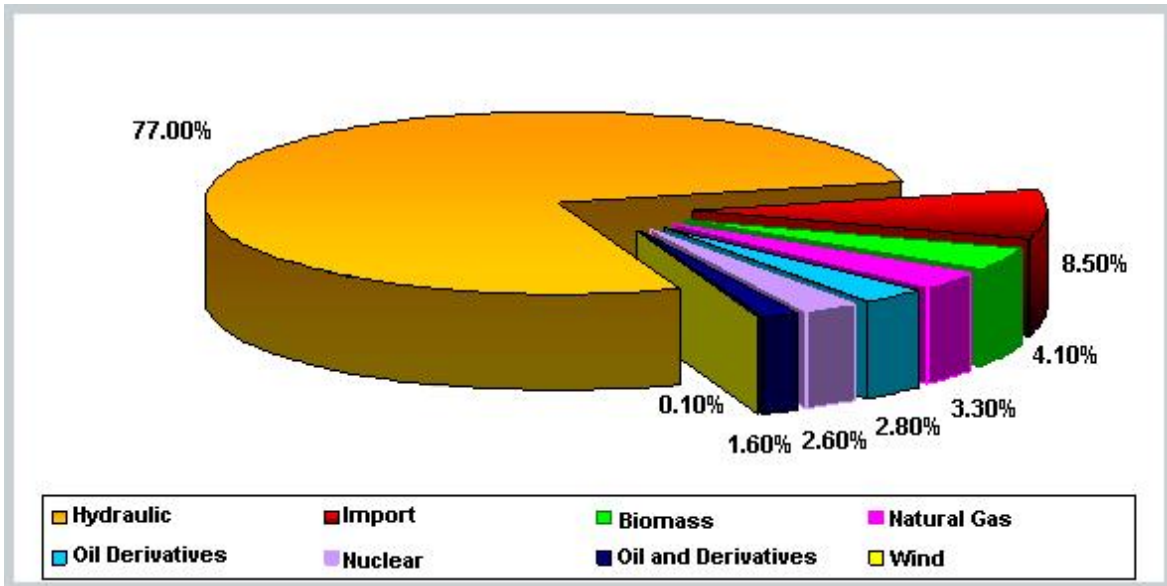
² Ministry of Mines and Energy, Energetic Matrix 2030.

³ A 10-years expansion planning for the energy sector.

⁴ As amended by Laws No. 10,762/2003 and No. 11,075/2004 and regulated by Decrees No. 4,541/2002, No. 5,025/2004, No.5,163/2004 and No. 5,882/06.

⁵ Subject to the fulfillment of the eligibility criteria required by the BNDES.

⁶ Eletrobrás, 2009.



The rules and date of the second phase of PROINFA are still to be defined, notwithstanding the demand in the market for a long term program on renewable energy. In any case, its rules will require conciliation with the new power sector's regulatory framework, created after the enactment of Law No. 10,848 of March 15, 2004. That law required electricity distributions to purchase energy through competitive tenders only. The first tenders occurred in 2005 and, in 2007, there were specific auctions for renewable energies and one exclusive for biomass. In 2009 an auction for the sale of wind energy is expected.

Energy generation from wind and sugarcane bagasse complements hydro generation with regard to seasonality. Therefore, in a hydrological system such as Brazil's, the development of these sources is very important to provide system security. The Brazilian wind potential was calculated to be 143,000 GW⁷ according to studies dated 2001. However, because of the technology's development, this potential is today expected to be much higher.

Whether under PROINFA or through tender offers, renewable energy continues to deserve special treatment in Brazil. As example of tax benefits currently available, there are Import and ICMS⁸ tax benefits for the import or domestic purchase of certain equipment such as turbines and generators. There is also Reidi benefits (*Regime Especial de Incentivos para o Desenvolvimento da Infra-Estrutura*), which exempts infrastructure investments from payment of federal social contributions. Renewable projects up to certain capacity limits are also entitled to discounts in the transmission or distribution tariffs, and are exempt from paying for research and development as well as other power sector specific obligations. There are also credit facilities currently available (BNDES, Banco do Nordeste, etc) in Brazil for these projects. In the current scenario, the success of these projects shall be conditioned to an efficient analysis of all tax and benefits' opportunities available. In the case of auctions, this assessment shall be made prior to submission of any bid offer, especially considering that the winner in these tenders is the one that presents the lowest price.

Moreover, based on the PROINFA experience, the Brazilian Government continues to conduct studies on the sustainable expansion of the renewable sources with lowest impact on consumers' tariffs. The success of renewable energy expansion in Brazil will demand a program of energy purchases on terms and prices that permit the development of the local equipment industry, the implementation of mechanisms for stabilization of contractual revenues which allow projects' bankability and, finally, the continuous improvement of the regulatory framework. As an example, the need to develop infrastructure allowing plants to connect to the transmission system resulted in the enactment of Decree No. 6,460/2008. According to this decree, generators can now be reunited in groups for the purpose of sharing costs in connection with a

⁷ National Windpower Potential Atlas – developed by CEPEL and Eletrobrás in 2001.

⁸ Equivalent to value added tax.

common transmission facility. Finally the recent development of a market for trading of carbon dioxide certificates shall also contribute substantially for the development of the renewable projects in Brazil.

Based on the foregoing, we can say Brazil has some of the best prospects for renewable energy projects in Latin America. The combination of economic growth, political will and regulatory reform provides a fertile environment for renewables.

Marília Rabelo Corrêa

Rolim, Godoi, Viotti & Leite Campos