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Itaipu Binacional: An Achievement in Massive Construction and Power Production

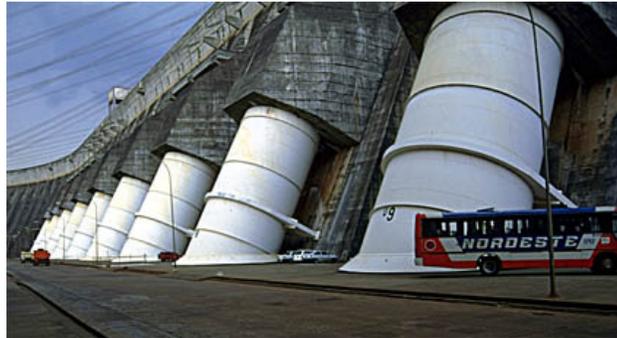
Itaipu is truly a massive structure, which is a sight to behold from close as well as in pictures. The Itaipu Hydroelectric project is one of the wonders of the modern world. Powering one of the largest cities in Brazil, Sao Paulo, as well as 90 percent of Paraguay. Its massive size and enormous power output make it both highly productive as well as a massive tourist attraction. Even with its impressive stature, Itaipu manages to be the most powerful hydroelectric power plant on the planet. China is currently in construction of a power plant that will be bigger in size, however Itaipu will still be the most powerful because the river which powers it is amongst the largest in the world.



The construction work started in 1975, reaching its peak in 1978 with 30,000 people at work. Monthly on-site concrete production reached 338 000 m³. In total, 15 times the mass of concrete used for the Euro tunnel was supplied. The height of the dam reaches 196 m, its length 7.76 km. The lake created by this is approximately 850 square miles and contains 29 billion tons of water. Unit 1 started to operate in December 1983. Electrical grid connection to Paraguay was established in March 1984, Brazil was connected 5 months later. In March 1991 the last unit, No.18, was put into operation. The water intake of one single 715 MW Francis-turbine is 700 m³ squared, its weighted efficiency is 93.8%. Each year Itaipu generates 75 TWh of electricity and avoids 67.5 million tons of carbon dioxide emissions, compared to coal power plants. The final cost of Itaipu amounts to 20 billion dollars US, 50% of this value are direct investments and balance financial charges. If the whole area of the lake, at nominal levels, would be

covered by solar modules the power of the would be 135 000 MW, which would produce 230 TWh a year. For the same yearly output as ITAIPU a solar PV-plant would cost US\$ 132 billion.

When the project was completed in 1991, it truly was a modern marvel. Brazil in combination with Paraguay had created the largest hydroelectric plant in the history of the world. The Parana River which is where the plant gets its power, closely borders Argentina. The fact that Brazil dammed the water bothered Argentina because if the dam were to be destroyed the water from the lake would destroy everything in its path for over 100 miles, until it hit the coast in Argentina.



The picture above shows some of the 18 turbines that power Itaipu. Each of the turbines puts out over 700 MW of energy. One of the turbines is enough to power about 90 percent of Paraguay. All of the other turbines are dedicated to powering Brazil. In the next few months Brazil is bringing two more turbines into operation, bringing the total power output to over 14,000 MW.

Since its opening, more than 10 million people have visited the Itaipu Hydroelectric Project. These people have come from more than 160 countries. The sheer size and power of this project make it deserving of the title of one of the seven wonders of the modern world. It is truly a feat of engineering and construction. Not only is this plant powerful but it is also very environmentally conscious. Builders created new reserves for wild life and flora that would normally have been destroyed by a project of this magnitude. The earth consciousness of the project is also an important aspect. Itaipu will continue to grow and power both Paraguay and Brazil, the 6th largest country in the world, for many years to come.