El Boletín Brasil presenta, de la mano de la profesora Dra. Marianne L. Wiesebron, Coordinadora del Núcleo de Estudios Brasileños “Rui Barbosa”, del Departamento de Estudios Latinoamericanos de la Universidad de Leiden, Holanda, un excelente análisis sobre la “Seguridad Energética de Brasil y la estrategia brasileña en el contexto regional”. El artículo destaca, en primer lugar, la evolución de la política energética nacional brasileña; en un segundo apartado se evalúa la estrategia regional de seguridad energética; a continuación se destacan los rasgos más importantes de la política bilateral en materia energética entre Brasil y Venezuela y entre Brasil y Bolivia; y, por último, se presenta una serie de conclusiones sobre la estrategia de seguridad energética brasileña y sus desafíos más importantes en un futuro cercano.

Brazilian Energy Security

Brazil’s strategies in the regional context

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I - Brazilian national policies

Since the Brazilian government started to implement plans for systematic industrialization in the thirties of the twentieth century, energy and infrastructure have been considered two essential elements of Brazilian national development. Concerning energy, this objective was further strengthened in the fifties, when President Vargas, during his last mandate, created Petrobras and Electrobras. The two oil crises in the seventies led the Brazilian government to strive for more auto-sufficiency and diversification. To reduce dependency on oil, still practically all imported in that period, the government started to work with ethanol as an alternative to petrol for cars. Ethanol is produced from sugar cane and is a renewable source of energy. The use of ethanol as energy implies constructing adapted engines for cars and adjust gas stations. Although, already for a long time, all petrol in Brazil contains a certain percentage of ethanol. At the moment it is about 25%.

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Amongst the other forms of energy the Brazilian government worked on, was nuclear energy, which it started developing in the seventies in cooperation with the German government. It remains of marginal importance as energy but is relevant for technological development. In the beginning of May 2006, Brazil has opened its first plant producing enriched uranium. The objective is to produce enough enriched uranium for its 3 nuclear energy power stations, which should be achieved by 2017, at the latest.

Furthermore, for electricity, some power stations are working on coal, which is found in the south of Brazil, or gas — both relatively cheap providers of electricity — and many hydroelectric projects were set up, within Brazil or with neighbouring countries, in particular with Paraguay.

Brazil is, on the one hand, investing in depth in oil production, literally, as Petrobras has mastered techniques to drill oil at a depth of over 3000 meters. In 2006, Brazil has achieved self-sufficiency in oil production and even more. On the other hand, Petrobras is also investing in diversification, as it started to produce biodiesel, for which it uses a plant which grows abundantly in the country, mamona, (*Ricinus communis* part of the *Euphorbiaceae*), known as "castor bean" which can produce castor oil, and seems ideally suited for the production of biodiesel: now 5% bio-products is added to diesel, which will increase to 12% over a couple of years, which is the limit for engines, without any adaptation.

Concerning car production, Brazil has become more sophisticated and started to produce fuel-flex cars with engines that can work either on petrol or on ethanol. These cars sell like hot cakes. In 2005, approximately ¾ of the new cars sold were flex cars. And some cars work with 3 forms of fuel, including gas.

Embraer, the Brazilian aerospace company, developed the first plane using ethanol instead of kerosene, as fuel. It is a small plane, for the short howl, but is a technically interesting development. The waiting list for these planes is over a year.

Brazil is also investing in the export of ethanol: its biggest client is the USA. Although this country produces ethanol itself from corn, it still needs Brazilian ethanol. Till now, sugar cane is the most efficient raw material for ethanol, more efficient that sugar beet and much more efficient than corn. Moreover the US government wants to add 10% ethanol to petrol for cars. Another major importer is Japan made the use of 2% to 5% ethanol in petrol for cars mandatory. India, South Korea, Nigeria and Venezuela are other Brazilian clients. Brazil is the world biggest producer and exporter of ethanol. It is investing enormous amounts in infrastructure, and will do so the coming years to reach its objective of exporting 10 billion litres per year. This year Brazil should arrive at 2 billion thanks to the ethanol terminal in Santos, which should become operative this year.
The most recent form of renewable energy, Brazil is investing in, is in wind energy. In the south of Brazil, a park with wind turbines is being built. Solar energy is also used, although still on a small scale. However, oil, gas, ethanol and hydroelectricity remain the main forms of energy at the moment.

II – Regional integration as a security strategy

To improve its energy security, the Brazilian government is increasing cooperation in the area of energy within the region, especially concerning oil, gas and hydroelectricity. South America is a region with an abundance in sources of energy. It has about 11.5% of the world oil reserves and over 4% of its gas reserves. But in most countries, energy had not been explored properly, and, as in Brazil, the oil crisis of the seventies was a wake-up call and led to the exploration and development of the national energy resources and also to cooperation and interconnecting energy projects, especially in border areas.

However, energy security has not yet been achieved in spite of this abundance and increased cooperation. Cooperation has taken on a number of forms. The most important is regional integration and the creation in 1991 and development of Mercosur since has played a foremost role in this aspect, which was further enhanced with the association of Bolivia and Chile in 1996. Looking at the Southern Cone, there is a pole for the production of hydroelectricity in the binational power stations, in existence and under construction, and a circle between the three great basins producing gas that are already linked partially by pipe-lines or will be in the future. Together they form what constitutes the Pôlo-Anel. This cooperation leads to energy, which is provided in a reliable way, at a reasonable price, as local energy production cuts costs and increases local competitiveness. But, this project could become much more efficient if there were a formal agreement establishing the rules and regulations for this teamwork on a grander scale than the binational projects.

Meanwhile, by 2004, the countries associated with Mercosur is including practically all the Andean Community, separately and as a whole, although Venezuela might leave this group, while increasing its integration with Cuba and Bolivia. In December of 2004, another process of integration got started, the Community of South American Nations. The negotiations to establish this Community got started end 2004 and involve the whole of South America, i.e. Mercosur, the Andean Community, Chile, Surinam and

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2 In South America: by far the country with the largest proven oil and gas reserves is Venezuela. It is the 5th world oil producer. With much smaller reserves in oil are Brazil, Ecuador, Argentina and Colombia and in gas, are Bolivia and Argentina. Brazil is the second world producer’s of hydroelectricity (over 11% of the world production).

3 These working binational power stations are: Itaipu, Yaciretá and Salto Grande. Corpus and Garabi will become part of this pole. The gas circle is formed by the basins of Neuquen, Campos and San Alberto.
Guyana. If everything goes according to schedule the Treaty should get enforced by 2008 and has a couple of objectives, which go much further than a free trade agreement. The priorities concern the political dialogue, fiscal integration, the environment, energy integration, South American financial mechanisms, asymmetries, the promotion of social cohesion, social inclusion and social justice, and telecommunications. So these priorities are related to economic, financial but also environmental and social issues, besides energy questions. While these topics are being discussed on a continental scale, quite a number of programmes, concerning infrastructure and energy have already been set up on a bilateral scale. One of the huge projects is the proposal of Venezuela to build a gas pipeline from Venezuela to Argentina, involving Brazil and Bolivia, and would involve about 10,000 km pipeline at an estimated cost of 20 billion dollar, which have yet to be found.

Amongst other multilateral projects, Venezuela would also like to set up is a form of cooperation between the different state companies. Besides Venezuela, it would include Argentina, Bolivia, Brazil and Ecuador. The objective is joining their forces and creating one big company, which could make use of the joint efforts to boost technology, infrastructure, such as the construction of pipelines, refineries, etc., and investments. The question is how to respect state enterprises, allow for state intervention, i.e. respect sovereignty and simultaneously find a legal way to create this South-American giant energy company, with the ability to compete with its private multinational sisters, which have also been joining forces in recent years. This way, for instance, Petróleos de América (Petroamérica) could be created.

In the meantime quite a number of bilateral agreements have already been signed and are working. For Brazil, two partners are of paramount importance, Venezuela, for oil and Bolivia, for gas. Argentina is a much smaller partner.

III - Bilateral energy co-operation

A. Brazil-Venezuela
The first leaders to discuss joining forces were the presidents of Brazil and Venezuela, Fernando Henrique Cardoso and Rafael Caldera, already in 1995. The first bilateral agreement between both countries was signed in 2002, when F.H. Cardoso was still president: an agreement of cooperation for the joint exploration and exploitation of oil and gas. An oil refinery was built in Belém do Pará and petrol stations, at prices below those of the market, were installed in the North-East of Brazil, a region lagging behind economically, while very populated.

4 Petróleos do Brasil (Petrobras), Empresa Nacional de Energía de Argentina (ENERSA), Petróleos de Venezuela (Pdvsa), Petróleos de Ecuador (Petroecuador), Yacimientos Petrolíferos Fiscales Bolivianos (YPFB)
Chávez is not limiting itself to bilateral agreements but tries to foster regional agreements, where oil is delivered at interesting prices and against interesting financial conditions. Further agreements with Mercosur will help increase Brazilian and regional energy security.

After Venezuela also signed an agreement with Ecuador, the Unidad Hidrocarburífera Regional, in 2004, the official compromise to create regional state multinational seems to have really started. Meanwhile Argentina, under Kirchner, joined the process. Bolivia, under the two previous presidents, Gonzalo Sánchez de Losada, but especially under Carlos Mesa, showed great interest in jumping aboard this ship. However the situation changed with the election of Evo Morales, which has also consequences for the process of regional integration and the cooperation with Brazil.

B - Brazil-Bolivia.

Petrobras has made huge investments in Bolivia and, through Empresa Bolivariana de Distribución – EDB, controls 25% of the local fuel market and also operates the 2 main refineries of the country, in partnership with the Empresa Bolivariana de Refinación – EBR. Moreover, Bolivia is the main supplier of gas for Brazil, which is becoming an increasingly important fuel for that country. The construction of the pipeline from Santa Cruz to the South East of Brazil, finished by 1999, represented a crucial contribution for much easier access to gas. Bolivia has the second biggest reserves of gas, after Venezuela in South America.

Brazil is for 50% dependent on gas from Bolivia, while the other half is produced by Brazil itself. Petrobras has made huge investments in Bolivia and had the intention to invest 5 billion dollars more in the near future, but only if the company gets guaranties about its investments.

This is not certain at the moment after the rather forceful show of force by sending in troops, Evo Morales nationalised the natural gas fields, the pipelines and the refineries on the 1st of May, 2006. Gas has been a hot issue in Bolivia for quite some time. In fact, the intention of Sánchez de Losada of selling gas to Mexico and the USA, while making use of a Chilean port, cost him his job as a consequence of a popular uprising. The Bolivians, who do not always see eye to eye with the Chileans since the Pacific War (1879-1884), which cost them their access to the Ocean, demanded nationalisation of the gas companies, one of the topics of the election platform of Morales.

Bolivia, the poorest country of South America, needs foreign investments and the government has no money for serious compensations and said it has no intention of paying compensation to the companies that got 180 days to come to an agreement with the government. While the action had a high national political content as there soon will be elections for a constitutional assembly, it is also a fact that the contracts with Brazil and Argentina are rather favourable compared to the actual market prices, they represent more or less about half the actual market price. The price increase the
The Bolivian government is proposing would still keep the prices under these market prices. But of course, the final price will be lower than the increase proposed at this moment.\(^5\) The Bolivian did promise that there would be no interruption in the deliveries and the countries should not worry on that account. The Bolivian government has to be careful if it wants to attract the investments it needs for its own development. The political support from Venezuela might not be enough in the long run.

**Conclusion**

Brazil has come a very long way and has become self-sufficient with regards to the production of oil. It will even export oil and oil products this year. It is the world leader in the production and export in ethanol. It is investing in alternative forms of energy. However, it is still dependant on gas imports, in particular from Bolivia, although the actual crisis will encourage the path to more self-sufficiency in this area and discourage future investments in that country for a while.

On the other hand, the Brazilian governments consider regional integration of paramount importance to increase its energy security and its level playing field. This implies being aware of asymmetries and dealing with them in a responsible way to prevent further tensions in the region. Therefore the countries will have to find a *modus vivendi* to increase and improve cooperation, which will pay dividends economically, politically and socially to all concerned: governments, companies and the societies.

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\(^5\) The price Brazil is paying at the moment is 3,4 US$ per thousand BTU, Argentina even less, 3,14. Bolivia is proposing an increase of 2 US$ per thousand BTU. The market price stands over 6 US$ per thousand BTU. (BTU = *British thermal unit*, a standard unit of energy)