

GOVERNMENT ECONOMIC POLICIES AND ENERGY MARKETS: OLD AND NEW PARADIGMS IN BRAZIL*

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Energy markets are characterized by what economists call imperfections and market failures. There are traditionally being influenced by governmental policies, such as price controls and public investments. However, during the 1990s there have been efforts to privatize the energy industry in developed and developing countries. These attempts have been more than just privatization processes in Latin America. They have implied the creation of energy markets itself. This paper presents the difficulties encountered by neo-liberal governments in Brazil, the reasons of its failure to develop a natural gas market, and the perspectives for the new neo-structuralist government in doing it. The hypothesis is that the neo-structuralist government can succeed where neo-liberal policies failed because of its ideological orientation and the new Brazilian natural resource base.

The first part of the paper introduces the theoretical characteristics of energy markets. Then, the second presents the empirical evidence to identify the long-term energy problems in Brazil. This section also presents the problems of neo-liberal policies to solve those long-term problems. In section three, the challenges for Lula are identified and in section four, Lula's initial energy policies are analyzed. Finally, the last section points out end remarks.

I. ENERGY AND MARKET IMPERFECTIONS

Electricity and energy industries in general require large initial investments. The large amount of investment would not be a problem itself if these investors could recover their initial investment at the speed and rate that equivalent investments were allocated in other sectors. It is normal for large projects to have a pool of investors, and it is common for multinationals and large conglomerates to pool resources in order to reduce their individual risk of failure. However, in the energy industry such a recovery does not come automatically. Governments have to inter-

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vene and guarantee that the right economic environment will be set in order to let investors recover their initial investments. Governments have to intervene because energy markets themselves cannot ensure normal rates of return.

Why the market itself cannot guarantee a normal return? In the case of electricity, the necessary investment for a power plant, transmission lines and distribution lines include a huge infrastructure investment that only could be carried out if the investors receive monopoly rights. The scale of these investments is such that firms are natural monopolies. Electricity firms need to operate at big scales in order to be profitable, and they usually locate themselves in dense urban areas where their huge fixed costs could be split over millions of people and thousands of businesses. Thus, the market itself would only justify electricity investments within dense urban areas. Less dense urban areas would have to pay very high rates, and rural areas would have just to forget electricity services because rates would be just absurdly high.

There is no country in the world that claims electricity is just for the rich or urban dwellers. Electricity is a public service that should be supplied in dense populated areas as well as remote villages. Furthermore, once electricity becomes a public service rates should be affordable for all citizens. How an electric firm is going to be profitable in remote villages where there is not enough scale economies? There is no way without subsidizing these operations. Usually governments grant monopoly rights to electrical firms and condition these rights to service both urban and rural remote areas. The monopoly compensates both services and ends up even. The government explicitly grants monopoly rights and ensure high rates of return in dense urban areas in order to force the firm to compensate for the losses in rural remote areas.

Utility services provide social benefits that markets do not value. There are some countries and regions where not even monopoly rights and extra benefits in the densest areas would make private investors to enter remote areas. Simple, banks would not fund such a project because the time of return exceeds 30 years and no government could guarantee favorable conditions for so long. Banks would find the project too risky and would stop private entrepreneurs. In this case there is an external benefit (service into remote areas) that the market does not evaluate favorably. Governments have usually solved this problem by creating state-owned utility providers. The society as a whole considers that it is good for the country to provide electricity to remote areas, and the government in the name of the society pays for the investment.

Market failures therefore are present in the energy industry independently of the type of firm ownership. From the 1950s to the end of the 1980s it had been common to find state-owned

firms running the energy industry in Latin America. During the 1990s, on the contrary, neo-liberal governments introduced privatization in the energy sector, and it is common since then to find private firms running this sector. In the particular case of Brazil, under both ownership patterns firms enjoy monopoly rights and price controls. Privatization has had to be complemented with the creation of markets.

II. BRASILIAN LONG-TERM ENERGY PROBLEMS: GENERATION CAPACITY AND ENERGY MATRIX

Industrialization without energy is not possible in modern times. Not surprisingly, under the skin of the industrial Brazilian miracle of the 1960s-1970s there was a monumental increase in hydropower energy generation. While manufacturing and industry were growing at almost 10% per year, energy production did it at 12% per year during those years (Figure 2). Furthermore, this 20-year boost accounts for the increase of 500 % in generation capacity from 1950 to 1990 (Mendonca and Hall, 1999). Thus, the Brazilian industrialization, like other modern industrialization processes, has been very intensive in energy consumption. Empirical evidence shows that even after considering the introduction of energy efficient technologies, more investment goes along with more energy intensity. Furthermore, the degree on industrialization is positively correlated with the increase of energy intensity (Miketa, 2001). Therefore, we should expect that any re-birth of the Brazilian industrialization miracle in the 21st century will be at least as energy intensive as it was the original.

Given that the new Brazilian government, Lula's government, has emphasized on industrialization and economic growth, it is governmental top priority to ensure proper investment in electric generation. However, former governments during the last two decades had not been able to produce consistent and successful policies for it. The challenge for Lula is to come up with policies where former presidents had failed. How severe is the failure, what is the nature of it and why previous policies failed?

II.1 Weak numbers to support the failure of generation capacity

One set of literature emphasizes on the failure to attract investment for generation capacity. These authors show total generation capacity was 10 GW in 1970, 31GW in 1980, 49 GW in 1990 and 64.3 GW by 2000 (Figure 1). This gives an annual average increment of 12.03 % during the 1970s, 1.83 % during the 1980s and 1.03 % during the 1990s. The GDP annual growth rates were 8.6 %, 1.6% and 2.4% respectively (Mendonca and Hall 1999, Xavier 2003). There-

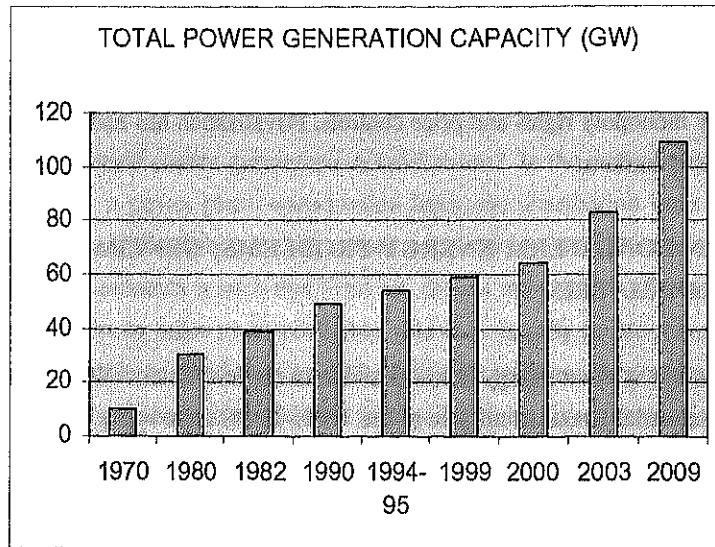


Figure 1

fore, generation capacity has been growing at lower rates overtime and it reached a dangerous low level in the 1990s. While the economy recovered mildly at 2.4% per year during the 1990s, energy capacity grew only at 1.03% per year, half the rate of GDP growth. For these authors neo-liberal policies failed to attract investment in generation and the system is not able to support economic expansion.

Neo-liberal defenders, on the contrary, claim generation capacity has increased after market reforms and privatization were in place in the second half of the 1990s. They show generation growth rates were 1.03 %, 2.04 % and 6.1% for the periods 1990-95, 1995-2000 and 2000-2003 respectively (Brito, 2003). Their point is generation capacity has indeed increased enormously after market reforms were in place.

A third position claims that by 2003 there is excess supply of electricity. This is the argument of the current Eletrobras' CEO, seems to be the perception in the Ministry of Mining and Energy (MME), and it is also what neo-liberals claim today to defend their past market oriented policies (Brasil Energy, 2003). This was not certainly the discourse of the Brazilian government from 1990 to 2002.

The evaluation of the empirical evidence supports more the third position than the others. There is a sustained decline in growth rates that neo-liberal policies could not reverse. However,

there is no clear contradiction between the growth rates of generation and economic activity, and there is no evidence for potential deficit capacity. Growth rates of electricity production illustrate these points. Electricity production has been indeed declining overtime, but has always been higher than GDP, manufacturing and industrial growth rates (Figure 2). During the Brazilian miracle of the 1960s and 1970s with manufactures growing at 10% per year, electricity production did it at 12% per year. During the 1980s electricity production continued growing at 5.6% per year while manufacturing did it at only 1.9% and GDP at 2.9%. During the 1990s manufactures had zero negative growth rates but electricity continued growing at 4.2 % per year. Therefore, it seems that electricity production is not a constraint.

The previous numbers show that generation itself is not the main energy problem. However, it is a fact that Brazil suffered blackouts and rationing in 2001. Thus, the real problem has been the dependence on almost exclusively hydropower sources and the financial incapacity of the Brazilian federal government to continue supporting the hydropower system since 1990.

II.2 Energy Matrix and Market Reforms: The Real Failure

The risk of blackouts during low rainy seasons is very high given that 90.5 % of the Brazilian electricity comes from hydropower plants. The rest comes from oil products, coal and nuclear plants in the rates of 5%, 2% and 1% respectively (Figure 3). Brazilian governments

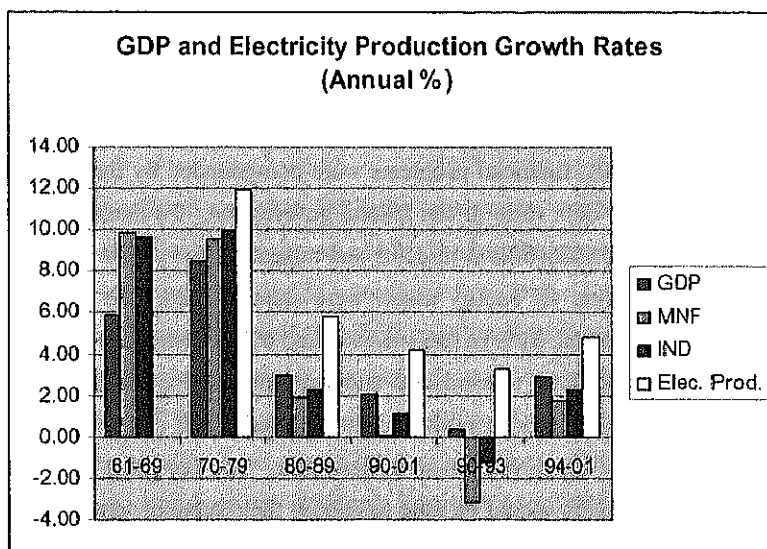


Figure 2

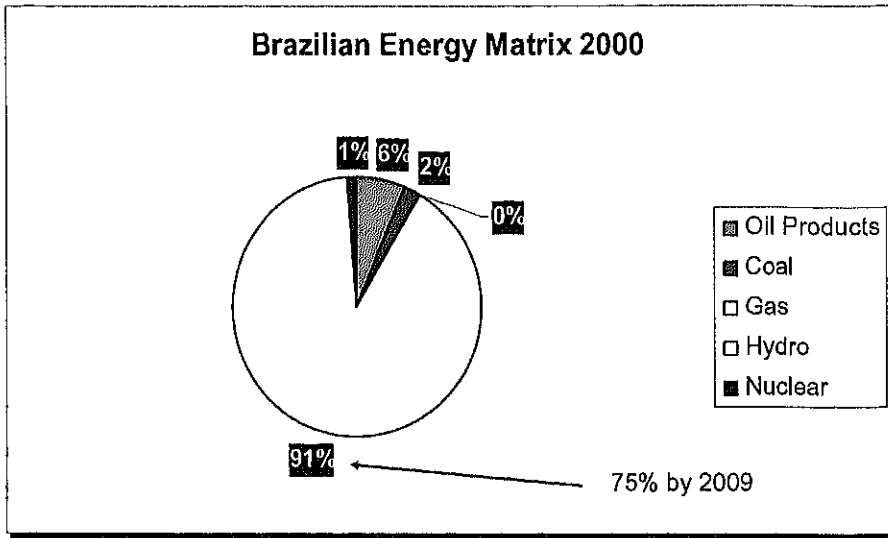


Figure 3

explicitly developed this matrix structure since the 1960s and strengthened after the 1973 oil crisis. Having low oil resources and enormous hydro-power potential, it was, and still is, reasonable to support the Brazilian miracle with hydropower energy, and complement it with alternative sources. Big dams ensure water reservoirs, create alternative tourism activities and give the lowest long term cost of generation than any other source (Moreira 2004). Even though these benefits are significant and the current hydropower capacity only represents 25% of that potential (Bartle, 2002), the Brazilian government could not continue investing in large hydro projects during the 1990s.

By the end of the 1980s, financial problems were compounded by the losses in the entire energy system and the high debt ratio of the federal government. To avoid an energy collapse the government took over US\$26 billion in debts and raised tariffs by 70% in 1993 (Mendonca and Hall 1999). At that time all energy assets were state-owned. The federal government accounted for 54% of generation, 32% of transmission and 6% of distribution (ibid 1999). Local states owned the rest of generation, transmission and distribution. The new framework shifted to a market oriented system with no deterministic central planning and market forces dictating the prices paid to generators and the development of new units. The key point was that distribution companies and large consumers would be able to choose their supplier, creating competition at the level of generation and wholesale supply. Competition at the level of small consumers was not designed and the government continued regulating the final price.¹ The reform was aimed to

produce partial competition and remains like this so far.

The government expected to solve the financial burden of new investments in generation with privatization and incentives to invest in natural gas fired power plants. Privatization was supposed to alleviate financial burdens and secure future investment. Natural gas was, and still is, the best technical alternative to change Brazilian energy matrix. Natural gas fired generation or co-generation plants require lower initial investment, shorter time to be built, and are environmentally better than hydropower plants (Soares 2001). But, Brazil did not have huge natural gas reserves by 1990 and there was no market for it. Therefore, the Cardoso's administration combined the processes of energy privatization, natural gas imports and the creation of a market for natural gas. All three processes turned out to be more complicated than expected.

Privatization started in 1995 with electrical distribution. Bids were higher than expected and amounted up to US\$ 15 billions. Privatization at the level of generation followed three years later, but contrary to the former success, bids were lower than expected. Even worse, the expansion investment accrued during 1995/1998 was 30% short of the US\$23.7 billion minimum required to avoid a supply collapse (Mendonca and Hall, 1999). Without receiving enough investment on time the needs for investment increased 69% for the next 5 years. Eletrobras estimated a minimum investment of US\$40 billion to avoid blackouts for the period between 1998 and 2002 (Mendonca and Hall, 1999). Because private investment continued low the government created an emergency program, Programa Prioritario de Termelétricas (PPT), to give more incentives to private investors. However, expectations on private response became short when low levels of rain in 2001 forced the government to implement an emergency plan with public funds and state-owned firms. Thus, privatization did not become the solution to increase energy capacity.

When the energy reform started in 1993, the government expected private capital to be the engine to bring in natural gas from abroad and to develop the necessary domestic market for it. However, private involvement to bring in natural gas from Bolivia resulted to be minor by 1995. Petrobras, state-owned, committed to 51% of Gasbol (pipeline from Bolivia to Brazil), the Bolivian Pension Fund offered 6% and the rest came from five multinationals.² Once the project started its construction in 1997, the government introduced Law 9478/1997. It states the purpose of the Brazilian energy policy is to protect the environment and foster energy conservation by expanding the use of natural gas on economic bases (Szklo, 2003). This is the first law that

¹ The regulatory agency is ANEEL since 1996, and depends on the Ministry of Mining and Energy.

explicitly mentions natural gas and the need of public policies to ensure its economic profitability. Its timing reflects the need to ensure an environment where Petrobras and the private partners could recover their huge investment in Gasbol.

The government expected private involvement not only at the supply side of the gas business, but also at the demand side. The chain of transactions from supply to demand starts with oil firms selling natural gas to a transporter, this in turn to regional distributors, and finally distributors to consumers. For the case of the Bolivian gas, Petrobras and other oil firms sell gas to YPFB (Bolivian state-owned holding). This, in turn sells to Gaspetro, gas arm of Petrobras. Then, Gaspetro sells it to private state monopoly distributors in Brazil. These distributors, finally, sell natural gas to thermoelectric plants, co-generators, firms and households. The development of the market depends on the expansion of end users, specially generation and cogeneration plants and firms. However, this did not happen. The capacity of Gasbol is 30 MCM³ per day, and Gaspetro committed to buy 15 MCM per day in 2000. However, Gaspetro effectively sold less than 7 MCM per day to state distributors, and these in turn, only sold 2.45 MCM per day to final consumers (Brasil Energia, No 239 and 244, Oct 2000 and Mar 2001). Given there is a take-or-pay clause in all national and international gas contracts, there was a clear financial burden against Gaspetro and distributors.⁴ Private firms were not convinced to enter co-generation. The real demand for natural gas from Bolivia was only 8.2% of Gasbol capacity by 2001.

The low rainy season in 2001 made visible the failures of both privatization and expansion of natural gas domestic market. It forced the government to modify the original PPT launched in

² Transportadora Brasileira Gasoducto Bolivia-Brasil S.A. (TBG) built the pipeline Gasbol with an investment of US\$ 2.1 billion. Gasbol runs a total of 3150 Km, 540 in Bolivia and the rest in Brazil. The owners of TBG are Petrobras through Gaspetro with 51% ownership. British Gas, El Paso, and BHP have 9.66% each. Shell and Enron 4 % each. Transredes owns 12% (Bolivian pension fund 6%, Enron 3% and Shell 3%) (Brasil Energia, No 229, Dec 1999)

Petrobras Bolivia operates 2 gas fields in Bolivia with 300 billion MC on reserves (San Alberto and San Antonio in Tarija). Petrobras has 35% ownership, Total (France) has 15% and Empresa Petrolera Andina has 50%. Petrolera Andina is owned 50% by the Fondo de Pensiones Boliviano, 40 % equally divided by Repsol-YPF and Perez Companac, and 10% by Pluspetrol. (Brasil Energia No 225 and 229, Ago and Dec 1999).

Petrobras Bolivia sells the gas to YPFB, and this in turn sells it to Petrobras. YPFB also sells the gas from Petrolera Andina and Chaco (50% fondo de pensiones de Bolivia, 50% BP Amoco). When Gasbol will be at full capacity, Petrobras Bolivia will have 24.1% of commercialization. Fondo de Pensiones de Bolivia 26.2 and the rest will go to 10 producers (Perez Companac, Repsol-YPF, Total, Pluspetrol, Tesoro, BP Amoco, Vintage, British Gas, Arco and Dong Won) (Brasil Energia No. 229, Dec 1999).

³ MCM stands for Million Cubic Meters.

⁴ The contract between the Bolivian and Brazilian sides assumes Brazil will buy 30 MMC per day 8 after 1999, when exports started. By 2000, Gaspetro could sign contracts with distributors up to 22.45 MMC per day. But the effective demand was only 10 % of that amount (Brasil Energia No. 239, Oct 2000).

February 2000. The initial plan included economic incentives for 49 thermoelectric plants. However, these plants remained in drawing papers. Then after the re-evaluation the government targeted only 17 plants, and added a critical element. This time Petrobras would be the financial and constructing firm. It expected these plants would consume 40 MCM per day by 2003 (Brasil Energia, No 251, Oct 2001). The incentive was a low price for natural gas at only US\$ 2.581 per MCM, lower than US\$ 3.51 per MCM charged to other consumers (Brasil Energia, No 249, ago 2001).

The story of the PPT's thermoelectric plants mimic the story of the Bolivian pipeline. Petrobras became the default anchor of both projects. Petrobras took control of the Bolgas pipeline and became the single column of PPT.

Summarizing, the failure of market oriented policies in Brazil has been the failure in attracting investment for natural gas co-generation. These policies failed to break the dependency on hydropower generation. In 1990 natural gas was introduced with policies that failed successful penetration. The average contribution of natural gas for the period 1990-2001 had been just 0.35% of total generation (Figure 3). Why energy policies cannot develop a natural gas market? Why it is so difficult to change the Brazilian energy matrix?

III. THE UNRESOLVED PROBLEMS THAT CHALLENGE LULA'S ADMINISTRATION

At the heart of the problem lies a combination of monopoly characteristics of energy firms and a relative price system that give no incentives at all to invest in natural gas generation. Most private distributors have monopoly rights within their states and got very inefficient firms. The former firms couldn't make profits even though they enjoyed one of the world's highest differences between the price paid to generators and the price received by consumers. Privatization did not reduce such a margin. The price distributors pay to generators is usually 60% in the international market. But in Brazil it is 40%. Consequently, after privatization distributors captured those extra-benefits for themselves and made huge profits (Mendonca and Hall, 1999).

The price for generators is also low in terms of the generating costs of new units. While distributors pay between US\$ 28/MWh to US\$ 32/MWh to generators, the MME estimated in 1999 the marginal cost to add new capacity with gas imports from Argentina and Bolivia was US\$ 45/MWh. The costs were 50% higher than the 'free' price distributors paid to generators (Mendonca and Hall, 1999).

Relative prices also favor transporters. In the case of the Bolivian natural gas, the price paid in Brazil is high not only because the huge US\$ 2.1 billion initial investment, but also the financial burden in order to recover this capital in just 10 years. From the US\$ 3.54 per MCM price of the Bolivian gas, 40% is just transportation cost (Brasil Energia, No. 249, Ago 2001). Therefore, the domestic price ensures transporters and few multinationals to recover their investments.

The implications of these relative prices go beyond the appropriation of profits by distributors and transporters. "The current tariff policy explains the success and failure of privatization in the distribution and generation sectors respectively. The current tariff structure does not compensate investments in generation and allows monopolistic rents in distribution. [This outcome] can be very detrimental to the country's economy. It is holding up the development of new generation units and it is increasing the risk of electricity black-outs. Another expected drawback of the current polity is that the wholesale electricity market would start in 2002 in an electricity deficit situation. This condition would increase even more the market power of the existing generation units, which would be able to impose oligopoly pricing and capture sizable monopolistic rents (Mendonca and Hall, 1999, p.80)." Privatization without the proper regulation to avoid monopoly rents at the level of distribution and generation distorts the system and create conditions for energy crisis.

The failure of the neo-liberal policies to introduce natural gas is also related to the market oriented reforms itself. The market logic does not work properly because of market failures. The reform establishes co-generators should negotiate selling rates at spot markets and buy back rates bilaterally with distributors. The first price should reduce the risks of investing in co-generation plants in competitive markets. However, in reality its effect is limited because state distributors have monopoly power and enjoy a low price. The second price is the price distributors charge co-generators when the gas plant needs maintenance or is not working. Being bilaterally negotiated does not help cogeneration because the market evaluates short term conditions and ignores the long term benefit of 'avoided capacity expansion' (Szklo, 2003). Then, the back up rates charged by distributors has been very high since 1999 (Brasil Energia, No 224, Jul 1999).

The PPT program of 2000 failed simple because natural gas was expensive and would increase electric tariffs. Furthermore, for the cases where private firms were willing to take advantage of PPT, they couldn't find funding. Banks were not willing to support projects with unclear and insecure rate of return (Brasil Energia, No 234, May 2000). The reformulation of it in 2001 was more a desperate response to find an 'anchor' for the natural gas market than a solid reform to correct previous policies. The plan forced Petrobras to invest in thermoelectric pro-

jects that should boost the use of natural gas. The goal was to get closer to the target of 25% of natural gas in the energy matrix by 2007. However, even this reduced PPT plan is in danger because the government maintained the same relative prices that killed the original PPT in the first place.

Cogeneration is the best option for natural gas, but this requires firms to substitute current inputs of energy, get financial incentives and clear rules to sell excess electricity to the hydro system, as well as fair prices to buy electricity from it. The PPT does not address these issues. It does not mention anything about the relative prices that still favor oil combustible or alcohol vehicular against natural gas. It fails to explicitly ensure the purchase of fixed energy supply quality during the dry season; there is no formal treatment of the buy back rate that compares cogeneration to other thermo-power technologies and does not give incentives to more efficient systems (Szklo, 2003). Furthermore, as we mentioned before, the price distributors pay to cogenerators covers only half of their costs.

Neo-liberal policies not only failed to address relative prices and market failures, but also indirect measures to increase domestic natural gas demand, for instance legal and trade policies that could increase residential consumption. In Europe most of the gas consumption goes to heating systems. In Brazil this should go to air conditioning and water heating. In Brazil the average residential consumption is estimated in less than 250 m³ per year, 1/4th or 1/20th of Italy's consumption. To increase residential consumption the government would use legal instruments. For instance, in Sao Paulo there is a municipal law that enforces households to buy canalized natural gas if their respective street has the infrastructure. This law would be extended to all cities in Brazil to 'force' more consumption (Brasil Energia, No. 243, feb 2001). In terms of trade policies, there are no Brazilian air conditioning equipments and there is an import tariff between 35% and 40%. Thus, air conditioning equipments are relatively expensive. The government would have combined incentives for the local development of this industry and lower trade barriers to reduce internal prices (Brasil Energia, No. 249, Ago 2001). However, Cardoso's government decided to do nothing in these lines.

The unresolved problems are not the lack of investment for generation. There is enough electricity production given the level of economic activity. The problem is how to combine a system based in hydro with short term and medium term water scarcities. Policies based on market reforms and privatization have ensured monopoly rents for distributors and natural gas providers. However, they have neglected the incentives for the introduction of counter rain seasonal alternatives, and the introduction of more efficient technologies. It still favors oil com-

bustible and alcohol vehicular. It also neglects to improve efficiency in the current hydropower system. The losses of energy had increased from 11% during the 1970s, to 12% during the 1980s, and to 16% during the 1990s. How to reverse this process of deterioration and how to correct for the failure of past governments are the challenges for Lula.

IV. CHANGES IN THE ENERGY SECTOR: FROM NEO-LIBERALISMS TO NEO-STRUCTURALISM

During the first seven months of being in power, Lula's administration has terminated the PPT program and introduced a national minimum content for oil and electricity new projects. Then, Petrobras is no longer forced to invest in thermo-electric plants, and these plants are not the 'anchor' of the natural gas market anymore. High top officials claimed the PPT plan was 'artificial' and 'unsustainable' for a tropical hydro-rich country (Maria de las Gracas, Brasil Energy). In order to introduce the national content, Petrobras was forced to postpone bid processes for new platforms (Brasil Energy). The firm had also been forced to break a deal to buy a heavy oil refinery in the USA (Brasil Energy). For these cases top officials argued governmental priority is to create jobs domestically and support the domestic industry. Petrobras's officials argued that they accept this policy because Petrobras has national responsibility (Petrobras CEO, Brasil Energy). How valid are these arguments and, more important, how they would correct for the mistakes of the past?

In the energy sector the distinction between artificial and real conditions is very thin. It is common that best technical alternatives are not supported and developed overtime because the necessary economic conditions depend on governmental policies. There are market failures in the energy industry that force governments to intervene. Therefore, energy policies always create 'artificial' conditions to induce investment, develop new products and serve most of the people with reasonable tariffs. This is how natural gas was introduced in the UK, in France and the US. This is how alcohol was introduced in Brazil since 1975, and this is the way hydropower plants and nuclear plants were introduced in that country. Energy policies created artificial conditions in order to expand the use of those energy inputs. The alcohol program is a success story from 1975 to 1986 and a failure since then. The hydropower system is a success from 1960 to 1990, and shows problems since 1990. All energy policies create artificial conditions and if consistent, can be successful for 10 years, 20 years or longer. However, consistency requires that (1) energy policies adapt to new technological improvements and economic conditions, and (2) energy policies set and change relative prices compatible with the new conditions.

We described that the new technological and economic conditions of the 1990s pointed out to the development of natural gas markets in order to correct for the great dependency on hydro resources. However, it failed in delivering the corresponding relative prices. It was trapped between the ideology of market oriented policies and the reality of market failures. In this respect, the Lula's administration has better change to do it for three reasons. First, Petrobras's role has shifted from the default anchor of natural gas market (agent of last resort) to an explicit instrument of industrialization. Second, the government's view of Petrobras has shifted from a monopoly that should be more competitive to a big oligopoly whose size should be used for industrialization. Finally, the energy sector has changed from being a bottleneck that could block economic expansion to a sector that it is the industry itself.

It is within this new framework that we have to understand the energy policies of the first seven months of Lula's government. It is within this framework that we understand the termination of PPT, the introduction of national contents and the stop of investments in foreign refineries. However, these policies are not yet complemented with changes in relative prices. They are not either giving the three necessary complements to develop any source of energy: guaranteed prices, secured quantities, and financial support (Moreira, 1999). These are the policies that will come in the next months and that will determine the evolution of the Brazilian energy matrix.

V. ENDING REMARKS

The failure to develop a market for natural gas during the 1990s is the failure of neo-liberal policies to give relative prices and financial incentives that favor natural gas generation. It is the failure of microeconomic policies. There was a contradiction between a competitive market oriented ideology and the oligopoly elements of the energy sector. Given the failure to attract private investment, the state-owned Petrobras became the default anchor of the gas market. A firm that should become more competitive since 1995, and not vertically integrated, became stronger and expanded its business to the energy gas industry.

Within the neo-structuralist framework of Lula, there are more changes of designing relative prices and financial incentives in order to expand the natural gas market. These policies have to set relative prices that favor co-generation. This implies to modify monopoly margins at both the level of electric private distribution and transporters. These policies will also affect the profit margins of oil fuel, GLP and alcohol producers. All these changes will generate political opposition. However, Lula has more changes than FHC because the reform will not be based on natural gas imports. The reform will be to expand national gas reserves. This nationalistic argu-

ment will help Lula to find policies to change the energy matrix. It is even possible that the alcohol program will be limited to the mix of gasoline and gas (gashol). At best, Lula would try to introduce a mix of alcohol and diesel. However, natural gas vehicular will be its best option.

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