TEXTO PARA DISCUSSÃO

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COST OF ELECTRICITY IN BRAZIL: EFFECTS OF 2004 REGULATORY REFORM

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Abstract

In 2004, in the beginning of the first president Lula mandate, a complete regulatory reform of electricity was launched. In 2008, four years after, Brazilian Congress started an investigation of the causes of Brazilian relatively high electricity tariffs. The results of the investigation pointed out numerous reasons, but failed to identify generation costs as one of the main causes. In this paper the analysis done by Congress is broadened addressing the trend in electricity production costs. The main conclusions are that the implementation of auctions together with subsidies from state enterprises did not reduce future acquisition costs as much as expected, but successfully reduced the rhythm of price increases. The long run marginal expansion cost is increasing very fast because new hydro plants are ever more distant of consumption centers and environmental costs are difficult to mitigate. Thermal plants and other technologies, though increasing in importance, still have much higher prices. In case prices reflected marginal incremental costs, electricity prices would have been much higher. The fact that consumers do not see such high incremental costs, allow them to take wrong consumption decisions. As consumers are able to buy at prices lower than marginal cost, consumption levels go too far. Demand increases amplify the electricity market gap and reinforce the necessity of new investments.

Keywords

Electricity; regulatory reform; energy auctions and generation costs.
JEL: L43

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1 - Introduction

In the nineties, Brazilian electricity privatization program followed some rather conventional rules: separation of functions, generation, transmission, distribution and trade; concessions auctioned; competition in generation; price cap regulation for distribution and revenue cap for transmission; introduction of independent power producers and a centrally coordinated dispatch system.

This model, inspired by the English, was ineffective mainly because new private investments in generation practically did not occur. The demand had grown by about 6% a year in the preceding 40 years, and was not met by supply. In 2001there was a major crisis and consumption was rationed.

Investments in generation did not take place because they were risky: in the early stages of the privatization program, new investors preferred to buy existing plants instead of building new ones. Brazilian government needed so much to increase supply that gave up divesting old plants, as originally planned, to favor interest in construction. This measure proved insufficient. Even when only new plants were auctioned, perceived risks continued to hinder new investments.

Distributors were not willing to offer PPAs – Power Purchase Agreements to new investors because, in case of adequate rainfall, there would be much better energy buying opportunities in the spot market than backing the investments in a new plant. Energy acquisition costs could pass-through but, in this case, prices in the concession area would be relatively higher when compared to other distributors. Therefore, existing plants traded off new thermo or hydro plants.

Worse still, since energy acquisition costs could pass-through, and generation profits were not regulated, some distributors built their own plants to profit by means of self-dealing. These were not big projects because they were backed by only one distributor. They could mean extra profits for the utility, but could not solve the short supply national problem.

Distributors were not the only ones to blame. New generators were not willing to compete in the spot market with big existing state producers with low generation costs. Even when distributors offered PPAs, this guarantee was not considered sufficient. New investments were also impaired by a clumsy environmental regulatory apparatus that did not support big projects in the Amazon basin. Finally, the necessary big projects could not be supported by isolated distribution utilities and consortiums had very high transaction costs.

In 2004, in the beginning of the first president Lula mandate, a complete regulatory reform was launched. In 2008, four years after, Brazilian Congress started an investigation of the causes of Brazilian relatively high electricity tariffs. The results of the investigation pointed out numerous reasons, but failed to identify generation costs as one of the main causes. The aim of this paper is to broaden the analysis done by Congress by means of addressing the trend in electricity production costs.

This paper assesses the impact of distributors' acquisition costs on tariffs. As the regulatory reform practically coincides with the end of the first round of tariff revisions after privatization, this assessment is done by comparing the results for each one of the 61 distribution utilities in the first round of tariff revisions to two other measures: 1) the second round of tariff revisions, i.e., the acquisition costs at the onset of the new regulatory model; and 2) the individual utilities´ projected costs for 2015 when the new model will be in full operation.[2] The year 2015 was chosen as the end of the forecast horizon since nearly 25% of all generation concessions will expire in 2015, with a major expected effect on the prevailing prices. Beyond 2015 (twenty years after the issuance of Law 9.074/95) all concessions will have to be re-auctioned and will not be eligible to automatic renewals anymore.

The paper is structured as follows: In section 2 we describe the regulatory reform; the results of the two first rounds of distribution tariff revisions are detailed in section 3; the analysis and forecast of the new model's effects on the acquisition costs of energy is shown in section 4, and section 5 concludes the article.

2 – The 2004 regulatory reform and energy auctions

In 2004, the now prevailing regulatory model was launched. It was designed to mitigate the risks that curbed private investments. The main obstacles were removed and no contracts were broken. In the first place, government restarted central planning and now appoints the new projects to be auctioned. Utilities are no longer allowed to individually buy energy to supply their concession area. Government took the responsibility to buy in auctions all the energy necessary to attend their captive markets (approximately 75% of the total market). Big consumers, with the possibility of representing themselves, were given the option to deal in the free market. Presently, distributors need only inform their energy needs and the government is responsible for making the purchases and guaranteeing the overall equilibrium of demand and supply. Distributors may be punished in case they provide erroneous forecasts of their expected market.

As energy acquisitions became centrally made by government through auctions run by CCEE – Câmara de Comercialização de Energia Elétrica, huge projects in the Amazon basin were made feasible with a relatively low demand risk because the production of each and every plant, either new or existent, would be sold to a pool of all distributors countrywide. Environmental risks were also mitigated because the previous licenses would be issued by government before the auctioning of new plants.

One of the main concerns before the launch of the regulatory reform was the remarkable increase in the marginal cost of electricity production. Around 2001, with the rationing program, Brazil

[2] The auctions´ database was extracted from the auctioneer's homepage (CCEE – Câmara de Comercialização de Energia Elétrica), www.ccee.org.br. The tariff revisions' database was built using the official documents on the tariff revision processes. Their full references are listed in the References section.

strived to put new plants into operation using technologies different from its traditional hydroelectric plants (still 85% of total generation). Big new hydro plants became a second best because they would take too long to build and would have to be located in the Amazon region, requiring high transmission investments and environmental care. Also, big hydro plants could not be sponsored by a single Distribution Company; they demanded a pool of distributors to give economic support.

Other technologies (thermal, wind, small hydro, biomass and others) were substantially more expensive and it was not easy to get new plants built to compete for the markets with such high price disadvantage. In case electricity market prices reflected marginal costs, there would be big profits for the state enterprises, which run almost all existing plants and practically no economic advantages to the new private investors. According to the Ministry of Mining and Energy, overall 2030 demand will be 134% to 244% higher than it was in 2005.[3] Supply has to correspond.

Furthermore, electricity, together with other regulated prices, was an important component of core inflation and Brazilian Central Bank authorities follow the inflation target policy. Indeed, as electricity prices rise with the introduction of more costly technologies, inflation also rises. With higher core inflation, interest rates would also have to increase and Brazil already had one of the highest in the world.

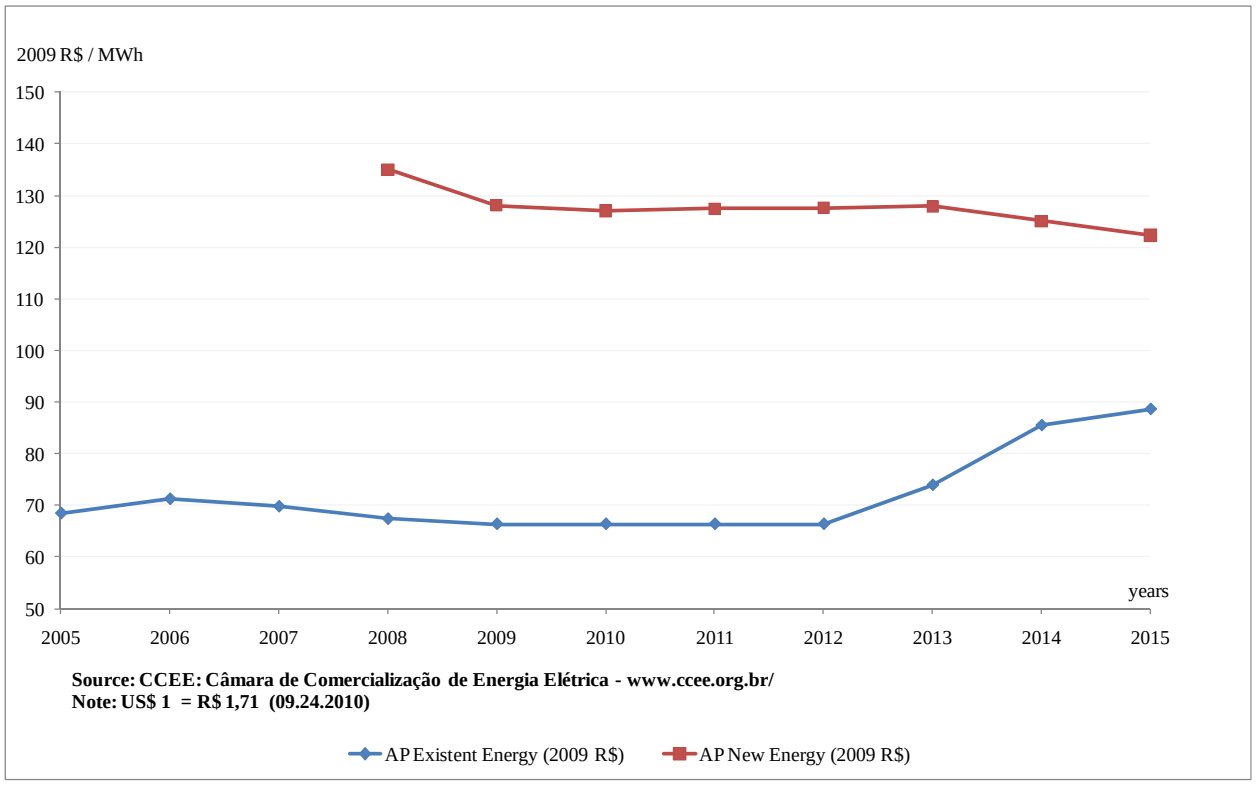
Government took the opportunity of regulatory reform to interfere in this increasing price trend. The idea was to abandon marginal costs and make energy prices reflect average costs instead. This would enable the combination of very high prices for the new energy while existing energy would be priced very low. Consumers would pay average prices and, therefore, would be unable to see the real price paid for the expansion.

Auctions were separated into two segments with different rules and prices. Existing energy (almost exclusively generated by public enterprises) is traded at a lower price cap than that allowed for the new private projects. Consumers pay the average mix cost of all technologies and not the marginal cost. Figure 1 below shows the historical evolution of average “existent” (“almost all state”) energy auction prices and “new” (“almost all private”) ones in constant 2009 reais.

As may be observed, the difference between existent and new auction prices is narrowing. The first existing energy auctions had very low prices but, with time, prices increased. New energy prices experienced some reduction from 2012 on because of the auctioning of large Amazon hydro projects. In fact, in case these projects were implemented with the same technology used in Brazil in the sixties and seventies, their prices would have been even lower. But lately, environmental costs had to be reduced and this was done through a new technology that demanded much smaller dams, but also reduced productivity.

[3] Ministério das Minas e Energia, 2007.

Figure 1 – Evolution of Auctions' Average Acquisition Costs per Segment –Existing or New



As observed, existing energy is sold in auctions for a much lower price because auctions' winners offer the biggest discounts relative to a specific price ceiling, which is fixed relatively low for existing plants. In the past, Brazilian citizens invested huge amounts of public money to get these projects done. Now, they are already paid for. The differences in existent and old energy prices are justified by the new projects necessities of capital expenditures.

Table 1 next registers the results of auctions by segment, existing or new energy, from the start of the new regulatory framework until July 2010. Thermal plants, which include natural gas, sugar cane biomass and wind powered plants, were included in the production system.

Table 1 – Auction Prices by Segment and Technology

EXISTING ENERGY AUCTIONS					
Auction	Date	Volume: MWh	AP: Current R$/MWh	Technology	Duration
		634.938.912	57,5	Hydro	2005-8[1]
		475.608.096	67,3	Hydro	2006-8
1st Auction of E.E.	07.12.2004	82.190.016	75,5	Hydro	2007-8
2nd Auction of E.E.	02.04.2005	92.919.600	83,13	Hydro	2008-08
3rd Auction of E.E.	11.10.2005	2.683.008	62,95	Hydro	2006-03
4th Auction of E.E.	11.10.2005	81.769.248	94,91	Hydro	2009-08
5th Auction of E.E.	14.12.2006	14.306.112	104,74	Hydro	2007-08
TOTAL		**1.384.414.992**	**66,38**		

NEW ENERGY AUCTIONS					
Auction	Date	Volume: MWh	AP: R$/MWh	Technology	Duration
		18.672.432	106,95	Hydro	2008-30
		73.769.256	132,26	Thermo	2008-15
		12.096.528	114,28	Hydro	2009-30
		112.408.560	129,26	Thermo	2009-15
		233.778.552	115,04	Hydro	2010-30
1st Auction of N.E.	16.12.2005	113.349.552	121,81	Thermo	2010-15
		270.331.104	126,77	Hydro	2009-30
2nd Auction of N.E.	29.06.2006	356.313.792	128,12	Thermo	2009-15
		149.642.448	120,86	Hydro	2011-30
3rd Auction of N.E.	10.10.2006	70.350.360	137,44	Thermo	2011-15
4th Auction of N.E.	26.07.2007	171.470.784	134,67	Thermo	2010-15
		188.039.280	129,14	Hydro	2012-30
5th Auction of N.E.	16.10.2007	209.999.112	128,37	Thermo	2012-15
6th Auction of N.E.	17.09.2008	141.489.696	128,42	Fuel Oil/LNG	2011-15
		31.819.128	98,98	Hydro	2013-30
7th Auction of New Energy	30.09.2008	394.941.888	145,23	Fuel Oil/LNG/Coal /SCB	2013-15
Santo Antônio's Auction of N.	10.12.2007	379.236.146	78,87	Hydro	2012-30
Jirau's Auction of N.E.	19.05.2008	348.649.463	71,37	Hydro	2013-30
Belo Monte's Auction of N.E.	20.04.2010	794.925.103	77,97	Hydro	2015-30
10th Auction of N.E.	30.07.2010	85.998.384	99,48	Hydro	2015-30
TOTAL		**4.157.281.567**	109,30		

1) Contracts starting in 2005 with 8 years duration

SCB: Sugar Cane Bagasse

LNG: Liquefied Natural Gas

N.E.: New Energy

E.E.: Existent Energy

Source: Câmara de Comercialização de Energia Elétrica (CCEE) www.ccee.org.br

The "adjust auctions" were not included in the analysis, as they involve small energy amounts and have short duration.

Lower energy acquisition costs, as aimed by government, would be achieved through several measures. The first and foremost is the lower-tariff auction mechanism. Second, immediately after the auctions, which take place three to five years before the initial delivery of energy, a long run PPA (Power Purchase Agreement) is signed between the generator and the distributors' pool. These PPAs bear such low risks that may be used as guarantees in the related financial operations for the plant´s construction, lowering its financial cost.

Third, the new model does not allow self-dealing. Deverticalization and the ban of self-dealing adversely affected integrated utilities that had privileged access to existent plants forcing them to share these resources with the pool. On the other hand, the burden of Itaipu with its US-dollar indexed prices was also moved to the pool.[4] This is also the case of the expensive new projects. Since PPAs have terms up to 30 years, the long-term effects of these regulatory changes are rather permanent.

3 – Two Rounds of Tariff Revisions

Distribution price-cap regulatory model was brought into the scene by privatization. As widely recognized, the fact that Brazil started its privatization program before the approval of a regulatory framework increased the risk of the first investors.

The first distribution companies to be privatized received a concession contract with a price cap and had to live with rules on the making. The regulatory interval of around four or five years was believed sufficient to bring about substantial decreases in end consumers' prices because state enterprises were highly inefficient. This hope did not materialize by the end of the first regulatory period or even by the end of the second. Brazilian society wondered why.

Table 2 next registers the energy acquisition costs of all 61 Brazilian electricity distributors: They averaged R$105,5 for the first round of tariff revisions (2003-2005) and R$ 101,7 for the second regulatory period (2007-2009), when expressed in 2009 reais. Thus, acquisition costs remained practically the same in real terms.

[4] Itaipu US$ indexed prices may be a curse or a blessing depending on the exchange rate. This is the only plant whose prices are quoted in a foreign currency. Itaipu was built by a consortium of Paraguayan and Brazilian governments.

Table 2 - Energy Acquisition Costs per Utility in the First and Second Rounds of Tariff Revisions

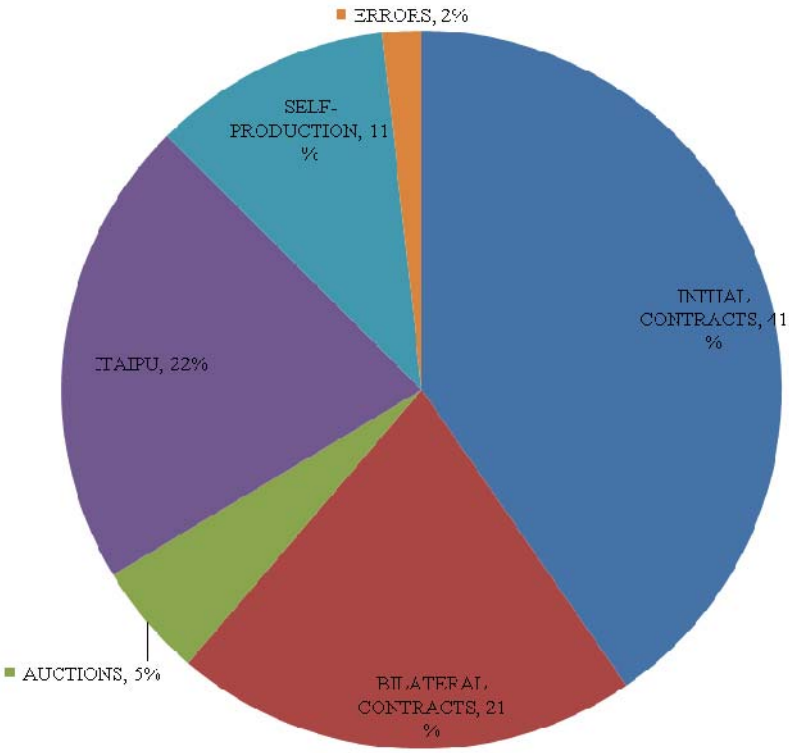
	First round of tariff revisions			Second round of tariff revisions		
UTILITIES	Acquisition costs in Dec. 2009 Brazilian reais	Begining of new tariff period	Quantities bought in the test year - MWh	Acquisition costs in Dec. 2009 Brazilian reais	Begining of new tariff period	Quantities bought in the test year - MWh
AES SUL	123.0	Apr-03	8,065,588	100.0	Apr-08	8,448,709
AMPLA / CERJ	107.0	Dec-03	9,746,809	98.8	Mar-09	10,914,084
BANDEIRANTE	113.9	Oct-03	10,495,816	100.8	Oct-07	9,723,920
BOA VISTA	146.8	Nov-05	491,666	150.2	Nov-09	605,483
CAIUA	97.3	Feb-04	913,764	97.1	May-08	1,124,405
CEAL	75.4	Aug-05	2,874,862	82.4	Aug-09	3,160,050
CEB	106.3	Aug-04	4,104,785	103.6	Aug-08	5,650,767
CEEE	114.2	Oct-04	7,434,912	99.1	Oct-08	8,612,440
CELESC	117.0	Aug-04	15,297,715	111.8	Aug-08	16,562,255
CELG	88.0	Sep-05	8,912,235	90.9	Sep-09	10,516,473
CELPA	70.6	Aug-03	4,925,115	79.1	Aug-07	7,133,068
CELPE	109.7	Apr-05	9,551,788	109.7	Apr-09	11,482,549
CELTINS	70.4	Jul-04	1,065,135	120.8	Apr-08	1,459,860
CEMAR	73.0	Aug-05	3,983,384	82.8	Aug-09	5,081,612
CEMAT	106.1	Apr-03	4,052,839	124.7	Apr-08	5,581,920
CEMIG	93.4	Apr-03	38,150,971	91.8	Apr-08	27,402,852
CEPISA	79.6	Aug-05	2,523,129	84.2	Aug-09	2,864,059
CERON	113.0	Nov-05	2,191,271	104.5	Nov-09	2,630,273
CFLO	102.0	Feb-04	215,202	111.5	Feb-08	245,030
CHESP	116.0	Sep-04	61,253	77.2	Sep-08	91,829
CNEE / NACIONAL	96.6	Feb-04	426,075	96.4	May-08	531,767
COCEL	102.3	Mar-04	198,990	96.6	Jun-08	231,936
COELBA	87.8	Apr-03	10,989,683	95.7	Apr-08	14,940,301
COELCE	96.7	Apr-03	7,055,703	115.3	Apr-07	7,712,889
COOPERALIANÇA	50.4	Feb-06	129,957	123.8	Aug-09	168,215
COPEL	108.4	Jun-04	20,104,583	86.2	Jun-08	22,799,977
COSERN	76.0	Apr-03	3,504,917	89.4	Apr-08	4,351,252
CPFL PAULISTA	118.9	Apr-03	21,329,677	114.8	Apr-08	22,574,352
CPFL PIRATININGA	120.3	Oct-03	11,359,582	114.4	Oct-07	9,322,400
CPFL SANTA CRUZ / CLFSC	68.3	Feb-04	808,854	97.2	Feb-08	962,309
CPFL JAGUARI / CJE	96.0	Feb-04	442,664	93.5	Feb-08	544,135
CPFL LESTE PAULISTA / CPEE	104.8	Feb-04	309,189	88.1	Feb-08	330,495
CPFL MOCOCA / CLFM	110.0	Feb-04	195,859	108.4	Feb-08	215,478
CPFL RGE	123.7	Apr-03	7,194,587	125.0	Apr-08	8,210,940
CPFL SUL PAULISTA / CSPE	98.4	Feb-04	398,146	98.3	Feb-08	422,010
DEMEI	97.8	Jun-05	98,520	118.5	Jun-09	112,364
DMEPC	71.6	Jun-04	337,649	80.9	Jun-08	407,371
EEB	95.0	Feb-04	747,016	106.7	May-08	675,730
EEVP / PARANAPANEMA	104.7	Feb-04	671,304	102.0	Feb-08	767,417
EFLJC	114.0	Mar-04	14,949	156.7	Mar-08	11,075
EFLUL	117.8	Mar-04	54,630	136.2	Mar-08	64,354
ELEKTRO	103.6	Aug-03	11,549,684	86.0	Aug-07	11,410,959
ELETROACRE	139.2	Nov-05	679,695	101.4	Nov-09	859,025
ELETROCAR	103.4	Jun-05	153,527	126.8	Jun-09	166,492
ELETROPAULO	120.4	Jul-03	37,732,090	107.5	Jul-07	38,686,118
ELFSM	119.3	Feb-04	317,690	94.0	Feb-08	398,777
ENERGISA-BO / CELB	95.4	Feb-05	536,827	97.3	Feb-09	637,247
ENERGISA-MG / CFLCL / CATAGUAZES	139.4	Jun-04	1,117,236	132.0	Jun-08	1,216,321
ENERGISA-NF / CENF	102.4	Jun-04	330,291	84.8	Jun-08	326,000
ENERGISA-PB / SAELPA	89.2	Aug-05	2,889,436	88.2	Aug-09	3,467,280
ENERGISA-SE / ENERGIPE / ESDE	75.7	Apr-03	2,252,630	87.5	Apr-08	2,330,210
ENERSUL	94.5	Apr-03	3,492,451	97.3	Apr-08	3,959,127
ESCELSA	104.5	Aug-04	5,839,726	93.0	Aug-07	6,206,343
FORCEL	95.7	Aug-04	24,294	83.2	Aug-08	36,107
HIDROPAN	107.7	Jun-05	81,098	129.3	Jun-09	90,855
IENERGIA	67.9	Aug-04	163,461	116.6	Aug-08	232,177
LIGHT	100.0	Nov-03	25,289,726	100.6	Nov-08	25,529,712
MANAUS ENERGIA / CEAM / MESA	115.6	Nov-05	4,973,276	149.3	Nov-09	5,799,617
MUXENERGIA	102.8	Jun-05	35,893	149.2	Jun-09	45,786
SULGIPE	102.7	Dec-04	245,475	86.3	Dec-08	296,837
UHENPAL	124.9	Dec-05	56,748	91.0	Apr-09	67,502
Average	101.42			104.37		
Weighted Average	*105.54*			101.71		

Source: ANEEL Agência Nacional de Energia Elétrica homepage. Tariff Revisions Technical Notes.

The cost of the energy purchased is not the only determinant of final consumer prices, but is the most important one. Acquisition costs did not fall in the passage of the first to the second round of tariff revisions because new investments had to be made at increasing marginal costs. The fact that the acquisition costs did not rise resulted from the decision to subsidize the new projects with the existing ones and also to equate prices to average instead of marginal costs.

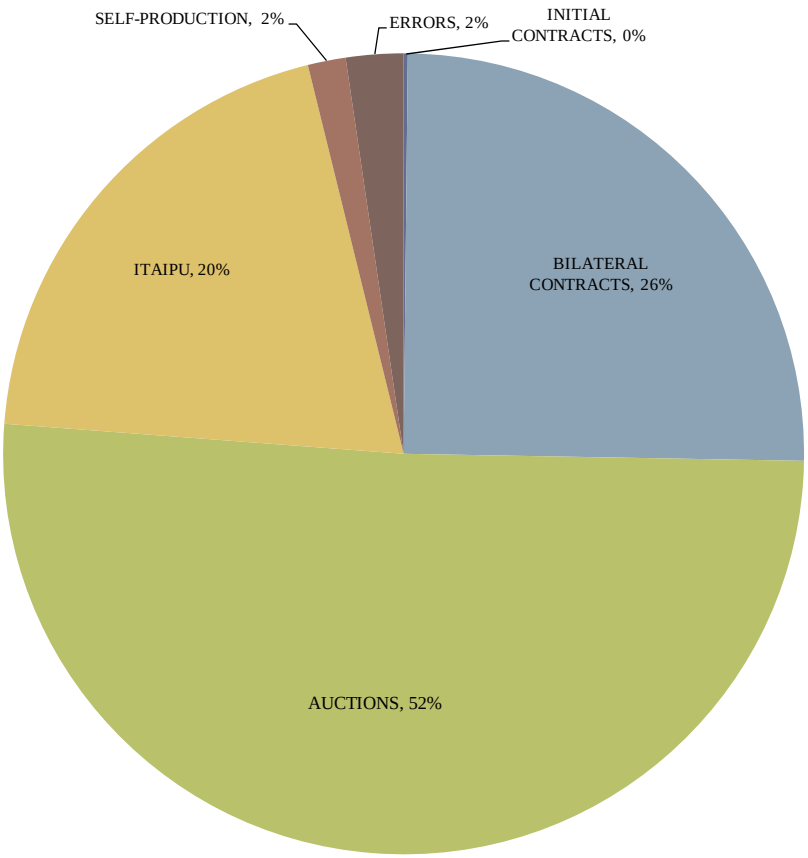
In the first tariff revision period auctions were a very small portion (5%) of the total energy purchased. However, in the second, the importance of auctions was much bigger (52%) as illustrated in Figures 2 and 3. In the future, energy purchases to supply captive consumers will be made only through auctions and Itaipu. The new big plants of the Amazon basin will be in operation and hence the current relative importance of Itaipu will decrease.

Figure 2 – Acquisition Costs in the First Round of Tariff Revisions 2003-2005



Initial and bilateral contracts prevailed before the new regulatory model
Parts do not sum exactly 100% due to errors and omissions
Source: ANEEL Agência Nacional de Energia Elétrica homepage. Tariff Revisions Technical Notes.

Figure 3 – Acquisition Costs in the Second Round of Tariff Revisions 2003-2005

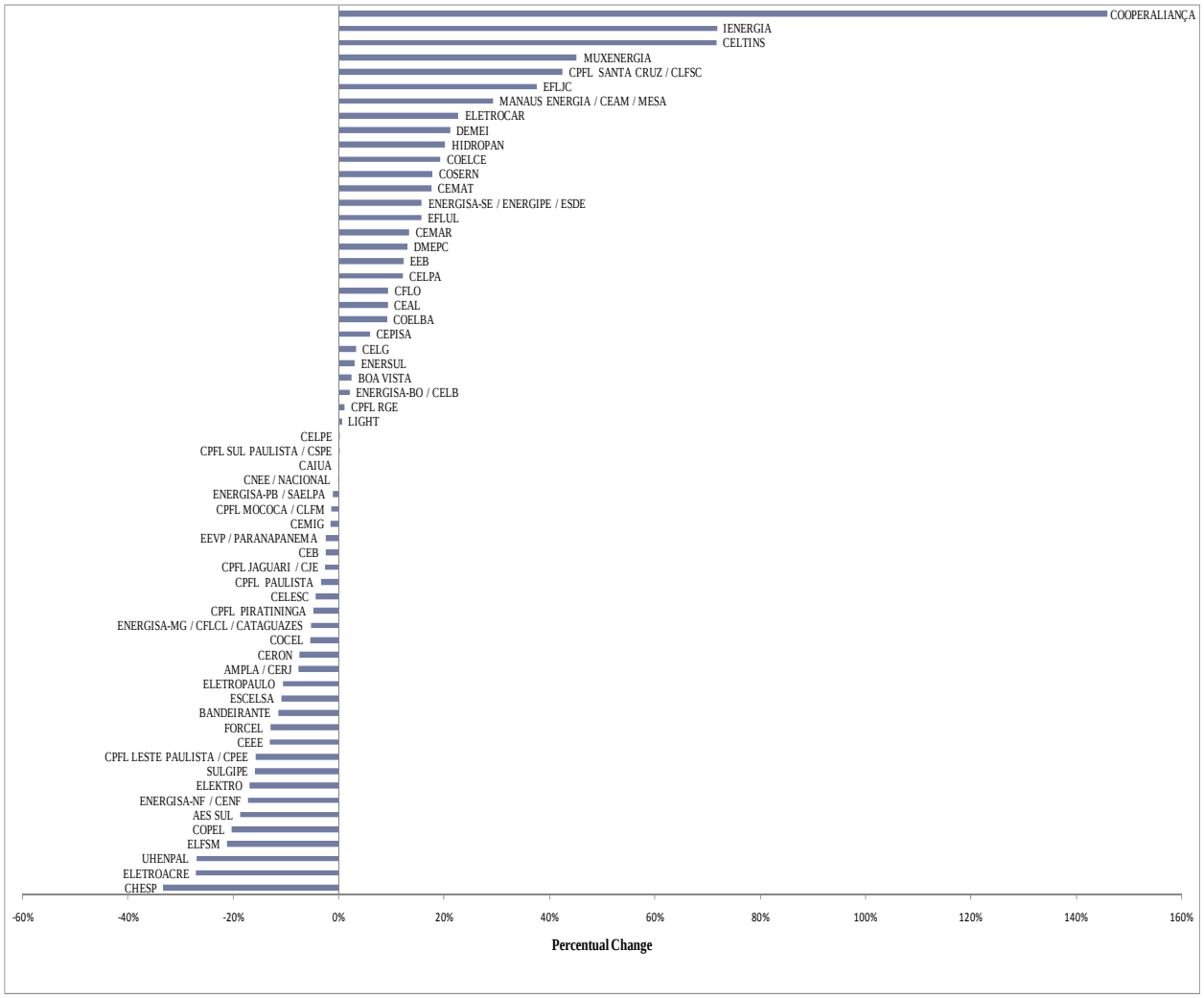


Parts do not sum exactly 100% due to errors and omissions
Source: ANEEL Agência Nacional de Energia Elétrica homepage. Tariff Revisions Technical Notes.

One of the main consequences of this model is the convergence of acquisition costs all over the country. Distributors that used to have lower acquisition costs because of verticalization or any other privileged access to low cost plants will have to share these advantages with all other distributors as their old contracts expire. On the other hand, the very expensive alternative technologies are diluted in the pool cost. Distributors that used to have high acquisition costs will witness a decrease.

Figure 4 shows the change in acquisition costs experienced by distributors in the passage of the first to the second round of tariff revisions.

Figure 4 – Percentual Change in Acquisition Costs between the First and the Second Round of Tariff Revisions.



As expected, approximately half of all distributors experienced a rise in their acquisition costs and the other half a fall. Those in the extreme positions, suffered major changes, which were reflected in their final concession area prices. Figures 5 and 6 illustrate the relative position of distributors in each round of tariff revisions.

Figure 5 – Costs of Acquisition in the First Round of Tariff Revisions

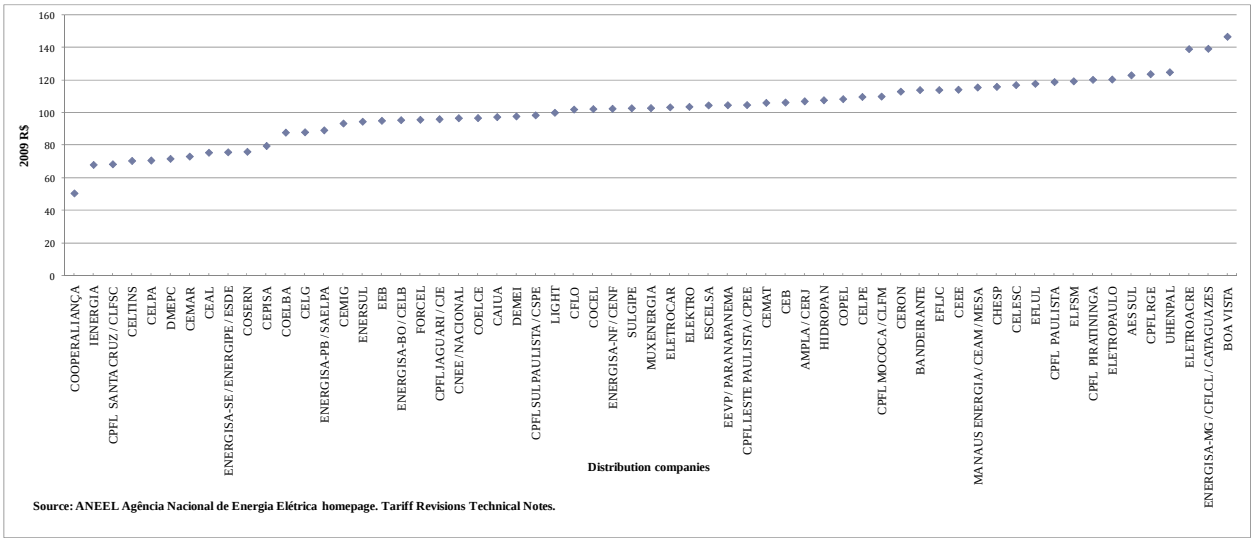
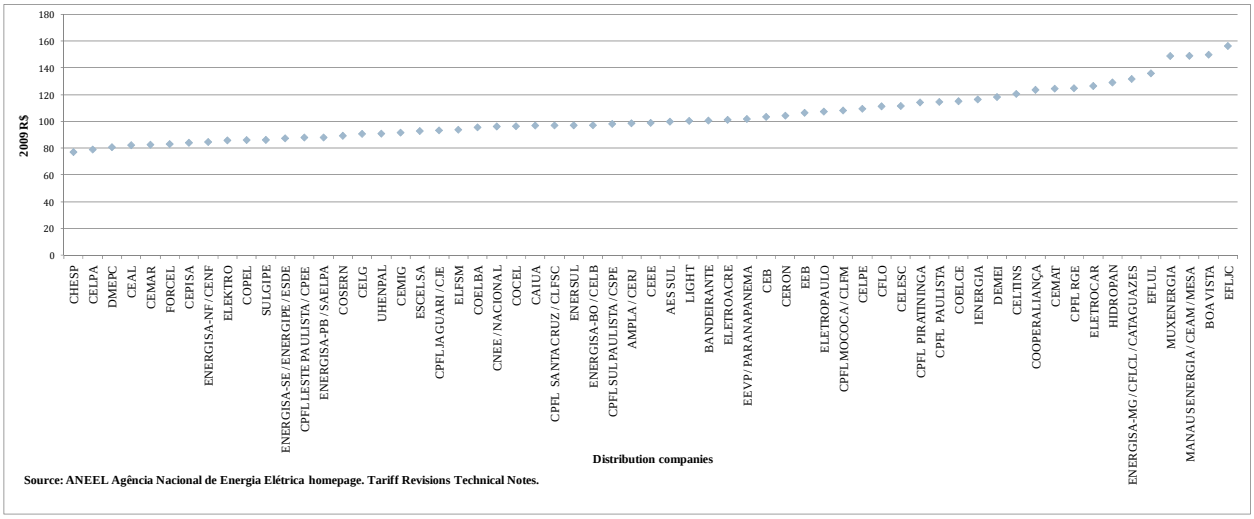
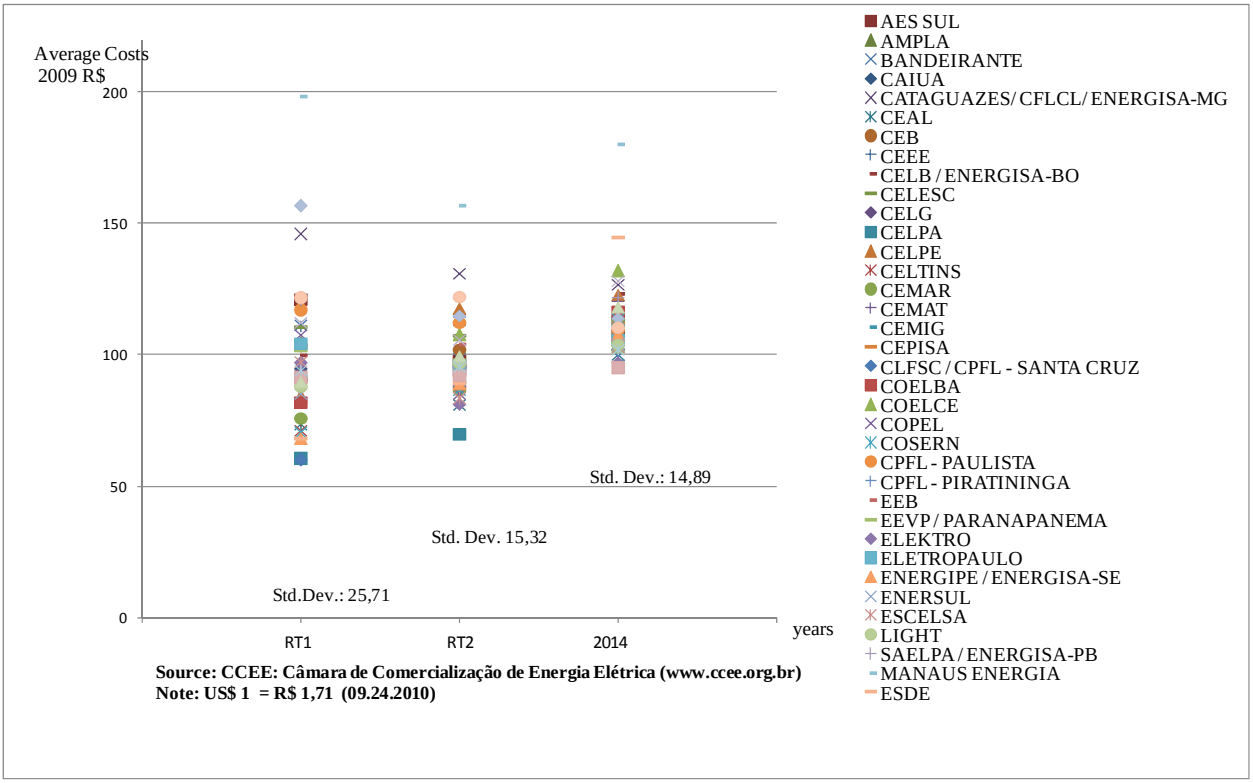


Figure 6– Costs of Acquisition in the Second Round of Tariff Revisions



In the near future, acquisitions costs will be almost the same in almost all concession areas. The isolated systems (concessions in the North of Brazil, in the Amazon region) may be the exceptions. This process of convergence has already started,as ilustrated in Figure 7, where we can see the increasing concentration around the average. The figure advances the subject of the next section since a preliminary view of the third round of tariff revisions is forecasted for 2014.

Figure 7 – Convergence of Acquisition Costs



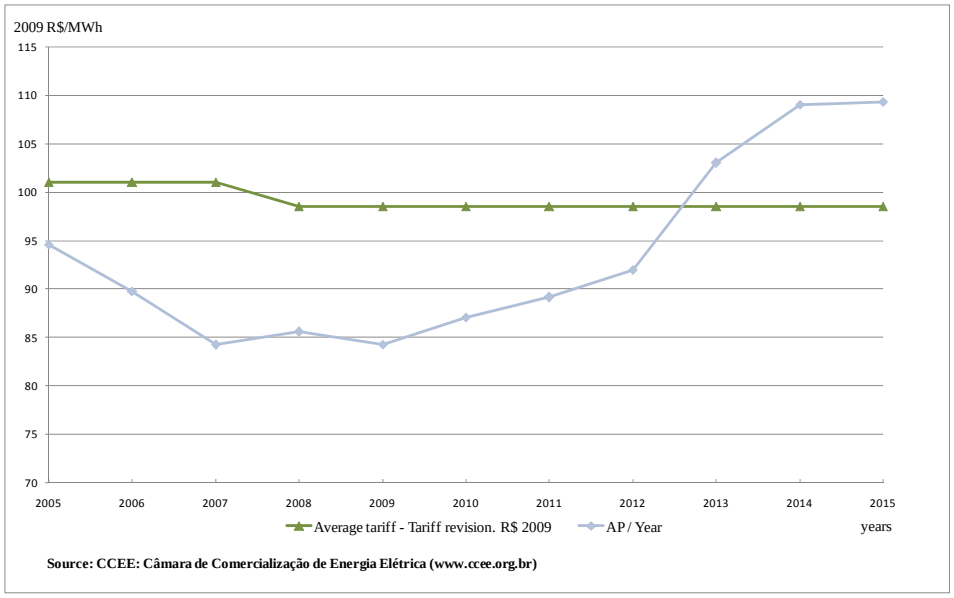
Source: CCEE: Câmara de Comercialização de Energia Elétrica (www.ccee.org.br)
Note: US$ 1 = R$ 1,71 (09.24.2010)

4 - Effects of the new regulatory model on acquisition costs

Since 2004, distributors have been buying in auctions the energy necessary to supply their captive markets. So far, approximately 80%[5] of the total energy required in 2015 has already been contracted in auctions. Figure 8 below indicates 2013 as the year when acquisition costs will be higher than the ones prevailing in the first two rounds of tariff revisions. By then, there will start a rising pressure on final consumers' prices coming from energy costs of acquisition. In Figure 8, the line representing the tariff revisions is extended into the future only as a basis of comparison. Of course, these values were obtained in the past and will change in the third round of tariff revisions which have only started. The line representing the costs of acquisition is the result of the calculus of the weighted average of all auction prices already contracted to be paid by every utility operating in Brazil. For easier comparison all values are expressed in 2009 reais.

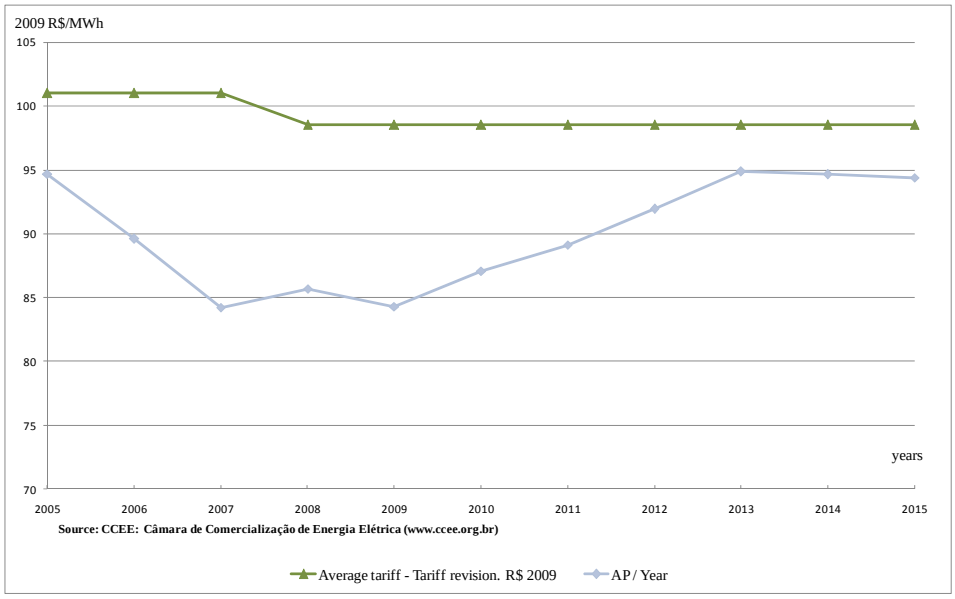
[5] This estimation was done considering 336.410.897 MWh as the total distribution market in 2007 (The central year in the second tariff revisions round). This amount is the sum of the energy reported by each of the 61 concession utilities in their second tariff revision. The captive market represents roughly 75% of this amount. The result of this operation was increased by 6% per year as a forecast of the total distribution utilities' market in 2014.

Figure 8 – Comparison of acquisition costs in tariff revisions and in auctions



This effect of cost acquisition increases on final prices in 2013 will partially depend on the renewal of the contracts of existing energy sold in the first auction of existing energy. In case blocks sold maintain their prices the new acquisition costs will drive final consumers prices down as ilustrated in Figure 9.

Figure 9 – Comparison of acquisition costs in tariff revisions and in auctions



5 – Conclusions

The objective of this paper is to contribute to the understanding of the reasons why Brazilian electricity prices did not fall substantially after almost ten years of price cap regulation. Brazilian congress investigation appointed various causes but failed to identify energy production costs. This paper evaluates and quantifies the impact of distributors' acquisition costs on tariffs. It starts by examining what were the individual acquisition costs of each one of the 61 electricity distribution companies operating in Brazil before the implementation of the new regulatory model (using their tariff revision processes as a database). Then, this number was compared to two others: their acquisition costs on the first round of tariff revisions after the implementation of the auctions; and the projection of their acquisition costs based on the purchases in the auctions until 2015. This time frame was chosen because 25% of all generation concessions expire in 2015 with a major expected effect on the prevailing prices.

The main conclusions are that the implementation of auctions together with subsidies from state enterprises did not reduce future acquisition costs as much as expected, but these measures successfully reduced the rhythm of price increases. The long run marginal expansion cost is increasing very fast because new hydro plants are ever more distant of consumption centers and environmental costs are difficult to mitigate. Thermal plants and other technologies, though increasing in importance, still have much higher prices. Were it not for the artificialities introduced by the 2004 regulatory model, price increases would be very high in the near future.

In case prices reflected marginal incremental costs, electricity prices would have been much higher. The fact that consumers do not see such high incremental costs, allow them to take wrong consumption decisions. As consumers are able to buy at prices lower than marginal cost, consumption levels go too far. Demand increases amplify the electricity market gap and reinforce the necessity of new investments.

It is interesting to remark that different distributors are not given exactly the same buying chances in this new regulatory model. At each auction, individual utilities buy only for those periods when energy is missing in their concession areas. In case the Ministry of Mines and Energy decides to make a new auction, purchases cannot be made to make "good deals" of reserve to the future or substitute for the purchases already made. Moreover, the Ministry does not publish the auctions schedule in advance so that utilities might not act strategically trying to optimize their purchases over time. Therefore, having a lower acquisition cost does not mean that the utility has superior managerial skills. It only means that the right auction (existent energy) was made on the right time (for the period when it was missing in that specific concession area). Utilities in the same economic group (the same management) frequently have different acquisitions costs in case the opportunities opened to them are different.

The price reducing effect of subsidies will probably be reinforced in 2015 when many large generation concessions now held by state enterprises expire. Brazilian Constitution says they

have to be re-auctioned, but there has been much discussion on this matter, bringing instability to the electricity markets. This discussion is quite relevant and manifold. Brazilian government spent lots of public money in the past to get these projects built. Now that they are already paid for, the time is ripe to have them operating at a cost of only operational items. In case these projects be reauctioned, big state enterprises will lose their assets.

Finally, long-term contracts like the ones offered today, reduce prices volatility favoring investments planning in industries or any other demanding electricity, but introduce rigidities because they cannot be changed. The energy offered by the state at lower prices is produced by state companies listed at the NYSE and São Paulo Stock Exchange. This raises questions regarding governance and responsibilities to shareholders. The maintenance of subsidies and consequently the trend of prices are highly dependent on very fragile political decisions.

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