Contractual Advantages and Shortcomings for the Development of Wind Power in Brazil and Argentina

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Abstract

Recently both Brazil and Argentina have implemented competitive biddings to promote wind power generation following other earlier incentive programs. Analyzing contract uncertainties, penalty clauses, income mechanisms and other incurred costs this study presents a comparison of contracts and tender notices for recent successful processes that contracted wind power generating capacity. It was found that Brazilian contracts are designed more specifically for wind power than Argentinean contracts, demanding a better project design from entrepreneurs while at the same time providing more opportunities for increasing income. On the other hand the liberty of determining commissioning dates for Argentinean projects is an advantage in an infant sector.

1. Introduction

In the last decades wind power has presented a strong growth in many regions of the world, albeit not simultaneously. Technologies for generating electricity with wind mills exist for more than a century, but a significant growth in wind power happened only from 1980 onwards, starting in California (Ackermann, 2005). Thereafter a number of countries implemented incentive mechanisms for wind power, which can be roughly classified as follows:

1. Feed-in Tariffs
2. Renewable Portfolio Standards
3. Competitive Mechanisms (Tenders, Auctions)
4. Fiscal and Investment Incentives

In order to promote a number of renewable generation technologies these incentive mechanisms are usually combined and altered, as is the case for European Union members,

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many of who have experimented with more than one mechanism (EWEA, 2009). Indeed, in the years between 1997 and 2006 most have changed or adapted their incentive policy for renewable power technologies, either because the existing mechanisms were considered to be inadequate or because some technologies had reached a maturity point were different incentives were deemed necessary.

In effect, adaptation of public policies for renewable power technologies is frequent, and the trend has both followed and propelled the development of these technologies worldwide. It has not been different in Brazil and Argentina, were public support for wind power has been reshaped continuously in the past decades.

In both countries several wind power projects were developed from the early nineties with the support of academic institutions and local power generators and distributors, though the latter played a greater part in Argentina. The Brazilian government implemented in 2001 a feed-in tariff development programme for the technology, PROEOLICA, along with incentives for wind power generation in isolated regions, as indicated by Dutra et al. (2008). Moreover, the Argentinean government anticipated Brazil with the enactment in 1998 of law 25.019, which established feed-in tariffs for wind and solar power generation.

However, both attempts were largely unsuccessful, either because the tariff was inadequate (the Brazilian case) or because of severe economic disarray, as occurred in Argentina (Dutra et al., 2008). Thereby both had by 2004 only a handful of wind power plants connected to the power grid, for an installed capacity of approximately 30 MW of wind power in Argentina and 29 MW in Brazil (CADER, 2009; EPE, 2010).

2. Recent Developments in Wind Power

Adopting a new incentive policy, the Brazilian government instituted in 2002-2003 the Alternative Energy Sources Incentive Program (PROINFA) which through a tender process aimed at contracting 1100 MW of wind power due to be commissioned by 2006, along with an equivalent small hydro and biomass installed capacity. In the competitive bidding that took place in 2004 more than 1400 MW in wind power projects were contracted, and though the program is often criticized for the delays and numerous deadline extensions (which are responsible for there being a number of wind power projects still in construction in 2010) it was crucial for developing wind power in Brazil.

Argentina did not implement additional incentive mechanisms in the 1998-2005 period, and by 2009 Brazil had clearly been more successful in promoting wind power, with a

significantly higher installed capacity (602,3 MW against 29,8 MW in end 2009) (CADER, 2009; ANEEL, 2010a). However, Argentina possesses a better wind resource in Patagonia, and has recently implemented new incentive mechanisms, as described below. Moreover, both have an established wind turbine industry, since a subsidiary of Enercon (Wobben Windpower) is present in Brazil since the mid-nineties and NRG Patagonia recently started producing wind turbines in Argentina, while IMPSA Wind (an Argentinean company) is present in both countries.

Recently both governments have reformed their policy for renewable power generation. Argentina has adopted with law 26.190/2006 a target share of non-conventional energy sources in the electricity matrix, and competitive mechanisms for promoting wind power were established in both countries. These mechanisms are described in section 5, and it must be mentioned that in Brazil the programmed second stage of PROINFA was definitely substituted by the auction mechanisms, while Argentina retains its feed-in tariff (whose level was even updated in 2006).

3. Objective

The first sections indicate that the study of the factors responsible for the development of wind power in Brazil and Argentina can use several different approaches, for example focusing the incentive or industrial policies.

In their textbook on contract theory Bolton et al. (2005) assume that “the contracting parties do not need to worry about whether the courts are able or willing to enforce the terms of the contract precisely” and also “the penalties for breaching the contract [are] assumed to be sufficiently severe”. These assumptions may be valid for establishing an economic theory, but in practice they constitute a major concern of contracting parties.

The objective of this study is therefore to analyze contractual terms from competitive incentive mechanisms recently established in Brazil and Argentina, indicating which characteristics are most adequate for developing wind power, ensuring contract enforcement or could result in a lower cost of energy.

Interestingly, contractual terms for public incentive mechanisms are isonomic parameters, equal to all entrepreneurs interested in developing wind power in a given country. It is necessary to note that other non-isonomic and isonomic parameters play a pivotal role on determining the viability of wind power projects and the cost of wind energy, such as financing conditions, engineering, procurement and construction costs and sale price of wind-

generated electricity, but these are not in the scope of this study. For those interested in such questions, a study developed by the European Wind Energy Association presents a detailed analysis of the parameters that affect the economic viability of wind power (EWEA, 2009).

Moreover, this study does not intend on presenting the design of energy auctions or tenders in Brazil and Argentina, although the subject is mentioned when related to contractual terms. Interesting studies on auctions include those developed by Krishna (2002) on auction theory and by Moreno et al. (2010) on Latin American energy auctions.

4. Methodology

Two main sources of information compose the core documentation for this study: Firstly, tender notices (for one bidding in Argentina and two auctions in Brazil), and secondly auction and bidding model contracts. This study compares contractual conditions from the most recent auctions and bidding in both countries. The analyzed tender notices and contracts were provided by the Brazilian electricity regulatory agency ANEEL (2010b, 2010c, 2010d, 2010e) and the Argentinean energy company ENARSA (2009a, 2009b), and are publicly available.

Contract analysis must pay attention to the following contractual topics:

1. Uncertainties
2. Enforcement, Penalties and Rescission Clauses
3. Income Mechanisms
4. Additional Incurred Costs

Rescission terms and enforcement clauses and penalties are those mechanisms designed to ensure firstly that parties participating in competitive biddings honor their commitment to sign the contract, and secondly that after they also honor the dispositions of the contract. In effect, Krishna (2002) indicates that if an auctioneer does not commit to abstaining from offering the unsold product in the future (the “no-sale” commitment) the perspective of future auctions affects negatively the closing price of present auctions. Similarly, if enforcement clauses are insufficient contracting parties could refrain from honoring the contract if any benefit could be gained with the perspective of a future auction, or bid in an auction intending to breach the contract.

Additionally, project timelines are an important part of a contract and corresponding enforcement clauses should exist for ensuring the timely commissioning of wind power

projects. Pricing mechanisms should also exist and assure a low cost of energy while simultaneously being fair, i.e. assuring an adequate return to the wind power entrepreneur. Finally, additional dispositions on contracts are frequent and may incur in additional costs for the entrepreneur, and must therefore be analyzed.

5. Competitive Incentive Mechanisms

The current policy for the promotion of renewable power sources in Argentina was established by law 26.190/2006 and regulated by the decree 562/2009, while reserve energy auctions in Brazil were instituted by law 10.848/2004. The Argentinean state energy company ENARSA has been using tenders to contract generating capacity since 2007, and therefore the mechanism of competitive bidding is newer in Argentina than in Brazil, were it has been applied since 2004. Additionally, there have been a greater number of auctions in Brazil than tenders in Argentina.

However, both countries have taken competitive biddings as their favored incentive mechanism for wind power only recently (a first reserve energy auction took place in Brazil in 2008 for contracting electricity generated from biomass). In December 2009 a renewable energy tender (RET) was organized by ENARSA in Argentina, while in August of the following year two energy auctions occurred in Brazil, the Alternative Sources Auction (ASA) and the Reserve Energy Auction (REA), all of which comprised wind power (a previous auction for wind power took place in December 2009).

In Argentina 754 MW of installed wind power were contracted at an average weighted price of 126,9 US$/MWh (SEN, 2010). In Brazil the REA and ASA had an average weighted price of 122.69 R$/MWh and 134.13 R$/MWh for over 2000 MW of installed capacity (70.11 and 76.65 US$/MWh, respectively, at an exchange rate of 1.75 R$/US$) (CCEE, 2010a, 2010b).

All processes were considered to be successful, at least for wind power, for the Brazilian strike prices were considerably below the PROINFA tariffs and the auction reserve prices, and even though the Argentinean RET did not succeed in contracting the targeted generating capacity for all technologies the capacity from wind power was overcontracted (the original target was 500 MW).

6. Contractual Terms

Moreno et al. (2010) analyze energy auctions in Latin America and state that “every market design must be tailor-made for the country‘s conditions and environment”, with auction design exerting a major role on the success of such mechanisms. This can also be said of contracts, where contract design is crucial for providing the necessary conditions for incentivizing the development of wind power projects while keeping at bay parties more interested in exploring contract flaws.

6.1. Uncertainties

Greenpeace (2008) presents several flaws of PROINFA that affected its performance, such as uncertainties on the institutions responsible for determining the quantity of electricity that could be sold by participating wind power projects.

In the Brazilian ASA the power exchange (CCEE) is clearly responsible for buying the wind-generated electricity at the agreed price and is exposed to eventual breaches of contract, while in the REA each generator signs contracts with participating distributors, who must also provide a financial guarantee for participating in the auction, therefore assuring winning generators that long-term power purchases agreements (PPA) will be signed.

As for Argentina all agreements are contracted directly with ENARSA, who is also the auctioneer. Therefore, although payments delays cannot be excluded in both countries there are no uncertainties on the responsibility for those. Consequently, the studied competitive biddings clearly state the responsibility on energy payments. Moreover, these biddings have been used before to contract generating capacity (unlike PROINFA), which further reduces uncertainties.

6.2. Enforcement, Penalties and Rescission Clauses

The lack of sufficient enforcement clauses and penalties is sometimes indicated as a contributing factor to the frequent delays of PROINFA projects, as indicated by Greenpeace (2008) who states that:

> “in other cases, there was not even the technical capacity: the concession owners were not interested in really building the plants but in speculating, transmitting the concession to other buyers.”

The viewpoint may seem extreme but it is shared with other actors of the Brazilian wind power sector. Adequate penalties serve as an entry barrier that excludes from the processes

those entrepreneurs unable or unwilling to honor their commitments. Moreover, Krishna (2002) indicates that an efficient auction (i.e. where the winners are those that value the projects the most) is better than an auction where the winner intends to resell the project, in which case the transaction costs may result in higher energy costs.

All studied contracts impose similar penalties for ensuring bid honoring and avoiding commissioning delays. They demand around 1% of total investment as a caution for ensuring the bid, which is returned after the signature of the contract, and 5% for delay penalties.

However, while both auctions in Brazil specify *a priori* a starting operation date, the Argentinean (or foreign) entrepreneur specifies its own date of commercial operation, and the price of projects is adjusted according to this date, with a smaller commission period being favored. This constitutes a slack parameter that may help accelerating commissioning dates, if risks of delays are well-managed by the entrepreneurs and the proposed construction periods are realistic.

The penalty levels are similar to those applied previously in other successful auctions where contracts were honored, and therefore are adequate as entry barriers to purely speculative interests. Moreover, in the Argentinean RET and Brazilian REA selling the contract is permitted only with the authorization of the energy buyer, while ASA contracts may not be transmitted except in case of company restructuring.

6.3. Income Mechanisms

When examining the contracts, one difference is apparent between the countries: while in Brazil contracts are in the national currency and price-indexed, in Argentina contract prices are established in United States dollars, although payments are made in local currency, without any indexation on price indexes. Since both economies have shown to be particularly crisis-prone (until recently, at least), a dollarized income represents a strength for the Argentinean contractual terms, albeit perhaps only from the entrepreneur’s point of view (especially if foreign).

However, lack of indexation represents a serious shortcoming, and the Argentinean contract length is shorter than the Brazilian, lasting 15 years against 20 in its northern neighbor. Moreover, both countries already possess a number of wind turbine producers, which reduces the importance of dollar-indexed prices.

As for limits in energy production, as mentioned in Argentina all energy is bought by ENARSA at the agreed price, up to the contracted hourly limit and without penalties for

underproduction, while hourly excesses can be sold in the spot market. In Brazil, all REA energy is sold to the power exchange (CCEE) at the agreed price, with a 4-year compensating mechanism for over- and underproduction. As for ASA energy, it is sold to distributors up to the annual limit, with a penalty for annual underproduction, while excess energy can be freely traded in the power market. Moreover, while in REA no producer can compensate underproduction buying energy in the power market from other producers such practice is allowed in ASA contracts.

Penalties for underproduction constitute an incentive to correctly predicting the output of a wind power project in earlier phases, although the REA contains a provision according to which the committed capacity of a wind power project can be revised downwards if it underproduces in a 4-year period. Dalbem et al. (2010) demonstrate that this is an incentive to bid with a project capacity slightly higher than the predicted capacity, since underproductions can later be compensated by a revision of the committed capacity, albeit the advantage is small and not necessarily used by most entrepreneurs.

Therefore, it can be seen that the Brazilian limits on production are in general stricter, penalizing underproduction while at the same time allowing the generators to benefit from extremely favorable wind regimes that may peak production above contracted levels, while the Argentinean hourly limit reduces the benefit of such a scenario, although contracts in Argentina present a protection from possible currency crises.

6.4. Additional Incurred Costs

While in Argentina the delivery point is the system connection point for the wind power plant, in Brazil producers are responsible for system losses until the gravity center, located midway between loads and generators, requiring therefore an energy surplus.

Moreover, for REA in Brazil auction costs are shared by the winners and in the RET in Argentina tender notices are sold to the participants, while in the ASA auction costs are shared by winning generators and participating distribution companies. However, it must be noted that costs for conducting the auction are likely to represent only a small share of total wind power project costs.

7. Conclusions

This study indicated the importance of correct contract design and the possible flaws that could result in project delays or additional costs for the wind energy buyer, while also indicating practices that encourage a responsible posture from the wind power entrepreneurs.

Uncertainties on the responsibility of payments are largely absent from competitive processes in both countries, although payment delays are always possible and cannot be excluded. The Brazilian contractual terms are somewhat more complex and strict than the Argentinean. While in Brazil producers face the risk of penalties for underproduction, which can incur in greater costs of energy, they dispose of a greater number of tools designed to hedge against these penalties.

Additionally, there is more liberty for trading energy in Alternative Sources Auction contracts, which can be attractive if the wind power sector reaches maturity. Finally, the hourly limit on generation and lack of indexation of Argentinean contracts represent a significant risk factor, and though it cannot be said that the Brazilian contracts are unquestionably better, they are more specifically designed for wind power, undoubtedly because the Argentinean contract was crafted for a greater number of energy sources. On the other hand Argentinean contracts allow the wind power entrepreneurs to specify the commissioning date, which in an infant sector may be an important characteristic.

Therefore, if governments plan on further promoting wind power through new tenders and auctions Argentina can benefit by designing contracts specifically to wind power, while Brazil could favor the Alternative Sources Auctions format, which is more similar to other energy auctions and encourages entrepreneurs to participate in the power market. It is important however to always remember that factors other than contractual terms can be even more important on determining the development of the wind power sector, and analysis of these factors is also necessary.

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