Evolution of the MIBEL Derivatives Market: a Model for Latin American Markets?

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ABSTRACT

A description of the evolution of the Iberian Power Futures Market managed by OMIP ("*Operador do Mercado Ibérico de Energia, Pólo Portugués*") since its foundation on July 3, 2006, is done. Such a market has experienced a gradual development in terms of number of participants, traded volumes, and tighter bid/ask spreads. The main amount of traded energy is driven by compulsory call auctions for the Portuguese last resort supplier, especially in the first two years of the market, due to the fact that the largest Spanish distribution companies were also requested to purchase energy in those auctions until July 2009. Its close interrelation with coexistent forward market mechanisms within the Iberian Electricity Market (the so–called "*MIBEL*") and with the dominant OTC ("*Over The Counter*") market has favoured its development. Other factors influencing its liquidity growth are the critical mass obtained by the the increasing number of OMIP trading members –some of them actively participating as *market makers*–, the enrollment of key *brokers*, and a sound *business development* policy performed by OMIP. Based on the positive experiences of this young market, some recommendations are formulated for the proper development of the burgeoning Latin American energy derivatives markets.

Keywords: MIBEL, Futures Market, OTC, Forward Contracting Auctions.

1. INTRODUCTION

This article describes the evolution of the Iberian Power Futures Market managed by OMIP, within the framework of the *Iberian Electricity Market*, the so-called *"MIBEL"*. Such an organised futures market is also known as the MIBEL Derivatives Market. A comparative evolution with the dominant OTC market is performed, as well as with the coexistent regulated forward contracting mechanisms, namely, OMIP call auctions, *Virtual Power Plant* (VPP) auctions, and auctions catering for the last resort supplies (the so-called *CESUR* auctions). Additionally, this research describes the current situation of the Latin American energy derivatives markets and formulates some recommendations for the proper development of these emerging markets. The Conclusions summarise the findings of this research.

2. THE IBERIAN POWER FUTURES MARKET VERSUS THE DOMINANT OTC MARKET AND THE COEXISTING REGULATED FORWARD CONTRACTING MECHANISMS

Since its beginning on July 3, 2006, the Iberian Power Futures Market managed by OMIP, within the framework of the Iberian Electricity Market (MIBEL), has experienced a steady development, in terms of number of participants, transactions, and open interest. The *clearinghouse* functions are performed by OMIClear, a daughter company fully owned by OMIP. At the end of January 2010, 37 market players participate in OMIP. Eighteen of them belong to Iberian *vertically integrated energy groups* (five Spanish distribution companies, their six related generation/trading companies, their related five last resort suppliers, as well as the Portuguese last resort supplier and the corresponding generation company). Only a reduced group of seven members is composed of *pure financial* agents. The amplest group, if excluded the vertically integrated energy companies, is composed of

twelve *energy traders*. At the end of January 2010, four *market makers* have been active in OMIP quoting some of the prompt contracts. Those month, quarter or year contracts are actually the most traded ones. Such market makers are *RBS Sempra*, *EGL Spain*, *Deutsche Bank*, and *Citigroup Global Markets*. Since November 18, 2008, the MIBEL Derivatives Market has the European Union (EU) Regulated Market status, according to *Directive 2004/39/EC* of the European Parliament and of the Council of April 21, 2004, on *Markets in Financial Instruments* ("*MiFID*"), following the registration with the Portuguese Securities Market Commission (*Comissão do Mercado de Valores Mobiliários*, CMVM) on October 30, 2008 (OMIP-OMIClear, 2010).

The main amount of traded energy in OMIP has been driven so far by *compulsory call auctions* according to national regulations aimed at fostering the MIBEL. In particular, the *International Agreement of Santiago de Compostela*, signed by the Portuguese and the Spanish governments on October 1, 2004, related to the constitution of the MIBEL between the Spanish kingdom and the Portuguese republic, indicates that these compulsory call auctions would serve as a transitory mechanism to foster the liquidity of the continuous market managed by OMIP. The Spanish distribution companies and the Portuguese last resort supplier with more than 100,000 clients have been obliged to purchase in these auctions until July 1, 2009, in order to partly cover their portfolios of end-user regulated supplies. Such an obligation initially comprised 5% of their regulated supplies, for the second half of year 2006, as agreed by the MIBEL Council of Regulators in the Évora Summit (November 2005), and published in the corresponding legislation (Spanish Order ITC/2129/2006 and Portuguese "*Portaria*" 643/2006), and 10% for year 2007 onwards, as agreed in the Badajoz Summit (November 2006), and published in Spanish Order ITC/3990/2006 and Portuguese "*Despacho*" n.º 780/2007 –for first half of year 2007–, Spanish Order ITC/1865/2007 and Portuguese Despacho n.º /2007 of 29 June 2007 –for second half of year 2007 and first half of year 2008–, Spanish Order ITC/1934/2008 and Portuguese Despacho 19098/2008 –for second half of year 2008–, and Spanish Order ITC/3789/2009 and Portuguese Despacho n.º 125-A/2009 –for first half of year 2009– (MITyC, 2006a, 2006b, 2007, 2008, 2009a; MEI, 2006, 2007a, 2007b, 2008, 2009a). Since the second half of year 2009, only the Portuguese last resort supplier (*EDP Serviço Universal*) has the obligation to purchase energy in OMIP call auctions, according to Portuguese Despacho n.º 16150/2009 –for the second half of year 2009– and Despacho n.º 1659/2010 –for the first half of year 2010– (MEI, 2009b, 2010).

As indicated by Martín Martínez (2008), the OTC ("*Over The Counter*") power market within the Iberian peninsula has been essentially developed since 1999 by two brokers. As shown in Figure 1, the OTC traded volumes in the Iberian Market during the first three and a half years of existence of the MIBEL Derivatives Market (i.e the period spanning from July 2006 to December 2009) have been 3.5 times bigger than the volumes exchanged in OMIP (*auctions* and *continuous*), and 12% of such OTC volumes have been registered by OMIP and settled by its clearinghouse, OMIClear. Since the last quarter of 2007 the amount of energy traded in the OMIP continuous market has grown slightly compared to previous trading levels, with a record in March 2009 (2.6 TWh, almost doubling the volume from the compulsory call auctions celebrated that month). In that month, historical OTC record is also reached (17 TWh). Since the start of this market until the end of January 2010, the accumulated amount of energy traded in OMIP call auctions doubles the amount traded in the continuous market. Such a ratio is 5.75 when considering only the first two years of existence of that market. From August 2008 onwards the accumulated volumes traded in each market mode are approximately the same. This means that the liquidity of this market is boosted by both market modes with the same strength. Such a growth of the continuous volumes signalise promising results along OMIP market development in coming years. Vertical dotted lines split Figure 1 in different periods, reflecting the variation in compulsory call auction volumes as stated by national regulations (Spanish ITC Orders and Portuguese "Portarias"/"Despachos" aforementioned). It can be noticed that the biggest auction volumes were traded during the second half of year 2007 and the first half of year 2008. In October 2008 the volumes traded in continuous surpassed the auctioned volumes for the first time, and this situation has turned to be quite frequent afterwards. In the first three years of existence of the MIBEL Derivatives Market, the traded volumes in the continuous market during each month keep a correlation coefficient of 0.9 with the monthly traded OTC volumes, thus being the OTC market a key driver of the liquidity evolution within the organised market managed by OMIP. The OTC volumes cleared in OMIP reach record levels in November 2008 (4.2 TWh) and in January 2010 (4 TWh). These high values are justified by the fact that OMIP trading members also active in OTC markets may then prefer to use OMIP Clearinghouse (managed by OMIClear) to settle some OTC trades instead of credit lines, especially when the credit conditions are constrained.

Regarding OMIP cleared volumes –i.e. futures and OTC registered–, although holding a steady growing pace, are still reduced compared to other more mature European Power Futures Markets, as Nord Pool (Nordic Countries), and EEX (Germany in 2008, and Germany and France since the autumn of 2009, due to a merger between EEX and Powernext). Table 1 compares those markets for years 2008 and 2009, with data obtained from the market operators (EEX, 2009, 2010; Nord Pool, 2009, 2010; OMIP-OMIClear, 2010).

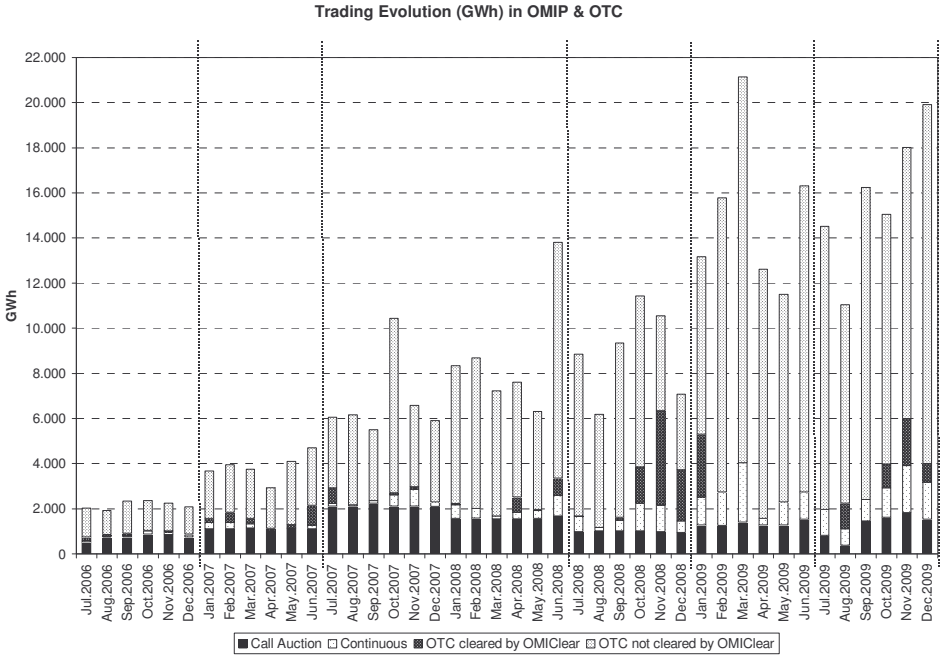

Figure 1. Evolution of Trading Volumes (GWh) in OMIP (auction, continuous, and OTC registered in OMIP) and in OTC (not cleared by OMIClear). Sources: OMIP-OMIClear (2010), Intermoney (2009)

Table 1: Cleared Volumes (TWh, Power) in the main European Energy Derivatives Exchanges. Sources: EEX (2009, 2010), Nord Pool (2009, 2010), OMIP-OMIClear (2010)

	EEX				Nord Pool				OMIP			
Year	Futures [1]	OTC cleared [2]	Total [1]+[2]	%[2]/ [1]+[2]	Futures [1]	OTC cleared [2]	Total [1]+[2]	%[2]/ [1]+[2]	Futures [1]	OTC cleared [2]	Total [1]+[2]	%[2]/ [1]+[2]
2008	266	899	1.165	77%	1.437	1.140	2.577	44%	22	10	32	31%
2009	285	740	1.025	72%	1.220	944	2.164	44%	31	20	51	39%

Figure 2 shows the evolution of the trading volumes (MWh) in OMIP continuous market and the increasing enrollment of trading members since the start of this market in July 2006 until the end of January 2010. The contracts traded in OMIP continuous market are Baseload Futures ("FTB"), where one contract equals one MW for a given delivery hour. They have financial settlement and some of them have also physical delivery. The spot reference price used in the settlement is the daily arithmetical mean of the day ahead price in the Spanish zone. The maturities of those contracts are Week (the so-called "FTB Wk"), Month ("FTB M"), Quarter ("FTB Q") and Year ("FTB Y"). Since March 2, 2009, new standardised OTC products can be settled by OMIClear, with the same maturities as mentioned above: *baseload financial swaps* and *baseload physical forwards* –known in OMIP as "FWB" and "SWB" respectively– both with the same reference price as the futures aforementioned. Since July 1, 2009, new baseload financial futures contracts can be traded or OTC registered in the organised market managed by OMIP, with the same maturities as the other instruments previously mentioned and with the spot reference price equal to the daily arithmetical mean of the day ahead price in the Portuguese zone. These futures are identified by OMIP as "FPB". Regarding the clearing and settlement of all those new instruments, whereas the FPB contracts do not introduce any new requirements compared to FTB, for the swaps and forwards there is no *cascading* of the Year and Quarter Contracts into the corresponding Month contracts and their *financial settlement*

is executed on a monthly basis instead of the daily one of the futures contracts. Only the futures contracts are exposed to the daily adjustment of profits and losses (the so-called "*mark-to-market*"). Since January 20, 2010, new Peak load Futures can be traded in OMIP, the so-called "FTK". They have financial settlement and some of them have also physical delivery. The spot reference price used in the settlement is the daily arithmetical mean of the day ahead price in the Spanish zone during the peak hours (i.e. from 8 a.m. to 8 p.m., from Mondays to Fridays). They share the same basic features as the FTB products as they have the same maturities, the same trading calendar, the same market modes (auction, continuous and registration of OTC trades), and the same clearing and settlement methods (OMIP, 2010).

All the new instrument types introduced in year 2009 ("FWB", "SWB", and "FPB") are not being successful, as only 2 swaps have been recorded (on March 19, 2009, 15 *SWB YR-10* contracts, and on March 20, 2009, 10 *SWB Q3-09* contracts), and neither forward contracts nor Portuguese futures have been traded yet (OMIP-OMIClear, 2010). Conversely, the Peak Futures ("FTK") introduced in 2010 are contributing to the liquidity improvement of this market, mainly due to the obligations of the Portuguese last resort supplier in the call auctions of the first half of year 2010, as stated in MEI (2010), and –in a minor degree, but quite encouraging– due to some transactions traded in continuous and OTC registered in OMIP as reported by OMIP-OMIClear (2010).

Vertical dotted lines in Figure 2 show the successive expansions of the continuous trading time window introduced by OMIP to foster the liquidity of this market mode. Addditionally, black triangular markers indicate the months where regulated forward contracting auctions coexisting with OMIP ones –namely CESUR and VPP auctions– are celebrated. As described by Capitán Herráiz and Rodríguez Monroy (2009), since the middle of June 2007, there exist coexisting forward contracting mechanisms within the Iberian Electricity Market, enlarging the forward trading capabilites of the market players, being limited until that moment to the OTC market and the futures market managed by OMIP. These new mechanisms are the Virtual Power Plant (VPP) auctions (in Spanish, known as "*Emisiones Primarias de Energía*" or *EPE auctions*), and the last resort supply auctions (in Spanish, known as "*Contratos de Energía para Suministros de Último Recurso*" or *CESUR auctions*). In the Spanish EPE auctions, call options regarding ''virtual'' capacity of the Spanish *incumbent* generators (Endesa and Iberdrola) are auctioned following a multi-round ascending clock algorithm in order to mitigate market power. The CESUR auctions are a forward contracting mechanism for the Spanish distribution companies and the Portuguese last resort supplier, complementing their procurements in the OMIP call auctions as well as in the spot market.The CESUR auctions have facilitated the entry of new agents and foster the development of the coexisting forward contracting mechanisms. The CESUR auctions contribute to the price valuation of the energy included in the last resort tariffs and intend to prevent further undesirable regulated tariff deficits. From the 9th CESUR auction –celebrated on June 25, 2009– onwards, the distribution companies no longer acquired energy but the *last resort suppliers*, as the latter have taken over the regulated supplies of the former since July 1, 2009, and the settlement is pure financial (MITyC, 2009b). As communicated by OMIP-OMIClear (2008), VPP auctions have been celebrated in Portugal, where OMIP has been the entity responsible for managing the auction, and OMIClear has acted as the clearinghouse, the central counterpart and the settlement system. Extensive description of the regulation and the results of these auctions is provided by MIBEL Regulatory Council (2009). Table 2 summarises the dates and the products traded in all these auctions so far.

In order to see if the market makers are actively contributing to foster liquidity, a vertical line is drawn in Figure 2 identifying the start of the first market maker agreement in September 2007. From Figure 2 it can be inferred that the existence of market makers, the expansion of the continuous trading window and the coexisting regulated forward contracting mechanisms, together with the trading boost provided by the OTC market, contribute to the increasing trend of the continuous traded volumes in OMIP. Regarding the enrollment of members, four categories are distinguished: *distribution* (i.e. Spanish distribution companies as well as Portuguese and Spanish last resort suppliers), *integrated* (i.e. generation companies belonging to vertically integrated energy groups), *non integrated* (i.e. energy traders belonging to multinational enterprises), and *financial* (i.e. pure financial agents like the commodities departments of investment banks). The gradual enrollment of trading members contributes positively to the bigger traded volumes. In this way, a *reinforcement of the financial players in OMIP*, whose main function will presumably be as speculators, would be desirable in order to strenghten the liquidity and the efficient performance of the MIBEL Derivatives Market. In order to reach that goal, it may make sense for the

market operator to perform focused business development actions with attractive incentives for the financial players. Such actions may be, for instance, specific discounts in the admission fees or special conditions when signing market maker agreements. On the other hand, the chart also showns when key OTC brokers have entered OMIP (*CIMD Agencia de Valores* and *ICAP Energy* respectively), attracting bigger OTC volumes for registration in OMIP. Both continuous and OTC registered volumes keep a growing pace though the latter are more erratic.

Table 2: Regulated Forward Contracting Mechanisms within the MIBEL framework complementing the OMIP Call Auctions. Sources: EPE (2009), CESUR (2009), OMIP-OMIClear (2008)

	Spanish VPP ("EPE") Auction			CESUR Auction			Portuguese VPP Auction	
	Auction Date	Products		Auction Date	Products		Auction Date	Products
1st	June 13, 2007	Baseload & peak: quarter "Q+1"; 6 month "(Q+1)+(Q+2)"; year "(Q+1)+(...)+(Q+4)"	1st	June 19, 2007	Baseload: quarter "Q+1"	1st	June 26, 2007	Baseload: quarter "Q+1"
2nd	Sept. 13, 2007		2nd	Sept. 18, 2007		2nd	Sept. 21, 2007	
3rd	Dec. 11, 2007		3rd	Dec. 18, 2007		3rd	Jan. 16, 2008	Base: months "M+1", "M+2"; quarters "Q+1", "Q+2", "Q+3"
4th	March 11, 2008		4th	March 13, 2008	Baseload: quarter "Q+1"; 6 month "(Q+1)+(Q+2)"	4th	March 7, 2008	Base Quarters "Q+1", "Q+2"
5th	June 10, 2008		5th	June 17, 2008				
6th	Sept. 23, 2008	Base & peak: 6 month "(Q+1)+(Q+2)"; year "(Q+1)+(...)+(Q+4)"	6th	Sept. 25, 2008				
7th	March 24, 2009		7th	Dec. 16, 2008	Baseload and peak: quarter "Q+1"			
			8th	March 26, 2009				
			9th	June 25, 2009	Base & peak quarters: "Q+1"; "Q+2"			
			10th	Dec. 15, 2009				

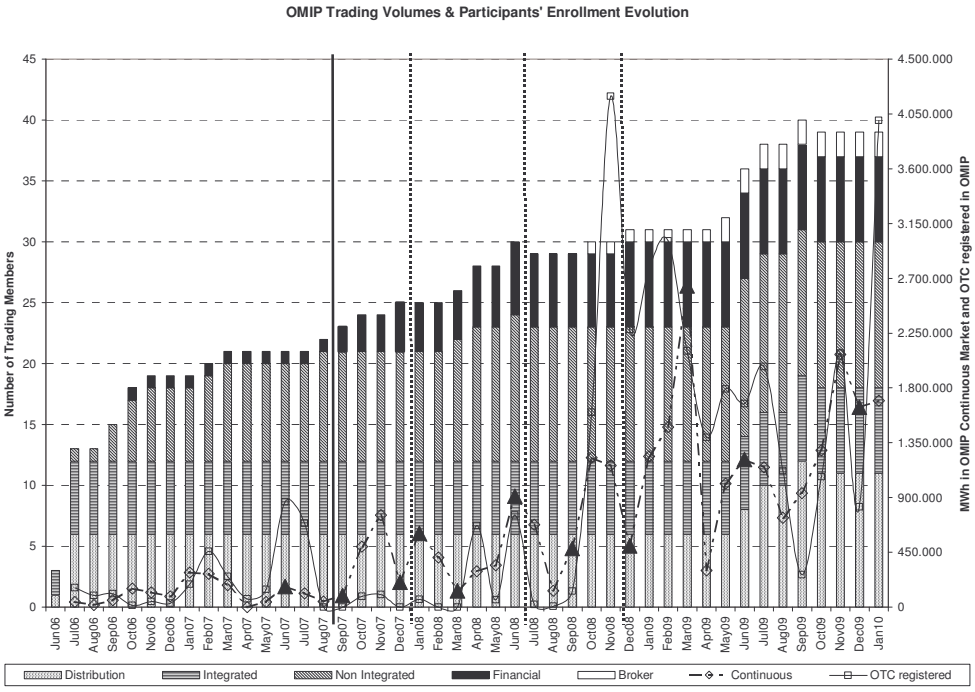

Figure 2. Enrollment of trading members and evolution of volumes (MWh) in OMIP continuous market and OTC cleared in OMIP. Source: OMIP-OMIClear (2010)

As stated by Martín Martínez (2008), the regulated forward contracting mechanisms have provided more liquid forward price references, and they have contributed to the liquidity of the futures market, and especially to the Spanish financial OTC power market. The OMIP, CESUR and VPP auctions have impacted positively in the trading of power derivatives. The participants in those auctions employ forward products, mainly via OTC and to some extent through OMIP continuous market, in order to optimise their open positions from those auctions. New agents have enrolled in those forward contracting mechanisms. Due to the sinergies between those mechanisms, new participants in the VPP auctions have shown interest in the CESUR auctions, increasing the competition in

the CESUR auctions and also in OMIP continuous market. The sellers in the CESUR auctions capture some of the risk borne by the purchases of the last resort suppliers. Those sellers can manage their risk in the forward markets, promoting competition, removing discriminations with the suppliers of the liberalised market, improving the price formation, and facilitating the design of the last resort rates through a transparent and liquid price.

Other factors contributing to the market development of the MIBEL Derivatives Market are: (i) the recurrent *campaigns of commission discounts* fostered by OMIP-OMIClear intended to boost the liquidity; (ii) OMIP-OMIClear continuous effort to innovate by implementing *new software tools* in order to facilitate the trading, clearing and settlement operations; (iii) *permanent dialogue of OMIP-OMIClear with the stakeholders* to successfully implement the new business developments (in order to reach this goal, OMIP-OMIClear holds regularly with their members *Trading & Products and Clearing & Settlement Committees*' Meetings in order to improve service and member's satisfaction); (iv) pro-active dialogue between OMIP-OMIClear and the Portuguese and Spanish energy and securities regulators; (v) actions reinforcing the corporate social responsibility, as the approval of OMIP-OMIClear *Ethic Codes*, in force since July 6, 2009, in order to strenghten their governance structures and supervisory capabilities, promoting and guaranteeing the transparency and competition amongst all the participants, thus ensuring the confidence of the market participants and their willingness to trade in this market.

All these efforts done by the market operator are vital as bigger cleared volumes are expected in the coming years. It is important to remark that, in line with the conclusions of the *G20 summit*, in September 25, 2009, in Pittsburgh (USA), and the envisaged *policy actions* for the proper regulation of derivatives markets by the *European Commission*, it is expected to clear increasingly the standardised OTC derivatives contracts through central clearinghouses to mitigate counterpart risk, as higher capital requirements could be requested to bilateral clearing (European Commission DG MARKT, 2009).

3. STATUS QUO OF LATIN AMERICAN ENERGY DERIVATIVES MARKETS

This section describes the current situation of the energy derivatives markets in Latin America, with special focus on the electricity sector, and in minor extent, the hydrocarbons and biofuels. Regarding power futures markets in Latin America, there is no relevant experience comparable to that of the MIBEL derivatives market. The basis for such desired derivatives markets would be the existence of robust spot markets. Nevertheless, there are some experiences regarding auction mechanisms, regarding concessions for capacity investment or local energy supply. A review of such market initiatives is provided below.

OMEL (2009), in a basic overview of Central and South American electricity markets, indicates that such countries keep agreements configuring three big regional markets: (i) Mexico and the so-called *Regional Electricity Market* ("MER"), the latter composed of Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama; (ii) Venezuela and the so-called *Community of the Andes Nations* ("CAN"), the latter composed of Colombia, Ecuador, Peru, Bolivia and Chile; (iii) the so-called *South Common Market* ("MERCOSUR"), including Brazil, Paraguay, Uruguay, Argentina and Chile. The global situation of such regional markets can be summarised as follows: (a) There are remarkable divergences between the basic features of each local market as well as the end-user prices; (b) The different energy policies confront, preventing the progress in the development and integration of those markets; (c) The demand is growing fast and the generation reserves are dwindling; (d) Some countries are performing auctions to guarantee the investment in the required infrastructures. In the case of Argentina, the operator of the spot market and also acting as system operator (CAMMESA, "*Compañía Administradora del Mercado Mayorista Eléctrico*") plays a fundamental role in the implementation of new market regulations aimed to equilibrate the increase of generation capacity and demand. In Colombia, the high dependency on hydroelectric generation makes necessary to have available firm generation to satisfy the demand even in situations of generation scarcity –hurricane "*El Niño*" provokes severe droughts, affecting the hydro reservoirs–. Usual *capacity payments* are not valid to face this situation. A new model for *reliability payments* constituting an *organised financial hedging* has been established. Such a model remunerates the new generation capacity and provides incentives to keep large hydro reservoirs facilitating hydro generation even in drought situations. A *scarcity price* is established. When this price is lower that the spot price, then the latter is used to

execute the contracts offering firm capacity. The market operator (XM) has managed two auctions in May and June 2008. The former, following a descending clock algorithm, intends to grant new firm capacity, in operation from December 2012 onwards at least during 20 years. The latter considers projects with larger lead times, such as big hydroelectric plants. The new model for reliability payments permits, as a safeguard mechanism, a new set of auctions –the so-called *re-configuration auctions*– as well as a *secondary market*.

ARIAE (2008) provides an overview of the regulatory frameworks in Latin American countries. In Chile, the power producers can sell their energy in the spot market – either via centralised pool, where equilibrium price, the so-called *short term marginal cost*, is obtained through a matching algorithm executed by a central dispatching (*Centro de Despacho Económico de Carga*, CDEC) or bilaterally with other generators– and also through medium and long term contracts with distribution companies or large industrial customers. The regulation in Chile assumes that all the supply contracts between generation companies and their clients are *financial contracts*. In Argentina, a proposal of a new regulatory framework in 2001 intended to foster *forward contracting* between power producers and distribution companies or large customers, being the resulting energy transactions coordinated and dispatched by CAMMESA, but it was not finally implemented. Nonetheless, the generation companies and the energy traders may sign *bilateral contracts* with distribution companies and large customers, with freely agreed conditions, and covering at least 1 month of supply. These contracts are publicly known and registered in CAMMESA. They accrue 36% of the energy dispatched by CAMMESA. There are not standardised forward or futures markets, or other energy derivatives markets, being the bilateral contracts the only hedging instruments. It is interesting to remark the important interconnection infrastructures of Argentina with the neighbouring countries (7 gas pipelines with Chile, 1 with Bolivia linked to Brazil, 1 with Uruguay, and strong electrical interconnections) that are scarcely used. This situation, together with their important exploitable resources, facilitates the opportunities for *energy swaps* with the six interconnected countries as well as Peru. In this context, contributions from active market agents may provide key solutions to boost the potential energy trading in the region. In Mexico, the electricity supply is managed by a public company ("*Comisión Federal de Electricidad*", CFE) who purchases the electricity to concessionaires, according to the dispatching rules of the National Electricity System. In case of surplus, the concessionaires can sell them the energy through auctions, or through automatic reception mechanisms (either notified or not). In Central America, the member states of SICA ("*Sistema de la Integración en Centroamérica*") are developing SIEPAC ("*Sistema de Interconexión Eléctrica de los Países de América Central*"), aiming to develop common market rules to facilitate power trading and to build a power grid from Guatemala to Panama. Those member states have signed a Framework Treaty for the Electrical Market in Central America, thus implementing the MER. Whereas in Honduras and Costa Rica there is not a competitive generation market –as in both cases, a centralised vertically integrated company controls such activity– in the rest of countries the situation is as follows: in Panama and Nicaragua through *occasional* or *opportunity* markets where surpluses can be sold, in Guatemala through a spot market, and in El Salvador through a *balancing* market. The market and system operations are jointly performed by the following companies in each country: "*Centro Nacional de Despacho*", CND, in Panama; "*Administrador del Mercado Mayorista*", AMM, in Guatemala; "*Unidad de Transacciones*", UT, in El Salvador; "*Centro Nacional de Despacho de Cargas*", CNDC, in Nicaragua; "*Empresa Nacional de Energía Eléctrica*", ENEE, in Honduras; and "*Instituto Costarricense de Electricidad*", ICE, in Costa Rica. On the other hand, MER is a wholesale power market *overlapped* with the local national markets, composed of trades between market players and short term transactions arisen from re-dispatching amongst the national system operators. MER is composed of two market modes: *contract* market and *opportunity* market. In the former, the contracts should be signed between agents of different countries. There are *Firm* Contracts and two types of *Interruptible* Contracts: *Financial* and *Physical-Flexible*. In the latter, the following *opportunity offers* are possible: *injection*, *withdrawal*, *flexibility* associated to *Firm* Contracts, *flexibility* associated to *Interruptible Physical-Flexible* Contracts, and *maximum payment for variable transmission rates* (associated to *Interruptible Physical-Flexible* Contracts). The real operation of MER is very recent, as SIEPAC began in 2009. Currently only surpluses of the local markets and emergency energy are traded. In the medium term, new generation investments with regional scope and enlargement of the transmission capacity are foreseen.

Regarding *hydrocarbons* and *biofuels*, the development of *gas hubs* and derivatives markets could be very useful for managing the risks in the local markets. Such initiatives would promote competition in markets traditionally controlled by state-owned monopolies (e.g. PDVSA in Venezuela and Pemex in Mexico).

Existing experiences with *agricultural commodities*, such as the futures and options traded in Latin American financial markets could be exploited for developing similar initiatives regarding other energy products (mainly electricity, gas, and biofuels). As indicated in BM&F BOVESPA (2009), this *Stock, Commodities, and Futures Exchange* was created in May 2008 as the merger of *Bolsa de Mercadorias & Futuros* and *Bovespa*. The new company is one of the biggest stock exchanges in the world, and the largest in Latin America, positioning Brazil as an international *financial hub* for trading of stocks, commodities and other futures. In September 2008, this exchange arranged the second auction for "*Certified Emission Reductions*" (REC) of carbon credits owned by the Municipal Prefecture of São Paulo. 713,000 REC were managed in a single lot in terms of *Clean Development Mechanisms* (MDL). As stated in BM&F BOVESPA (2010), futures and options regarding *ethanol*, *sugar*, *soya*, and *corn* are currently traded. In Argentina, as shown by MATba (2009), in this futures market ("*Mercado a Término de Buenos Aires*"), agricultural futures and forwards are traded –*corn*, *wheat*, *soya* and *sunflower*– where *exchange for physicals* is possible. This tool provides flexibility, as financial futures can turn into physical forwards, and financial costs can be diminished due to the avoidance of the mark-to-market process. A list of the main financial markets in Latin America can be found in MEFF (2010).

The following recommendations could foster the proper development of the desired Latin American energy derivatives markets: (i) a sound regulatory and supervisory framework, as the MIBEL one, in which the futures market, diverse regulated forward contracting mechanisms and the OTC market positively coexist; (ii) institutional and regulatory risks should be minimised in order to provide confidence to investors and key players; (iii) further integration of the regional electricity markets, i.e. MER, CAN and MERCOSUR: the existing Regional Initiatives –7 for electricity and 3 for gas– for the integrated EU Energy Market led by the Council of European Energy Regulators (CEER) and the European Regulatory Group for Electricity and Gas (ERGEG), may be used as references; (iv) strong harmonisation efforts between local markets with the ultimate goal of a single energy market: in this sense, ARIAE plays a fundamental role providing support for the implementation of such harmonisation measures by each national regulatory agency; (v) increased investments in interconnections in order to promote cross-border trade; (vi) market incentives for the most active traders voluntarily performing market making actions to spur the desired liquidity; (vii) expansion of the coverage of the financial commodities markets currently operating in Latin America, as they could be used as excellent platforms to develop such energy derivatives markets.

4. CONCLUSIONS

Since its beginning on July 3, 2006, the Iberian Power Futures Market managed by OMIP (Iberian Forward Market Operator), within the framework of the Iberian Electricity Market (MIBEL), has experienced a continuous development, in terms of number of participants and traded volumes (the latter especially since the last quarter of year 2007). The main amount of traded energy in OMIP has been driven by compulsory call auctions, especially in the first two years of the market, according to national regulations aimed at fostering the MIBEL. The volumes negotiated in OMIP continuous market tend to grow independently of the variations in the compulsory call auction volumes. Therefore this market develops by itself and not only or mainly due to regulatory effects. Regarding the amount of members and the traded volumes, although holding a steady growing pace, OMIP liquidity is still reduced compared to other more mature European Power Futures Markets, with Nord Pool as the most mature market. The *forward contracting mechanisms* within MIBEL –i.e. OMIP call auctions, OMIP continuous market, VPP auctions and CESUR auctions together with OTC trades– do coexist in harmony without preying upon each other. Such a positive coexistence is due to the *arbitrage* possibilities amongst them. Therefore liquidity in OMIP continuous market is favoured by the good evolution of these other market mechanisms. The causes of the positive coexistence are a good *market design* and a sound *regulation* facilitating proper *supervision* of those market mechanisms and providing *confidence* to the market players, as well as excellent *learning capabilities* from the most active players. Additionally, OMIP *Market Maker Agreements* are also helping to develop OMIP continuous market. There is still much room for new enrollments in OMIP, especially from *energy traders* active in the coexistent forward mechanisms as well as *financial players* who may seek potential gains from energy markets as an alternative to the spoilt financial markets by the still recent global financial crisis. Other factors explaining the growing trend of volumes traded in OMIP and cleared by OMIClear are the

expansions of the time windows of the continuous trading phase as well as the enrollment of *brokers*, contributing to bigger OTC trades registered in OMIP. Furthermore, *discount campaigns* promoted by OMIP-OMIClear in their commissions, OMIP steady efforts in streamlining their *information systems*, and a permanent dialogue with all the stakeholders to optimise OMIP business development actions also help to liquidity improvements. Thus, such liquidity gains are globally obtained through a combination of all these *interrelated factors*.

Currently, there is no sound initiatives regarding Latin American Energy Derivatives Markets, as the typical hedging instruments in the local power markets are the bilateral contracts, and the hydrocarbon markets are still mainly driven by former monopolies. The successful experiences regarding power derivatives within MIBEL may be employed to boost the potential energy derivatives markets in Latin America. An harmonised approach led by ARIAE similar to the EU regional initiatives regarding a single EU energy market, an appropriate climate for investors, the promotion of incentives for dynamic traders, and expansion of the existing financial commodities markets in Latin America embracing energy derivatives products would also help to fulfil this worthy goal.

REFERENCES

ARIAE (2008). *Energía y Regulación en Iberoamérica, Asociación de Reguladores Ibero-Americanos de la Energía (ARIAE), Vol. II*, 1ª ed. Comisión Nacional de Energía (CNE). Ed. Thomson Civitas, Navarra.

BM&F BOVESPA (2009). *Relatório anual 2008*. BM&F BOVESPA, A Nova Bolsa, S.A., São Paulo.

BM&F BOVESPA (2010). *Boletim Diario, nº 024/5 de fevereiro de 2010*. BM&F BOVESPA S.A. – Bolsa de Valores, Mercadorias e Futuros, São Paulo.

Capitán Herráiz, A., Rodríguez Monroy, C. (2009). "Analysis of the efficiency of the Iberian power futures market". *Energy Policy*, 37, 3566–3579.

CESUR (2009). Oficial website of Spanish Bilateral Contracting Auctions for Last Resort Supplies ("CESUR Auctions"), 1st-5th auctions and from 6th onwards respectively: www.subasta-cesur.eu/auction.asp; www.subastascesur.omel.es/frames/index.jsp

EEX (2009). Growth Through Security, 2008, *Annual Report, EEX, European Energy Exchange AG*, Leipzig.

EEX (2010). Power Trading Results on EPEX Spot and EEX Power Derivatives in 2009, *Press Release,* EPEX Spot European Power Exchange and EEX Power Derivatives, Leipzig, Paris 13 January 2010.

EPE (2009). Oficial website of Spanish Virtual Power Plant Auctions ("EPE", Emisiones Primarias de Energía): www.subasta-epe.com/es/public

European Commission DG MARKT (2009). "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Central Bank. Ensuring efficient, safe and sound derivatives markets: Future policy actions", *COM(2009) 563/4*. Provisional Version, Brussels.

Intermoney (2009). El Mercado Eléctrico en España, diciembre 2009. Madrid, 15 de enero de 2009, im energía sa, consultoría, p. 56.

MATba (2009). *Reporte, Año IV, Número 37, Octubre-Noviembre-Diciembre 2009*. MATba, Mercado a Término de Buenos Aires.

Martín Martínez, M.J. (2008). "Mecanismos de contratación a plazo de energía eléctrica", *Energía: Desarrollos Regulatorios en Iberoamérica, ARIAE, 2008, XII Reunión Anual Iberoamericana de Reguladores de la Energía*. Ed. Civitas, Navarra, pp. 375-391.

MEFF (2010). *Financial Markets Websites*. MEFF Sociedad Rectora de Productos Financieros Derivados de Renta Variable, S.A.U., www.meff.es

MEI (2006). Ministerio da Economia e da Inovação. Portaria n.º 643/2006. Diário da República, N.º 121, Série I–B, 26 de Junho de 2006.

MEI (2007a). Despacho n.º 780/2007. Diário da República – II Série, nº 11 – 16 de Janeiro de 2007, pp. 1251-1252.

MEI (2007b). Despacho n.º /2007. Diário da República, 29 de Junho de 2007.

MEI (2008). Despacho n.º 19098/2008. Diário da República, Nº 137, Série II, 17 de Julho de 2008.

MEI (2009a). Despacho n.º 125-A/2009. Diário da República, 2.ª série, N.º 1, 2 de Janeiro de 2009.

MEI (2009b). Despacho n.º 16150/2009. Diário da República, 2.ª série, N.º 135, 15 de Julho de 2009.

MEI (2010). Despacho n.º 1659/2010. Diário da República, 2.ª série – N.º 16 – 25 de Janeiro de 2010.

MIBEL Regulatory Council (2009). "Descripción del Funcionamiento del MIBEL", November 2009, by Comissão do Mercado de Valores Mobiliários (CMVM), Entidade Reguladora dos Serviços Energéticos (ERSE), Comisión Nacional del Mercado de Valores (CNMV), and Comisión Nacional de Energía (CNE).

MITyC (2006a). Ministerio de Industria Turismo y Comercio. Orden ITC/2129/2006, de 30 de junio, por la que se regula la contratación a plazo de energía eléctrica por los distribuidores en el segundo semestre de 2006. BOE 158, 4 de julio de 2006, pp. 25020-25024.

MITyC (2006b). Orden ITC/3990/2006, de 28 de diciembre, por la que se regula la contratación a plazo de energía eléctrica por los distribuidores en el primer semestre de 2007. BOE 312, 30 de diciembre de 2006, pp. 46680-46683.

MITyC (2007). Orden ITC/1865/2007, de 22 de junio, por la que se regula la contratación a plazo de energía eléctrica por los distribuidores en el segundo semestre de 2007 y en el primer semestre de 2008. BOE 152, 26 de junio de 2007, pp. 27314-27318.

MITyC (2008). Orden ITC/1934/2008, de 3 de julio, por la que se regula la contratación a plazo de energía eléctrica por los distribuidores en el segundo semestre de 2008. BOE 162, 5 de julio de 2008, pp. 29517-29520.

MITyC (2009a). Orden ITC/3789/2008, de 26 diciembre, por la que se regula la contratación a plazo de energía eléctrica por los distribuidores en el primer semestre de 2009. BOE 314, 30 de diciembre de 2008, pp. 52430-52434.

MITyC (2009b). Orden ITC/1659/2009, de 22 de junio, por la que se establece el mecanismo de traspaso de clientes del mercado a tarifa al suministro de último recurso de energía eléctrica y el procedimiento de cálculo y estructura de las tarifas de último recurso de energía eléctrica. BOE 151, 23 de junio de 2009, pp. 52252-52279.

Nord Pool (2009). *Annual Report, 2008, Nord Pool ASA*, Lysaker.

Nord Pool (2010). Market Reports, www.nordpool.com/en/asa/Newsroom/Reports/Market-reports

OMEL (2009). "La Liberalización Eléctrica en el Contexto Internacional", *Memoria 2008, Operador del Mercado Ibérico de Energía – Polo Español, S.A.,* Madrid. pp. 131-186.

OMIP (2010). Technical Specifications of the Products, www.omip.eu/downloads.php

OMIP-OMIClear (2008). Website for information and results of VPP auctions held in Portugal ("Leilões PT-VPP"), www.omip-sa.com/listas.php?id=176

OMIP-OMIClear (2010). OMIP-OMIClear Daily Market Bulletins of the MIBEL Derivatives Market, July 3, 2006 – February 12, 2010.

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