IBERDROLA

9 November 2010

ABSTRACT

The purpose of this paper is to discuss how the interconnections create Social Welfare (SW) in the wholesale markets both in the import and export country.

In particular, this document focuses on the ban on imports to the *Dominant Agents* in the Spain-France (IFE) interconnection. According to the Spanish regulation, companies with an ordinary regime production greater than 10 % within MIBEL market (Spain + Portugal) are not allowed to import energy from neighbour's countries. These companies are called D*ominant agents*. Throughout this paper we will prove that the relative competition in the E-F direction is greater than in the F-E direction, that there is a reduction in the Total Social Welfare in both countries and that the interconnection is not congested in the 27% of the hours since the prohibition came into effect. However, Dominant Players still cannot access F-E capacity.

BENEFITS OF INTERCONNECTED MARKETS

Firstly, we will analyze the behaviour of a single market (country A). As the basis of economics states, the marginal price of the market stands where offer and demand match each other (P'_A).
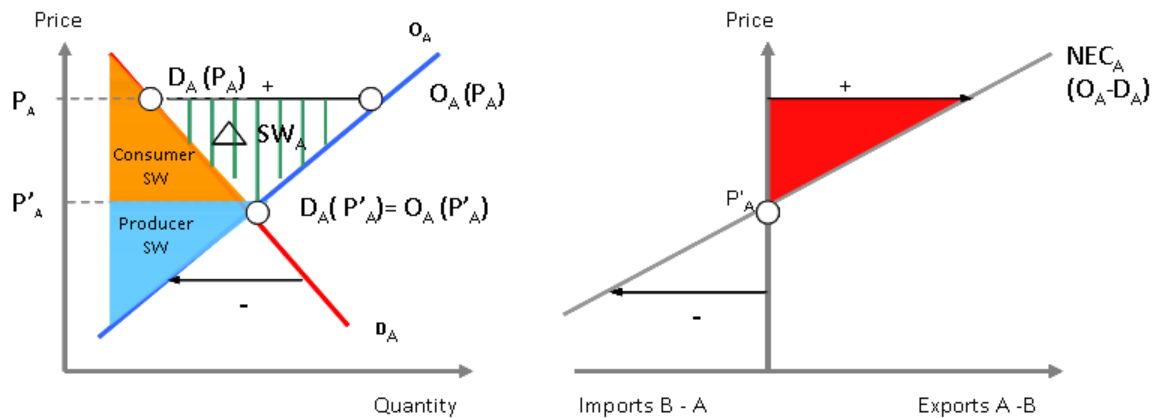

Illustration 1

On the left part of equilibrium point (P'_A), the producers will be overpaid compared with what they requested (blue area). Analogous, suppliers will pay less than what they were willing to (orange area). These two areas are known as the Producer Social Welfare and the Consumer Social Welfare, respectively. In case this market has the possibility of exporting energy to a neighbour country (country B), this will trigger to an increase of the price (from $P_{A'}$ to P_A), a rise in the production (from $O_A(P'_A)$ to $O_A(P_A)$) and a reduction in the consumption (from $D_A(P_{A'})$ to $D_A(P_A)$). As a result of all of this, the social welfare in country A will be increased by ΔSW_A (striped green area).

The Net Export Curve (NEC) is defined as the difference between the offer and the demand, as shown in the illustration 1 on the right side. The NEC is positive when energy is carried from country A to country B and negative when energy is carried from country B to country A.

Secondly, we will analyze which is the situation with the two interconnected countries, country A and country B (illustration 2). As shown in the Illustration below, the right side of the horizontal axis corresponds to the "quantity exported from A to B", while the left side illustrates the "quantity exported from B to A". Thus, the NEC of country A (NEC_A) will be an increasing function, whereas the NEC of country B (NEC_B) will result in a decreasing function.

In case there would be no congestions in the interconnection, both markets would have the same price ($P_A = P_B$). As it is illustrated on the illustration below, this will lead to an increase of the Social Welfare in both countries. In particular, the increase of Social Welfare of country A (ΔSW_A) will be received entire by the producers of this country, whereas the increase of Social Welfare of country B (ΔSW_B) will be received fully by the consumers of the latter country.
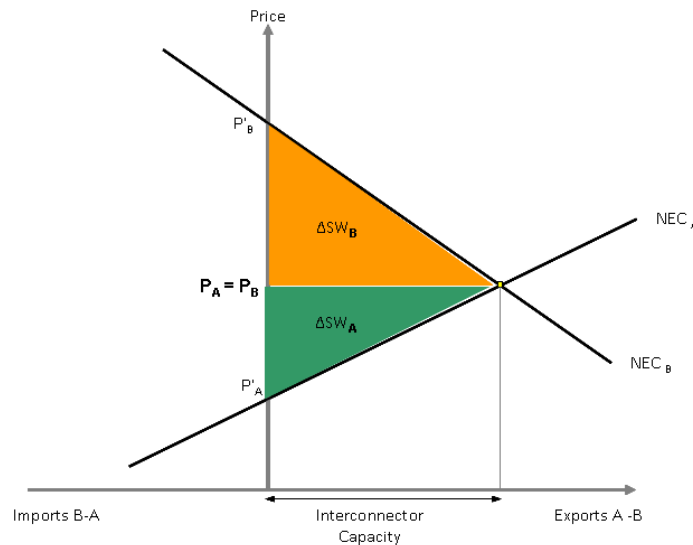

Illustration 2

However, in most cases the available capacity is limited to a value that does not lead to an equality of prices in both countries ($P_A \neq P_B$). This case is shown in the following illustration.
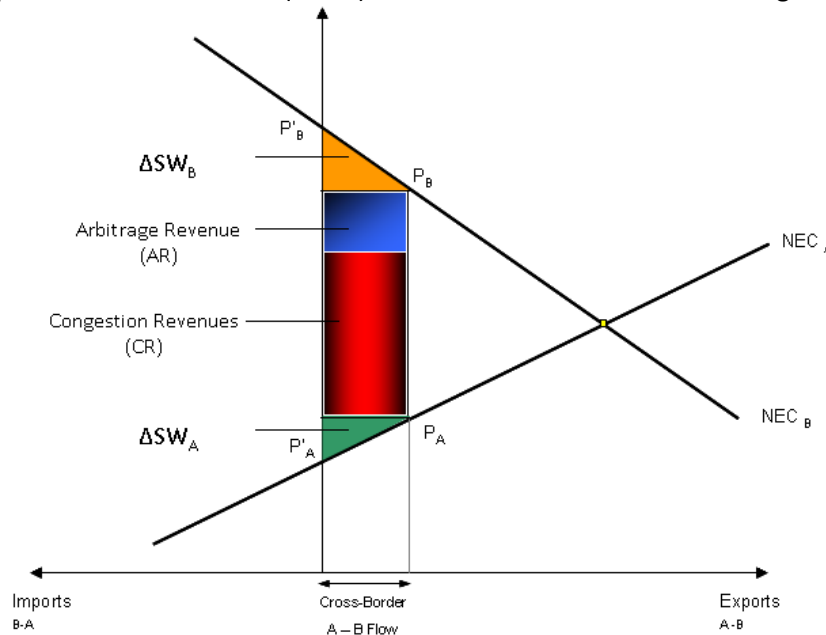

Illustration 3

In countries in which cross border capacity is allocated through an explicit auction, market players place bid based on a competitive mechanism. According to EC/1228/2008 we assume the congestion revenues generated by these auctions, will serve to increase the Social Welfare generated in both countries. In this case, the Total Increase of Social Welfare can be determined by the following equation:

Total Increase of Social Welfare = ΔSW_A + ΔSW_B + Congestion Revenues (CR)

Given the fact that market players place bids for the Interconnection Wholesale Value (IWV), which is the difference between P_A and P_B multiplied by the cross-border capacity, the IWC can be divided into:

Interconnection Wholesale Value (IWV) = Congestion Revenue (CR) + Arbitrage Revenue (AR)

The greater the Congestion Revenue (CR) is in comparison with Interconnection Wholesale Value (IWV) the less arbitrage revenue is obtained by players in the interconnection and the higher Total Increase in Social Welfare in both countries. This can be achieved through a transparent, non-discriminatory and competitive auction process.

THE SPAIN – FRANCE INTERCONNECTION CASE

Due to Spanish Regulation RDL 5/2005, *Dominant Agents* are not allowed to purchase energy outside the Iberian Peninsula in order to import it to Spain.

The definition of Dominant Agent can be found in the abovementioned law and it is shown as follows: "having a higher share of 10% of generation and power supply in (Spain & Portugal)". The list of *Dominant Agents* is published periodically by CNE, the Spanish Regulator, on which currently IBERDROLA, ENDESA, UNION FENOSA and EDP are listed.

In this part of the document, we will analyze which are the effects that this ban is creating on the Total Increase of Social Welfare both in France and Spain.

1. The Arbitrage Margin in the France to Spain direction is greater that in the Spain to France direction

The following tables show in columns the Congestion Revenue (CR), the Arbitrage Margin (AM), the Interconnection Wholesale Value (IWV= CR+AM) and the ratio between Arbitrage Revenue and Interconnection Wholesale Value (AR/IWC). We will perform this analysis for the annual, monthly and daily capacity rights during the year 2008 in both directions. Figures are shown in Euros [1].
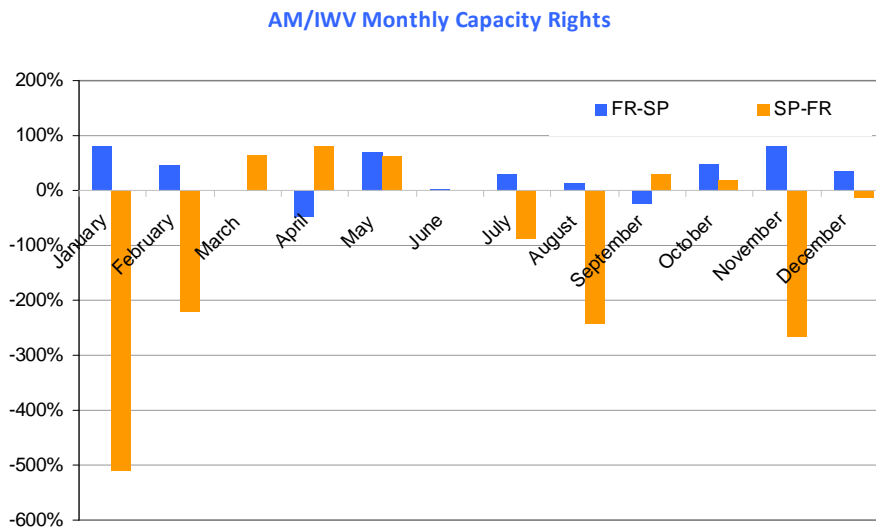
a. **Daily Capacity Rights 2008**

2008	Fr-Es				Es-Fr			
	CR	AM	IWV	AM/IWC	CR	AM	IWV	AM/IWC
January	3.273.950	2.220.050	5.494.001	40%	234.217	29.416	263.634	11%
February	2.498.914	740.768	3.239.682	23%	90.625	37.288	127.913	29%
March	1.691.858	728.015	2.419.873	30%	614.422	285.337	899.759	32%
April	530.073	1.173.152	1.703.226	69%	1.203.177	118.935	1.322.112	9%
May	3.080.969	323.587	3.404.556	10%	558.778	99.589	658.367	15%
June	2.038.805	734.525	2.773.329	26%	2.126.046	305.750	2.431.796	13%
July	2.819.765	822.801	3.642.566	23%	823.594	-35.007	788.587	-4%
August	4.266.028	-53.002	4.213.026	-1%	227.898	23.133	251.030	9%
September	852.549	661.446	1.513.995	44%	613.526	86.806	700.332	12%
October	445.400	531.112	976.511	54%	2.447.839	31.771	2.479.610	1%
November	2.480.155	1.481.116	3.961.271	37%	1.126.777	123.943	1.250.720	10%
December	2.294.475	1.263.517	3.557.991	36%	586.267	-9.255	577.012	-2%
Total	**26.272.940**	**10.627.087**	**36.900.026**	**29%**	**10.653.166**	**1.097.707**	**11.750.873**	**9%**

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[1] We would like to clarify that in the studies performed, when no export capacity was available, the considered value of the interconnection was the compensation for the Long Term Capacity.

AM/IWV Daily Capacity Rights
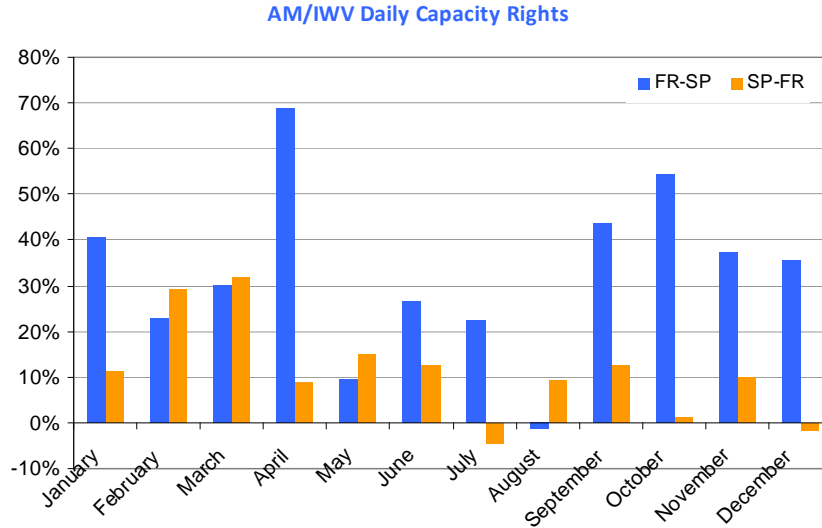
b. Monthly Capacity Rights 2008

2008	Fr-Es				Es-Fr			
	CR	AM	IWV	AM/IWC	CR	AM	IWV	AM/IWC
January	323.417	1.415.985	1.739.402	**81%**	1.673.330	-1.398.936	274.394	**-510%**
February	584.640	499.021	1.083.661	**46%**	160.080	-110.482	49.598	**-223%**
March	463.460	-2.047	461.413	**0%**	108.713	209.137	317.850	**66%**
April	246.024	-81.724	164.300	**-50%**	417.024	1.796.536	2.213.560	**81%**
May	777.816	1.849.847	2.627.663	**70%**	179.280	286.529	465.809	**62%**
June	308.160	5.044	313.204	**2%**				
July	960.541	432.659	1.393.200	**31%**	482.890	-227.622	255.268	**-89%**
August	463.680	78.190	541.870	**14%**	487.368	-345.317	142.051	**-243%**
September	994.006	-186.767	807.239	**-23%**	630.240	253.065	883.305	**29%**
October	349.085	321.908	670.993	**48%**	2.114.112	475.339	2.589.451	**18%**
November	190.000	865.794	1.055.794	**82%**	2.532.240	-1.843.610	688.631	**-268%**
December	363.648	187.455	551.103	**34%**	1.266.170	-149.342	1.116.828	**-13%**
Total	**6.024.476**	**5.385.366**	**11.409.842**	**47%**	**10.051.447**	**-1.054.702**	**8.996.745**	**-12%**

AM/IWV Monthly Capacity Rights

c. Annual Capacity Rights 2008

|	Fr-Es				Es-Fr			
	CR	AM	IWV	AM/IWC	CR	AM	IWV	AM/IWC
2008	5.965.306	2.031.812	7.997.118	**25%**	7.463.677	-2.785.906	4.677.771	**-60%**

AM/IWV Yearly Capacity Rights
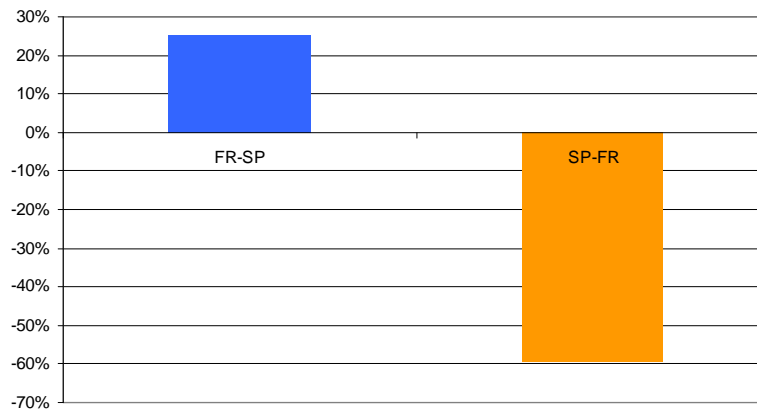
The following conclusions are drawn:

1. Arbitrary Margin is significantly greater in the France-Spain direction than in the Spain-France direction.
2. Should we have the same decree of competition in the France-Spain direction than in the Spain-France direction, the increase of the Social Welfare in both countries will be equal to 20.697.631 M€ in 2008 (7.180.074 M€ from the daily capacity rights, 6.722.959 M€ from the monthly capacity rights, and 6.794.597 M€ from the yearly capacity rights).

2. End consumers are not taking advantage of the arbitrage margins kept by players

As shown in the graph below, players obtaining high Arbitrage Margin are not using the energy to supply end consumers.
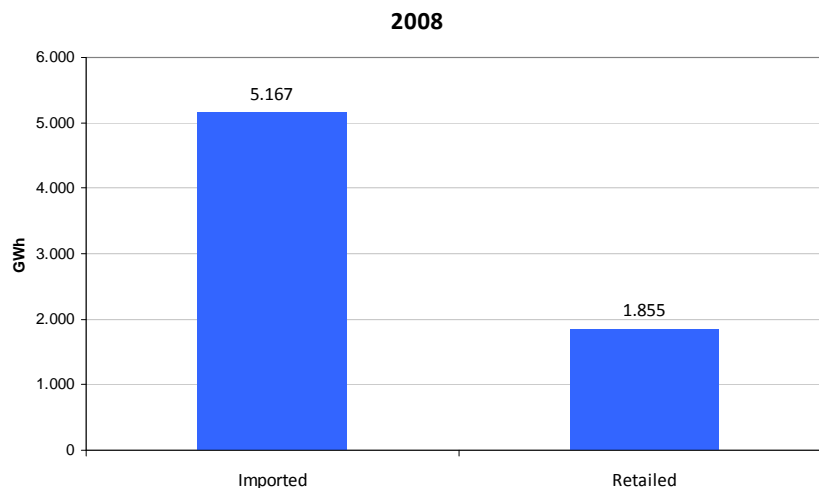
2008

Despite the huge advances taken in the Spanish Retail Business during 2008, the supply to end-customers by active players importing from France was considerably lower than the volume imported by them. In fact, the total volume imported in 2008 accounted for 5,1 TWh, while the total Retail Business of these players was only 1,8 TWh.

3. The interconnection is not congested a significant percentage of hours in which importing energy from France to Spain is economically viable (Powernext<OMEL).

There is spare and economically viable capacity in the interconnection. Even in these hours, importing energy from France to Spain is forbidden to the *Dominant Agents*. Since the prohibition came into effect, 43% of the hours in which importing was economically viable have not been congested.

In the following table, percentages of non-congested hours during the year are shown:

	2006	2007	2008	2009
Percentage of non-congested hours in which importing energy is economically viable	67%	31%	39%	36%