



MARKET COUPLING ON THE ITALIAN – SLOVENIAN BORDER

2011



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1. Regulatory Framework

On the Italian-Slovenian border, the allocation of daily capacities is done by the Italian-Slovenian Market Coupling (hereinafter: ITA-SI MC), that simultaneously effects an implicit allocation of physical daily transmission rights and a clearing of energy offers-demands.

This project was initiated in April 2008, when GME, Borzen and BSP have entered into a collaboration by signing a Memorandum of Understanding, for the purpose “*to develop a proposal of market coupling mechanism for the management of the interconnector capacity, starting with electrical border between Italy and Slovenia*” and with the final aim of offering a response to the challenges of a further regional integration of electricity markets within the EU.

This initiative has been supported by the Ministries of Foreign Affairs of Italy and Slovenia, that, on behalf of the respective Governments, stated their cooperation to the aforementioned MoU by signing a Joint Declaration on September 8th 2008, which stated “*to support the activities aimed at further integration of European internal energy market, also in the field of Energy Community, including the cooperation between GME and Borzen*”.

GME, BSP and Borzen, presented in November 2008 a Discussion document “*Establishment of A Market Coupling Mechanism On The Slovenian-Italian Border*” to set up the technical and operational features for the integration of Market Coupling activities. This document was formally submitted to the Italian Ministry of Economic Development (MSE - Italy) and the Slovenian Ministry of Economy (ME - Slovenia), the Italian Regulatory Authority for Electricity and Gas (AEEG), the Energy Agency of the Republic of Slovenia (AGEN-RS), the Italian TSO (Terna), the Slovenian TSO (ELES), with a view to possibly enter into a wider agreement under which the parties involved will jointly organize and manage the Market Coupling project, with no prejudice to their respective activities.



On May 22nd 2009, a Kick-off meeting was organised, attended by the MSE – Italy, the AGEN-RS, the TSOs and the PX/MOs, where the participants established a bilateral Working Group (WG), involving representatives from relevant Ministries, NRAs, TSOs and PX/MOs, to work in parallel both on the technical aspects and the governance/contractual issues for the implementation of the ITA-SI MC. The participants also agreed to periodically inform the Implementation Group of the Central-South Region about the progresses of the ITA-SI MC project.

The Ministries of Foreign Affairs of Italy and Slovenia, on behalf of the respective Governments, re-affirmed their support to the WG by signing a Joint Declaration on November 9th 2009, which agreed *“to provide every support to the interstate expert working group in pursuing the objective of integrating the electricity markets”*.

In accordance with the conclusions of the Kick-off meeting held in Rome on May 22nd 2009, the NRAs presented the Italian - Slovenian Market Coupling project during the 14th Implementation Group meeting for the region of Central South Europe.

The MSE – Italy and the ME – Slovenia, on behalf of the respective Governments, stated their institutional support to the implementation of Market Coupling project on the Italian-Slovenian border by signing a Memorandum of Understanding on August 27th 2010, which agreed *“to ensure institutional support to the process aiming to allocate cross border capacity on Italian-Slovenian border through implicit method by organizing a day-ahead market coupling on the Slovenian-Italian border.”*

The AEEG (Resolution ARG/EI 143/10, of 13th September 2010) and AGEN-RS (Approval n. 141-4/2010-3/EE-03, of 13th October 2010) approved the draft of the Master Agreement that establishes a reference frame for the identification of main features regarding the ITA-SI MC.

In the field of the EU regulation for the electricity sector, the ITA-SI MC project is in compliance with and support the provisions stated by the Regulation (EC) n. 714/2009 which in detail establishes (Art.12) to apply *“the coordinated allocation of cross-border capacity through non-discriminatory market-based solutions, paying due attention to the specific merits of implicit auctions for short-term allocations”*.



In the specific context of the Italian Legislation, the achievement of the aforementioned object, follows up the regulation in force issued by the Italian Law n. 02/2009 (Art. 3 comma 10-*ter*) which requires to promote the activities for a wider integration of the Italian power market with the other power markets of the neighbouring countries.



2. ITA-SI MC: main features

Under a common regulatory framework defined by the MoU signed by MSE – Italy and the ME – Slovenia on August 27th 2010 and by the Master Agreement approved by AEEG and AGEN-RS, GME (the Italian PX), BSP (the Slovenian PX), Terna (the Italian TSO), Eles (the Slovenian TSO) and Borzen (the Slovenian Market Operator), will coordinate their activities related to the functioning of the day-ahead markets in order to perform the ITA-SI MC.

According to the provision of the Master Agreement, ITA-SI MC is a decentralised price coupling that determines cross-border schedules by adopting a common algorithm and coordinated procedures and software that fully reflects local matching rules, local bid and offer curves and zonal structure in Italy and Slovenia.

The role of shipping agent, meaning the role of being counterpart of PXs for the transactions corresponding to cross-border schedule determined by market coupling, is initially performed by the TSOs. ITA-SI MC will coexist with other forms of physical allocation of cross-border capacity, such as explicit auctions of medium and long term products.



3. Description of the model

ITA-SI MC is a decentralised price coupling under which the parties involved coordinate their operations with no prejudice to their respective activities.

In this respect, the contractual scheme and the governance of the ITA-SI MC reflect competences and responsibilities already held by each party.

The cross-border schedules are the import/export quantities, as calculated by the GME and BSP, through a common matching algorithm, reflecting the differences between the prices of neighbouring zones of Italy and Slovenia, under the technical limitation provided by TSOs.

In order to guarantee a high quality of results, GME and BSP will adopt a common matching algorithm and apply the same matching rules on the respective day-ahead markets. This common algorithm relies on the following features:

- **Hourly implicit auction with no inter-temporary constraint.** Results of each hour will be computed independently from the results of the remaining hours of the same day;
- **Market splitting algorithm.** The common matching algorithm includes the overall structure of the grid model defined by the Italian and Slovenian TSO, including a total number of 18 zones; 17 zones for the Italian market (6 physical zones; 5 constrained zones consisting only of generating units whose interconnection capacity with the grid is lower than their installed capacity; 6 virtual zones adopted to give separate evidence to the import/export from/to Italian electrical borders) and 1 zone for the Slovenian market.

Clearing market price is defined by the system marginal price given by the intersection of demand and supply curves.

If resulting cross-border schedules among the zones do not violate any transmission limit, the clearing price is a single price in all zones and it is equal to the marginal price given by the overall demand and supply curves. On the contrary, if at least one grid limit is violated, the algorithm “splits” the market in two market



zones – one export zone including all the zones upstream of the constraint and one import zone including all the zones downstream of the constraint. In each market zone, the algorithm repeats the above-mentioned intersection process and, for each market zone, it builds a zonal supply curve and a demand curve.

The result is a zonal clearing price, which is different in each market zone and that is higher in the importing market zone and lower in the exporting one. If, as a result of this solution, additional constraints within each market zone have been violated, the market splitting process is iteratively repeated within this zone until obtaining a result which is consistent with grid constraints.

With regard to the price of electricity allocated for consumption in Italy it shall be evidenced that - in order to have a real price coupling, which takes into proper consideration market rules applied both in the Slovenian power market and in the Italian power market, and which is capable to determine an appropriate power flow with a correct direction consistent with and reflecting the “real” price difference between Italy and Slovenia, in case of price difference between Italian physical zones - the algorithm applies a national single purchasing price (PUN) limited to the 6 Italian physical zones, which is equal to the average of zonal prices weighted by zonal consumption.

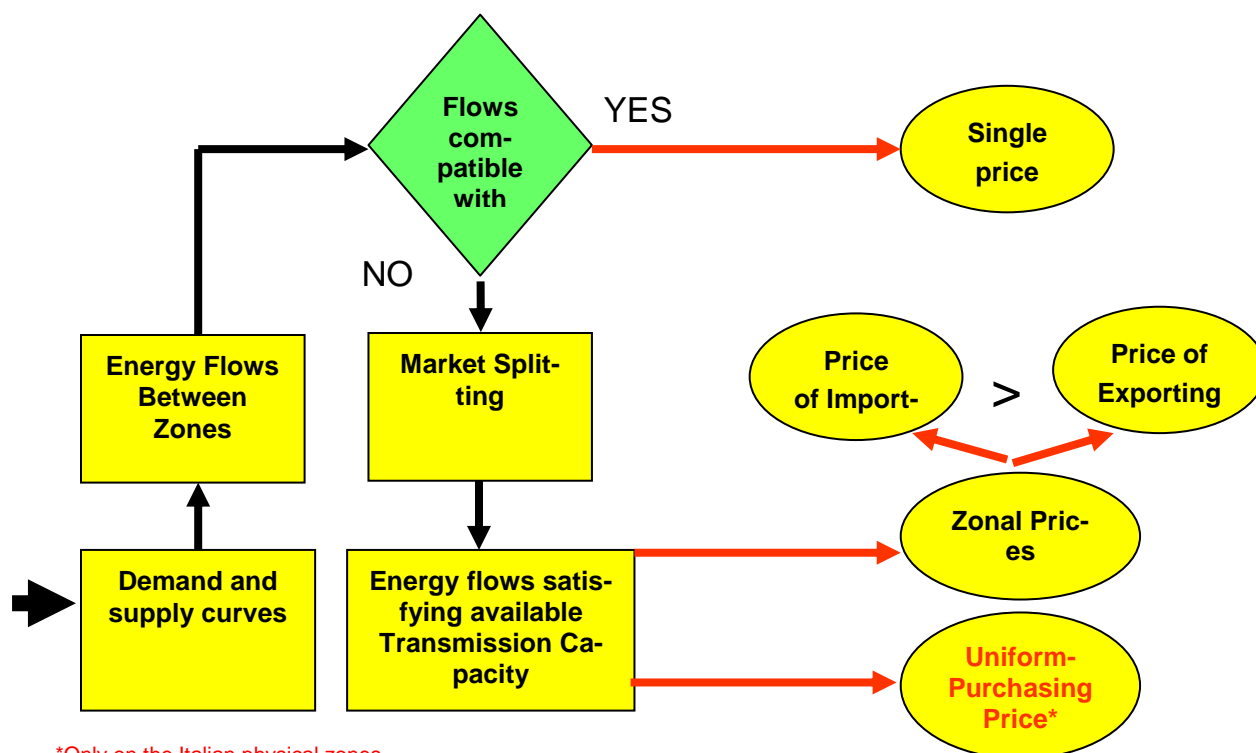
The above-described market splitting mechanism is adopted with an ATC grid model but it supports also a flow-based grid model.

- **Stepwise bid/offer curve.** Supply and demand curves processed by the matching software are stepwise. Each step of the curve consists of a pair of values indicating the volume of electricity offered to the market and the related price.

In order to build the overall curves, in first place, all supply offers are ranked in increasing price order on the aggregate supply curve and all demand bids are ranked in decreasing price order on the aggregate demand curve.

In second place, the ranking between bids and offers submitted at the same price is defined on a rotational monthly basis, giving the priority to bids and offers coming from one PX¹.

In third place, in case of bids or offers submitted at the same price and coming from the same PX, local rules are applied in order to define the priority.



*Only on the Italian physical zones

¹ For instance, assuming that in the month of January, bids/offers of the Italian market have priority with respect to the Slovenian ones, in case there are two offers, one coming from an Italian market participant and one coming from a Slovenian market participant, submitted at the same price, the Italian one will have priority. On the contrary, assuming that in the month of February, bids/offers of the Slovenian market have priority with respect to the Italian ones, in case there are two offers, one coming from an Italian market participant and one coming from a Slovenian market participant, submitted at the same price, the Slovenian one will have priority.



4. Operational procedures

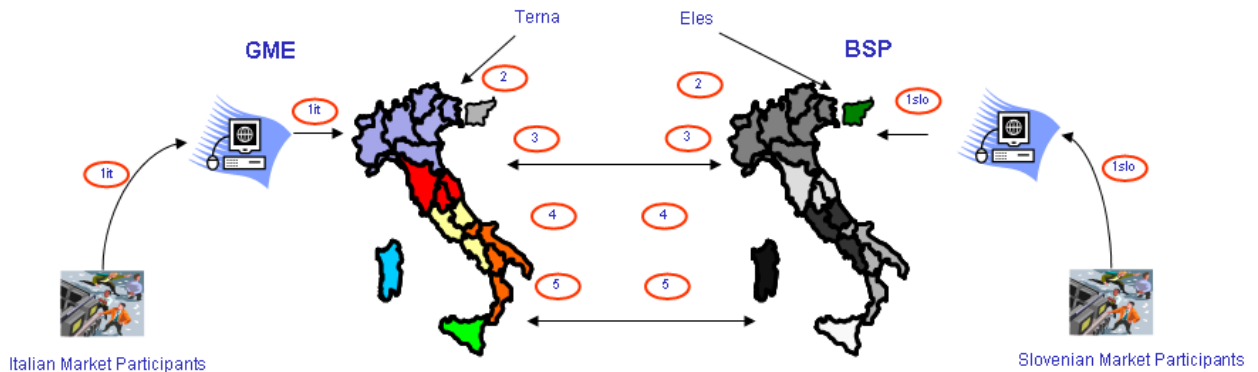
The ITA-SI MC adopts a decentralized approach, where each PX manages its own trading system and runs its own matching software, which incorporates a common matching algorithm taking into account the overall grid model defined by the Italian and Slovenian TSO for their respective markets.

As a consequence:

- market participants of Italian and Slovenian market will submit bids and offers to the trading system of their local PX;
- each TSO will communicate to its local PX the information regarding the daily ATC values between Italy and Slovenia to be allocated through the ITA-SI MC and PXs publish this information on their respective trading platform;
- GME and BSP will:
 - o exchange all relevant information regarding bids and offers (in anonymous way) of respective market participants;
 - o exchange all relevant information regarding ATC values.

In particular:

- GME will communicate to BSP transmission limits between the zones of the Italian markets;
- GME and BSP will check that the ATC values, between Italy and Slovenia, communicated by respective TSO, are the same.
- o simultaneously run the respective matching software in order to compute the market results;
- o check the consistency of the calculated market results and publish the results.



- 1it Italian market participants submit bids/offers to GME
- 1slo Slovenian market participants submit bids/offers to BSP
- 2 Each TSO send ATC values for the SI-Ita border to its local PX
- 3 GME and BSP share bids/offers (in anonymous way) and ATC values communicated by respective TSOs
- 4 GME and BSP simultaneously run the matching algorithm and compute results
- 5 GME and BSP check the consistency of results and publish results

An indicative timeline of the operations will be:

- Between 07:00 Am and 7:45 Am: for each direction TSOs calculate and confirm daily ATC values to be allocated through the ITA-SI MC, i.e. implicit auctions, respectively
- 07:45 Am: daily ATC are made available to PXs according to respective national arrangements between TSO and PX. PXs check whether received daily ATC values are the same and publish them on their respective trading platform².
- 09:00 Am: gate closure of the Italian and Slovenian day-ahead market.
- By 09:40 Am: PXs exchange relevant anonymous bids and offers of their market participants, structure of the zones of their internal market and transmission limits between the zones of their internal market.
- By 09:50 Am: each PXs calculate market results.
- By 10:15 Am: PXs check the consistency of market results.

² This information is also published on the web site of PXs.



- By 10:25 Am: each PX confirms, make available to its local TSO (according to national arrangements) and publishes market results on their respective trading platform³.

³ This information is also published on the web site of PXs.



5. ATC reserved for the ITA-SI MC

For the starting year of 2011, the indicative daily ATC values to be allocated through the ITA-SI MC, i.e. implicit auctions, will be in the range of ATC values currently allocated through daily explicit auction